
Jacobs

**Ngarara Farms
Avifauna Assessment**



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Appendix I Description of Threatened and At Risk species

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Executive Summary

Kessels Ecology has been contracted by Jacobs to carry out an assessment of the potential effects of the proposed subdivision at Ngarara Farms, Waikanae, on the avifauna (birdlife) of the area. The aim of this report is to provide supporting information for the preparation of the Environmental Management Plan, which is a requirement of the Structure Plan.

Of the 67 bird species found in the vicinity of Ngarara Farms, 23 have a nationally At Risk or Threatened status. Of these six key bird species are highlighted as being of primary interest at Ngarara Farms and these are as follows:

- **Australasian Bittern:** This Nationally Critical species utilises the Kawakahia Wetland which appears to be a regionally important site for it. It should not be adversely affected by this proposal if planned measures to protect its wetland habitat are adopted.
- **North Island Fernbird:** The Waikanae population is highly significant as it is the southernmost population of the subspecies, and well separated from the next most southerly known population. It should not be adversely affected by this proposal if planned measures to protect its wetland habitat are adopted. Its status in Kawakahia Wetland, and the extent to which (if at all) it utilises the marginal scrub vegetation should be determined as part of future monitoring.
- **New Zealand Pipit:** This species is of some concern as it is the only one of the identified key species for whom farmland (dominant in the Waimeha NDA) is a major habitat. The available information however indicates it is uncommon in the Wellington/Kapiti Coast area, and the loss of approximately 3.15 ha of pasture vegetation communities in the Waimeha Neighbourhood Development Area (NDA) in the first stage of the development would likely have an effect on at most a single pair of this species.
- **Pied Stilt:** Though a wetland bird, the Pied Stilt does utilise wet pasture, although the extent to which it does this at Ngarara Farms is unknown. Only approximately 0.28 ha of wet pasture is scheduled for conversion in the Waimeha NDA proposal, which would not have a significant impact on this species.
- **Spotless Crake and Marsh Crake:** These are highly secretive species and not often seen, but there is one record of Spotless Crake at Ngarara Farms, and one record of Marsh Crake nearby at Waikanae Estuary. While they should not be adversely affected by this proposal if planned measures to protect their wetland habitat are adopted, further surveys to clarify their status at Ngarara Farms would be desirable in future.

Management guidelines for each neighbourhood within the Ngarara Farms block have been proposed to protect their ecological values, with the guidelines being more restrictive for neighbourhoods adjoining more sensitive areas. The Waimeha NDA has a set of measures to avoid, remedy or mitigate effects, including a 20-metre buffer zone between the residential areas and the Kawakahia Wetland, and consent conditions for the management of site works including erosion and sediment control and potential contaminants. These measures will reduce adverse effects of the subdivision on habitats for the aforementioned key bird species. Increased domestic animal populations could lead to increased predation of sensitive wetland species within the neighbouring Kawakahia Wetland; this could be mitigated by instituting a predator control programme to reduce predation by species such as rats, possums and mustelids, or putting in place other measures to mitigate for increased domestic animal populations, such as advocacy and education. Ensuring residents are aware of the significance of the areas they are living beside, and initiatives such as keeping cats indoors at night and encouraging community involvement in pest control projects, could do a great deal towards minimising human impacts on species which are sensitive to predation.

The main vegetation types that will be reduced by the Waimeha subdivision are pasture, wet weedy pasture, gorse scrub, pine plantation, mahoe scrub and old growth exotic treeland. Only the pasture communities are likely to be utilised by at risk species, and effects on these



birds resulting from the loss of habitat are expected to be no more than minor in the case of New Zealand Pipit, and less than minor for Pied Stilt.

The Ngarara Farms proposals involve the construction of a number of ponds to clean and attenuate runoff, and create attractive landscape features. At present there is very little habitat available for birds which require open water for feeding so that these newly constructed features will result in creation of important habitat for species such as dabchick, shags and ducks. No such ponds are proposed for the first stage of the proposal at Waimeha, however, so no effects on waterbirds, either positive or negative, are expected.

A significant part of the Ngarara Farms proposal is the restoration of degraded habitats and the creation of new areas of indigenous vegetation. These areas include 20-metre buffers around wetland areas, riparian plantings along streams and bush corridors. They will likely be of benefit to birdlife generally, and although they will probably be little used by the At Risk and Threatened species discussed above, they could help to protect core habitat areas from outside human and animal disturbance.

