5 Appendix 5 – Full list of SEAs

Table 10-8 Terrestrial SEAs which are present within 2 km of the Project Area

SEA	Criteria met For Classification
SEA_T_2163	1, 2, 4
SEA_T_2164	3
SEA_T_2165	2, 3, 4
SEA_T_2165A	2
SEA_T_2168	2, 3
SEA_T_2169	1, 2, 3, 4
SEA_T_2180	1, 2, 4, 5
SEA_T_2190	1, 2, 3, 4
SEA_T_2191	2, 3, 4
SEA_T_2192	2, 3
SEA_T_2192a	1, 2, 3, 4
SEA_T_2193	3
SEA_T_2194	1, 2, 3
SEA_T_2204	2
SEA_T_2205	1, 3
SEA_T_2206	3
SEA_T_2209	2, 3
SEA_T_2212	2, 3
SEA_T_2213	1, 3
SEA_T_2214	3, 4
SEA_T_2214a	4
SEA_T_2214b	4
SEA_T_2215	1
SEA_T_2217	1
SEA_T_2218	2
SEA_T_2220	1, 2
SEA_T_2222	1, 4
SEA_T_2223	1, 4
SEA_T_2456	1
SEA_T_2458	1, 3, 4

SEA	Criteria met For Classification
SEA_T_3490	2, 4
SEA_T_3491	2, 4
SEA_T_3496	2, 4
SEA_T_3497	2, 4
SEA_T_3526	2, 3, 4, 5
SEA_T_3590	2, 3
SEA_T_5446	4
SEA_T_6263	2, 4
SEA_T_6264	2
SEA_T_6304	3
SEA_T_6320	4
SEA_T_6323	3
SEA_T_6324	4
SEA_T_6345	3
SEA_T_6346	2, 3
SEA_T_6349	4
SEA_T_6384	2, 3
SEA_T_6390	4
SEA_T_6405	4
SEA_T_6406	2, 4
SEA_T_6416	1, 2, 3
SEA_T_6418	3, 4
SEA_T_6420	4
SEA_T_6420a	4
SEA_T_6421	4
SEA_T_6422	4
SEA_T_6453	1, 2, 3
SEA_T_6463	2, 3, 4, 5
SEA_T_6481	4
SEA_T_6482	4

SEA	Criteria met For Classification
SEA_T_6483	4
SEA_T_6539	2, 4
SEA_T_6652	1, 2, 3,4
SEA_T_6652b	2
SEA_T_6669	1, 2, 3, 4
SEA_T_6683	2, 4
SEA_T_7017	2, 3
SEA_T_8064	4
SEA_T_8065	2, 4
SEA_T_8078	2, 4
SEA_T_8108	4
SEA_T_8109	2
SEA_T_8112	1
SEA_T_8115	4
SEA_T_8116	1, 2, 3
SEA_T_8117	2, 5
SEA_T_8119	1, 2, 3
SEA_T_8124	2, 4
SEA_T_8125	1
SEA_T_8127	4
SEA_T_8129	4, 5
SEA_T_8133	3
SEA_T_8198	1, 2, 4
SEA_T_8200	4
SEA_T_8203	4
SEA_T_8205	4

SEA	Criteria met For Classification
SEA_T_8206	1, 2, 4
SEA_T_8207	1, 2
SEA_T_8208	2, 4
SEA_T_8287	2, 3
SEA_T_8291	3, 4, 5
SEA_T_8292	2, 4
SEA_T_8293	3, 4
SEA_T_8294	2, 3, 4
SEA_T_8295	1, 2, 3, 4
SEA_T_8296	1, 3
SEA_T_8297	1, 2, 3
SEA_T_8298	1, 2, 3
SEA_T_8299	1, 2, 3, 4
SEA_T_8300	1, 2, 3, 4
SEA_T_8301	4
SEA_T_8305	2
SEA_T_8310	3
SEA_T_8311	2, 4
SEA_T_8332	1, 2, 3
SEA_T_8334	3, 4, 5
SEA_T_8338	1, 2, 3
SEA_T_8340	1, 2, 3
SEA_T_8343	1, 2, 3
SEA_T_8428	4
SEA_T_8431	4

Table 10-9 Marine SEAs which are present within 2 km of the Project Area

SEA	Criteria met For Classification
SEA-M1-57a	Mangroves grade into coastal forest on western side of Waiokahukura (Lucas Creek). The saline vegetation is an important habitat for threatened secretive coastal fringe birds, particularly where it abuts terrestrial vegetation, which provides roosts and potential nest sites for birds. The forest cover here consists of kauri on the ridges with puriri and kahikatea dominant on the slopes and in the gullies. The coastal forest is comprised of pohutukawa, kowhai and karaka. A large area of regenerating kauri/ tanekaha-broadleaved forest occurs on the northern Waiokahukura (Lucas Creek)escarpment. It forms part of the largest block of continuous forest in the Tamaki Ecological District.
SEA-M1-64b	Saline vegetation and other intertidal areas grade into coastal pohutukawa forest on sheltered cliffs, then into taraire forest on coastal hill country, and finally into kanuka forest on a headland. Both of the latter are considered to be the best examples of their types in the ecological district. At Karepiro Creek, the marine environment grades into significant coastal saltmarsh on stabilised sand above Mean HighWater Springs. The Department of Conservation has selected this area as an Area of Significant Conservation Value (ASCV).
SEA-M1-64w1	Extensive intertidal feeding habitat for waders along this coastline.
SEA-M2-57b	This area is the best example of the muddy, mangrove- lined inlets of the inner Waitemata Harbour. The diversity and productivity of the flora and fauna is generally large with extensive beds of shellfish and abundances of birds and fish. Gradations between the marine environment and either natural freshwater or natural terrestrial systems are a major characteristic of the ramifying arms of the system. These arms are also important as pathways for migration by native freshwater fish. The mangroves and saline vegetation is an important habitat for threatened secretive coastal fringe birds, particularly where it abuts terrestrial vegetation, which provides roosts and potential nest sites for birds. Brighams, Rangitopuni, Paremoremo, Lucas and Hellyers creeks in the upper reaches of the Waitemata Harbour offer largely un spoilt tidal inlets with hill sides of regenerating native forest in the area of Lucas and Paremoremo Creeks. The forest cover here consists of kauri on the ridges with puriri and kahikatea dominant on the slopes and in the gullies. The coastal forest is comprised of pohutukawa, kowhai and karaka. The SEA-M2 Schedule 4 Significant Ecological Areas – Marine Schedule Auckland Unitary Plan Operative in part 51 extensive sheltered intertidal areas retain large quantities of soft sediment derived from the watershed. The mangroves and salt marshes are important as wildlife habitats. Birds which can be found in the area include black shag, kingfisher and white-fronted tern. A large area of regenerating kauri/ tanekaha-broadleaved forest occurs on the northern Waiokahukura (Lucas Creek) escarpment. It forms part of the largest block of continuous forest in the Tamaki Ecological District. Pohutukawa line the coastal edge of Paremoremo Creek mouth, and significant remnants of coastal forest grade into mangroves.
SEA-M2-65a	Wading birds feed in the adjacent intertidal areas to the south of the shell spits. The estuary also provides a good habitat for the coastal birds. There are also intact ecological sequences from mangroves and saline vegetation grading into coastal forest on the northern slopes of the Wade River. Here coastal broadleaved forest and shrubland forms a narrow continuous corridor from the mouth of the river to the upper reaches.
SEA-M2-72	Moderate to small sized estuary with a variety of habitats for plant and animal communities in the marine area. The harbour contains significant areas of intertidal banks where migratory wading birds feed and use this estuary as a stepping stone in their travels. A range of coastal birds, particularly shags, also feed within the estuary as do a number of species of waterfowl that utilise the estuary and the adjacent oxidation ponds on the southern margin. The mangroves and saltmarsh that occupy the remaining parts of the estuary are a habitat for banded rail particularly where adjoining terrestrial vegetation provides shelter for the birds at high tide and offers potential nesting sites. A remnant of riverine kowhai-hinau-hard beech forest occurs on the northern edge of the SEA-M2 Schedule 4 Significant Ecological Areas – Marine Schedule Auckland Unitary Plan Operative in part 60 Ōrewa River
SEA-M2-72w1	Extensive intertidal feeding habitat for waders in this estuary.

6 Appendix 6 – Full List of Fauna Records

Table 10-10 List of bird species recorded within 2 km of the Project Area based on the eBird and iNaturalist databases, as well as incidental observations onsite

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Record Source
African Collared-Dove	–	*Streptopelia roseogrisea*	Not Threatened	eBird
Australasian bittern	Matuku-hūrepo.	*Botaurus poiciloptilus*	Threatened – Nationally Critical	iNaturalist
Australasian Grebe	Tikitiki	*Tachybaptus novaehollandiae*	Non-Resident Native - Coloniser	eBird
Australasian Swamphen	Pūkeko	*Porphyrio melanotus*	Not Threatened	eBird, observed onsite
Australian Magpie	Makipai	*Gymnorhina tibicen*	Introduced and Naturalised	eBird
Australian Shoveler	Kuruwhengi	*Spatula rhynchotis*	Not Threatened	eBird
Banded Dotterel	Pohowera	*Charadrius bicinctus*	At Risk - Declining	iNaturalist
Banded Rail	Mioweka	(*Gallirallus philippensis assimilis*)	At Risk – Declining	iNaturalist
Bar-Tailed Godwit	Kuaka	*Limosa lapponica*	At Risk - Declining	eBird, iNaturalist
Bellbird	Korimako	*Anthornis melanura*	Not Threatened	eBird
Black Shag	Māpunga	Phalacrocorax carbo	At Risk - Relict	iNaturalist
Black Petrel	Tāiko	*Procellaria parkinsoni*	Threatened - Nationally Vulnerable	iNaturalist
Black Swan	Kakianau	*Cygnus atratus*	Not Threatened	eBird
Black-Billed Gull	Tarāpuka	*Chroicocephalus bulleri*	At Risk - Declining	eBird, iNaturalist
Brown Quail	Kuera	*Synoicus ypsilophorus*	Introduced and Naturalised	eBird
Brown Teal	Pāteke	*Anas chlorotis*	Threatened - Nationally Increasing	iNaturalist
Buller's Shearwater	–	*Puffinus bulleri*	At Risk - Naturally Uncommon	iNaturalist
California Quail	Tikaokao	*Callipepla californica*	Introduced and Naturalised	eBird
Canada Goose	–	*Branta canadensis*	Introduced and Naturalised	eBird, observed onsite

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Record Source
Caspian Tern	Taranui	*Hydroprogne caspia*	Threatened - Nationally Vulnerable	eBird, iNaturalist
Common Chaffinch	Pahirini	*Fringilla coelebs*	Introduced and Naturalised	eBird
Common Myna	–	*Acridotheres tristis*	Introduced and Naturalised	eBird, observed onsite
Cook's Petrel	Tītī	*Pterodroma cookii*	At Risk - Relict	iNaturalist
Dabchick	Weweia	*Poliocephalus rufopectus*	Threatened - Nationally Increasing	iNaturalist
Dotterel	Tūturiwhatu	*Charadrius obscurus*	Threatened - Nationally Increasing	iNaturalist
Dunnock	–	*Prunella modularis*	Introduced and Naturalised	eBird
Eastern Rosella	Kākā Uhi Whero	*Platycercus eximius*	Introduced and Naturalised	eBird
Eurasian Blackbird	Manu Pango	*Turdus merula*	Introduced and Naturalised	eBird, observed onsite
Eurasian Skylark	Kairaka	*Alauda arvensis*	Introduced and Naturalised	eBird
European Goldfinch	–	*Carduelis*	Introduced and Naturalised	eBird
European Greenfinch	–	*Chloris chloris*	Introduced and Naturalised	eBird
European Starling	Tāringi	*Sturnus vulgaris*	Introduced and Naturalised	eBird, observed onsite
Fantail	Pīwakawaka	*Rhipidura fuliginosa*	Not Threatened	eBird, observed onsite
Gray Gerygone	Riroriro	*Gerygone igata*	Not Threatened	eBird, observed onsite
Gray Teal	Tete	*Anas gracilis*	Not Threatened	eBird
Graylag Goose	Kuihi	*Anser anser*	Introduced and Naturalised	eBird
Grey duck	Pārera	*Anas superciliosa*	Threatened - Nationally Vulnerable	eBird
Unidentified Gull	–	*Larinae* sp.	N/A	eBird
House Sparrow	Tiu	*Passer domesticus*	Introduced and Naturalised	eBird, observed onsite
Kelp Gull	Karoro	*Larus dominicanus*	Not Threatened	eBird

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Record Source
Laughing Kookaburra	–	*Dacelo novaeguineae*	Introduced and Naturalised	eBird
Little Black Shag	Kawau Tūī	*Phalacrocorax sulcirostris*	At Risk - Naturally Uncommon	eBird
Little Pied Shag	Kawau Paka	*Microcarbo melanoleucos*	At Risk - Relict	eBird
Long-Tailed Cuckoo	–	*Eudynamys taitensis*	Threatened - Nationally Vulnerable	eBird
Mallard	Rakiraki	*Anas platyrhynchos*	Introduced and Naturalised	eBird
Mallard X grey duck (Hybrid)	–	*Anas platyrhynchos x superciliosa*	N/A	eBird
Masked Lapwing	–	*Vanellus miles*	Not Threatened	eBird
Morepork	Ruru	*Ninox novaeseelandiae*	Not Threatened	eBird
Muscovy Duck	–	*Cairina moschata*	Introduced	eBird
New Zealand Wood Pigeon	Kererū	*Hemiphaga novaeseelandiae*	Not Threatened	eBird, iNaturalist
North Island Fernbird	Mātātā	*Poodytes punctatus*	At Risk - Declining	eBird
North Island Kākā	Kākā	*Nestor meridionalis*	At Risk - Recovering	eBird, iNaturalist
Pacific Reef-Heron	Matuku Moana.	*Egretta sacra*	Threatened - Nationally Endangered	eBird, iNaturalist
Paradise Shelduck	Pūtangitangi	*Tadorna variegata*	Not Threatened	eBird, observed onsite
Unidentified Passerine	–	*Passeriformes* sp.	N/A	eBird
Pied Shag	Kāruhiruhi	*Phalacrocorax varius*	At Risk - Recovering	eBird
Pied Stilt	Poaka	*Himantopus leucocephalus*	Not Threatened	eBird
Red Billed Gull	Tarāpunga	*Larus novaehollandiae scopulinus*	At Risk - Declining	eBird, iNaturalist
Ring-Necked Pheasant	–	*Phasianus colchicus*	Introduced and Naturalised	eBird
Rock Pigeon	–	*Columba livia*	Introduced and Naturalised	eBird

Common Name	Māori Name	Scientific Name	Conservation Status (Robertson et al., 2021)	Record Source
Royal Spoonbill	Kōtuku ngutupapa	*Platalea regia*	At Risk - Naturally Uncommon	eBird
Sacred Kingfisher	Kotare	*Todiramphus sanctus*	Not Threatened	eBird, observed onsite
Shining Bronze-Cuckoo	Pīpīwharauroa	*Chrysococcyx lucidus*	Not Threatened	eBird
Silvereye	Tauhou	*Zosterops lateralis*	Not Threatened	eBird
Song Thrush	Manu-kai-hua-rakau	*Turdus philomelos*	Introduced and Naturalised	eBird
Sooty Shearwater	Tītī	*Puffinus griseus*	At Risk - Declining	iNaturalist
South Island Oystercatcher	Tōrea	*Haematopus finschi*	At Risk - Declining	eBird
Spotless Crake	Pūweto	*Zapornia tabuensis*	At Risk - Declining	eBird
Spotted Dove	–	*Streptopelia chinensis*	Not Threatened	eBird
Swamp Harrier	Kāhu	*Circus approximans*	Not Threatened	eBird, observed onsite
Tomtit	Miromiro	*Petroica macrocephala*	Not Threatened	eBird
Tui	Tūī	*Prosthemadera novaeseelandiae*	Not Threatened	eBird
Variable Oystercatcher	Tōrea pango	*Haematopus unicolor*	At Risk - Recovering	eBird
Welcome Swallow	Warou	*Hirundo neoxena*	Not Threatened	eBird
White heron	Kōtuku	*Ardea alba*	Threatened - Nationally Critical	eBird
White-Faced Heron	Matuku moana	*Egretta novaehollandiae*	Not Threatened	eBird
White-Fronted Tern	Tara	*Sterna striata*	At Risk - Declining	iNaturalist
Wild Turkey	Korukoru	*Meleagris gallopavo*	Introduced and Naturalised	eBird
Yellowhammer	–	*Emberiza citrinella*	Introduced and Naturalised	eBird

Table 10-11 List of herpetofauna species within 5 km of the Project Area based on the DOC Bioweb and iNaturalist databases, as well as incidental observations onsite

Common Name	Maori Name	Scientific Name	Conservation Status (Hitchmough et al., 2021)	Record Source
Auckland Green Gecko / Elegant Gecko	Moko kākāriki	*Naultinus elegans*	At Risk - Declining	DOC Bioweb, iNaturalist
Copper Skink	–	*Oligosoma aeneum*	At Risk - Declining	DOC Bioweb
Forest Gecko	Moko pirirākau	*Mokopirirakau granulatus*	At Risk - Declining	DOC Bioweb, iNaturalist
Green And Golden Bell Frog	Poraka	*Ranoidea aurea*	Introduced and Naturalised	iNaturalist
Ornate Skink	–	*Oligosoma ornatum*	At Risk - Declining	DOC Bioweb
Pacific Gecko	Teretere	*Dactylocnemis pacificus*	Not Threatened	DOC Bioweb
Plague Skink	–	*Lampropholis delicata*	Introduced and Naturalised	DOC Bioweb, oberved onsite
Shore Skink	Tatahi	*Oligosoma smithi*	At Risk - Declining	iNaturalist
Southern Bell Frog	–	*Ranoidea raniformis*	Introduced and Naturalised	DOC Bioweb, iNaturalist, observed onsite

Table 10-12 List of freshwater fish species recorded within the catchments and streams present within the Project Area based on the nzffdms database, as well as incidental observations onsite

Common Name	Scientific Name	Conservation Status (Dunn et al., 2017)	Record Source
Banded Kōkopu	*Galaxias fasciatus*	Not Threatened	nzffdms
Catfish	*Ameiurus nebulosus*	Introduced and Naturalised	nzffdms
Common Bully	*Gobiomorphus cotidianus*	Not Threatened	nzffdms
Common Smelt	*Retropinna retropinna*	Not Threatened	nzffdms
Crans Bully	*Gobiomorphus basalis*	Not Threatened	nzffdms
Freshwater Shrimp	*Paratya curvirostris*	Not Threatened	nzffdms
Gambusia	*Gambusia affinis*	Introduced and Naturalised	nzffdms
Giant Bully	*Gobiomorphus gobioides*	At Risk - Naturally Uncommon	nzffdms
Giant Kōkopu	*Galaxias argenteus*	At Risk - Declining	nzffdms
Goldfish	*Carassius auratus*	Introduced and Naturalised	nzffdms
Grass Carp	*Ctenopharyngodon idella*	N/A Exotic	nzffdms
Īnanga	*Galaxias maculatus*	At Risk - Declining	nzffdms
Koaro	*Galaxias brevipinnis*	At Risk - Declining	nzffdms
Koi Carp	*Cyprinus carpio*	Introduced and Naturalised	nzffdms
Koura	*Paranephrops* Sp.	Data Deficient	nzffdms
Longfin Eel	*Anguilla dieffenbachii*	At Risk - Declining	nzffdms
Perch	*Perci fluviatilis*	Introduced and Naturalised	nzffdms
Redfin Bully	*Gobiomorphus huttoni*	Not Threatened	nzffdms
Rudd	*Scardinius erythrophthalmus*	Introduced and Naturalised	nzffdms
Shortfin Eel	*Anguilla australis*	Not Threatened	nzffdms
Torrentfish	*Cheimarrichthys fosteri*	At Risk - Declining	nzffdms
Unidentified Bully	*Gobiomorphus* Sp.	N/A	nzffdms
Unidentified Eel	*Anguilla* Sp.	N/A	nzffdms
Unidentified Galaxiid	*Galaxias* Sp.	N/A	nzffdms

Table 10-13. Native freshwater fish species recorded within the catchments associated with the Project Area

Species	Conservation Status (Dunn et al., 2017)	Ecological Value	Catchment and Relevant NoR					
			NoR 4, 6, 10	NoR 1, 3, 4, 7, 8	NoR 1, 8, 11	NoR 1, 4, 5, 8, 9, 12, 13	NoR 1, 4	NoR 1, 4, 9
			Ōrewa River	Wēiti Stream and John Creek (Named tributary of Wēiti Stream)	Rangitopuni Stream	Dairy Stream	Ōkura River	Waiokahukura (Lucas Creek)
Banded Kōkopu *(Galaxias fasciatus)*	Not Threatened	Low	X	X	X	X	X	X
Common bully *(Gobiomorphus cotidianus)*	Not Threatened	Low	X	X	X	–	X	X
Common smelt *(Retropinna retropinna)*	Not Threatened	Low	–	–	–	–	X	–
Crans bully *(Gobiomorphus basalis)*	Not Threatened	Low	–	–	X	–	X	X
Freshwater Shrimp *(Paratya curvirostris)*	Not Threatened	Low	X	–	X	–	X	X
Giant bully *(Gobiomorphus gobioides)*	At Risk – Naturally Uncommon	High	X	X	–	–	X	–
Giant Kōkopu *(Galaxias argenteus)*	At Risk – Declining	High	X	–	–	–	X	–
Grass carp *(Ctenopharyngodon idella*)	N/A	N/A	X	–	–	–	–	–
Īnanga *(Galaxias maculatus)*	At Risk – Declining	High	X	X	X	X	X	–
Koaro *(Galaxias brevipinnis)*	At Risk – Declining	High	–	–	–	–	X	–