For most of the key species traffic would be only a minor concern, though it may be an issue for Australasian Bittern. Consideration could be given to installing signs, or planting taller vegetation alongside roads at sites where bitterns are likely to fly over when moving between one wetland site and another would force the bitterns to fly higher and over vehicles. This would probably not be an issue in the Waimeha NDA, since roads do not pass close to or between wetland areas.

The proposal includes plans to increase public access to the wetlands, which could potentially lead to greater disturbance of the wetland birds. However as long as access is along clearly defined and well-constructed boardwalks any disturbance should be more than compensated for by increased awareness and “ownership” of the wetland areas and their inhabitants by residents. Buffer zones between residential areas and wetlands should also help to keep human access into the wetland areas along well-defined paths.



1 Introduction

Kessels Ecology has been contracted by Jacobs to carry out an assessment of the potential effects of the proposed subdivision at Ngarara Farms, Waikanae, on the avifauna (birdlife) of the area, with a particular focus on the first stage of the development, the Waimeha Neighbourhood Development Area. The aim of this report is to provide supporting information for the preparation of the Environmental Management Plan, which is a requirement of the Structure Plan. The report:

- Identifies key nationally at risk and threatened bird species, and details their national threat status and habitat requirements;
- Analyses the potential adverse and positive effects of the subdivision on these key birds and their habitats;
- Proposes methods to ensure the protection of key bird species and enhancement of their habitats.
- Investigates the value of the proposed vegetation buffer around key habitats and reviews the avoidance, remediation and mitigation measures proposed; and
- Makes recommendations on other measures which could be undertaken to alleviate any adverse effects associated with the subdivision, and on baseline and ongoing monitoring requirements for key bird species and their habitats.

The report supplements the Assessment of Ecological Effects prepared for SKM and Maypole Environment Ltd by Boffa Miskell Ltd (2008).

2 Methods

A substantial body of information on the avifauna of the Kapiti Coast is available, and this is reviewed to identify the species likely to be present at Ngarara Farms. Sources include the Atlas of Bird Distribution in New Zealand 1999-2004, the New Zealand eBird website, the Ornithological Society's Classified Summarised Notes scheme (which ran until 2003), and the BirdingNZ.net Bird Sightings and Alerts.

Surveys have been carried out by Dr Leigh Bull (2011) on the avifauna of the area affected by the nearby Mackays to Peka Peka Expressway Proposal, and some information has been incorporated from this.

Potential impacts on birds identified as likely to be present are assessed in relation to the impacts of the Ngarara Farm proposal on the habitat types likely to be used by the various species. In particular, we assess effects of the proposed first stage of the subdivision on key nationally at risk and threatened avian species and provide assessment of the proposed 20 m buffer width. The specific effects in the Structure Plan which are addressed include roading, earthworks, residential housing, stormwater, waste water, recreational facilities and human activity.

The location of Ngarara Farms is shown in Figure 1.