Species	Conservation Status (Dunn et al., 2017)	Ecological Value	Catchment and Relevant NoR					
			NoR 4, 6, 10	NoR 1, 3, 4, 7, 8	NoR 1, 8, 11	NoR 1, 4, 5, 8, 9, 12, 13	NoR 1, 4	NoR 1, 4, 9
			Ōrewa River	Wēiti Stream and John Creek (Named tributary of Wēiti Stream)	Rangitopuni Stream	Dairy Stream	Ōkura River	Waiokahukura (Lucas Creek)
Koura (*Paranephrops* Sp.)	Data Deficient	N/A	X	–	X	X	X	X
Longfin eel *(Anguilla dieffenbachii)*	At Risk – Declining	High	X	X	X	X	X	X
Redfin bully *(Gobiomorphus huttoni)*	Not Threatened	Low	X	X	X	–	X	X
Shortfin eel *(Anguilla australis)*	Not Threatened	Low	X	X	X	X	X	X
Torrentfish *(Cheimarrichthys fosteri)*	At Risk – Declining	High	X	–	–	–	–	–
Unidentified bully (*Gobiomorphus* Sp.)	N/A	N/A	–	–	X	–	–	–
Unidentified eel (*Anguilla* Sp.)	N/A	N/A	X	X	X	X	X	X
Unidentified galaxiid (*Galaxias* Sp.)	N/A	N/A	X	X	–	X	–	–

7 Appendix 7 – Full List of Streams and Wetlands

Table 10-14 Named rivers / streams and their tributaries that will be crossed within the Project Area (LINZ, 2022)

NoR	Ōrewa River and tributaries	Wēiti Stream and tributaries	John Creek (named tributary of Wēiti Stream) and tributaries	Rangitopuni Stream and tributaries	Huruhuru (Dairy Stream) and tributaries	Ōkura River and tributaries	Waiokahukura (Lucas Creek)and tributaries
NoR 1	–	X	X	X	X	X	X
NoR 2	–	–	–	–	–	–	–
NoR 3	–	X	–	–	–	–	–
NoR 4	X	X	X	–	X	X	X
NoR 5	–	–	–	–	X	–	–
NoR 6	X	–	–	–	–	–	–
NoR 7	–	X	–	–	–	–	–
NoR 8	–	–	X	X	X	–	–
NoR 9	–	–	–	–	X	–	X
NoR 10	X	–	–	–	–	–	–
NoR 11	–	–	–	X	–	–	–
NoR 12	–	–	–	–	X	–	–
NoR 13	–	–	–	–	X	–	–

Table 10-15. Summary of streams that fall within a proposed designation boundary for the North Projects, as well as their ecological values (see Section 4.4 for assessment methodology)

Stream ID	Stream Name	Hydroperiod	RHA Category	Ecological Value	Relevant NoR
N1-S1	Wēiti Stream	Permanent	High (RHA score: 81.5)	High	NoR 1, 4
N1-S2a*	Unnamed Tributary of John Creek	Permanent	–	Moderate	NoR 1
N1-S2b*	Unnamed Tributary of John Creek	Intermittent	–	Low	NoR 1
N1-S3*	Unnamed Tributary of John Creek	Permanent	–	Moderate	NoR 1
N1-S4*	Unnamed Tributary of the Rangitopuni Stream	Permanent	–	Moderate	NoR 1
N1-S5*	Dairy Stream	Permanent	–	Moderate	NoR 1
N1-S6*	Unnamed Tributary of the Dairy Stream	Intermittent	–	Low	NoR 1
N1-S7*	Unnamed Tributary of the Ōkura River	Permanent	–	Moderate	NoR 1, 4
N1-S8*	Unnamed Tributary of the Ōkura River	Intermittent	–	Low	NoR 1, 4
N1-S9	Ōkura River	Permanent	Moderate (RHA score: 45)	Moderate	NoR 1, 4
N1-S10a*	Unnamed Tributary of the Ōkura River	Permanent	–	Moderate	NoR 1, 4
N1-S10b*	Unnamed Tributary of the Ōkura River	Permanent	–	Moderate	NoR 1, 4
N1-S11*	Unnamed Tributary of the Ōkura River	Permanent	–	Moderate	NoR 1, 4
N3-S1*	Unnamed Tributary of the Wēiti Stream	Intermittent	–	Low	NoR 3
N4-S1*	Ōrewa River	Permanent	–	Moderate	NoR 4
N4-S2*	Ōrewa River	Permanent	–	High	NoR 4
N4-S3a*	Wēiti Stream.	Permanent	–	Moderate	NoR 4
N4-S3b	Unnamed Tributary of John Creek	Permanent	Low (RHA Score: 28)	Moderate	NoR 1, 4
N4-S4*	John Creek	Permanent	–	Moderate	NoR 4

Stream ID	Stream Name	Hydroperiod	RHA Category	Ecological Value	Relevant NoR
N4-S5*	John Creek	Permanent	–	Moderate	NoR 4
N4-S6a*	John Creek	Permanent	–	Moderate	NoR 4
N4-S6b*	John Creek	Permanent	–	Low	NoR 4
N4-S7*	Unnamed Tributary of John Creek	Permanent	–	Low	NoR 4
N4-S8*	Unnamed Tributary of John Creek	Intermittent	–	Low	NoR 4
N4-S9*	Unnamed Tributary of John Creek	Intermittent	–	Low	NoR 4
N4-S10*	John Creek	Permanent	–	Low	NoR 4
N4-S11*	John Creek	Permanent	–	Moderate	NoR 4
N4-S12*	John Creek	Permanent	–	Moderate	NoR 4
N4-S13*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4
N4-S14*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 4
N4-S15a*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 4
N4-S15b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4, 5
N4-S16a*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4, 13
N4-S16b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 13
N4-S17a	Unnamed Tributary of the Dairy Stream	Permanent	Low (RHA Score: 38.5)	Moderate	NoR 4, 13
N4-S17b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4
N4-S18*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4, 12
N4-S19*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 4
N4-S20	Unnamed Tributary of the Ōkura River	Permanent	Moderate (RHA Score: 44.5)	Low	NoR 4
N4-S21*	Unnamed Tributary of the Ōkura River	Intermittent		Low	NoR 1, 4

Stream ID	Stream Name	Hydroperiod	RHA Category	Ecological Value	Relevant NoR
N4-S22	Unnamed Tributary of the Ōkura River	Permanent	Moderate (RHA Score: 69)	High	NoR 4
N4-S23*	Unnamed Tributary of Lucas Creek	Permanent	Moderate (RHA Score: 54)	Moderate	NoR 4
N4-S24*	Unnamed Tributary of Lucas Creek	Permanent	–	High	NoR 1, 4
N4-S25	Unnamed Tributary of the Rangitopuni Stream	Permanent	Moderate (RHA Score: 41)	Moderate	NoR 1, 11
N4-S26*	Unnamed Tributary of the Rangitopuni Stream	Permanent	–	Moderate	NoR 11
N5-S1a^	Unnamed Tributary of the Dairy Stream	Intermittent	Moderate (RHA Score: 43)	Low	NoR 5
N5-S1b^	Dairy Stream	Permanent	Moderate (RHA Score: 45.5)	Moderate	NoR 5, 13
N5-S1c*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 5
N6-S1*	Tributary of the Ōrewa River	Permanent	–	Moderate	NoR 5, 13
N6-S2*	Tributary of the Ōrewa River	Intermittent	–	Low	NoR 6
N6-S3*	Tributary of the Ōrewa River	Intermittent	–	Low	NoR 6
N6-S4a*	Tributary of the Ōrewa River	Permanent	–	Moderate	NoR 6
N6-S4b*	Tributary of the Ōrewa River	Permanent	–	High	NoR 6
N6-S4c*	Tributary of the Ōrewa River	Intermittent	–	Low	NoR 6
N6-S4d*	Tributary of the Ōrewa River	Intermittent	–	Moderate	NoR 6
N6-S4e*	Tributary of the Ōrewa River	Intermittent	–	Low	NoR 6
N6-S5*	Ōrewa River	Permanent	–	Moderate	NoR 6
N6-S6*	Unnamed Tributary of the Ōrewa River	Permanent	–	Moderate	NoR 6
N7-S1a^	Wēiti Stream	Permanent	Moderate (RHA Score: 62.5)	Moderate	NoR 7
N7-S1b*	Unnamed Tributary of the Wēiti Stream	Permanent	–	Moderate	NoR 7
N7-S2a*	Unnamed Tributary of the Wēiti Stream	Permanent	–	Moderate	NoR 7

Stream ID	Stream Name	Hydroperiod	RHA Category	Ecological Value	Relevant NoR
N7-S2b*	Unnamed Tributary of the Wēiti Stream	Permanent	–	Low	NoR 7
N8-S1*	Unnamed Tributary of John Creek	Intermittent	–	Low	NoR 8
N8-S10*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 8
N8-S2*	Unnamed Tributary of the Rangitopuni Stream	Permanent	–	Moderate	NoR 8
N8-S3*	Unnamed Tributary of the Rangitopuni Stream	Permanent	–	Moderate	NoR 8
N8-S4*	Rangitopuni Stream	Permanent	–	Moderate	NoR 8
N8-S5a^	Unnamed Tributary of the Dairy Stream	Permanent	Moderate (RHA Score: 47.5)	Moderate	NoR 8
N8-S5b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 8
N8-S6*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 8
N8-S7a*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 8, 12
N8-S8a*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 8
N8-S8b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 8
N8-S9*	Unnamed Tributary of the Dairy Stream	Intermittent	–	Moderate	NoR 8
N8-S10*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 8
N9-S1^	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 9
N9-S2*	Unnamed Tributary of the Dairy Stream	Permanent	–	Moderate	NoR 9
N9-S3*	Unnamed Tributary of Lucas Creek	Permanent	–	High	NoR 9
N10-S1*	Ōrewa River	Permanent	–	Moderate	NoR 10
N12-S1a^	Unnamed Tributary of the Dairy Stream	Permanent	Moderate (RHA Score: 57.5)	Low	NoR 12
N12-S1b*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 12
N12-S2*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 12

Stream ID	Stream Name	Hydroperiod	RHA Category	Ecological Value	Relevant NoR
N12-S3*	Unnamed Tributary of the Dairy Stream	Permanent	–	Low	NoR 12
N12-S4a	Unnamed Tributary of the Dairy Stream	Permanent	Moderate (RHA Score: 43)	Moderate	NoR 12
N12-S4b	Unnamed Tributary of the Dairy Stream	Permanent	Low (RHA Score: 38.5)	Moderate	NoR 12

Notes: ^ = Ecological feature assessed from roadside or adjacent property boundary due to access restrictions. * = Ecological feature assessed at a desktop level due to access restrictions

Table 10-16. Summary of wetlands that fall within a proposed designation boundary for the North Projects, as well as their ecological values (see Section 4.4 for assessment methodology)

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N1-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 1
N1-O3*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O4*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O5*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 1
N1-O6*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O7*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O8*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O9*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O10*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1

[17] Open water, as an ecological feature, has been included under the wetland section.

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N1-O11*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O12*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O13*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O14*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 1
N1-O15*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O16*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O17*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 1
N1-O18*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O19*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 1
N1-O20*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 1, 4
N1-O21*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 1
N1-W1*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1
N1-W2*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1
N1-W3*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1
N1-W4	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 1
N1-W5^	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1
N1-W6^	EW	Natural Wetland	Potential for spotless crake.	Low	NoR 1
N1-W7^	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N1-W8*	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 1
N1-W9^	EW	Natural Wetland	Potential for spotless crake.	Low	NoR 1
N1-W10*	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 1
N1-W11*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 1
N1-W12^	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 1
N3-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 3
N3-O2^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 3
N4-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O3*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O4*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O5*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 4
N4-O6*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O7*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O8*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O9*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O10*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4
N4-O11*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N4-O12*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O13*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O14*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O15*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 4
N4-O16*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O17*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 4
N4-O18*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4
N4-O19*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O20*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4
N4-O21*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O22*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O23^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O24*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O25*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O26*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4
N4-O27^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O28*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 1, 4

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N4-O29*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O30*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O31*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O32*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O33*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O34*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O35*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O36^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O37*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O38*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-O39*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 1, 4
N4-O40*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Moderate	NoR 4
N4-O41*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, species of shags, and white heron.	Moderate	NoR 4
N4-O42*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, species of shags, and white heron.	Moderate	NoR 4
N4-O43*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4
N4-O44*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 4

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N4-O45*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Moderate	NoR 4
N4-W1a	SA1.2	Wetland	Potential for banded rail, Australasian bittern, species of shags, white heron, and spotless crake.	High	NoR 10
N4-W1b	SA1.2	Natural Wetland	Potential for banded rail, Australasian bittern, species of shags, white heron, and spotless crake.	High	NoR 4
N4-W2*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W3*	EW	Artificial Wetland	Potential for Australasian bittern, spotless crake.	Low	NoR 4
N4-W4*	EW	Artificial Wetland	Potential for spotless crake.	Low	NoR 4
N4-W5*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W6*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W7^	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W8	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W8*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W9^	EW	Natural Wetland	Potential for Australasian bittern, spotless crake.	Moderate	NoR 4
N4-W10^	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W11	EW, WL14	Natural Wetland	Unlikely to support TAR birds.	Moderate	NoR 4
N4-W12*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 4
N4-W13*	EW	Natural Wetland	Unlikely to support TAR birds.	Negligible	NoR 4
N4-W14*	EW	Natural Wetland	Potential for spotless crake.	Low	NoR 4
N5-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 5
N6-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 6

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N6-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 6
N6-O3^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 6
N6-W1*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 6
N6-W2*	EW	Natural Wetland	Potential for Australasian bittern, spotless crake.	Moderate	NoR 6
N6-W3	WL11, WL19, Native rushland	Natural Wetland	Potential for banded rail, Australasian bittern, North Island fernbird, spotless crake.	High	NoR 6
N6-W4*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 6
N6-W5*	PLW	Natural Wetland	Potential for Australasian bittern, spotless crake.	Moderate	NoR 6
N7-O1^	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 7
N7-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 7
N7-W1*	EW	Artificial Wetland	Unlikely to support TAR birds.	Low	NoR7
N7-W2*	EW	Artificial Wetland	Unlikely to support TAR birds.	Low	NoR 7
N8-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O3*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O4*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O5*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 8
N8-O6*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O7*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8
N8-O8*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 8

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N8-W1	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 8
N8-W2*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 8
N8-W3*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 8
N8-W4^	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 8
N8-W5	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 8
N8-W6*	EW	Natural Wetland	Potential for Australasian bittern, spotless crake.	Moderate	NoR 8
N8-W7^	EW	Natural Wetland	Potential for spotless crake.	Moderate	NoR 8
N8-W8	EW	Natural Wetland	Potential to support dabchick (due to association with an OW wetland).	Moderate	NoR 8
N8-W9^	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 8
N9-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 9
N9-W1^	EW	Natural Wetland	Potential to support dabchick (due to association with an OW wetland), spotless crake, Australian bittern.	Moderate	NoR 9
N9-W2^	EW	Natural Wetland	Potential to support dabchick (due to association with an OW wetland), spotless crake, Australasian bittern.	Moderate	NoR 9
N11-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 11
N11-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 11
N11-W1	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 11
N12-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-O3*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-O4*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-O5*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, dabchick, grey duck, and spotless crake.	Low	NoR 12

Wetland ID	Wetland Type[17]	NPS-FM Classification	Potential for TAR Species	Ecological Value	Relevant NoR
N12-O6*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-O7*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-O8*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 12
N12-W1*	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 12
N12-W2	EW	Natural Wetland	Unlikely to support TAR birds.	Low	NoR 12
N13-O1*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 13
N13-O2*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 13
N13-O4*	OW	Artificial Wetland	Potential for Australasian bittern, brown teal, grey duck, and spotless crake.	Low	NoR 13
N13-W1*	EW	Natural Wetland	Potential to support spotless crake.	Low	NoR 13

Notes: ^ = Ecological feature assessed from roadside or adjacent property boundary due to access restrictions. * = Ecological feature assessed at a desktop level due to access restrictions.

8 Appendix 8 – Terrestrial Value Assessment

8.1 NoR 1: Rapid Transport Corridor (RTC) between Albany and Milldale

Table 10-17 Assessment of ecological value for terrestrial ecology features for NoR 1

Attributes to be considered	ES	MF 4	PL. 1	PL. 2	PL. 3	TL. 3	VS2	VS3	WF 11	WF 13	Justification
Representativeness	1	4	3	3	2	2	4	4	4	4	Associated with SEA - MF4, PL.2, VS2, WF11, WF13
Typical structure and composition	1	4	2	2	1	1	3	3	4	4	ES, PL.3, TL.3: Habitats have been significantly altered by human activities (exotic dominated). PL.1, PL.2: Habitat and species have been affected by human activities. MF4, VS2, WF11, WF13: Habitat has been insignificantly affected by human activities.
Indigenous representation	1	4	3	3	2	2	4	4	4	4	ES: <10% of the species are indigenous. PL.3, TL.3: 10-50% of the species are indigenous. TL.2: 50-90% of the species are indigenous. MF4, PL.1, PL.2 VS2, VS3, WF11, WF13: >90% of the species are indigenous.
Rarity/distinctiveness	2	4	3	4	4	4	4	4	4	4	
Species (habitat) of conservation significance	2	4	3	4	4	4	4	3	4	4	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (MF4, TL.3, VS2, WF11, WF13) Kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (PL.2, MF4, TL.3, VS2, WF11, WF13) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise all forest types that have appropriate understorey.
Distinctive ecological values	-	4	-	-	-	-	-	4	4	4	MF4, VS2, VS3, WF11 WF13: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale (native forest cover). All other habitats not playing an important role in provisional or regulatory ecosystem services at any scale.

Attributes to be considered	ES	MF 4	PL. 1	PL. 2	PL. 3	TL. 3	VS2	VS3	WF 11	WF 13	Justification
Diversity and pattern	**1**	**4**	**1**	**2**	**1**	**2**	**4**	**3**	**4**	**4**	
Habitat diversity	1	4	1	1	1	1	4	3	4	4	MF4, VS2, VS3, WF11 WF13: Very High diversity of vegetation and geomorphological structure and Moderate patchiness interspersion. All other habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	4	1	2	1	1	3	3	4	4	Increased species diversity in areas with indigenous species present and late succession: TL.2, MF4, VS2, WF11 WF13 Species diversity not significant at any scale for all other habitats.
Patterns in habitat use	1	3	1	1	1	2	3	1	4	4	TL.3, VS2, MF4, WF11, WF13 rated high due to potential seasonal utilisation by long-tailed bat, North Island kākā, and long-tailed cuckoo. All other habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**2**	**4**	**2**	**3**	**2**	**2**	**4**	**3**	**4**	**4**	
Size, shape and buffering	1	2	1	3	1	1	3	3	4	4	TL.3 provides buffering to N1-S2a, N1-W2, N1-S3, N1-S5 PL.3 provides buffering to N1-O10, N1-W8, VS2 buffering N1-S9. WF11 buffering N1-S10a. VS3 buffering N1-S10a
Sensitivity to change	1	4	1	2	-	1	3	3	4	4	Intact, mature habitat vs habitats that are generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	2	3	2	3	2	2	4	3	4	4	Most forest types, but in particular any aged woody structure, increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and skinks. Considerations of any SEA
Combined value	**L**	**VH**	**M**	**M**	**M**	**M**	**VH**	**H**	**VH**	**VH**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.2 NoR 3: Pine Valley East Station and associated facilities

Table 10-18 Assessment of ecological value for terrestrial ecology features for NoR 3

Attributes to be considered	PL.1	PL.3	TL.3	Justification
Representativeness	**4**	**2**	**2**	
Typical structure and composition	1	1	1	Habitats significantly altered by human activities (exotic dominated).
Indigenous representation	4	2	2	PL.3, TL.3: 10-50% of the species are indigenous.
Rarity/distinctiveness	**2**	**2**	**2**	
Species (habitat) of conservation significance	2	2	2	Habitats scored low due to limited extent despite potential use by long-tailed bat and long-tailed cuckoo (both Threatened, value score of 4) and herpetofauna (At Risk - Declining, value score and 3).
Distinctive ecological values	-	-	-	Habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**1**	**1**	
Habitat diversity	1	1	1	All habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	1	Species diversity not significant at any scale for all habitats.
Patterns in habitat use	1	1	1	All habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**1**	**1**	**0**	
Size, shape and buffering	1	1	-	PL.3 provides some buffering to N3-O1.
Sensitivity to change	1	-	-	All habitats generally modified with no residual sensitive receptors.
Ecological networks	-	-	-	All habitats are not important in terms of connectivity for the survival of any species at any scale.
Combined value	**Low**	**Low**	**Low**	

8.3 NoR 2: Milldale Station and associated facilities

Table 10-19 Assessment of ecological value for terrestrial ecology features for NoR 2

Attributes to be considered	PL.3	Justification
Representativeness	**2**	
Typical structure and composition	1	Habitats significantly altered by human activities (exotic dominated).
Indigenous representation	2	PL.3, TL.3: 10-50% of the species are indigenous.
Rarity/distinctiveness	**2**	
Species (habitat) of conservation significance	2	Ground skinks (At Risk - Declining, value score and 3) likely to utilise PL.3. Habitat score low due to limited extent and roadside location.
Distinctive ecological values	-	Habitat not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	
Habitat diversity	1	Has a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	Species diversity not significant at any scale.
Patterns in habitat use	1	Not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**1**	
Size, shape and buffering	-	Small and isolated roadside patch.
Sensitivity to change	-	Generally modified with no residual sensitive receptors.

Attributes to be considered	PL.3	Justification
Ecological networks	-	Not important in terms of connectivity for the survival of any species at any scale.
Combined value	**Negligible**	

8.4 NoR 4: SH1 Improvements

Table 10-20 Assessment of ecological value for terrestrial ecology features for NoR 4

Attributes to be considered	EF	EG	ES	MF4	PL.1	PL.2	PL.3	TL.1	TL.2	TL.3	VS2	VS3	WF 11	WF 13	Justification
Representativeness	**2**	**1**	**2**	**4**	**3**	**3**	**2**	**4**	**2**	**1**	**4**	**3**	**4**	**4**	Associated with SEA - MF4, PL.2, VS2, WF11, WF13, TL.3
Typical structure and composition	1	1	1	4	2	2	1	1	2	1	3	3	4	4	
Indigenous representation	2	1	2	4	3	3	2	4	2	1	4	3	4	4	EG: <10% of the species are indigenous. ES, EF, PL.3, TL.3: 10-50% of the species are indigenous. TL.2: 50-90% of the species are indigenous. MF4, PL.1, PL.2, TL.1, VS2, WF11, WF13: >90% of the species are indigenous.
Rarity/ distinctiveness	**3**	**2**	**2**	**4**	**2**	**4**	**4**	**3**	**3**	**4**	**4**	**3**	**4**	**4**	
Species (habitat) of conservation significance	3	2	2	4	2	4	4	3	3	4	4	3	4	4	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (EF, MF4, TL.1, TL.2, TL.3, VS2, WF11, WF13). North Island kākā (At Risk - Recovering, value score of 3), long-tailed cuckoo (Threatened - Nationally Vulnerable, value score of 4) expected to utilise suitable habitat (EF, TL.1, TL.2, TL.3, WF11 WF13)

Attributes to be considered	EF	EG	ES	MF4	PL.1	PL.2	PL.3	TL.1	TL.2	TL.3	VS2	VS3	WF 11	WF 13	Justification
															Herpetofauna (At Risk - Declining, value score of 3) likely to utilise suitable habitat with appropriate understorey. EF, EG, PL.1, TL.1 , TL.2 scored lower due to limited extent.
Distinctive ecological values	-	-	-	4	-	-	-	3	-	-	4	3	4	4	TL.1, MF4, VS2, VS3, WF11, WF13: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale (native forest cover). All other habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**2**	**1**	**1**	**3**	**2**	**2**	**1**	**2**	**2**	**1**	**3**	**3**	**4**	**4**	
Habitat diversity	1	1	1	3	1	2	1	2	1	1	3	3	4	4	MF4, VS2, VS3, WF11 WF13: Very High diversity of vegetation and geomorphological structure and Moderate patchiness interspersion. All other habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	1	3	2	2	1	2	1	1	3	3	4	4	Increased species diversity in areas with indigenous species present and late succession: PL.2, TL.1, MF4, VS2, VS3, WF11, WF13 Species diversity not significant at any scale for all other habitats.
Patterns in habitat use	2	1	1	3	1	1	1	2	2	1	3	3	4	4	EF, MF4, TL.1, TL.2, TL.3, VS2, WF11, WF13 rated high due to potential seasonal utilisation by long-tailed bat, North Island kākā, and long-tailed cuckoo. TL.1, TL.2, MF4 lower due to limited

Attributes to be considered	EF	EG	ES	MF4	PL.1	PL.2	PL.3	TL.1	TL.2	TL.3	VS2	VS3	WF 11	WF 13	Justification
															extent. All other habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**2**	**1**	**1**	**4**	**2**	**2**	**1**	**3**	**1**	**3**	**4**	**4**	**4**	**4**	
Size, shape and buffering	1	1	1	2	2	1	1	1	1	3	3	3	4	4	EF provides buffering to unlabelled stream (north end of NoR), TL.3 buffers N4-W1, N4-S2, N4-S6a, N4-S13, N4-14, N4-S15b, N4-S16a WF11 buffers N4-S3a MF4 buffers N1-S1 PL.1 buffers N4-S5, N4-O6, N4-O7 PL.3 buffers N1-S24 VS2 buffers unlabelled stream to north-east of where NoR 1 and 4 diverge), N1-S9, N1-S22 VS3 buffers N4-S10a
Sensitivity to change	1	-	-	4	1	2	-	3	1	1	3	3	4	4	Intact, mature habitat vs habitats that are generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	2	-	-	4	-	-	-	1	1	3	4	4	4	4	Aged woody structure (MF4, TL.1, TL.2, TL.3, VS2, WF11, WF13) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species. TL.3 associated with SEA_T_2169 MF4 associated with SEA_T_2192a WF11 associated with SEA_T_2180 VS2 associated with SEA_T_2218 TL.1 and TL.2 scored low due to limited extent.
Combined value	**M**	**L**	**L**	**H**	**M**	**M**	**L**	**M**	**L**	**M**	**H**	**H**	**VH**	**VH**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.5 NoR 5: SH1 crossing at Dairy Stream

Table 10-21 Assessment of ecological value for terrestrial ecology features for NoR 5

Attributes to be considered	EG	PL.3	TL.3	Justification
Representativeness	**1**	**1**	**1**	
Typical structure and composition	1	1	1	TL3, and PL.3: Habitats have been significantly altered by human activities (exotic dominated).
Indigenous representation	1	1	1	TL.3: <25% species are indigenous PL.3 < 50% of the species are indigenous.
Rarity/distinctiveness	**2**	**3**	**3**	
Species (habitat) of conservation significance	2	3	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using ecological features associated with the Project Area (Potentially all types expect for grassland, ES, VS3, PL1 which is not well-established / lacks tall, thick woody vegetation). Kaka and long-tailed cuckoo (At Risk - value score of 3) may use EF, PL.2, TL, VS2, VS3, mature indigenous forest types. Not Threatened native birds (value score of 2) likely to utilise ecological features within the Project Area (all forest types except for grassland). Herpetofauna (Not threatened, and At Risk - Declining, value score 2 and 3) likely to utilise ecological features within the Project Area (all forest types that have appropriate understorey).
Distinctive ecological values	-	-	-	Habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**1**	**1**	
Habitat diversity	1	1	1	Habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	1	Species diversity not significant at any scale for all habitats.
Patterns in habitat use	1	1	1	Habitats not important for lifecycle completion or periodic habitat utilisation on any scale.

Attributes to be considered	EG	PL.3	TL.3	Justification
Ecological context	**1**	**1**	**1**	
Size, shape and buffering	-	1	-	PL.3 provides some buffering function to N5-O1
Sensitivity to change	-	-	-	Habitats generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	-	1	1	PL.3 and TL.3 important on local scale.
Combined value	**Negligible**	**Low**	**Low**	

8.6 NoR 6: Connection between Milldale and Grand Drive

Table 10-22 Assessment of ecological value for terrestrial ecology features for NoR 6

Attributes to be considered	ES	PL.1	PL.3	TL.3	VS2	Justification
Representativeness	**2**	**3**	**2**	**2**	**4**	
Typical structure and composition	1	2	1	1	3	ES, PL.3, TL.3: Habitats significantly altered by human activities (exotic dominated). PL.1: Habitat affected by human activities VS2: Habitat insignificantly affected by human activities.
Indigenous representation	2	3	2	2	4	ES, PL.3, TL.3: 10 - 50% of the species are indigenous. PL.1, VS2: >90% of the species indigenous. PL.1 scored 3 instead of 4 due to limited size.
Rarity/distinctiveness	**3**	**3**	**3**	**4**	**3**	
Species (habitat) of conservation significance	3	3	3	4	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (TL.3) North Island kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (EF, TL types, WF types) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise ecological features within the Project Area (all forest types that have appropriate understorey).
Distinctive ecological values	-	-	-	1	3	VS2: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale (native forest cover). VS2 scored lower due to smaller extent and existing fragmentation. TL.3: Habitat playing an important role in provisional or regulatory ecosystem services typically on Local scale All other habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**2**	**1**	**3**	**4**	
Habitat diversity	1	1	1	1	4	VS2: Increased habitat diversity in areas with indigenous species present. All other habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).

Attributes to be considered	ES	PL.1	PL.3	TL.3	VS2	Justification
Species diversity	1	2	1	1	3	Increased species diversity in areas with indigenous species present and late succession: PL.1, VS2 Species diversity not significant at any scale for all other habitats.
Patterns in habitat use	1	1	1	3	3	TL.3, VS2 rated high due to potential seasonal utilisation by long-tailed bat, North Island kākā, and long-tailed cuckoo. All other habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**2**	**1**	**1**	**3**	**3**	
Size, shape and buffering	2	1	1	2	3	VS2 provide a buffering function to N6-S4. TL.3 provides buffering to N6-S1., N6-S6. ES buffers N6-S5. All other habitats are represented by small and isolated patches.
Sensitivity to change	1	1	-	1	3	VS2: Intact, mature habitat All other habitats generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	1	-	-	3	3	Aged woody structure (TL.3, VS2) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species; both have SEA to their north. All other habitats are not important in terms of connectivity for the survival of any species at any scale.
Combined value	**L**	**M**	**L**	**M**	**H**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.7 NoR 7: Pine Valley Road Upgrade

Table 10-23 Assessment of ecological value for terrestrial ecology features for NoR 7

Attributes to be considered	MF4	PL.3	TL.3	VS2	Justification
Representativeness	**4**	**2**	**2**	**4**	SEA associated with MF4 and VS2
Typical structure and composition	3	1	1	3	PL.3, TL.3: Habitats have been significantly altered by human activities (exotic dominated). MF4, VS2: Habitat has been insignificantly affected by human activities.
Indigenous representation	4	2	2	4	PL.3, TL.3: 10-50% of the species are indigenous. MF4, VS2: >90% of the species are indigenous.
Rarity/distinctiveness	**4**	**3**	**4**	**4**	
Species of conservation significance	4	3	4	4	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using MF4, TL.3, VS2. Long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (TL.3, MF4) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise ecological features within the Project Area (all forest types that have appropriate understorey).
Distinctive ecological values	3	-	-	3	MF4 and VS2: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale.
Diversity and pattern	**4**	**1**	**1**	**4**	
Habitat diversity	2	1	1	3	VS2: Increased habitat diversity in areas with indigenous species present. MF4 scored lower despite being indigenous dominated due to small extent.
Species diversity	1	1	1	3	VS2: Increased species diversity in areas with indigenous species present
Patterns in habitat use	4	1	1	4	MF4 and VS2 rated high due to potential seasonal utilisation by long-tailed bat. All other habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.

Attributes to be considered	MF4	PL.3	TL.3	VS2	Justification
Ecological context	**4**	**2**	**2**	**4**	
Size, shape and buffering	3	1	2	3	TL.3 provides buffering for N7-S1b. VS2 and MF4 buffering N7-S1a. PL.3 provides some buffering to N7-O1, N7-O2 and other small unnamed ponds. MF4 and VS2 associated with SEA.
Sensitivity to change	3	-	-	2	MF4, VS2: Intact habitat and late succession. MF4: Regional IUCN threat status is Critically Endangered
Ecological networks (linkages, pathways, migration)	4	2	2	4	MF4 and VS2 associated with SEA_T_5446, and can provide stepping stone habitat for long-tailed bats and other terrestrial TAR native bird species to the SEAs to the north-east, north-west, and south.
Combined value	**VH**	**L**	**M**	**VH**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.8 NoR 8: Dairy Flat Highway (between Silverdale and Dairy Flat) Upgrade

Table 10-24 Assessment of ecological value for terrestrial ecology features for NoR 8

Attributes to be considered	EG	PL.3	TL.2	TL.3	VS2	VS3	Justification
Representativeness	**1**	**2**	**3**	**2**	**4**	**4**	Associated with an SEA - VS3
Typical structure and composition	1	1	2	1	3	2	EG, PL.3, TL.3: Habitats significantly altered by human activities (exotic dominated). TL.2, VS3: Habitat affected by human activities VS2: Habitat insignificantly affected by human activities.
Indigenous representation	1	2	3	2	4	4	EG: <10% of the species are indigenous. PL.3, TL.3: 10-50% of the species are indigenous. TL.2: 50-90% of the species are indigenous. VS2, VS3: >90% of the species are indigenous.
Rarity/distinctiveness	**3**	**4**	**4**	**4**	**4**	**3**	
Species (habitat) of conservation significance	3	4	4	4	4	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (TL.3, VS2) Kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (EF, TL types) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise all forest types that have appropriate understorey.
Distinctive ecological values	-	-	-	-	3	3	VS3, VS2: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale.
Diversity and pattern	**1**	**1**	**3**	**2**	**3**	**3**	
Habitat diversity	1	1	1	1	3	3	Increased habitat diversity in areas with indigenous species present and in areas with late succession. VS2, VS3: High diversity of vegetation and geomorphological structure
Species diversity	1	1	1	1	3	3	VS2, VS3: Increased species diversity in areas with late succession. Also depends on disturbance / weed dominance.

Attributes to be considered	EG	PL.3	TL.2	TL.3	VS2	VS3	Justification
Patterns in habitat use	1	1	3	2	2	3	Potential seasonal utilisation by long-tailed bat, long-tailed cuckoo, kākā
Ecological context	**1**	**2**	**3**	**3**	**3**	**3**	
Size, shape and buffering	1	2	2	3	3	3	TL.2 provides buffering for N8-S4, TL.3 provides buffering for N8-S2, N8-S5, N8-S6, VS2 provides buffering for N8-S5 VS3 provides buffering for N8-S4,
Sensitivity to change	-	-	1	1	3	3	Intact, mature habitat vs habitats that are generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	-	-	3	1	3	2	Aged woody structure (TL.2, TL.3, VS2, VS3) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species. VS3 associated with SEA_T_2204. TL3 scored lower as it is spread out.
Combined value	**L**	**M**	**H**	**M**	**H**	**H**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.9 NoR 9: Dairy Flat Highway (between Dairy Flat and Albany) Upgrade

Table 10-25 Assessment of ecological value for terrestrial ecology features for NoR 9

Attributes to be considered	EF	EF.1	ES	PL.3	TL.2	TL.3	VS2	WF11	WF12	WF9	Justification
Representativeness	**1**	**2**	**2**	**2**	**3**	**2**	**4**	**4**	**4**	**4**	Associated with SEA - EF, ES, VS2, WF11, WF12, WF9
Typical structure and composition	1	1	1	1	3	1	4	4	4	4	EF, EF.1, ES, PL.3, TL.3: Habitats have been significantly altered by human activities (exotic dominated). TL.2, VS2, WF9, WF11, WF12: Habitat has been insignificantly affected by human activities. (TL.2 scored lower due to higher exotic cover).
Indigenous representation	1	2	2	2	3	2	4	4	4	4	ES, EF.1, PL.3, TL.3: 10-50% of the species are indigenous. TL.2: 50-90% of the species are indigenous. VS2, WF9, WF11, WF12, : >90% of the species are indigenous
Rarity/distinctiveness	**4**	**4**	**2**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species (habitat) of conservation significance	4	4	2	4	4	4	4	4	4	4	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (EF, EF.1, TL.2, TL.3, WF11. WF12, WF9.) Kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (EF, TL types, WF types, VS2) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise forests with appropriate understorey. Copper skink may utilise ES. ES scored lower due to small extent and patchiness.
Distinctive ecological values	-	-	-	-	-	-	3	3	3	3	VS2, WF11, WF12, WF9: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale.
Diversity and pattern	**3**	**2**	**1**	**1**	**3**	**3**	**3**	**4**	**4**	**4**	
Habitat diversity	1	1	1	1	1	1	3	4	4	4	Increased habitat diversity in areas with indigenous species present and in areas with late succession.

Attributes to be considered	EF	EF.1	ES	PL.3	TL.2	TL.3	VS2	WF11	WF12	WF9	Justification
											WF11, WF9, WF12: Very High diversity of vegetation and geomorphological structure
Species diversity	1	1	1	1	1	1	3	4	4	4	Increased species diversity in areas with indigenous species present and in areas with late succession: WF11, WF12, WF9
Patterns in habitat use	3	2	1	1	3	3	3	4	4	4	EF, EF.1, TL.2, TL.3, VS2, WF11, WF12, WF9 rated high due to potential seasonal utilisation by long-tailed bat, North Island kākā, and long-tailed cuckoo. EF.1 scored lower dur to limited extent
Ecological context	**3**	**2**	**2**	**1**	**2**	**2**	**4**	**4**	**4**	**4**	
Size, shape and buffering	2	2	2	1	1	2	4	4	4	4	PL.3 buffers N9-W1, N9-W2 TL.3 buffers N9-S2 EF.1 buffers N9-S3 EF, ES, VS2, WF11, WF12, WF9 associated with SEA, buffering unlabelled streams.
Sensitivity to change	-	1	-	-	-	-	3	4	4	4	Intact, mature habitat vs habitats that are generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	3	2	-	-	2	2	4	4	4	4	Aged woody structure (EF, TL.2, TL.3, VS2, WF11, WF12, WF9) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species. EF, ES, VS2, WF11, WF12, WF9 associated with SEA
Combined value	**M**	**M**	**L**	**L**	**M**	**M**	**H**	**VH**	**VH**	**VH**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

8.10 NoR 10: Wainui Road Upgrade

Table 10-26 Assessment of ecological value for terrestrial ecology features for NoR 10

Attributes to be considered	PL.3	TL.3	VS3	Justification
Representativeness	**2**	**2**	**3**	SEA associated with TL.3
Typical structure and composition	1	1	2	PL.3, TL.3: Habitats significantly altered by human activities (exotic dominated). VS3: Habitat insignificantly affected by human activities.
Indigenous representation	2	2	3	PL.3, TL.3: 10 - 50% of the species are indigenous. PL-types can be very variable due to modification and disturbance, would also expect PL.1 and PL.3 to have greater exotic indigenous species composition. VS3: >90% of the species are indigenous.
Rarity/distinctiveness	**2**	**4**	**3**	
Species (habitat) of conservation significance	2	4	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) potentially using TL.3. Herpetofauna (At Risk - Declining, value score of 3) likely to utilise ecological features within the Project Area (all forest types that have appropriate understorey). PL.3 scored lower due to patchiness and location on the roadside.
Distinctive ecological values	-	-	3	VS3: Habitat playing an important role in provisional or regulatory ecosystem services typically on Regional scale (native scrub). All other habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**3**	**3**	
Habitat diversity	1	1	3	VS3: Increased habitat diversity in areas with indigenous species present. All other habitats have a Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	3	VS3: Increased species diversity in areas with indigenous species present. Species diversity not significant at any scale for all other habitats.

Attributes to be considered	PL.3	TL.3	VS3	Justification
Patterns in habitat use	1	3	1	TL.3 rated high due to potential seasonal utilisation by long-tailed bat and long-tailed cuckoo. All other habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**1**	**3**	**3**	
Size, shape and buffering	1	3	3	TL.3 provides buffering for N4-S2, associated with SEA_T_2214 to its North. VS3 provides buffering for N10-S1
Sensitivity to change	-	1	3	VS3: Intact, mature habitat All other habitats generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	-	2	3	Aged woody structure (TL.3) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species. Area north of TL3 is an SEA. All other habitats are not important in terms of connectivity for the survival of any species at any scale.
Combined value	**Low**	**Moderate**	**Moderate**	

8.11 NoR 11: New connection between Dairy Flat Highway and Wilks Road

Table 10-27 Assessment of ecological value for terrestrial ecology features for NoR 11

Attributes to be considered	PL.3	TL.3	Justification
Representativeness	**2**	**2**	
Typical structure and composition	1	1	PL.3, TL.3: Habitats significantly altered by human activities (exotic dominated).
Indigenous representation	2	2	PL.3, TL.3: 10 - 50% of the species are indigenous.
Rarity/distinctiveness	**3**	**3**	
Species (habitat) of conservation significance	3	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using TL.3 Kākā (At Risk – Recovering, value score of 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use PL.3 and TL.3. Herpetofauna (At Risk - Declining, value score of 3) likely to utilise ecological features within the Project Area (all forest types that have appropriate understorey). Scored lower due to limited extent.
Distinctive ecological values	-	-	Habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**1**	
Habitat diversity	1	1	Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	Species diversity not significant at any scale for all other habitats.
Patterns in habitat use	1	1	Habitats not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**0**	**1**	
Size, shape and buffering	-	-	Isolated patches.