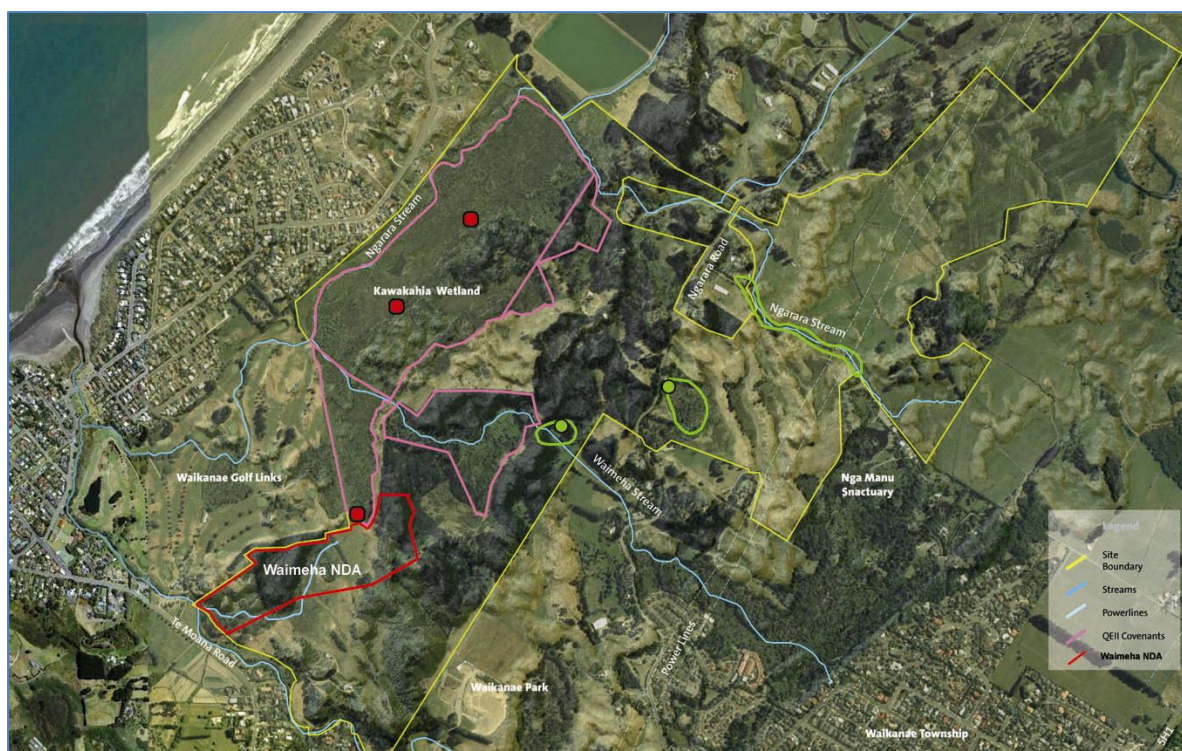


Figure 1. Ngarara Farms location, site boundary in yellow, Waimeha NDA boundary in red. Records are shown for Australasian Bittern (red) and North Island Fernbird (green). Confirmed fernbird habitat outlined in green (after Bull, unpubl.).

3 Avifauna

3.1 Bird Species

Table 1 shows the bird species recorded as occurring within the 10 km² mapping square which includes the Ngarara Farm site in the most recent OSNZ Atlas project (Robertson et al., 2007), together with some additional records of other species as detailed in footnotes. Primary habitats are taken from Robertson et al. (2007); all habitats contributing more than 25% of records for a species are listed, in declining order of importance. “Forest” is in all cases indigenous forest; “Wetland” is freshwater wetland. Threat status follows Robertson et al., (2013).

Table 1. Birds known to occur in the vicinity of Ngarara Farms.

Common name	Latin name	Threat status	Primary habitat
New Zealand Dabchick	<i>Poliiocephalus rufopectus</i>	Nationally Vulnerable	Wetland
Australasian Little Grebe	<i>Tachybaptus novaehollandiae</i>	Coloniser	Wetland
Black Shag	<i>Phalacrocorax carbo</i>	Naturally Uncommon	Wetland, Coastal
Pied Shag ¹	<i>Phalacrocorax varius</i>	Nationally Vulnerable	Coastal
Little Shag	<i>Phalacrocorax varius</i>	Naturally Uncommon	Wetland, Coastal
Little Black Shag	<i>Phalacrocorax sulcirostris</i>	Naturally Uncommon	Wetland, Coastal
White-faced Heron	<i>Ardea novaehollandiae</i>	Not Threatened	Farmland, Coastal, Wetland
White Heron ²	<i>Ardea modesta</i>	Nationally Critical	Wetland
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Nationally Critical	Wetland
Royal Spoonbill	<i>Platalea regia</i>	Naturally Uncommon	Coastal, Wetland
Black Swan	<i>Cygnus atratus</i>	Not Threatened	Wetland, Coastal

¹ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=3362#p15568>,
<http://ebird.org/ebird/newzealand/view/checklist?subID=S18692296>