Attributes to be considered	PL.3	TL.3	Justification
Sensitivity to change	-	1	Habitats generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	-	-	Habitats not important in terms of connectivity for the survival of any species at any scale.
Combined value	**Low**	**Low**	

8.12 NoR 12: Bawden Road Upgrade and Extension

Table 10-28 Assessment of ecological value for terrestrial ecology features for NoR 12

Attributes to be considered	EF	ES	PL.3	TL.3	Justification
Representativeness	**2**	**2**	**2**	**2**	SEA associated with TL.3
Typical structure and composition	1	1	1	1	EF, ES, PL.3, TL.3: Habitats have been significantly altered by human activities (exotic dominated).
Indigenous representation	2	2	2	2	ES, EF, PL.3, TL.3: 10-50% of the species are indigenous.
Rarity/distinctiveness	**4**	**3**	**4**	**3**	
Species (habitat) of conservation significance	4	3	4	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (EF, TL.3) Kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (EF, TL.3) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise areas with sufficient understory. TL.3 scored lower due to patchiness.
Distinctive ecological values	-	-	-	-	Habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**2**	**1**	**1**	**2**	
Habitat diversity	1	1	1	1	Low diversity of vegetation and geomorphological structure and low patchiness/interspersion (uniformity).
Species diversity	1	1	1	1	Species diversity not significant at any scale for all habitats.
Patterns in habitat use	2	1	1	2	Habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**2**	**-**	**1**	**1**	

Attributes to be considered	EF	ES	PL.3	TL.3	Justification
Size, shape and buffering	1	-	1	1	EF provide some buffering for N12-O2. ES provides some buffering for N12-W1. PL.3 provides some buffering for N12-O5, N1-O10, N12-O7,
Sensitivity to change	-	-	-	-	Habitats generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	2	-	-	1	Aged woody structure (EF, TL.3) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats and other terrestrial TAR native bird species. TL.3 scored lower due to limited extent.
Combined value	**Moderate**	**Low**	**Low**	**Low**	

8.13 NoR 13: East Coast Road (between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange) Upgrade

Table 10-29 Assessment of ecological value for terrestrial ecology features for NoR 13

Attributes to be considered	ES	PL.3	TL.3	Justification
Representativeness	**2**	**2**	**2**	
Typical structure and composition	1	1	1	ES, PL.3, TL.3: Habitats have been significantly altered by human activities (exotic dominated).
Indigenous representation	2	2	2	ES, PL.3, TL.3: 10-50% of the species are indigenous.
Rarity/distinctiveness	**1**	**2**	**3**	
Species (habitat) of conservation significance	1	2	3	Long-tailed bat (Threatened – Nationally Critical, value score of 4) present and potentially using suitable habitat (TL.3) Kākā (At Risk – Recovering, value 3) and long-tailed cuckoo (Threatened – Nationally Vulnerable, value score of 4) may use established forests (TL.3) Herpetofauna (At Risk - Declining, value score of 3) likely to utilise all forest types that have appropriate understorey. TL.3 and PL.3 scored lower due to patchiness. ES scored lower due to small area.
Distinctive ecological values	-	-	-	Habitats not playing an important role in provisional or regulatory ecosystem services at any scale.
Diversity and pattern	**1**	**1**	**1**	
Habitat diversity	1	1	1	
Species diversity	1	1	1	Species diversity not significant at any scale.
Patterns in habitat use	1	1	1	All habitats are not important for lifecycle completion or periodic habitat utilisation on any scale.
Ecological context	**1**	**1**	**2**	

Attributes to be considered	ES	PL.3	TL.3	Justification
Size, shape and buffering	1	1	1	Small extent of TL.3 provides buffering to N13-S5b.
Sensitivity to change	-	-	-	Intact, mature habitat vs habitats that are generally modified with no residual sensitive receptors.
Ecological networks (linkages, pathways, migration)	-	-	2	Aged woody structure (TL.3) increase stepping stone value (connecting other areas of ecological value) for long-tailed bats.
Combined value	**Low**	**Low**	**Low**	

9 Appendix 9 – Aquatic Value Assessment

9.1 NoR 1: Rapid Transport Corridor (RTC) between Albany and Milldale

Table 10-30 Assessment of ecological value for aquatic ecology features for NoR 1

Attributes to be considered	N1-S1	N1-S2a	N1-S2b	N1-S3	N1-S4	N1-S5	N1-S6	N1-S7	N1-S8	N1-S9	N1-S10a	N1-S10b	Justification
Representativeness	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**1**	**3**	**2**	**2**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	3	1	1	1	1	2	1	1	1	3	2	2	Scores reflect difference in riparian margin quality.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	4	4	Giant Bully (*Gobiomorphus gobioides*: At Risk - Naturally Uncommon), Inanga (*Galaxias maculatus*: At Risk - Declining), and Longfin eel (*Anguilla dieffenbachii*: At Risk - Declining) have been recorded in wider study area
Diversity and pattern	**3**	**2**	**1**	**1**	**1**	**2**	**1**	**0**	**1**	**1**	**2**	**2**	
Level of natural diversity	3	2	1	1	1	2	1	-	1	1	2	2	Estimated based on desktop review from REC High (RHA score: 81.5)
Ecological context	**4**	**4**	**2**	**4**	**4**	**4**	**2**	**4**	**2**	**4**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	3	2	1	2	2	3	1	2	1	3	3	2	Order 0 streams = N1-S2b, N1-S6, N1-S8 Order 1 streams = N1-S2a, N1-S3, N1-S4, N1-S7, N1-S10b Order 2 and 3 streams = N1-S1, N1-S5, N1-S9, N1-S10a
Hydroperiod	4	4	2	4	4	4	2	4	2	4	4	4	Within ecological context, permanent streams were allocated highest score. Streams including N1-S2b, N1-S6 and N1-S8 scored lower due to small catchment.

Attributes to be considered	N1-S1	N1-S2a	N1-S2b	N1-S3	N1-S4	N1-S5	N1-S6	N1-S7	N1-S8	N1-S9	N1-S10a	N1-S10b	Justification
Combined value	**H**	**M**	**L**	**M**	**M**	**M**	**L**	**M**	**L**	**M**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

9.2 NoR 3: Pine Valley East Station and associated facilities

Table 10-31 Assessment of ecological value for aquatic ecology features for NoR 3

Attributes to be considered	N3-S1	Justification
Representativeness	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	N3-S1 riparian vegetation has been significantly altered by agricultural/horticultural activities (desktop review)
Rarity/distinctiveness	**2**	
Species of conservation significance	2	**Wēiti Stream** Giant bully (*Gobiomorphus gobioides*: At Risk - Naturally Uncommon), inanga (Galaxias maculatus: At Risk - Declining), and longfin eel (*Anguilla dieffenbachii*: At Risk - Declining) have been recorded in Wēiti Stream. Common, non-threatened species present in the wider catchment of Wēiti Stream and John Creek. N3-S1 is connected to the Wēiti Stream catchment but is very small and intermittent. There are no REC records for this stream. Therefore, its suitability as fish habitat may be a little lower.
Diversity and pattern	**1**	
Level of natural diversity	1	No REC records for geology etc. Estimated based on desktop review.
Ecological context	**3**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	Zero order stream
Hydroperiod	3	Intermittent (>6 months)
Combined value	**Low**	

9.3 NoR 4: SH1 Improvements

Table 10-32 Assessment of ecological value for aquatic ecology features for NoR 4

Attributes to be considered	N4-S1	N4-S2	N4-S3a	N4-S3b	N4-S4	N4-S5	N4-S6a	N4-S6b	N4-S7	N4-S8	N4-S9	Justification
Representativeness	**2**	**3**	**3**	**1**	**2**	**1**	**2**	**1**	**1**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	2	3	3	1	2	1	2	1	1	1	1	Riparian vegetation of N4-S1, N4-S2 and N4-S5 has been considerably altered by agricultural and residential development. N4-S4 riparian vegetation has been somewhat modified - especially by residential developments. Riparian vegetation of N4-S3a has been removed on one side for agricultural purposes. Kauri podocarp forest on the other. N4-S6a, N4-S6b. N4-S7, N4-S8, N4-S9, riparian vegetation has also been significantly altered/entirely removed by agricultural and horticultural activities over time. N4-S3b RHA value = 28 which is reflected in riparian habitat modification.
Rarity/distinctiveness	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**	
Species of conservation significance	3	3	3	3	3	3	3	3	2	2	2	**Ōrewa River** Giant bully (At Risk - Naturally Uncommon), giant kokopu (At Risk - Declining), inanga (At Risk - Declining), longfin eel (At Risk - Declining), torrentfish (At Risk - Declining) are all present in Ōrewa River. Common, non-threatened fish species are also present. **Wēiti Stream and John Creek** Giant bully (*Gobiomorphus gobioides*: At Risk - Naturally Uncommon), inanga (Galaxias maculatus: At Risk - Declining), and longfin eel (*Anguilla dieffenbachii*: At Risk - Declining) have been recorded in Wēiti Stream.

Attributes to be considered	N4-S1	N4-S2	N4-S3a	N4-S3b	N4-S4	N4-S5	N4-S6a	N4-S6b	N4-S7	N4-S8	N4-S9	Justification
												Common, non-threatened species present in the wider catchment of Wēiti Stream and John Creek. N4-S7, N4-S8, N4-S9 very small/poor habitat quality. The at-risk species may still use for migration, so value of 2 instead of 3.
Diversity and pattern	**2**	**3**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	
Level of natural diversity	2	3	2	2	2	2	2	1	1	1	1	N4-S1 desktop proxy = SS, P, LO, LG, 4 N4-S2 desktop proxy = SS, P, MO, MG, 4 N4-S3a desktop proxy = SS, P, MO, LG, 4 N4-S4 desktop proxy = SS, P, LO, LG, 4 N4-S5 desktop proxy = SS, P. LO. LG, 4 N4-S6a desktop proxy = SS, P, LO, LG, 4 N4-S6b desktop proxy = SS, P, LO, LG, 4 N4-S3b RHA features = 15.5 = 2 N4-S7, N4-S8 rated a 1 because low level of natural diversity. Moderate patchiness and vegetation diversity.
Ecological context	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**3**	**4**	**3**	**3**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	3	3	2	2	2	2	1	1	1	1	Order 0 streams = N4-S1, N4-S6b, N4-S7, N4-S8, N4-S9 Order 1 streams = N4-S3b, N4-S4, N4-S5, N4-S6a N4-S1 Order 2 streams = N4-S2, N4-S3a
Hydroperiod	4	4	4	4	4	4	4	3	4	3	3	Intermittent (>6 months) streams = N4-S6b, N4-S8, N4-S9 Permanent streams = the rest
Combined value	**M**	**H**	**M**	**M**	**M**	**M**	**M**	**L**	**L**	**L**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-33 Assessment of ecological value for aquatic ecology features for NoR 4

Attributes to be considered	N4-S10	N4-S11	N4-S12	N4-S13	N4-S14	N4-S15a	N4-S15b	N4-S16a	N4-S16b	N4-S17a	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	1	1	1	1	1	1	1	1	1	N4-S13, N4-S14, N4-S15a, N4-S15b, N4-S16a, N4-S16b, N4-S17b riparian vegetation has also been significantly altered/entirely removed by agricultural and horticultural activities over time.
Rarity/distinctiveness	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	
Species of conservation significance	2	3	3	3	3	3	3	3	3	3	**John Creek** Giant bully (*Gobiomorphus gobioides*: At Risk - Naturally Uncommon), inanga (Galaxias maculatus: At Risk - Declining), and longfin eel (*Anguilla dieffenbachii*: At Risk - Declining) have been recorded in Wēiti Stream. Common, non-threatened species present in the wider catchment of Wēiti Stream and John Creek. **Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common species present.
Diversity and pattern	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	
Level of natural diversity	1	2	2	1	1	1	2	2	2	2	N4-S11 desktop proxy = M, P, LO, LG, 4 N4-S15b desktop proxy = SS, P, LO, LG, 4 N4-S16a desktop proxy = M, P, LO, LG, 4 N4-S16b desktop proxy = M, P, LO, LG, 4 N4-S17a RHA features = 15 = 2 N4-S13, N4-S14, N4-S15a rated a 1 because low level of natural diversity. Moderate patchiness and vegetation diversity.

Attributes to be considered	N4-S10	N4-S11	N4-S12	N4-S13	N4-S14	N4-S15a	N4-S15b	N4-S16a	N4-S16b	N4-S17a	Justification
											N4-S12 rated a 2 as no REC data for proxy. Connected to a series of pools, little riparian vegetation.
Ecological context	**4**	**4**	**4**	**4**	**3**	**3**	**4**	**4**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	1	1	1	1	1	2	2	2	2	Order 0 streams = value of 1 Order 1 streams = value of 2
Hydroperiod	4	4	4	4	3	3	4	4	4	4	Intermittent (>6 months) streams = N4-14, N4-15b Permanent streams = the rest
Combined value	**L**	**M**	**M**	**M**	**L**	**L**	**M**	**M**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-34 Assessment of ecological value for aquatic ecology features for NoR 4

Attributes to be considered	N4-S17b	N4-S18	N4-S19	N4-S20	N4-S21	N4-S22	N4-S23	N4-S24	N4-S25	N4-S26	Justification
Representativeness	**1**	**2**	**2**	**1**	**1**	**3**	**2**	**2**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	2	2	1	1	3	2	2	1	1	N4-S18 rated a 2 because 1996 imagery shows that riparian vegetation is still partially intact. N4-S21 Riparian vegetation has been significantly altered by horticultural and agricultural activities. N4-S22, N4-S23 historic aerials show that some riparian vegetation is somewhat intact, but some has been cleared for housing and agriculture.
Rarity/distinctiveness	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	

Attributes to be considered	N4-S17b	N4-S18	N4-S19	N4-S20	N4-S21	N4-S22	N4-S23	N4-S24	N4-S25	N4-S26	Justification
Species of conservation significance	3	3	3	3	2	3	3	3	3	3	**Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common species present. **Okura River** Giant bully (At Risk - Naturally Uncommon), giant kokopu (At Risk - Declining), inanga (At Risk - Declining), kōaro (At Risk - Declining) and longfin eel (At Risk - Declining) are present in the wider catchment. Several common species also have been recorded in the wider catchment. N4-S21 rated a 2 not a 3 as it is very small and intermittent so will not be as suitable habitat compared to other tributaries. **Lucas Creek** Longfin eel (At Risk- Declining) are present in the wider catchment. Common, non-threatened species also present. **Rangitopuni Stream** Inanga (At Risk - Declining) and longfin eel (At Risk - Declining) are present in wider catchment. Other common species have also been recorded.
Diversity and pattern	**2**	**2**	**2**	**1**	**1**	**4**	**3**	**4**	**2**	**1**	
Level of natural diversity	2	2	2	1	1	4	3	4	2	1	N4-S22, N4-S24 rated high for natural diversity due to onsite assessment notes. N4-S17b desktop proxy = M, P, LO, LG, 4 N4-S26 desktop proxy = SS, P, LO, LG, 4 N4-S19 RHA features = 10 = 1 N4-S19 rated a 2 as no REC data for proxy. Vegetation is somewhat diverse and intact. Small stream. N4-S21 rated a 1 for natural diversity as there was no REC data available for proxy.

Attributes to be considered	N4-S17b	N4-S18	N4-S19	N4-S20	N4-S21	N4-S22	N4-S23	N4-S24	N4-S25	N4-S26	Justification
Ecological context	**3**	**4**	**4**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	1	1	1	1	1	1	2	1	1	Order 0 streams = value of 1 Order 1 streams = value of 2
Hydroperiod	3	4	4	3	3	4	4	4	4	4	Intermittent (>6 months) streams = N4-17b, N4-20, N4-S21 Permanent streams = the rest
Combined value	**M**	**M**	**M**	**L**	L	**H**	**M**	**H**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

9.4 NoR 5: SH1 crossing at Dairy Stream

Table 10-35 Assessment of ecological value for aquatic ecology features for NoR 5

Attributes to be considered	N5-S1a	N5-S1b	N5-S1c	Justification
Representativeness	**1**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	1	1	N5-S1a, N5-S1b, N5-S1c riparian vegetation significantly altered by horticulture/agriculture.
Rarity/distinctiveness	**2**	**3**	**3**	
Species of conservation significance	2	3	3	**Rangitopuni Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common, non-threatened species present in the wider catchment**.** **Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common species present. N5-S1a rated a 2 instead of a 3 due to the overall poor quality of the habitat, even though at-risk species are present.
Diversity and pattern	**1**	**1**	**2**	
Level of natural diversity	1	1	2	N5-S1a RHA score = 10 = 1 N5-S1b RHA score was 11 and road site assessment notes show low overall natural diversity = 1 N5-S1c given a 2 because of connectivity to Dairy Stream and to another large pond.
Ecological context	**3**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	2	2	Order 0 streams = N5-S1a; Order 1 streams = N5-S1b, N5-S1c
Hydroperiod	3	4	4	Intermittent (>6 months) streams = N5-S1a Permanent streams = N5-S1b, N5-S1c
Combined value	**Low**	**Moderate**	**Moderate**	

9.5 NoR 6: Connection between Milldale and Grand Drive

Table 10-36 Assessment of ecological value for aquatic ecology features for NoR 6

Attributes to be considered	N6-S1	N6-S2	N6-S3	N6-S4a	N6-S4b	N6-S4c	N6-S4d	N6-S4e	N6-S5	N6-S6	Justification
Representativeness	**1**	**1**	**1**	**1**	**4**	**1**	**4**	**1**	**3**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	1	1	1	4	1	4	1	3	1	N6-S1, N6-S2, N6-S3, N6-S4a, N6-S4c, N6-S4e riparian habitat have been significantly modified by agriculture/horticulture. N6-S5 riparian habitat has been modified but is also partially intact. Native vegetation present. N6-S4b, N6-S4d mostly intact native forest
Rarity/distinctiveness	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	
Species of conservation significance	3	2	2	3	3	3	3	2	3	3	**Ōrewa River** Giant bully (At Risk-Naturally Uncommon), giant kokopu (At Risk - Declining), inanga (At Risk - Declining), longfin eel (At Risk - Declining) and torrentfish (At Risk - Declining) are all present in the wider Ōrewa river catchment. N6-S2, N6-S3, N6-S4e rated a 2 due to being intermittent and having poor habitat quality.
Diversity and pattern	**2**	**1**	**1**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	
Level of natural diversity	2	1	1	2	2	1	2	1	2	2	N6-S1 rated a 2 for natural diversity as is mostly surrounded by a pine plantation. N6-S2 rated a 1 for natural diversity as no riparian vegetation and is very small. N6-S3 rated a 1 for natural diversity as there were no REV data for proxy and aerial imagery depicts a stream with low diversity. N6-S4c, N6-S4e rated a 1 for natural diversity because of aerial imagery and lack of REV data. N6-S4d rated a 2 for natural diversity because of mix of vegetation.

Attributes to be considered	N6-S1	N6-S2	N6-S3	N6-S4a	N6-S4b	N6-S4c	N6-S4d	N6-S4e	N6-S5	N6-S6	Justification
											N6-S4a desktop proxy = SS, P, LO, LG, 4 N6-S4b desktop proxy = SS, P, LO, LG, 4 N6-S5 desktop proxy = SS, P, MO, LG, 4 N6-S6 desktop proxy = SS, P, LO, LG, 4
Ecological context	**4**	**3**	**3**	**4**	**4**	**3**	**3**	**3**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	1	1	2	2	1	1	1	3	1	Order 1 streams = N6-S4a, N6-S4b Order 2 streams = N6-S6 Rest Order 0 streams.
Hydroperiod	4	3	3	4	4	3	3	3	4	4	Intermittent (>6 months) streams = value 3 Permanent streams = value 4
Combined value	**M**	**L**	**L**	**M**	**H**	**L**	**M**	**L**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

9.6 NoR 7: Pine Valley Road Upgrade

Table 10-37 Assessment of ecological value for aquatic ecology features for NoR 7

Attributes to be considered	N7-S1a	N7-S1b	N7-S2a	N7-S2b	Justification
Representativeness	**2**	**2**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	2	2	1	1	N7-S1a Riparian RHA values indicate a 2. Aerial imagery also shows that riparian vegetation has been somewhat altered by residential development. N7-S1b, N7-S2a, N7-S2b riparian vegetation have been significantly altered by residential development.
Rarity/distinctiveness	**3**	**3**	**3**	**3**	
Species of conservation significance	3	3	3	3	**Wēiti Stream** Giant bully (*Gobiomorphus gobioides*: At Risk - Naturally Uncommon), inanga (*Galaxias maculatus*: At Risk - Declining), and longfin eel (*Anguilla dieffenbachii*: At Risk - Declining) have been recorded in Wēiti Stream. Common, non-threatened species present in the wider catchment of Wēiti Stream.
Diversity and pattern	**3**	**2**	**2**	**1**	
Level of natural diversity	3	2	2	1	N7-S1a RAV values add to 30 = 3 for natural diversity. N7-S1b desktop proxy = Al, P, SO, SG, 4. N7-S2a desktop proxy = Al, P, SO, SG, 4. N7-S2b rated a 1 as little to no vegetation diversity. Very small stream.
Ecological context	**4**	**4**	**4**	**3**	
Stream order	3	1	1	1	Order 0 streams = N7-S1b, N7-S2a, N7-S2b; Order 2 stream = N7-S1a
Hydroperiod	4	4	4	3	N7-S2b closer to intermittent stream on hydroperiod scale.
Combined value	**M**	**M**	**M**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

9.7 NoR 8: Dairy Flat Highway (between Silverdale and Dairy Flat) Upgrade

Table 10-38 Assessment of ecological value for aquatic ecology features for NoR 8

Attributes to be considered	N8-S1	N8-S2	N8-S3	N8-S4	N8-S5a	N8-S5b	N8-S6	N8-S7a	N8-S8a	N8-S8b	N8-S9	N8-S10	Justification
Representativeness	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	1	1	2	2	1	1	1	1	1	2	1	1	N8-S1, N8-S5b, N8-S6, N8-S7a original riparian vegetation completely removed. N8-S2, N8-S5a, N8-S8a riparian vegetation modified by residential and human activities. N8-S3 has mixed native regeneration surrounding it - same as in 1996 aerial photography. Has been somewhat altered by human activities. N8-S4 manuka/kanuka regeneration, other mixed forest surrounding the stream. This has been partially removed in the past by human activities.
Rarity/distinctiveness	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	
Species of conservation significance	2	3	3	3	3	3	3	2	3	3	3	3	N8-S1 rated a 2 for species of conservational importance as although there are some present in the wider catchment, it is unlikely they can successfully live in this stream and may just migrate through it. **Rangitopuni Stream** Inanga (At Risk - Declining) and longfin eel (At Risk - Declining) present. **Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii:* At Risk- Declining) have been recorded in the wider catchment. Common species present. N8-S7a given a 2 because it is not worth being Moderate ecological value - should be low.

Attributes to be considered	N8-S1	N8-S2	N8-S3	N8-S4	N8-S5a	N8-S5b	N8-S6	N8-S7a	N8-S8a	N8-S8b	N8-S9	N8-S10	Justification
Diversity and pattern	**1**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**2**	**1**	**2**	
Level of natural diversity	1	2	2	2	2	2	1	1	1	2	1	2	N8-S2 desktop proxy = SS, P, LO, LG, 4 N8-S3 desktop proxy = SS, P, LO, MG, 4 N8-S4 desktop proxy = SS, P, MO, LG, 4 N8-S5a desktop proxy = SS, P, MO, LG, 4 N8-S5b desktop proxy = SS, P, LO, LG, 4 N8-S6 desktop proxy = M, P, LO, LG, 4 N8-S8a desktop proxy = M, P, LO, LG, 4 N8-S10 desktop proxy = SS, P, LO, MG, 4 N8-S8b no REV data for proxy - allocated a 2 because of similar attributes as 8a.
Ecological context	**3**	**4**	**4**	**4**	**4**	**4**	**3**	**4**	**4**	**4**	**3**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	1	2	1	3	4	2	1	2	1	1	1	1	Order 0 streams = value 1 Order 1 streams = N8-S2, N8-S5b, N8-S7a Order 3 streams = N8-S4 Order 4 streams = N8-S5a
Hydroperiod	3	4	4	4	4	4	3	4	4	4	3	4	Intermittent (>6 months) streams = value 3 Permanent streams = value 4
Combined value	**L**	**M**	**M**	**M**	**M**	**M**	**L**	**L**	**M**	**M**	**L**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

9.8 NoR 9: Dairy Flat Highway (between Dairy Flat and Albany) Upgrade

Table 10-39 Assessment of ecological value for aquatic ecology features for NoR 9

Attributes to be considered	N9-S1	N9-S2	N9-S3	Justification
Representativeness	**2**	**2**	**2**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	2	2	2	
Rarity/distinctiveness	**3**	**3**	**3**	
Species of conservation significance	3	3	3	**Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common species present. **Lucas Creek** Longfin eel (At Risk- Declining) are present in the wider catchment. Common, non-threatened species also present.
Diversity and pattern	**1**	**2**	**2**	
Level of natural diversity	1	2	2	N9-S1 rated a 1 because of very low natural diversity, poor quality habitat etc. N9-S2 no REV data but rated a 2 based on habitat mapping which shows diverse vegetation and several fish species present in the wider catchment. N9-S3 desktop proxy = SS, P, LO, LG, 4 = 2
Ecological context	**4**	**4**	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	2	1	2	Order 0 streams = N9-S2, Order 1 streams = N9-S1, N9-S3
Hydroperiod	4	4	4	All permanent streams
Combined value	**Moderate**	**Moderate**	**Moderate**	

9.9 NoR 10: Wainui Road Upgrade

Table 10-40 Assessment of ecological value for aquatic ecology features for NoR 10

Attributes to be considered	N10-S1	Justification
Representativeness	**3**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	3	
Rarity/distinctiveness	**3**	
Species of conservation significance	3	**Ōrewa River** Giant bully (At Risk-Naturally Uncommon), giant kokopu (At Risk - Declining), inanga (At Risk - Declining), longfin eel (At Risk - Declining) and torrentfish (At Risk - Declining) are all present in the wider Ōrewa river catchment.
Diversity and pattern	**4**	
Level of natural diversity	4	N10-S1 rated a 4 even though the desktop proxy is a 3. This is because there are a lot of fish species (both common and threatened), and a diverse mix of vegetation that has only been somewhat modified.
Ecological context	**4**	**(Ecosystem services, importance and sensitivity)**
Stream order	3	Stream order 3.
Hydroperiod	4	Permanent.
Combined value	**High**	

9.10 NoR 12: Bawden Road Upgrade and Extension

Table 10-41 Assessment of ecological value for aquatic ecology features for NoR 12

Attributes to be considered	N12-S1a	N12-S1b	N12-S2	N12-S3	N12-S4a	N12-S4b	Justification
Representativeness	**2**	**1**	**1**	**1**	**2**	**1**	**(including SEV, RHA and ecological integrity)**
Riparian habitat modification	2	1	1	1	2	1	N12-S1a rated a 2 based on RHA values. N12-S1b, N12-S2 riparian habitat completely altered by human activities.
Rarity/distinctiveness	**3**	**2**	**2**	**2**	**3**	**3**	
Species of conservation significance	3	2	2	2	3	3	**Dairy Stream** Inanga (*Galaxias maculatus*: At Risk - Declining) and longfin eel (*Anguilla dieffenbachii*: At Risk- Declining) have been recorded in the wider catchment. Common species present. N12-S1b, N12-S2 given a 2 instead of a 3 due to poor habitat quality for all freshwater fish besides eels.
Diversity and pattern	**2**	**1**	**1**	**1**	**2**	**2**	
Level of natural diversity	2	1	1	1	2	2	N12-S1a desktop proxy = SS, P, MO, LG, 4
Ecological context	**4**	**4**	**4**	**4**	**4**	**4**	
Stream order	3	1	1	1	1	1	N12-S1a stream order 3.
Hydroperiod	4	4	4	4	4	4	All permanent.
Combined value	**M**	**L**	**L**	**L**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10 Appendix 10 – Wetland Value Assessment

10.1 NoR 1: Rapid Transport Corridor (RTC) between Albany and Milldale

Table 10-42 Assessment of ecological value for wetland (open water) ecology features for NoR 1

Attributes to be considered	N1-O1	N1-O2	N1-O3	N1-O4	N1-O5	N1-O6	N1-O7	N1-O8	N1-O9	N1-O10	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	Fully artificial
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O5.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands

Attributes to be considered	N1-O1	N1-O2	N1-O3	N1-O4	N1-O5	N1-O6	N1-O7	N1-O8	N1-O9	N1-O10	Justification
											(>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	-	-	-	-	-	-	-	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	2	-	-	-	-	-	-	-	-	-	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	2	2	2	2	2	2	2	2	2	2	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	2	2	2	2	-	2	2	2	2	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.

Attributes to be considered	N1-O1	N1-O2	N1-O3	N1-O4	N1-O5	N1-O6	N1-O7	N1-O8	N1-O9	N1-O10	Justification
Connectivity and migration	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-43 Assessment of ecological value for wetland (open water) ecology features for NoR 1

Attributes to be considered	N1-O11	N1-O12	N1-O13	N1-O14	N1-O15	N1-O16	N1-O17	N1-O18	N1-O19	N1-O20	N1-O21	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	1	Fully artificial. N1-O13 associated with an EW wetland due to location, but does not seem to be driving the hydrology of the surrounding rushes.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake for inland areas, and little black shag, pied shag for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O14, O17, O20, O21.

Attributes to be considered	N1-O11	N1-O12	N1-O13	N1-O14	N1-O15	N1-O16	N1-O17	N1-O18	N1-O19	N1-O20	N1-O21	Justification
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	-	-	1	-	-	-	-	-	3	3	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	-	-	-	-	-	-	-	1	-	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	2	2	2	2	2	2	2	2	2	1	2	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower.

Attributes to be considered	N1-O11	N1-O12	N1-O13	N1-O14	N1-O15	N1-O16	N1-O17	N1-O18	N1-O19	N1-O20	N1-O21	Justification
												Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	2	2	2	2	2	2	2	2	3	3	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-44 Assessment of ecological value for wetland ecology features for NoR 1

Attributes to be considered	N1-W1	N1-W2	N1-W3	N1-W4	N1-W5	N1-W6	N1-W7	N1-W8	N1-W9	N1-W10	N1-W11	N1-W12	Justification
Representativeness	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**2**	**2**	**(Wetland condition assessment)**
Hydrological modification	2	2	2	2	2	2	3	3	2	3	2	2	Scoring considered abstraction (including the presence and extent of exotic trees with high evapotranspiration rates), regulation by impoundments, drains or increased runoff from agricultural land or urban development.
Rarity/distinctiveness	**1**	**1**	**1**	**3**	**1**	**3**	**1**	**3**	**3**	**3**	**1**	**3**	

Attributes to be considered	N1-W1	N1-W2	N1-W3	N1-W4	N1-W5	N1-W6	N1-W7	N1-W8	N1-W9	N1-W10	N1-W11	N1-W12	Justification
Species of conservation significance	1	1	1	3	1	3	1	3	3	3	1	3	Spotless Crakes (At Risk - Declining, value score of 3) will utilise palustrine wetlands of sufficient size (>3000 m^2). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	1	1	Exotic dominated vegetation.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**4**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	2	-	2	3	-	-	3	-	3	2	4	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	2	-	-	-	3	-	2	-	-	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A

Attributes to be considered	N1-W1	N1-W2	N1-W3	N1-W4	N1-W5	N1-W6	N1-W7	N1-W8	N1-W9	N1-W10	N1-W11	N1-W12	Justification
													temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	-	3	3	3	-	-	2	-	-	3	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	-	-	2	-	-	-	-	-	-	3	-	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**M**	**L**	**M**	**L**	**M**	**L**	**M**	**L**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10.2 NoR 3: Pine Valley East Station and associated facilities

Table 10-45 Assessment of ecological value for aquatic ecology features for NoR 3

Attributes to be considered	N3-O1	N3-O2	Justification
Representativeness	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	Fully artificial.
Rarity/distinctiveness	**4**	**4**	
Species of conservation significance	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O1.
Vegetation type of conservation significance	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	
Diversity of habitat types	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**1**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	1	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	2	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.

Attributes to be considered	N3-O1	N3-O2	Justification
Sediment trapping	2	1	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	1	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**Low**	**Low**	

10.3 NoR 4: SH1 Improvements

Table 10-46 Assessment of ecological value for aquatic (open water) ecology features for NoR 4

Attributes to be considered	N4-O1	N4-O2	N4-O3	N4-O4	N4-O5	N4-O6	N4-O7	N4-O8	N4-O9	N4-O10	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	Fully artificial.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern for inland areas, shags and white heron for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O1, O5, O6, O7.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	3	3	3	2	-	-	3	3	2	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was

Attributes to be considered	N4-O1	N4-O2	N4-O3	N4-O4	N4-O5	N4-O6	N4-O7	N4-O8	N4-O9	N4-O10	Justification
											given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	1	1	1	1	1	1	1	1	1	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	1	1	1	1	1	1	1	1	1	2	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	3	3	2	3	3	3	3	2	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**M**	**M**	**M**	**M**	**L**	**M**	**M**	**M**	**M**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-47 Assessment of ecological value for aquatic (open water) ecology features for NoR 4

Attributes to be considered	N4-O11	N4-O12	N4-O13	N4-O14	N4-O15	N4-O16	N4-O17	N4-O18	N4-O19	N4-O20	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	Fully artificial.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern for inland areas, shags and white heron for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O15, O16, O17, O19.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	3	3	3	2	3	2	-	3	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.

Attributes to be considered	N4-O11	N4-O12	N4-O13	N4-O14	N4-O15	N4-O16	N4-O17	N4-O18	N4-O19	N4-O20	Justification
Streamflow augmentation	-	-	-	-	-	-	-	-	-	-	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	-	-	-	-	-	2	-	2	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	3	3	-	3	2	2	3	2	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**M**	**M**	**M**	**M**	**L**	**M**	**L**	**L**	**M**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-48 Assessment of ecological value for aquatic (open water) ecology features for NoR 4

Attributes to be considered	N4-O21	N4-O22	N4-O23	N4-O24	N4-O25	N4-O26	N4-O27	N4-O28	N4-O29	N4-O30	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	Fully artificial
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern for inland areas, shags and white heron for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O28, O29, O30.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	3	3	3	3	3	2	3	3	3	3	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	3	3	-	3	-	3	-	3	3	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.

Attributes to be considered	N4-O21	N4-O22	N4-O23	N4-O24	N4-O25	N4-O26	N4-O27	N4-O28	N4-O29	N4-O30	Justification
Streamflow augmentation	-	1	1	-	1	-	1	-	-	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	3	3	3	2	3	3	3	3	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**M**	**M**	**M**	**M**	**M**	**L**	**M**	**M**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-49 Assessment of ecological value for aquatic (open water) ecology features for NoR 4

Attributes to be considered	N4-O31	N4-O32	N4-O33	N4-O34	N4-O35	N4-O36	N4-O37	N4-O38	N4-O39	N4-O40	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	1	1	Fully artificial
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern for inland areas, shags and white heron for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise O35, O39, O40, O41, O42
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	3	3	3	3	3	3	3	3	3	3	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	3	3	3	-	3	3	3	3	3	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.

Attributes to be considered	N4-O31	N4-O32	N4-O33	N4-O34	N4-O35	N4-O36	N4-O37	N4-O38	N4-O39	N4-O40	Justification
Streamflow augmentation	1	2	1	1	-	1	1	1	1	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	-	-	-	-	1	-	-	1	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	3	3	3	3	3	3	3	3	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-50 Assessment of ecological value for aquatic (open water) ecology features for NoR 4

Attributes to be considered	N4-O41	N4-O42	N4-O43	N4-O44	N4-O45	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	Fully artificial
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. O41, O42
Vegetation type of conservation significance	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal, and temporary habitat were scored higher.
Ecological context	3	3	3	3	3	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	3	3	-	-	2	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	-	-	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.

Attributes to be considered	N4-O41	N4-O42	N4-O43	N4-O44	N4-O45	Justification
						O45 connected to an unnamed tributary of John Creek downstream
Sediment trapping	-	-	1	-	2	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	-	1	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**M**	**M**	**L**	**L**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-51 Assessment of ecological value for aquatic ecology features for NoR 4

Attributes to be considered	N4-W1	N4-W2	N4-W3	N4-W4	N4-W5	N4-W6	N4-W7	Justification
Representativeness	**4**	**3**	**2**	**1**	**2**	**1**	**2**	**(Wetland condition assessment)**
Hydrological modification	4	3	2	1	2	1	2	Scoring considered abstraction (including the presence and extent of exotic trees with high evapotranspiration rates), regulation by impoundments, drains or increased runoff from agricultural land or urban development. W3, 4, 5, and 6 may be associated with artificial channels, ponds. W 4 and 6 may be induced. W11 associated with stream

Attributes to be considered	N4-W1	N4-W2	N4-W3	N4-W4	N4-W5	N4-W6	N4-W7	Justification
Rarity/distinctiveness	**4**	**1**	**1**	**3**	**1**	**1**	**1**	
Species of conservation significance	4	1	1	3	1	1	1	Spotless Crakes (At Risk - Declining, value score of 3) will utilise palustrine wetlands of sufficient size (>3000 m^2). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Banded rail and shag species (At Risk - Declining) and the white heron (Threatened) likely using W1 which is SA.1 and located at an estuary.
Vegetation type of conservation significance	2	1	1	1	1	1	1	Exotic dominated vegetation. W1 is mangrove forest and scrub.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	W11 - mix of arum lily, manuka, swamp millet, and planted NZ flax Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) Saturation was scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**4**	**3**	**3**	**3**	**2**	**3**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	-	-	-	-	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	3	-	-	-	-	2	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	3	-	-	-	2	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap

Attributes to be considered	N4-W1	N4-W2	N4-W3	N4-W4	N4-W5	N4-W6	N4-W7	Justification
								sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	-	-	3	3	2	3	3	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	4	-	-	1	1	1	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**H**	**L**	**L**	**L**	**L**	**L**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-52 Assessment of ecological value for aquatic ecology features for NoR 4

Attributes to be considered	N4-W8	N4-W9	N4-W10	N4-W11	N4-W12	N4-W13	N4-W14	Justification
Representativeness	**2**	**3**	**2**	**3**	**2**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	2	3	2	3	2	1	1	Scoring considered abstraction (including the presence and extent of exotic trees with high evapotranspiration rates), regulation by impoundments, drains or increased runoff from agricultural land or urban development. W11 associated with stream
Rarity/distinctiveness	**1**	**3**	**1**	**1**	**1**	**1**	**3**	

Attributes to be considered	N4-W8	N4-W9	N4-W10	N4-W11	N4-W12	N4-W13	N4-W14	Justification
Species of conservation significance	1	3	1	1	1	1	3	Spotless Crakes (At Risk - Declining, value score of 3) will utilise palustrine wetlands of sufficient size (>3000 m^2). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed.
Vegetation type of conservation significance	1	1	1	1	1	1	1	Exotic dominated vegetation.
Diversity and pattern	**1**	**1**	**1**	**2**	**1**	**2**	**1**	
Diversity of habitat types	1	1	1	2	1	1	1	W11 - mix of arum lily, manuka, swamp millet, and planted NZ flax Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) Saturation was scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**1**	**3**	**2**	**4**	**2**	**1**	**1**	**(Ecosystem services, importance, and sensitivity)**
Flood attenuation	1	2	2	-	1	-	1	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	1	3	-	3	1	1	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	1	2	-	3	2	1	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).

Attributes to be considered	N4-W8	N4-W9	N4-W10	N4-W11	N4-W12	N4-W13	N4-W14	Justification
Water purification	-	3	2	3	-	-	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	1	4	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**M**	**L**	**M**	**L**	**N**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10.4 NoR 5: SH1 crossing at Dairy Stream

Table 10-53 Assessment of ecological value for aquatic ecology features for NoR 5

Attributes to be considered	N5-O1	Justification
Representativeness	**1**	**(Wetland condition assessment)**
Hydrological modification	1	Fully artificial.
Rarity/distinctiveness	**4**	
Species of conservation significance	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Although Dabchicks (Threatened - Nationally increasing - value score of 4) are able to use open water ponds, the ponds here are unlikely to provide attractive habitat (based mix of on size, degradation, disturbance, lack of dense planting around margins)
Vegetation type of conservation significance	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	
Diversity of habitat types	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	1	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent

Attributes to be considered	N5-O1	Justification
		saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	1	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	1	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**Low**	

10.5 NoR 6: Connection between Milldale and Grand Drive

Table 10-54 Assessment of ecological value for aquatic ecology features for NoR 6

Attributes to be considered	N6-O1	N6-O2	N6-O3	N6-W1	N6-W2	N6-W3	N6-W4	N6-W5	Justification
Representativeness	**1**	**1**	**1**	**2**	**3**	**2**	**1**	**3**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	2	3	2	1	3	Scoring considered abstraction (including the presence and extent of exotic trees with high evapotranspiration rates), regulation by impoundments, drains or increased runoff from agricultural land or urban development. Fully artificial - 1. N6-W5 - planted wetland around a stream
Rarity/distinctiveness	**4**	**4**	**4**	**1**	**4**	**4**	**1**	**4**	
Species of conservation significance	4	4	4	1	4	4	1	4	TAR birds such as North Island fernbird, spotless crake (At Risk - Declining, value score of 3), and dabchick (Threatened – Nationally Increasing, value score of 4) may utilise the N6-W3 which is a mix of planted native, sedgeland, raupō wetland. TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., Brown teal, spotless crake, Australasian bittern for inland areas, and black shag for coastal areas). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed.
Vegetation type of conservation significance	1	1	1	1	1	4	1	1	W3 is dominated by non-threatened natives and contains areas of raupō wetland which has an IUCN status of endangered.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**4**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	4	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.

Attributes to be considered	N6-O1	N6-O2	N6-O3	N6-W1	N6-W2	N6-W3	N6-W4	N6-W5	Justification
Ecological context	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	-	2	3	3	-	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	2	-	2	-	3	3	3	3	Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	2	2	2	3	-	-	2	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	2	2	-	2	-	-	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	2	-	2	1	3	3	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	L	L	L	**L**	**M**	**H**	**L**	**M**	

10.6 NoR 7: Pine Valley Road Upgrade

Table 10-55 Assessment of ecological value for aquatic ecology features for NoR 7

Attributes to be considered	N7-W1	N7-W2	Justification
Representativeness	1	1	**(Wetland condition assessment)**
Hydrological modification	1	1	Associated with artificial drains.
Rarity/distinctiveness	1	1	
Species of conservation significance	1	1	TAR birds unlikely to be present due to size and habitat quality.
Vegetation type of conservation significance	1	1	
Diversity and pattern	1	1	
Diversity of habitat types	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	3	3	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	3	3	Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower.

Attributes to be considered	N7-W1	N7-W2	Justification
			Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	3	3	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**Low**	**Low**	

10.7 NoR 8: Dairy Flat Highway (between Silverdale and Dairy Flat) Upgrade

Table 10-56 Assessment of ecological value for aquatic ecology features (open water) for NoR 8

Attributes to be considered	N8-O1	N8-O2	N8-O3	N8-O4	N8-O5	N8-O6	N8-O7	N8-O8	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	1	Fully artificial.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (i.e., grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. The ponds here are unlikely to provide attractive habitat for dabchicks (based on size, degradation, disturbance, lack of dense planting around margins).
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	2	2	2	2	2	2	2	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which

Attributes to be considered	N8-O1	N8-O2	N8-O3	N8-O4	N8-O5	N8-O6	N8-O7	N8-O8	Justification
									stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	-	-	-	-	-	-	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	2	1	-	-	-	-	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	-	-	-	-	-	-	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	1	1	1	1	1	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

Table 10-57 Assessment of ecological value for aquatic ecology features for NoR 8

Attributes to be considered	N8-W1	N8-W2	N8-W3	N8-W4	N8-W5	N8-W6	N8-W7	N8-W8	N8-W9	Justification
Representativeness	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**(Wetland condition assessment)**
Hydrological modification	3	2	2	2	2	2	2	3	2	Fully artificial.
Rarity/distinctiveness	**1**	**1**	**1**	**3**	**3**	**4**	**3**	**4**	**1**	
Species of conservation significance	1	1	1	3	3	4	3	4	1	TAR birds such as spotless crake (At Risk - Declining, value score of 3) and Australasian bittern (Threatened – Nationally Critical, value score of 4) will utilise palustrine wetlands of sufficient size (>3000 m^2). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise W8 due to its association with a nearby pond.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	1	1	1	1	1	1	1	1	1	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	3	2	2	3	3	3	3	4	3	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	2	-	3	3	-	3	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread

Attributes to be considered	N8-W1	N8-W2	N8-W3	N8-W4	N8-W5	N8-W6	N8-W7	N8-W8	N8-W9	Justification
										across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	3	-	-	-	-	3	-	4	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	2	3	3	-	3	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	-	-	-	-	-	-	-	3	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	2	2	1	-	1	3	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**M**	**M**	**M**	**M**	**M**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10.8 NoR 9: Dairy Flat Highway (between Dairy Flat and Albany) Upgrade

Table 10-58 Assessment of ecological value for aquatic ecology features for NoR 9

Attributes to be considered	N9-O1	N9-O2	N9-O3	N9-W1	N9-W2	Justification
Representativeness	**1**	**1**	**1**	**3**	**3**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	3	3	Fully artificial.
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	
Species of conservation significance	4	4	4	4	4	TAR birds have the potential to use open water / ponds / artificial wetlands (Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Dabchicks (Threatened - Nationally increasing - value score of 4) may utilise W1 and W2 due their association with nearby ponds.
Vegetation type of conservation significance	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**1**	**2**	**0**	**3**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	1	1	-	-	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which

Attributes to be considered	N9-O1	N9-O2	N9-O3	N9-W1	N9-W2	Justification
						stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	1	1	-	3	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	1	2	-	-	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	1	2	-	-	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**M**	**M**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10.9 NoR 11: New connection between Dairy Flat Highway and Wilks Road

Table 10-59 Assessment of ecological value for aquatic ecology features for NoR 11