² <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=3577&p=16095>



Mute Swan	<i>Cygnus olor</i>	Introduced and Naturalised	Wetland
Canada Goose	<i>Branta canadensis</i>	Introduced and Naturalised	Wetland
Cape Barren Goose	<i>Cereopsis novaehollandiae</i>	Introduced and Naturalised	Farmland, Wetland
Greylag Goose	<i>Anser anser</i>	Introduced and Naturalised	Farmland, Wetland
Paradise Shelduck	<i>Tadorna variegata</i>	Not Threatened	Farmland, Wetland
Mallard	<i>Anas platyrhynchos</i>	Introduced and Naturalised	Wetland, Farmland
Grey Duck	<i>Anas superciliosa</i>	Nationally Critical	Wetland
Grey Teal	<i>Anas gracilis</i>	Not Threatened	Wetland
Brown Teal ³	<i>Anas aucklandica</i>	Recovering	Wetland
New Zealand Shoveler	<i>Anas rhynchotis</i>	Not Threatened	Wetland
New Zealand Scaup	<i>Aythya novaeseelandiae</i>	Not Threatened	Wetland
Australasian Harrier	<i>Circus approximans</i>	Not Threatened	Farmland
Bush Falcon	<i>Falco novaeseelandiae</i> 'Bush'	Nationally Vulnerable	Forest
California Quail	<i>Callipepla californica</i>	Introduced and Naturalised	Farmland
Ring-necked Pheasant	<i>Phasianus colchicus</i>	Introduced and Naturalised	Farmland
Spotless Crane ⁴	<i>Porzana tabuensis</i>	Relict	Wetland
Marsh Crane ⁵	<i>Porzana pusilla</i>	Relict	Wetland
Pukeko	<i>Porphyrio porphyrio</i>	Not Threatened	Farmland, wetland
South Island Pied Oystercatcher	<i>Haematopus finschi</i>	Declining	Coastal, Farmland
Variable Oystercatcher	<i>Haematopus unicolor</i>	Recovering	Coastal
Pied Stilt	<i>Himantopus himantopus</i>	Declining	Coastal, Wetland
Black-fronted Dotterel ⁶	<i>Charadrius melanops</i>	Coloniser	Wetland, Coastal
Spur-winged Plover	<i>Vanellus miles</i>	Not Threatened	Farmland
Southern Black-backed Gull	<i>Larus dominicanus</i>	Not Threatened	Coastal, Farmland
Red-billed Gull	<i>Larus novaehollandiae</i>	Nationally Vulnerable	Coastal
Black-billed Gull	<i>Larus bulleri</i>	Nationally Critical	Coastal, Wetland
Caspian Tern	<i>Hydroprogne caspia</i>	Nationally Vulnerable	Coastal
White-fronted Tern	<i>Sterna striata</i>	Declining	Coastal
Kereru	<i>Hemiphaga novaeseelandiae</i>	Not Threatened	Forest
Rock Pigeon	<i>Columba livia</i>	Introduced and Naturalised	Farmland
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	Introduced and Naturalised	Forest, Farmland
Eastern Rosella	<i>Platycercus eximius</i>	Introduced and Naturalised	Farmland, Forest
Red-crowned Parakeet	<i>Cyanoramphus novaeseelandiae</i>	Relict	Forest
Shining Cuckoo	<i>Chrysococcyx lucidus</i>	Not Threatened	Forest
Morepork ⁷	<i>Ninox novaeseelandiae</i>	Not Threatened	Forest, Farmland
New Zealand Kingfisher	<i>Todiramphus sanctus</i>	Not Threatened	Farmland
Skylark	<i>Alauda arvensis</i>	Introduced and Naturalised	Farmland
Welcome Swallow	<i>Hirundo neoxena</i>	Not Threatened	Farmland, Wetland
New Zealand Pipit	<i>Anthus novaeseelandiae</i>	Declining	Farmland
Hedge Sparrow	<i>Prunella modularis</i>	Introduced and Naturalised	Farmland, Forest
Blackbird	<i>Turdus merula</i>	Introduced and Naturalised	Farmland, Forest
Song Thrush	<i>Turdus philomelos</i>	Introduced and Naturalised	Farmland
North Island Fernbird ⁸	<i>Bowdleria punctata vealeae</i>	Declining	Wetland
Grey Warbler	<i>Gerygone igata</i>	Not Threatened	Forest, Farmland
North Island Fantail	<i>Rhipidura fuliginosa</i>	Not Threatened	Forest
Silvereye	<i>Zosterops lateralis</i>	Not Threatened	Forest, Farmland
Bellbird	<i>Anthornis melanura</i>	Not Threatened	Forest
Tui	<i>Prothemadera novaeseelandiae</i>	Not Threatened	Forest
Yellowhammer	<i>Emberiza citrinella</i>	Introduced and Naturalised	Farmland
Chaffinch	<i>Fringilla coelebs</i>	Introduced and Naturalised	Farmland, Forest

³ <http://ebird.org/ebird/newzealand/view/checklist?subID=S3926293>

⁴ Boffa Miskell (2008).