Attributes to be considered	N11-O1	N11-W2	Justification
Representativeness	**1**	**2**	**(Wetland condition assessment)**
Hydrological modification	1	2	Scoring considered abstraction (including the presence and extent of exotic trees with high evapotranspiration rates), regulation by impoundments, drains or increased runoff from agricultural land or urban development. Fully artificial - 1
Rarity/distinctiveness	**4**	**1**	
Species of conservation significance	4	1	TAR birds have the potential to use open water / ponds / artificial wetlands (Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed.
Vegetation type of conservation significance	1	1	
Diversity and pattern	**1**	**1**	
Diversity of habitat types	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	3	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	1	-	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50%

Attributes to be considered	N11-O1	N11-W2	Justification
			permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	1	3	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	1	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**Low**	**Low**	

10.10 NoR 12: Bawden Road Upgrade and Extension

Table 10-60 Assessment of ecological value for aquatic ecology features for NoR 12

Attributes to be considered	N12-O2	N12-O3	N12-O4	N12-O5	N12-O6	N12-O7	N12-O8	N12-W1	N12-W2	Justification
Representativeness	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	1	1	1	1	2	2	1 - Fully artificial. Drain and modification present for W1 and W2
Rarity/distinctiveness	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**1**	**1**	
Species of conservation significance	4	4	4	4	4	4	4	1	1	TAR birds have the potential to use open water / ponds / artificial wetlands (Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed.
Vegetation type of conservation significance	1	1	1	1	1	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting. W1 – exotic species
Diversity and pattern	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	
Diversity of habitat types	1	1	1	1	1	1	1	1	1	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**1**	**2**	**1**	**1**	**2**	**1**	**2**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	2	1	2	1	1	2	1	2	-	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are spread across

Attributes to be considered	N12-O2	N12-O3	N12-O4	N12-O5	N12-O6	N12-O7	N12-O8	N12-W1	N12-W2	Justification
										the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	-	-	-	-	-	1	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	-	-	-	-	-	-	-	2	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	-	-	-	-	-	-	-	2	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	-	-	-	-	-	-	-	-	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	**L**	

Notes: N = Negligible, L = Low, M = Moderate, H = High, VH = Very High

10.11 NoR 13: East Coast Road (between Silverdale and Ō Mahurangi Penlink (Redvale) Interchange) Upgrade

Table 10-61 Assessment of ecological value for aquatic ecology features for NoR 12

Attributes to be considered	N13-O1	N13-O2	N13-O3	N13-W1	Justification
Representativeness	**1**	**1**	**1**	**2**	**(Wetland condition assessment)**
Hydrological modification	1	1	1	2	Fully artificial.
Rarity/distinctiveness	**4**	**4**	**4**	**3**	
Species of conservation significance	4	4	4	3	TAR birds have the potential to use open water / ponds / artificial wetlands (Brown teal, grey duck, spotless crake, Australasian bittern). Have considered to be present based on a conservative approach, but use is likely to be transient only as habitat is of low quality and would be frequently disturbed. Ponds here are unlikely to provide attractive habitat for dabchicks (based on size, degradation, disturbance, lack of dense planting around margins).
Vegetation type of conservation significance	1	1	1	1	Surrounded by pasture, exotic dominated vegetation, or restoration planting.
Diversity and pattern	**1**	**1**	**1**	**0**	
Diversity of habitat types	1	1	1	-	Scores reflect differences in the representation of different habitats associated with the period of inundation and or saturation. For example, small wetlands (<100 m^2) that provide only temporary (<3 months/yr.) saturation were scored lower while larger wetlands (>500 m^2) with permanent, seasonal and temporary habitat were scored higher.
Ecological context	**2**	**2**	**2**	**3**	**(Ecosystem services, importance and sensitivity)**
Flood attenuation	-	-	-	2	Scores reflect differences in wetland size in relation to its catchment (a wetland size that is >10% of its catchment was scored higher). Additional consideration was given to the way in which stormflows are

Attributes to be considered	N13-O1	N13-O2	N13-O3	N13-W1	Justification
					spread across the wetland. Other factors considered is surface roughness, slope, size of flood benches and sinuosity.
Streamflow augmentation	-	-	2	3	Artificial wetlands - retain flow vs augment flows Scores reflect differences in the size and representation of different hydroperiods for each wetland. Wetlands with >50% permanent saturation/inundation and directly connected to a downslope stream were scored higher. A temporary isolated wetland (such as a small seep) scored lower.
Sediment trapping	2	2	2	-	Scores reflect differences in estimated likely sediment yields from the catchments of each wetland (highest for steep catchments with no vegetation cover) against the ability of each wetland to trap sediment. Wetlands with diffuse flow patterns have high capacity to trap sediment while wetlands with strongly channelled flows and drains scored lower. Scoring also considered how frequently stormflows move through the wetland (>1 in 5 years likely to score lower, while >1 per year score higher).
Water purification	2	2	2	-	Scores consider sources of contamination in the wetland's catchment (agrichemicals, urban runoff etc.) and the wetland's capacity to treat water (size relative to catchment and hydrological modification). As an example, a pasture wetland that is >10% of catchment and which retains hydrological integrity scored higher, while a very small wetland that was <1% of its catchment and modified scored lower.
Connectivity and migration	1	1	1	-	Scores reflect differences in the position of wetlands within the larger stream networks.
Combined value	**Low**	**Low**	**Low**	**Low**	

11 Appendix 11 – Impact Assessment

NoR 1													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	1 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. New road cutting through some wetlands and a few stream tributaries. Bat presence confirmed via ABMs at 161 Ahutoetoe Rd (North end of NoR) and 422 Bawden Rd (south end of NoR). Roosts likely to be present in associated native and exotic vegetation. Bats highly likely to be disturbed by construction activities due to close proximity to bat corridor and potential roosts.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Crosses possible bat corridor around Awanohi Rd entrrance from East Coast Rd, where Bawden Rd and Dairy Stream Rd intersect, and then goes along a corridor for approximately 2.5 km at the northern end of the NoR (within 150 m of NoR boundary). Additional fragmentation expected to occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	1 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. New road. Proximity to bat corridors and possible roosts increase likelihood of disturbing bats.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	1 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for the southern end.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for a section in the southern end. It is a new road that passes through Dairy Stream as well as going along a John Creek tributary, both with high potential for bat foraging and commuting. Additional fragmentation is expected.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	1 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for a section in the southern end. It is anew road and some disturbance of bats is expected., especially considering the new road goes along a potential bat corridor for about 2.5 km on the northern end.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	1 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road mainly over grazed pasture, cutting through some wetlands and a few stream tributaries. It is highly likely that disturbance will occur that will result in changes to the population dynamics.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Very Low
Operation	Presence of the road	1 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road mainly over grazed pasture, cutting through some wetlands and a few stream tributaries. it is highly likely that loss in connectivity resulting in changes to the population dynamics will occur (particularly for species will a small home range, such as grey warbler).	Indirect	Local	Permanent (>25 years)		Highly Likely	Irreversible	Moderate	Low
Operation	Presence of the road	1 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road mainly over grazed pasture, cutting through some wetlands and a few stream tributaries. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Highly Likely	Irreversible	Moderate	Low
Construction	Noise/lighting/vibration/dust	1 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for the southern end. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Very Low
Operation	Presence of the road	1 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	1 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/dust	1 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road mainly over grazed pasture. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR (N1-W4, N1-W6, N1-W8, N1-W9, N1-W10, N1-W12), and adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging and nesting. The road designation goes over all named wetlands, thus disturbance by construction is highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate

NoR 1													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	1 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging and nesting. Spotless crake known to have high dispersal. Loss of connectivity resulting in changes to population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	1 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging and nesting. As it is a new road, disturbance to spotless crake due to road presence is likely.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	1 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	1 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Roads expected to be built before urbanisation. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	1 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road mainly over grazed pasture. Potential to utilise ponds within NoR and moderate to large sized wetlands (> 3000 m2)adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging The road designation goes over all named wetlands, thus disturbance by construction is highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging Australasian bittern known to have high dispersal, loss to connectivity unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) adjacent to NoR (west to NoR at towards South end, to east of intersection with Awanohi road (SA1.2), east of intersection with NoR 8) for foraging and nesting. On balance desturbance effect to bittern assessed as Unlikely	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	1 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 1													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	1 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Brown teal, dabchick, Pacific black duck potential to be found in any of the named ponds within NoR (N1-O1 to O21) or the several ponds within 100 m of NoR boundary along NoR. Road designation goes over almost all of the named ponds. Disturbance by construction activities highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Due to abundance of potential habitat within 100 m of this NoR of a new road, loss of connectivity likely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture, wetlands, and ponds. Not many suitable habitats within 100 m of road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	1 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	1 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	1 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	1 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	1 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. No significant habitat structure aside from the southern end of NoR, where road meets SH1. Kākā unlikely to be disturbed by presence of the road due to habituation to road disturbance (SH1) and lack of habitat where it is a new road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	1 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	1 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 1													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	1 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. As this is adjacent to SH1, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	1 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	1 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. No significant habitat structure aside from the southern end of NoR, where road meets SH1. Long-tailed cuckoos unlikely to be disturbed by presence of the road due to habituation to road disturbance (SH1) and lack of habitat where it is a new road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	1 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	1 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	1 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. As this is adjacent to SH1, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. Tree group no 106 acting foraging habitat for bats is unlikely. Potential of loss of foraging habitat of bats due to removal of district plan tree group ID 104, but as related to SEA_T_2218, significant impact is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Baseline. Bat roosts within distric plan tree group no. 106 unlikely (semi mature, lack of aged woody structure). Potential of bat roost loss due to removal of mature district plan trees in VS2/VS3 habitat (no. 104)	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Baseline. Tree group no. 106 is semi mature and adjacent to a road, bat presence unlikely. Bats are potentially present and thus can be injured/killed within tree group 104.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Potential for non-TAR birds to use district plan vegetation for foraging (which will be removed).	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Baseline. Potential for non-TAR bird nests to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low

NoR 1													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Potential for non-TAR birds to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	1 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Baseline. North Island kākā nests are generally in mature tree cavities, therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore killing or injuring a North Island kākā due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Potential for nests in the matured district plan trees 104	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Higher likelihood of kaka presence in tree group 104 than in baseline due to maturing of trees and association with SEA	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Baseline. Long-tailed cuckoo lay their eggs in the nests of whiteheads, yellowheads and brown creepers. These host bird species were not identified in the North ecological baseline. Therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore killing or injuring a long-tailed cuckoo due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	1 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Baseline. Potential for loss of gecko habitat due to the removal of indigenous district plan vegetation 104 adjacent to SEAs. Tree group 106 in PL3 habitat, unlikely to be habitat due to lack of mature indigenous trees	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Baseline. Potential for geckos to be present in VS2/VS3 habitat (tree group no. 104)	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	1 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate

NoR 2													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	2 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	New station next to Ahutoetoe Rd. Bat presence confirmed via ABMs at 161 Ahutoetoe Rd, and roosts likely present in association with the native vegetation. Bats highly likely to be disturbed by construction activities due to proximity to bat corridor and potential roosts.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	2 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. New station, no stream crossings, no fragmentation of large structure. Connectivity unlikely to be affected.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	2 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. New station next to motorway. It is anticipated that bats in the area are already habituated to road disturbance due to motorway.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	2 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone (Residential). Native vegetation to the south of NoR is expected to be retained as Conservation Zone, where there is potential for bat roosts.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	2 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Bat corridor approximately 140 m south of NoR, unlikely to be fragmented by operation.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	2 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Bats unlikely to be disturbed by the presence of the station in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	2 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New station next to SH1. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	2 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station, no stream crossings, no fragmentation of large structure. Connectivity unlikely to be affected.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	2 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station next to SH1. If birds are present, they are unlikely to be disturbed by the presence of the station due to habituation to presence of adjacent SH1.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	2 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	2 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	2 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	2 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo potentially utilise the native forest adjacent to NoR at the south side. They are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	2 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station, no stream crossings, no fragmentation of large structure. Connectivity unlikely to be affected.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	2 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is located next to SH1, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the station	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 2													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	2 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Native vegetation to the south of NoR is expected to be retained as Conservation Zone. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	2 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. New station, no stream crossings, no fragmentation of large structure. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	2 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, and as the NoR is located next to SH1, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the station. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. Tree group no 106 acting foraging habitat for bats is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Baseline. Bat roosts within distric plan tree group no. 106 unlikely (semi mature, lack of aged woody structure).	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Baseline. Tree group no. 106 is semi mature and adjacent to a road, bat presence unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Potential for non-TAR birds to use district plan vegetation for foraging (which will be removed).	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Baseline. Potential for non-TAR bird nests to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Potential for non-TAR birds to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Baseline. North Island kākā nests are generally in mature tree cavities, therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore killing or injuring a North Island kākā due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low

NoR 2													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Baseline. Long-tailed cuckoo lay their eggs in the nests of whiteheads, yellowheads and brown creepers. These host bird species were not identified in the North ecological baseline. Therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore killing or injuring a long-tailed cuckoo due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	2 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Baseline. Tree group 106 in PL3 habitat, unlikely to be habitat due to lack of mature indigenous trees	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Baseline. Potential for geckos to be present in PL.3 habita unlikely	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	2 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low

NoR 3													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	3 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. New station, over small Weiti stream tributary, a small patch of native plantings and exotic forest. John creek tributary approximately 150 m south of NoR possibly acts as a bat corridor. Bats could be be disturbed by construction activities due to close proximity to bat corridor.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	3 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. New station, does not cross through any riparian corridor or large vegetation structures. Fragmentation unlikely. If loss in connectivity occurs likely to be 'Local'	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. New station. There could be some disturbance to bats using the John Creek tirubtary bat corridor to the south of NoR from light and noise.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone. No significant structures close by except John creek tributary approximately 150 m south of NoR that could act as a bat corridor. (assumed trees with roost potential may be present at the time of construction and that construction occurs prior to urban development	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	3 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. New station, does not cross through any riparian corridor or large vegetation structures. Fragmentation unlikely. If loss in connectivity occurs likely to be 'Local'	Indirect	local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Bats unlikely to be disturbed by the presence of the station in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New station. NoR over small patch of exotic forest and pond. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	3 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	3 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	3 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	3 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	3 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	3 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New station. No wetland within NoR, but few small wetlands to the south of NoR, within 100m of designation. All < 3000 m2. Disturbance due to construction activities unlikely.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	3 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Spotless crake habitat outside of NoR designation. Spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 3													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	3 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Spotless crake habitat outside of NoR designation. Disturbance from station presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	3 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands likely to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	3 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands likely to be retained. Spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	3 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands likely to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	3 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New station. Potential to utilise small ponds in NoR (N3-O1, N3-O2) or wetlands within 100 m of south boundary of NoR. Australasian bittern are considered a highly mobile species in this area, with high dispersal. Therefore, it is unlikely that construction disturbance will result in changes to the population dynamics.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	3 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Potential to utilise wetlands within 100 m of south boundary of NoR. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Potential to utilise small ponds in NoR (N3-O1, N3-O2) or wetlands within 100 m of south boundary of NoR. Due to the existing disturbance from Sandspit Road, it is unlikely that disturbance from the presence of the road will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands likely to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	3 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands likely to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands likely to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New station. Ponds within NoR (N3-O1 N3-O2) expected to be developed over prior to construction. Construction activities unlikely to disturb any birds present.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low

NoR 3													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	3 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Brown teal, dabchick, pacific black duck potential to utilise ponds within NoR (N3-O2). NoR does not fragment any big open bodies of water thus connectivity is unlikely to be impacted.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station. Brown teal, dabchick, pacific black duck potential to utilise ponds within NoR (N3-O2). Disturbance by station presence unlikely to birds present in the area due to pond proximity to road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. The magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	3 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds likely to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds likely to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Patch of native plantings and exotic forest within NoR will be built over. New station. Any long-tailed cuckoo present expected to be disturbed by construction activity.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	3 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New station over native plantings and part of small exotic forest. Connectivity is expected to be impacted with nearby forests.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. The main exotic forest in NoR is adjacent to a road, so it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the station.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	3 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Construction is assumed to be before urbanisation. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	3 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Construction is assumed to be before urbanisation. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	3 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. The vegetation patches are by a road, so it is expected that any long-tailed cuckoos present is habtuated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the station. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	4 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade to existing road. Aside from WF11 stretch towards southern end of NoR, no significant vegetation structure. ABMs at 161 Ahutoetoe Rd, 228 Wilks Rd, 1722 East Coast Rd, 422 Bawden Rd confirm bat presence all along the NoR. Some disturbance to bat is expected due to bat corridors.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Several bat corridors pass across SH1. Although it is an upgrade to an existing road, additional fragmentation is still expected. However low baserate and poorly defined ecological nodes on either side of the infrastructure	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	4 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. It is anticipated that bats in the area are already habituated to road disturbance due the existing road. Likely disturbance at northern section associated with SEA_T_2192a only	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	4 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for section between Bawden Rd and Lonely Track Rd.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for section between Bawden Rd and Lonely Track Rd. Although it is an upgrade of existing road, additional fragmentation is expected as it crosses several possible bat corridors all along NoR. However low baserate and poorly defined ecological nodes on either side of the infrastructure	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	4 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone except for section between Bawden Rd and Lonely Track Rd, and it is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment. (Northern section associated with SEA_T_2192a only)	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/dust	4 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing SH1. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	4 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing SH1. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing SH1. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	4 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Also, likely to occur at any densely vegetated wetlands adjacent to SH1 based on past observations from iNaturalist. Disturbance due to construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	4 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Also, likely to occur at any densely vegetated wetlands adjacent to SH1 based on past observations from iNaturalist. As it is an upgrade to existing road, it's unlikely that loss in connectivity would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Also, likely to occur at any densely vegetated wetlands adjacent to SH1 based on past observations from iNaturalist. As it is an upgrade to existing road, any bird present is expected to be habituated to road disturbance and it's unlikely that disturbance due to road presence would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Frequently	Likely	Irreversible	Low	Low
Construction	Noise/lighting/vibration/dust	4 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for banded rail falls in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for banded rail falls in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for banded rail falls in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Black shag, little black shag, little pied shag, pied shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Disturbance due to construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. As it is an upgrade to existing road, it's unlikely that loss in connectivity would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. As it is an upgrade to existing road, any bird present is expected to be habituated to road disturbance and it's unlikely that disturbance due to road presence would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Black shag, little black shag, little pied shag, pied shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for cormorants falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for cormorants falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	4 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for cormorants falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W9, N4-W3, N4-W4, N4-W1) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). Disturbance by construction activities highly likely due to relation with road designation.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W9, N4-W3, N4-W4, N4-W1) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). As the road goes over most wetlands, loss of connectivity resulting in changes to population dynamics likely.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Operation	Presence of the road	4 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W9, N4-W3, N4-W4, N4-W1) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). Any spotless crake present is expected to be habituated to the environemnt due to existing road and hence disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Negligible	Moderate
Operation	Presence of the road	4 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Operation	Presence of the road	4 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W1, N4-W3, N4-W9) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). Disturbance by construction activities highly likely due to relation with road designation.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W1, N4-W3, N4-W9) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). As the road goes over most wetlands, loss of connectivity resulting in changes to population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to be utilising suitably sized wetlands (>3000 m2) within the NoR (N4-W1, N4-W3, N4-W9) and within 100 m of NoR boundary (west to NoR towards South end, to east of intersection with Awanohi Road (SA1.2), between NoR and Bawden Road, between NoR 4 and NoR 13). Any Australasian bittern present is expected to be habituated to the environemnt due to existing road and hence disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	4 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant wetlands falls in the future urban Zone. Delineated wetlands will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to utilise ponds within NoR (of notable size N4-O6, N4-O7, N4-O14, N4-21, N4-O23) and within 100 m boundary of NoR (notably between curve in Top Rd and NoR) Disturbance by construction activities highly likely due to relation with road designation.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise ponds within NoR (of notable size N4-O6, N4-O7, N4-O14, N4-21, N4-O23) and within 100 m boundary of NoR (notably between curve in Top Rd and NoR) As the road goes over most ponds, it is possible but Unlikley that this loss in connectivity will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise ponds within NoR (of notable size N4-O6, N4-O7, N4-O14, N4-21, N4-O23) and within 100 m boundary of NoR (notably between curve in Top Rd and NoR) Any bird present is expected to be habituated to the environemnt due to existing road and hence disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant ponds fall in the Future Urban Zone. Delineated ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant ponds fall in the Future Urban Zone. Delineated ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. Most of significant ponds fall in the Future Urban Zone. Delineated ponds will be retained. Environment expected to be similar to Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - White heron	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Disturbance due to construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	4 - White heron	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. As it is an upgrade to existing road, it's unlikely that loss in connectivity would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - White heron	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potetial to occur in wetlands N4-W1a and N4W1-b which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. As it is an upgrade to existing road, any bird present is expected to be habituated to road disturbance and it's unlikely that disturbance due to road presence would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - White heron	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for great egrets falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	4 - White heron	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for great egrets falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - White heron	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. N4-W1, where there is potential for great egrets falls in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	4 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. No significant habitat structure aside from the southern end of NoR. Kākā unlikely to be disturbed by presence of the road due to habituation to road disturbance (SH1) and lack of habitat where it is a new road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	4 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	4 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	4 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. As this is adjacent to SH1, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	4 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Temporary (days or months)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	4 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. No significant habitat structure aside from the southern end of NoR. Long-tailed cuckoos unlikely to be disturbed by presence of the road due to habituation to road disturbance (SH1) and lack of habitat where it is a new road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	4 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.		Local	Temporary (days or months)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	4 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.		Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	4 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located mainly in Future Urban Zone. Main forest bird habitat in NoR on the south end fall in Future Rural Zone and is likely to be retained. As this is adjacent to SH1, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.		Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. Potential of loss of foraging habitat of bats due to removal of approxiamtely 8000 m2 of VS2/VS3 vegetation. Due to the relation of district plan vegetation to SEA_T_2218, significant impact is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Baseline. Potential of bat roost loss due to removal of mature district plan trees in VS2/VS3 habitat	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Baseline. Potential for bats to be present and thus killed/injured within tree goups no 102, 103, 104 due to close relation to SEAs.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Potential for non-TAR birds to use district plan vegetation for foraging.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Baseline. Potential for non-TAR bird nests to be present in VS2/VS3 habitat.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Potential for non-TAR birds to be present and thus killed/injured.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	4 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low

NoR 4													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Baseline. North Island kākā nests are generally in mature tree cavities, therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore killing or injuring a North Island kākā due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Potential for nests in the matured district plan trees	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Higher likelihood of kaka presence than in baseline due to maturing of trees and association with SEA	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Baseline. Long-tailed cuckoo lay their eggs in the nests of whiteheads, yellowheads and brown creepers. These host bird species were not identified in the Northh ecological baseline. Therefore nest loss due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore killing or injuring a long-tailed cuckoo due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	4 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Baseline. Potential for loss of gecko habitat due to the removal of indigenous district plan vegetation adjacent to SEAs.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Baseline. Potential for geckos to be present in VS2/VS3 habitat	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	4 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate

NoR 5														
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	5 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. New road crossing Dairy Stream tributary. Possible bat roosts in exotic vegetation west of tributary. Bats could be disturbed due to construction activity.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	5 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. New road across Dairy stream tributary. Additional fragmentation likely to occur.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. New road but underneath SH1. It is anticipated that bats in the area are already habituated to road disturbance due the existing motorway.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Riparian vegetation along Dairy stream is expected to be retained. Construction activity may disturb bats due to potential roosts. Trees in riparian margin will remain present	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	5 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is a new road that crosses Dairy Stream (exotic riparian vegetation). Additional fragmentation is expected to occur.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is a new road going across SH1. Bats unlikely to be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. NoR is adjacent to SH1. Only vegetation present is exotic riparian. Bird are likely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Very Low
Operation	Presence of the road	5 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. NoR is adjacent to SH1. Little suitable habitat. Loss in connectivity from likely to result in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. NoR is adjacent to SH1. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	5 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Riparian vegetation to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Very Low
Operation	Presence of the road	5 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Riparian vegetation to be retained. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Riparian vegetation to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	5 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. Potential to utilise N5-O1 (unlikely due to size ~700 m2) and N13-W1 adjacent to East end. Unlikely to distrub spotless crake due to construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	5 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. Spotless crake unlikely to be within NoR boundary, so loss in connectivity resulting in significant changes in population dynamics low.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. Spotless crake unlikely to be within NoR boundary, so road disturbance resulting in significant changes in population dynamics low.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 5													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Notice/vibration/Dust	5 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	5 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	5 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. Potential to utilise N5-O1 (unlikely due to size ~700 m2) and N13-W1 adjacent to East end. Australasian bittern are considered a highly mobile species in this area, with high dispersal. Unlikely to distrub Australian bittern due to construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road crossing Dairy Stream tributary. Australian bittern unlikely to be within NoR boundary, it is unlikely that disturbance from the presence of the road will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to utilise pond within NoR (N5-O1), no other suitable habitat nearby (within 100m). Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 5													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	5 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Brown teal and pacific black duck unlikely to be in the area. As NoR djacent to SH1, any bird present is expected to be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Pond expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Pond expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	5 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to utilise exotic riparian forest on the west end of NoR. However, kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	5 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. In addition, as the NoR is adjacent to SH1, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	5 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone, adjacent to SH1. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	5 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	5 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone, adjacent to SH1. It is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	5 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is djacent to SH1, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 5													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	5 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	5 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	5 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone, adjacent to SH1. It is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 6													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	6 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Partly greenfield road, partly upgrade of an existing road, including four stream crossings - once of Orewa river and three times its tributaries, of which one is likely used by bats for foraging and commuting. Bats likely to be disturbed by construction activities	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Four stream crossings, of which two will be new. Significant TL.3 structure at northern end of NoR impacted. New Orewa River tributary to be crossed is likely bat corridor, fragmentation likely to occur.	Indirect	Regional	Permanent (>25 years)		Likely	Irreversible	Moderate	High
Operation	Presence of the road	6 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. New road, some exotic scrub and forest within zone of distrubance.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	6 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. The new section of the road crosses two Orewa River tributaries, of which one possibly acts as a bat corridor, while the section to be upgraded crosses over the River and one tributary. It is expected that the river and tributaries and associated vegetation will be retained, and the importance of the tributary as a corridor for bats will be increased due to the development in the area. Additional fragmentation is expected to occur.	Indirect	Regional	Permanent (>25 years)		Likely	Irreversible	Moderate	High
Operation	Presence of the road	6 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone but is for a greenfield road. Bats may be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	6 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. As the NoR is a new road that will be intersecting high quality habitat for non-TAR species, disturbance by construction activities highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Very Low
Operation	Presence of the road	6 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. As the NoR is a new road that will be intersecting high quality habitat for non-TAR species, it is highly likely that loss in connectivity resulting in changes to the population dynamics will occur (particularly for species will a small home range, such as grey warbler).	Indirect	Local	Permanent (>25 years)		Highly Likely	Irreversible	Moderate	Low
Operation	Presence of the road	6 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as wellas upgrade of existing road. As the NoR is a new road that will be intersecting high quality habitat for non-TAR species, it is highly likely that disturbance will occur that will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Frequently	Highly Likely	Irreversible	Moderate	Low
Construction	Noise/lighting/vibration/ dust	6 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Road is assumed to be built before urbanisation. Therefore, the magnitude and level of effect are considered lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	6 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Road is assumed to be built before urbanisation. Therefore, the magnitude and level of effect are considered lower than Baseline.	Indirect	Local	Permanent (>25 years)		Highly Likely	Irreversible	Moderate	Low
Operation	Presence of the road	6 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone.Road is assumed to be built before urbanisation. Therefore, the magnitude and level of effect are considered lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Highly Likely	Irreversible	Moderate	Low
Construction	Noise/lighting/vibration/ dust	6 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. Potential of spotless crake to utilise native rushland N6-W3 and large sized wetlands (> 3000 m2) (N6-W2, N6-W5) which road slope goes over. Disturbance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. Spotless crake potentially to use N6-W2 and N6-W5. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Spotless crake potentially to use N6-W2 and N6-W5. As it is a new road going through greenfields, disturbance to birds likely.	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	6 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 6													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	6 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetland will be retained. spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Roads are expected to be built before urbanisation occurs, bords are expected to not be habituated to disturbance yet. Magnitude and level of effects considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	6 - North Island fernbird	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. Potential of North Island fernbird to utilise native rushland N6-W3 (> 3000 m2). Disturbance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - North Island fernbird	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. No suitably sized wetland to be utilised by North Island fernbird. Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - North Island fernbird	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. No suitably sized wetland to be utilised by North Island fernbird. Disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - North Island fernbird	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - North Island fernbird	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetland will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - North Island fernbird	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. Potential of banded rail to utilise native rushland N6-W3 (> 3000 m2). Disturbance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. No suitably sized wetland to be utilised by banded rail. Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road passing through pasture as well as upgrade of existing road. No suitably sized wetland to be utilised by banded rail. Disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetland will be retained. spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low

NoR 6													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	6 - Black shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Possibly utilising permanent open water in the NoR (N6-O1, N6-O2, N6-O3) but unlikely as the ponds are far away from coast and do not have mature trees in surrounding. Therefore it is unlikely that disturbance from construction activities would result in changes to the population dynamics.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	6 - Black shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Possibly utilising permanent open water in the NoR (N6-O1, N6-O2, N6-O3) but unlikely as the ponds are far away from coast and do not have mature trees in surrounding. Therefore, it is unlikely that this loss in connectivity will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Black shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Possibly utilising permanent open water in the NoR (N6-O1, N6-O2, N6-O3) but unlikely as the ponds are far away from coast and do not have mature trees in surrounding. Therefore it is unlikely that disturbance from the presence of the road would result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - Black shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone Although the open water habitat is expected to remain, it is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	6 - Black shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone Although the open water habitat is expected to remain, it is anticipated that birds present will be habituated to disturbance in this environment. Therefore, it is unlikely that this loss in connectivity will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	6 - Black shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although the open water habitat is expected to remain, it is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Possibly utilising permanent open water in the NoR (N6-O1, N6-O2, N6-O3) for foraging, and the wetlands N6-W2, N6-W3 and N6-W5 for foraging. Construction activities likely to disturb Australasian bittern.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Possibly utilising pond N6-O3 and wetlands N6-W2, N6-W5. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Possibly utilising pond N6-O3, and wetlands N6-W2, N6-W5. As it is a new road going through greenfields, disturbance to birds in the wetlands likely.	Indirect	Local	Permanent (>25 years)	Frequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	6 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. Habitat features potentially associated with Bittern likely to be retained in the Future Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 6													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	6 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. It is expected that there will be existing fragmentation in the population. Therefore, it is unlikely that this loss in connectivity will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. NoR is located in Future Urban Zone. Roads are expected to be built before urbanisation occurs, bords are expected to not be habituated to disturbance yet. Magnitude and level of effects considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	6 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential for birds to utilise ponds within NoR. Construction activities will take place over N6-O1 and N6-O2, and the edge of N6-O3 (the only significantly sized pond: >3000 m2). It is highly likely that birds will be disturbed.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Ponds located adjacent to existing road, brown teal and pacific black duck populations expected to have already existing fragmentation. Connectivity unlikely to be further affected greatly.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Ponds located adjacent to existing road, birds present expected to be habituated to road disturbance.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	6 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, it is unlikely that this loss in connectivity will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds will be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	6 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Significant exotic treeland in northern end of NoR which could be utilised by Kākā, where the NoR is a new road. Disturbance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Negligible	Very Low
Operation	Presence of the road	6 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Some loss in connectivity expected as new road cuts through exotic treeland and a significant portion lost.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Operation	Presence of the road	6 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. It is expected that kākā would be habituated to road disturbance where there is an existing road, and unlikely to be disturbed, but where there is a new road the presence of the road expected to cause greater disturbance.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low

NoR 6													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	6 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Construction assumed to be before urbanisation. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Negligible	Very Low
Operation	Presence of the road	6 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Construction assumed to be before urbanisation. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Operation	Presence of the road	6 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	6 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline Significant riparian forest to the east end of NoR, within and adjacent to boundary. Long-tailed cuckoos likely to be disturbed by construction activities	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline Long-tailed cuckoos are highly mobile. Loss in connectivity resulting in changes to the population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline Where there is an existing road birds expectd to be habituated to road disturbance, Disturbance to long-tailed cuckoo Unlikely at the scale of the population	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	6 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment NoR is located in Future Urban Zone. Construction assumed to be before urbansation. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	6 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment NoR is located in Future Urban Zone It is anticipated that long-tailed cuckoo habitat would already be fragmented in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	6 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 7													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	7 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road, running along Weiti Stream and ts tributaries. Bat roost potential in riparian vegetation within NoR designation. Fragmented exotic forest along mainly south of NoR	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Upgrade of an existing road, crosses a stream which is likely to be utilised by bats for foraging and commuting where a roundabout is planned for the intersection betweent Pine Valley Rd and Young Access. Likelihood adjusted to Unlikely due to existing fragmentation however ecological nodes are present and potential bat movement cannot be excluded.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	7 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. Likely disturbance to bats close to SEA_T_5446	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	7 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Most mapped vegetation expected to be retained as they are riparian. Potential of bat roosts and bat corridor mean construction activity may disturb bats.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is an upgrade of an existing road, where Pine Valley Rd and Young Access intersect there is also a possible three-way bat corridor. Likelihood adjusted to Unlikely due to existing fragmentation however ecological nodes are present and potential bat movement cannot be excluded.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	7 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment. SEA_T_5446 will remain present in future	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	7 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	7 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	7 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	7 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Most mapped vegetation expected to be retained as they are riparian. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	7 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. NMost mapped vegetation expected to be retained as they are riparian. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	7 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Most mapped vegetation expected to be retained as they are riparian. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	7 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Potential to utilise large sized weltland (>5000 m2) within 100 m of NoR designation (notably one adjacent to NoR east of Young Access intersection) Distrubance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Potential to utilise moderate to large sized wetlands (> 3000 m2) within 100 m of NoR designation. Loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 7													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	7 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Disturbance resulting in changes to population dynamics unlikely due to habituation to road disturbance.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	7 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained in the Likely Future Ecological Environment. Therefore there is higher potential for spotless crake to be foraging and nesting in this habitat, and could be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	7 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	7 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Potential to utilise moderate to large sized wetlands (> 3000 m2) within 100 m of NoR designation, or ponds (N7-O1, N7-O2, N7-O3). Disturbance during construction likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Pine Valley Road. Potential to utilise moderate to large sized wetlands (> 3000 m2) within 100 m of NoR designation, or ponds (N7-O1, N7-O2, N7-O3). As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	7 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) within 100 m of NoR designation, or ponds (N7-O1, N7-O2, N7-O3). Disturbance resulting in changes to population dynamics unlikely due to habituation to road disturbance.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	7 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands are likely to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands are likely to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	7 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands are likely to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. As it is an upgrade to an existing road, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	7 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential of brown teal and pacific black duck to utilise ponds within or adjacent to NoR (N7-O1, N7-O2, N7-O3). It is highly likely that construction activities will disturb any bird present.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Ponds located adjacent to existing road, brown teal and pacific black duck populations expected to have already existing fragmentation. Connectivity unlikely to be further affected greatly.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 7													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	7 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Disturbance resulting in changes to population dynamics unlikely due to habituation to road disturbance.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	7 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	7 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	7 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential of long-tailed cuckoos in the kanuka scrub (SEA_T_5446) by intersection with Young Access, and exotic forest along western half of NoR. Distrubance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	7 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	7 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation along NoR expected to be retained as it is riparian. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	7 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation along NoR expected to be retained as it is riparian. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	7 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation along NoR expected to be retained as it is riparian. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 8													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	8 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road, crossing several tributaries of Dairy Stream, most significantly at intersection with Green Rd where the tributary has a higher potential of acting as a bat corridor. For over 2 km, from approximately Richards Rd to Horseshoe Bush Rd intersection, a possible bat corridor runs along Highway within 100 m of NoR designation. Bats are likely to be disturbed by construction activity.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	8 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. One stream crossing of important stream corridor (Dairy Stream tributary). Although it is an upgrade of an existing road, and these crossings are already bridged, additional fragmentation may occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	8 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. No/little high quality bat habitat	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR predominantly in Future Urban Zone, with a section (~3.5 km) running along edge of urban and rural zones. Mixed vegetation to the west in the Rural Zone section and some exotic riparian vegetation expected to be retained, thus any bats using the potnetial bat corridors may be disturbed by construction activity	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	8 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR predominantly in Future Urban Zone, with a section (~3.5 km) running along edge of urban and rural zones. The importance of the Dairy Stream tributary as a corridor for bats will be increased due to the development in the area. Additional fragmentation is expected to occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	8 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of an existing road. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	8 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of an existing road. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	8 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of an existing road. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/dust	8 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	8 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Native vegetation on the east of Sandspit Road (on the eastern side of the Mahurangi River tributary) is expected to be retained, however there is an area of Future Urban Zone between this vegetation throughout most of the NoR. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	8 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Native vegetation on the east of Sandspit Road (on the eastern side of the Mahurangi River tributary) is expected to be retained, however there is an area of Future Urban Zone between this vegetation throughout most of the NoR. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low

NoR 8													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	81 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Dairy Flat highway. Potential of spotless crake to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W4, N8-W5, N8-W6, N8-W7, N8-W8) and within 100m of NoR (where NoR8 and NoR1 intersect) Disturbance due to construction activity likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	81 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential of spotless crake to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W4, N8-W5, N8-W6, N8-W7) and within 100m of NoR (where NoR8 and NoR1 intersect) NoR doesn't cover much of the wetlands, connectivity loss resulting in changes in population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	81 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential of spotless crake to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W4, N8-W5, N8-W6, N8-W7, N8-W8) and within 100m of NoR (where NoR8 and NoR1 intersect) As it is an upgrade to an existing road, any bird present is expected to be habituated to road disturbance hence disturbance due to road presence is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	81 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. The magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	81 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. The magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	81 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. The magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/dust	8 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Dairy Flat highway. Potential of Australasian bittern to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W6) and within 100m of NoR (where NoR8 and NoR1 intersect) Disturbance due to construction activity likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	8 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential of Australasian bittern to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W6) and within 100m of NoR (where NoR8 and NoR1 intersect) As Australasian bittern are considered a highly mobile species in this area, with high dispersal, and the NoR doesn't cover much of the wetlands, connectivity loss resulting in changes in population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential of Australasian bittern to utilise moderate to large sized wetlands (>3000 m2) within NoR (N8-W6) and within 100m of NoR (where NoR8 and NoR1 intersect) As it is an upgrade to an existing road, any bird present is expected to be habituated to road disturbance hence disturbance due to road presence is unlikely.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 8													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	8 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential of brown teal, dabchick, and pacific black ducks to be utilising ponds within and adjacent to NoR. Dabchick may also be in wetland N8-W8 due to its proximity to an open water wetland. Road designation over N8-O1, N8-O2, N8-O3 (edge), N8-O7, N8-O8. Disturbance by construction activities highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	8 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Several ponds adjacent to highway affected. As it is an upgrade of existing road, loss of connectivity is unlikely to result in changes to population dynamics	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. As the NoR is an upgrade of an existing road, it is expected that any bird present would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	8 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands expected to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds and wetlands expected to be retained. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. NoR boundary over some patches of exotic treeland. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Disturbance by construction activities unlikely.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	8 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	8 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Likely	Irreversible	Low	Low

NoR 8													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/dust	8 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	8 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	8 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. In this environment, and as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Construction	Noise/lighting/vibration/dust	8 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	8 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/dust	8 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	8 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	8 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Mixed forest to the west of the highway (Rangitopuni Stream vegetation is expected to be retained, with an area of Future Rural Zone between this vegetation throughout most of the NoR. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 9													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	9 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road, Roosts likely to be present in associated native vegetation. Significant structures of TL.2, WF11, VS2, EF, WF9. Bats highly likely to be disturbed by construction activities due to close proximity to bat corridor and potential roosts.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	9 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Upgrade of an existing road. Riparian corridor within 100 m. Mitigation require light and noise management only	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	9 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline, Proximity to potential bat habitat in rural sections and possible roosts increase likelihood of disturbing bats. Mitigation will relate to noise and light management (no buffer planting required)	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	9 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Rural Zone with only the bottom section in Future Urban Zone (Albany). Roosts likely to be present in significant associated vegetation. Bats likely to be disturbed by construction activities in this area of the NoR.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	9 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Upgrade of existing road. Mitigation require light and noise management only	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	9 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Rural Zone and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment. Mitigation will relate to noise and light management (no buffer planting required)	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	9 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	9 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	9 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone with only the bottom section in Future Urban Zone (Albany). Environment expected to be similar to baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	9 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone with only the bottom section in Future Urban Zone (Albany). Environment expected to be similar to baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone with only the bottom section in Future Urban Zone (Albany). Environment expected to be similar to baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	9 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2 for foraging and nesting. Disturbance by construction activities highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate

NoR 9													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	9 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2 for foraging and nesting. However, spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR (N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2 for foraging and nesting. As it is an upgrade of an existing highway, birds present are expected to be habituated to road disturbance and so disturbance resulting in changes to population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	9 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for spotless crake to be foraging and nesting in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	9 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for spotless crake to be foraging and nesting in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for spotless crake to be foraging and nesting in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	9 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2. Australasian bittern are considered a highly mobile species in this area, with high dispersal. Therefore, it is unlikely that construction disturbance will result in changes to the population dynamics.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	9 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	9 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing highway. Potential to utilise moderate to large sized wetlands (> 3000 m2) in the NoR N9-W1, N9-W2) and an unnamed wetlnd adjacent to NoR opposite N9-W2. Although it is an upgrade to an existing road, due to significant increase in size and expected usage, disturbance to birds present likely.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	9 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for Australasian bittern to be foraging in this habitat similar to baseline. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	9 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for Australasian bittern to be foraging in this habitat similar to baseline. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 9													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	9 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for Australasian bittern to be foraging in this habitat similar to baseline. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	9 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to utilise ponds within NoR (N9-O1, N9-O2, where the road designation goes over both) and other ponds withn 100 m of boundary. Disturbance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	9 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	9 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. All suitable habitat small and far away enough from road. Distrubance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	9 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for brown teal, dabchick, Pacific black duck to be foraging in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	9 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for brown teal, dabchick, Pacific black duck to be foraging in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	9 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Delineated wetlands will be retained, potential for brown teal, dabchick, Pacific black duck to be foraging in this habitat similar to baseline. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
					Disturbance and displacement to nests and	Baseline.								
					population dynamics	Therefore, the magnitude and level of effect are considered the same as Baseline.								
Construction	Noise/lighting/vibration/ dust	9 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Significant structures of both native and exotic vegetation. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Low
Operation	Presence of the road	9 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	9 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Low
Operation	Presence of the road	9 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	9 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. In this environment, and as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 9													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	9 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Significant structures of both native and exotic vegetation. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	9 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	9 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	9 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	9 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	9 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Rural Zone. Vegetation is expected to be retained. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. Potential for bats to forage within the approximately 4300 m2 of removal of semi-mature to mature mixed indigenous and exotic vegetatation, but significant impact considered unlikely due to connectivity to a much greater SEA	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Baseline. Potential for bats to roost within district plan tree groups no. 901 and 905 adjacent to SEA_T_8300 (WF11).	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Baseline. Potential for bats to be injured within district plan tree groups no. 901 and 905 adjacent to SEA_T_8300 (WF11).	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Potential for non-TAR birds to use district plan vegetation for foraging .	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Baseline. Potential for non-TAR bird nests to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Potential for non-TAR birds to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan trees no 901 and 905 unlikely,	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low

NoR 9													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Baseline. North Island kākā nests are generally in mature tree cavities, therefore nest loss due to the removal of district plan vegetation no 901 and 905 unlikely (semi-mature)	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore killing or injuring a North Island kākā due to the removal of district plan vegetation unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Potential for nests in the matured district plan trees	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Higher likelihood of kaka presence than in baseline due to maturing of trees and association with SEA	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Baseline. Long-tailed cuckoo lay their eggs in the nests of whiteheads, yellowheads and brown creepers. These host bird species were not identified in the North ecological baseline. Therefore nest loss due to the removal of district plan vegetation no 1306 is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore killing or injuring a long-tailed cuckoo due to the removal of district plan vegetation no 1306 is unlikely	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	9 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Baseline. Potential for loss of lizard habitat due to the removal of district plan vegetation adjacent to WF11 SEA_T_8300.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Baseline. Potential for lizards to be present within district plan vegetation adjacent to WF11 SEA_T_8300.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate
Construction	Vegetation removal	9 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Moderate

NoR 10													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	10 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road, crossing Orewa River which is likely to be utilised by bats for foraging and commuting. Some native scrub and exotic forest to the east end of NoR. Bats not expected to be disturbed greatly	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. One stream crossing of important stream corridor (Orewai River) for bat utilisation . Although it is an upgrade of an existing road, and these crossings are already bridged, additional fragmentation may occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	10 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. Proximity to SEA_T_3590 and bat habitat associated with stream to the south of Wainui Rd crossing	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Native vegetation to the south of Wainui Road (on the northern side of Orewa River) is expected to be retained. Bats unlikely to be disturbed.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is an upgrade of an existing road, it is expected that Orewa River and associated native vegetation will be retained, and the importance of the river as a corridor for bats will be increased due to the development in the area. Additional fragmentation is expected to occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	10 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment. Proximity to SEA_T_3590 and bat habitat associated with stream to the south of Wainui Rd crossing- will remain in future	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	10 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	10 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	10 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation at the eastern end of Wainui Rd (on either side of Orewa River) is expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	10 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation at the eastern end of Wainui Rd (on either side of Orewa River) is expected to be retained. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	10 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Vegetation at the eastern end of Wainui Rd (on either side of Orewa River) is expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	10 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). Construction will take place in associated vegetation, hence disturbance is likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 10													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	10 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). There is an existing bridge, further loss of connectivity unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	10 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). Due to high quality of the habitat and connection to estuary/coast, there is a higher risk of disturbance and so a Moderate value has been assigned.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Banded rail	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - Banded rail	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	10 - Banded rail	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Black shag, little black shag, little pied shag, pied shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Construction will take place in associated vegetation, hence disturbance is likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). There is an existing bridge, further loss of connectivity unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	10 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). Due to high quality of the habitat and connection to estuary/coast, there is a higher risk of disturbance and so a Moderate value has been assigned.	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Black shag, little black shag, little pied shag, pied shag	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Short-term (<5 years)	Infrequently	Likely	Totally	Negligible	Moderate
Operation	Presence of the road	10 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 10													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	10 - Black shag, little black shag, little pied shag, pied shag	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - White heron	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2) along the water edge and grades into terrestrial vegetation further up the bank. Construction will take place in associated vegetation, hence disturbance is likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - White heron	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). There is an existing bridge, further loss of connectivity unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	10 - White heron	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Wainui Road. Potential to utilise N4-W1a adjacent to NoR boundary at the eastern end, which consists of coastal Mangrove Forest and scrub (SA1.2). Due to high quality of the habitat and connection to estuary/coast, there is a higher risk of disturbance and so a Moderate value has been assigned.	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - White heron	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - White heron	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	10 - White heron	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline	Indirect	Local	Permanent (>25 years)	Infrequently	Likely	Irreversible	Low	Moderate
Construction	Noise/lighting/vibration/ dust	10 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Significant riparian forest to the east end of NoR, within and adjacent to boundary. Long-tailed cuckoos likely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	10 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	10 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	10 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment NoR is located in Future Urban Zone. Native vegetation to the south of Wainui Road (on the northern side of Orewa River) is expected to be retained. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 10													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	10 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment NoR is located in Future Urban Zone. Native vegetation to the south of Wainui Road (on the northern side of Orewa River) is expected to be retained. As it is an upgrade to an existing road, additional fragmentation is not expected.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	10 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 11													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	11 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. New road crossing two tributaries of Rangitopuni Stream. Not much vegetation structures nearby, bats unlikely to be disturbed greatly by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	11 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Although it is a new road, it does not cross an significant structures (streams/forests) and additional fragmentation is not expected. Adjusted extent to Local due to size and quality of riparian margin and absence of ecological nodes that may be affected	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. It is anticipated that bats in the area are already habituated to road disturbance due the existing road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Bats are not expected to be greatly disturbed by construction activity.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	11 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is a new road, it does not cross an significant structures (streams/forests) and additional fragmentation is not expected. Adjusted extent to Local due to size and quality of riparian margin and absence of ecological nodes that may be affected	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone with no significant structures close by. Bats unlikely to be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Little vegetation area aroud NoR boundary. Disturbance by construction activities unlikely. The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	11 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Little vegetation area aroud NoR boundary. Fragmentation not great, loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Little vegetation area aroud NoR boundary. Disturbance by road presence unlikely.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	11 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	11 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	11 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Road designation over wetlands N11-W1 (unlikely to support TAR birds due to size) and N11-O2 (<500 m2, unlikely to find spotless crake). Disturbance by construction activities unlikely.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	11 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Road designation over wetlands N11-W1 (unlikely to support TAR birds) and N11-O2 (<500 m2, unlikely to find spotless crake). No significant wetland structure adjacent to road. Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. No significant wetland structure adjacent to road, disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low

NoR 11													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	11 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Road designation over wetlands N11-W1 (unlikely to support TAR birds) and N11-O2 (<500 m2, unlikely to find spotless crake). Disturbance by construction activities unlikely.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	11 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. No significant wetland structure adjacent to road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. No significant wetland structure adjacent to road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	11 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Road designation over wetlands N11-W1 (unlikely to support TAR birds due to size) and N11-O2. Australasian bittern are considered a highly mobile species in this area, with high dispersal. Disturbance by construction activities unlikely.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	11 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road over grazed pasture. No significant wetland structure adjacent to road, disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	11 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. New road over grazed pasture. Brown teal and pacific black duck potential to utilise open water wetlands (N11-O1, N11-O2). As road boundary goes over N11-O1, disturbance due to construction activities highly likely.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	11 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Potential to use N11-O1. Unlikely for loss in connectivity to result in changes in population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. New road not adjacent to significant wetland structures. Distrubance due to road presence resulting in changes in population dynamics unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Wetlands expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 11													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	11 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. No significant wetland structure adjacent to road. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. No significant wetland structure adjacent to road. Birds unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Kākā potentially in the patch of exotic treeland within NoR boundary along south edge. Therefore they are likely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Low
Operation	Presence of the road	11 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. No significant treeland structure associated with this NoR, loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Although it is a new road, the surrounding area is mainly grazed pasture, with little forest cover/kākā habitat. Therefore kākā are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Likely	Irreversible	Low	Low
Construction	Noise/lighting/vibration/ dust	11 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Low
Operation	Presence of the road	11 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	11 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is a new road, the surrounding area is mainly grazed pasture, with little forest cover/kākā habitat. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Likely	Irreversible	Low	Low
Construction	Noise/lighting/vibration/ dust	11 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo potentially in the patch of exotic treeland within NoR boundary along south edge. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	11 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. No significant treeland structure associated with this NoR, loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Although it is a new road, the surrounding area is mainly grazed pasture, with little forest cover/suitable habitat. Therefore long-tailed cuckoo are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	11 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low

NoR 11													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	11 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	11 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is a new road, the surrounding area is mainly grazed pasture, with little forest cover/suitable habitat. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 12													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	12 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road. Both ends of NoR surrounded by exotic forest/scrub and wetlands. Mature trees (mostly hedgerows) adjusent to construction areas provide potential bat habitat	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	12 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Possible bat corridor passes with 100m of NoR where Bawden Rd intersects Dairy Stream Rd. Although an upgrade of existing road and bridge across Dairy Stream tirbutary already exists, additional fragmentation may occur. Extent adjusted to Local due to low quality corridor and lack of ecological nodes	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road. It is anticipated that bats in the area are already habituated to road disturbance due the existing road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located in Future Urban Zone however road construction may occur prior to urban development	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	12 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Additional fragmentation may ccur. Extent adjusted to Local due to low quality corridor and lack of ecological nodes	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in Future Urban Zone and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	12 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	12 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	12 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	12 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	12 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	12 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Two wetlands within NoR boundary small (<3000 m2) so unlikely to be utilised by spotless crake. One large sized wetland (>5000 m2) ~80 m away from NoR boundary to the west potentially utilised by spotless crake. Distrubance by construction activities likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 12													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	12 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Potential to utilise large sized wetland (>5000 m2) ~80 m away from NoR boundary for foraging and nesting. However, spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	12 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Potential to utilise large sized wetland (>5000 m2) ~80 m away from NoR boundary for foraging and nesting. An bird presence is expected to be habituated to road disturbance hence disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	12 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	12 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Although it is anticipated that the delineated wetland will be retained, spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	12 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Delineated wetlands will be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	12 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. One large sized wetland (>5000 m2) ~80 m away from NoR boundary to the west potentially utilised by Australian bittern. Australasian bittern are considered a highly mobile species in this area, with high dispersal. Therefore, it is unlikely that construction disturbance will result in changes to the population dynamics.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	12 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Potential to utilise large sized wetland (>5000 m2) ~80 m away from NoR boundary for foraging and nesting. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing Bawden Road. Potential to utilise large sized wetland (>5000 m2) ~80 m away from NoR boundary for foraging and nesting. An bird presence is expected to be habituated to road disturbance hence disturbance due to road presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	12 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 12													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	12 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Potential to utilise open water habitats within NoR (N12-O1 to O8) and within 100 m of designation boundary (N1-O10, and unnamed few on both ends of NoR). Due to abundance of possible habitats, disturbance by construction activity highly likely	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	12 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. As the NoR is an upgrade of an existing road, it is expected that any bird present would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Brown teal, dabchick, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. Ponds are likely to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	12 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Brown teal, dabchick, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. As the NoR is an upgrade of an existing road, it is expected that any bird present would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Some exotic forest along NoR. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	12 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	12 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	12 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	12 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low

NoR 12													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	12 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR is located in Future Urban Zone. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 13													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	13 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Baseline. Upgrade of existing road, crosses two tributaries of Dairy Stream at the southern end of NoR. No significant vegetation structures. South of intersection with Worsnop Way the road crosses a possible bat corridor - ABM at site 1722 East Coast Rd confirms bat presence. Bats likely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Baseline. Upgrade of an existing road, crosses possible bat corridor (in Future Urban Zone), additional fragmentation may occur.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	13 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Baseline. Upgrade of existing road mostly out of FUZ	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - Bat	Very High	Construction- Bats	Disturbance and displacement to roosts (existing) due to construction activities (noise, light, dust etc.)	Likely Future Ecological Environment. NoR is located partly in rural zone (northern half) and partly in Future Urban Zone (southern half). Possible bat corridor falls in Urban Zone. Likelihood of bat disturbance is possible where construction occurs in proximity to trees with roost potential (mature trees). Stands of mature trees in rural area likley to be present during construction	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Bat	Very High	Operation- Bats	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland and riparian habitat due to the presence of the infrastructure	Likely Future Ecological Environment. NoR is located partly in rural zone (northern half) and partly in Future Urban Zone (southern half). Possible bat corridor falls in Urban Zone. Upgrade of existing road. Connectivity unlikely to be affected greatly.	Indirect	Regional	Permanent (>25 years)		Unlikely	Irreversible	Low	Moderate
Operation	Presence of the road	13 - Bat	Very High	Operation- Bats	Disturbance and displacement of (new and existing) roosts due to lighting and noise/vibration	Likely Future Ecological Environment. NoR is located in partly in rural zone (northern half) and partly in Future Urban Zone (southern half), and is an upgrade of an existing road. Bats unlikely to be disturbed by the presence of the road in this environment.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Not much significant structures nearby, related vegetation mainly amenity plantings and some small patches of exotic treeland. If birds are present, they are unlikely to be disturbed by construction activities (due to habituation to current conditions). The most conservative non-TAR species, such as grey warbler, has been used for this assessment.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	13 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Existing baseline fragmentation (existing road and bridged/culverted streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. If birds are present, they are unlikely to be disturbed by the presence of the road (due to habituation to current conditions).	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	13 - Non-TAR bird	Low	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	13 - Non-TAR bird	Low	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. It is anticipated that the habitat will already be fragmented in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - Non-TAR bird	Low	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. It is anticipated that birds present will be habituated to disturbance in this environment. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Continuously	Unlikely	Irreversible	Low	Very Low
Construction	Noise/lighting/vibration/ dust	13 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Potential to utilise large sized wetland, N13-W1 (>5000 m2) and dense vegetation associated with margins of ponds in NoR boundary (N13-O1, and N13-O2 and N13-O4, which the road designation goes over both) and adjacent to NoR. Disturbance due to construction activity likely.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate

NoR 13													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	13 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. However, spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). No significant wetland structure for habitat. Loss in connectivity resulting in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Any bird present is expected to be habituated to road disturbance hence further disturbance from road presence unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	13 - Spotless crake	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. Wetlands are expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Spotless crake	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. Spotless crake are considered to have 'good dispersal ability' (Cotter, 2016). Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - Spotless crake	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. No significant vegetation structure associated with NoR. Any bird present is expected to be habituated to road disturbance hence further disturbance from road presence unlikely.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	13 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Potential to utilise large sized wetland, N13-W1 (>5000 m2) and ponds in NoR boundary (N13-O1, and N13-O2 and N13-O4, which the road designation goes over both) and adjacent to NoR.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Potential to utilise wetlands and small open water habitats for foraging. As Australasian bittern are considered a highly mobile species in this area, with high dispersal, a loss in connectivity that results in changes to the population dynamics is considered unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Potential to utilise wetlands and small open water habitats for foraging. Due to the existing disturbance from East Coast Road, it is unlikely that disturbance from the presence of the road will result in changes to the population dynamics.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - Australasian bittern	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. Ponds are expected to be retained. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Australasian bittern	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Australasian bittern	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone, and partly on the boundary of Rural and Business Zones. Australasian bittern are considered a mobile species in this area, with high dispersal, and unlikely to be nesting. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low

NoR 13													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Noise/lighting/vibration/ dust	13 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Upgrade of the existing East Coast Road. Brown teals and pacific black ducks potential to utlisise open water habitats within the NoR (N13-O1, and N13-O2 and N13-O4, where the road designation goes over both), and other similarly sized ponds within 100 m of designation boundary (N5-O1, and other unnamed ponds mainly N13-O1 northwards). They are likely to be distrubed by construction activities due to abundance of habitat along NoR.	Indirect	Local	Short-term (<5 years)	Frequently	Highly Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. As the NoR is an upgrade of an existing road, it is expected that any bird present would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - Brown teal, grey duck	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (N13-O1, N13-O2), and partly on the boundary of Rural and Business Zones. Ponds are expected to be retained. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Likely	Totally	Low	Moderate
Operation	Presence of the road	13 - Brown teal, grey duck	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (N13-O1, N13-O2), and partly on the boundary of Rural and Business Zones. Ponds are expected to be retained. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Brown teal, grey duck	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (N13-O1, N13-O2), and partly on the boundary of Rural and Business Zones. Ponds are expected to be retained. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Most significant structure is the exotic treeland just north of Wilks Rd, adjacent to the NoR. Not much forest habitat otherwise. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low
Operation	Presence of the road	13 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Kākā are considered a highly mobile species in this area, with seasonal use and high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Frequently	Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	13 - North Island kākā	High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. In this environment, kākā are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Frequently	Unlikely	Totally	Negligible	Very Low

NoR 13													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Operation	Presence of the road	13 - North Island kākā	High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Operation	Presence of the road	13 - North Island kākā	High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. In this environment, and as the NoR is an upgrade of an existing road, it is expected that kākā would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Very Low
Construction	Noise/lighting/vibration/ dust	13 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Baseline. Most significant structure is the exotic treeland just north of Wilks Rd, adjacent to the NoR. Not much forest habitat otherwise. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. Therefore they are unlikely to be disturbed by construction activities.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	13 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Existing baseline fragmentation (existing road and bridged streams) means that loss in connectivity resulting in changes to the population dynamics is unlikely.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Baseline. Long-tailed cuckoo are considered a highly mobile species in this area, with high dispersal. In addition, as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Noise/lighting/vibration/ dust	13 - Long-tailed cuckoo	Very High	Construction- Birds	Disturbance and displacement to nests and individuals (existing) due to construction activities (noise, light, dust, vibration etc) resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. In this environment, long-tailed cuckoo are unlikely to be disturbed by construction activities. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Short-term (<5 years)	Infrequently	Unlikely	Totally	Negligible	Low
Operation	Presence of the road	13 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Loss in connectivity due to permanent habitat loss, light and noise effects from the road, leading to fragmentation of terrestrial, wetland, and riparian habitat due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. It is expected that there would already be existing fragmentation in this environment, therefore loss in connectivity resulting in changes to the population dynamics is unlikely. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)		Unlikely	Irreversible	Negligible	Low
Operation	Presence of the road	13 - Long-tailed cuckoo	Very High	Operation- Birds (native)	Disturbance and displacement of (new and existing) nests and individuals due to light, noise, vibration etc due to the presence of the infrastructure, resulting in changes to the population dynamics	Likely Future Ecological Environment. NoR partly located in Future Urban Zone, partly in Rural Zone (exotic treeland expected to be retained), and partly on the boundary of Rural and Business Zones. In this environment, and as the NoR is an upgrade of an existing road, it is expected that long-tailed cuckoo would be habituated to road disturbance. Therefore they are unlikely to be disturbed by the presence of the road. Therefore, the magnitude and level of effect are considered the same as or lower than Baseline.	Indirect	Local	Permanent (>25 years)	Infrequently	Unlikely	Irreversible	Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Baseline. The potential of tree group no 1306 acting as foraging habitat of bats is unlikely,	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Baseline. The vegetation is semi mature and adjacent to a raod, so bats roostiing in tree no. 1306 is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Baseline. The vegetation is semi mature and adjacent to a raod, so bats being in tree no 1306 hence being injured is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Roost loss through vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Bat	Very High	Construction- Bats	Kill or injure individual bats due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low

NoR 13													
Phase	Project Activity	Resource Unit (Habitat/Species)	Ecological Value	Effect Description Main	Effect Description Detailed	Effects Description Manual	Type	Extent (ZOI)	Duration	Frequency	Likelihood	Reversibility	Magnitude (pre-mitigation)	Level of Effect (Pre-mitigation)
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Potential for non-TAR birds to use district plan vegetation for foraging (which will be removed).	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Baseline. Potential for non-TAR bird nests to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Potential for non-TAR birds to be present	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - Non-TAR bird	Low	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Likely		Low	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan tree no 1306 unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Baseline. North Island kākā nests are generally in mature tree cavities, therefore nest loss due to the removal of district plan vegetation no 1306 unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. North Island kākā are a highly mobile species in the wider landscape, therefore killing or injuring a North Island kākā due to the removal of district plan vegetation no 1306 unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - North Island kākā	High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore loss of foraging habitat due to the removal of district plan vegetation is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Baseline. Long-tailed cuckoo lay their eggs in the nests of whiteheads, yellowheads and brown creepers. These host bird species were not identified in the North ecological baseline. Therefore nest loss due to the removal of district plan vegetation no 1306 is unlikely.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Baseline. Long-tailed cuckoo are a highly mobile species in the wider landscape, therefore killing or injuring a long-tailed cuckoo due to the removal of district plan vegetation no 1306 is unlikely	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Loss of foraging habitat due to vegetation removal	Likely Future Ecological Environment. Same as Baseline	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Nest loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Long-tailed cuckoo	Very High	Construction- Birds	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Low
Construction	Vegetation removal	13 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Baseline. Tree group no 1306 acting as lizard habitat is unlikely due to the lack of bush and individual stands of manuka	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Baseline. Potential for lizards to be present within tree no. 1306 unlikely due to exposed nature of trees	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - Lizards	High	Construction- Herpetofauna (native)	Lizard habitat loss due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low
Construction	Vegetation removal	13 - Lizards	High	Construction- Herpetofauna (native)	Kill or injure individual due to vegetation removal	Likely Future Ecological Environment. Same as Baseline.	Direct	Local	Permanent (>25 years)		Unlikely		Negligible	Very Low

12 Appendix 12 – Rapid Habitat Assessment

Stream ID	Deposited Sediment	Invertebrate habitat diversity	Invertebrate habitat abundance	Fish cover diversity	Fish cover abundance	Hydraulic heterogeneity	Bank erosion	Bank vegetation	Riparian width	Riparian shade	RHA Habitat Quality Score	Corresponding Habitat Value*
N1-S1	7	8	7	10	8	6	7.5	9	9	10	81.5	E
N1-S9	4	5	3	4	5	2	4.5	6	7	4.5	45	M
N4-S3b	2.5	3.5	1	3	4	4	6	2	1	1	28	P
N4-S17a	2	3	2	4	4	1	7	5	6	4.5	38.5	P
N4-S20	4	1	1	1	6	1	9	3	8.5	10	44.5	M
N4-S22	5	7	4	7	7	6	8	8	10	7	69	G
N4-S23*	4	5	1	4	5	4	8	7	8	8	54	M
N4-S25	4	5	1	3.5	3.5	1	9	3	6	5	41	M
N5-S1a^	4	1	1	1	6	1	9	3	9	8	43	M
N5-S1b^	4	1	2	3	4	1	9	4.5	9	8	45.5	M
N7-S1a^	5	4	5	7	8	6	5	7	9.5	6	62.5	G
N8-S5a^	5	4	2	6	5	5	6	4	7	3.5	47.5	M
N12-S1a^	5	4	3	5	5	3	8	8	8	8.5	57.5	M
N12-S4a	4	4	1	3.5	3	1	7	5	8	6.5	43	M
N12-S4b	4	4	1	3.5	3	1	7	3	7	5	38.5	P

Notes:

NA = Stream assessed at desktop level due to access restrictions.

* = Corresponding habitat values for each habitat quality score

P = Poor (Score 10-40)

M = Moderate (Score 41-60)

G = Good (Score 61-80)

E = Excellent (Score 81+)

N5-S1a is the only intermittent stream.