⁵ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=2825&p=11995>

⁶ <http://www.birdingnz.net/forum/viewtopic.php?f=3&t=3244&p=14221#p14221>

⁷ <http://www.birdingnz.net/forum/viewtopic.php?f=3&t=1316&p=5776>

⁸ Bull (2011), <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=1614>



Greenfinch	<i>Carduelis chloris</i>	Introduced and Naturalised	Farmland
Goldfinch	<i>Carduelis carduelis</i>	Introduced and Naturalised	Farmland
Redpoll	<i>Carduelis flammea</i>	Introduced and Naturalised	Farmland
House Sparrow	<i>Passer domesticus</i>	Introduced and Naturalised	Farmland, Residential
Starling	<i>Sturnus vulgaris</i>	Introduced and Naturalised	Farmland
Australian Magpie	<i>Gymnorhina tibicen</i>	Introduced and Naturalised	Farmland

3.2 Key Threatened and At Risk Species

Of the 67 species identified in Table 1 as found in the vicinity of Ngarara Farms, 23 have an At Risk or Threatened status. These are described in more detail in Appendix I, together with information on their known or likely habitat use in the Waikanae area. Many of these are unlikely to make significant use of the range of habitats available at Ngarara Farms, and specifically within the Waimeha NDA. Some require open water which is in very limited supply (Dabchick, the shag species, White Heron, Royal Spoonbill, Grey Duck and Brown Teal), while others are predominantly coastal species which (at least in the North Island) only occasionally feed or breed inland. These are South Island Pied Oystercatcher, Variable Oystercatcher, Red-billed Gull, Caspian tern, and White-fronted Tern. Black-billed Gull, Red-crowned Parakeet and Bush Falcon are rare visitors from core habitats elsewhere.

While the above species should not be forgotten, the six remaining species (Australasian Bittern, Spotless Crake, Marsh Crake, Pied Stilt, New Zealand Pipit and North Island Fernbird) are considered to be the ones which require the main focus when determining the effects of the Ngarara Farms proposal on Threatened and At Risk avifauna. Only one of these, namely New Zealand Pipit, is likely to make significant use of habitats within the Waimeha NDA, while another, the Pied Stilt, may possibly make minor use of a small area of wet pasture in the Waimeha NDA. The remainder are primarily or almost exclusively wetland birds which are known to be or are likely to be present in the Kawakahia Wetland adjoining the Waimeha NDA. This highlights the importance of the Kawakahia Wetlands and other wetlands within the site, which has already been noted elsewhere (Boffa Miskell, 2008; Smale and James, 2014). These key species are now discussed in more detail.

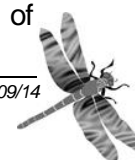
3.2.1 Australasian Bittern (Nationally Critical)

Australasian Bitterns have declined greatly because of habitat loss, and are now thought to number fewer than 900 individuals in New Zealand, and little more in Australia (Williams, 2013a). Though they are difficult to count because of their secretive habitats, there appears to have been an ongoing decline between the OSNZ atlas schemes of 1969-1979 and 1999-2004 (Bull et al., 1985; Robertson et al., 2007). The earlier scheme recorded bitterns right down the Kapiti coast, while the more recent one did not record them south of Levin, despite comparable surveying effort.

The new electronic eBird scheme has however more recently collated two records from the Kawakahia Wetland (Nikki McArthur, 16/9/2011, and Susanne Govezza, 18/2/2013). Bull (2011) also reported one heard at the south end of Kawakahia Wetland, near the edge of the Waimeha NDA. There are additional recent eBird records from the Waikanae Estuary (OSNZ Wellington, 30/8/2012) and eastern Waikanae (Stuart Nicholson, 11/9/2008). Boffa Miskell (2008) reported that a 2006 Wildlands survey recorded bittern “in the area of Harakeke Stream”. The status of bittern in the area is however clearly precarious, and the Kawakahia Wetland appears to be an important site for them regionally.

3.2.2 Spotless Crake (Relict)

This is a small wetland rail, predominantly occupying areas of tall, dense vegetation, particularly raupo. While records of Spotless Crake in the southern North Island are scarce (Robertson et al., 2007), Boffa Miskell (2008) reported that Wildlands staff heard the species “in the area of



Harakeke Stream” in 2006. This is a secretive bird that is difficult to detect, but this record indicates it has recently been present at Ngarara Farms; its continued presence is likely. Boffa Miskell (2008) mapped several small patches of raupo around the fringes of the Kawakahia Wetland; these would probably be the best places to search for this species, although they do occur in other assemblages of dense wetland vegetation.

3.2.3 Marsh Crake (Relict)

Another small wetland rail, the Marsh Crake is found in similar habitats to the Spotless Crake but is less frequently encountered, particularly in the North Island (O'Donnell, 2013). There is one recent (August 2013) record from the south side of the Waikanae Estuary, which indicates their presence in the region. They may be present in dense vegetation of the Kawakahia Wetland, though their secretiveness makes them likely to be overlooked.

3.2.4 Pied Stilt (Declining)

Pied Stilts utilise a range of coastal and freshwater wetland habitats (Adams, 2013), and can sometimes be seen feeding on wet pasture in coastal locations (Medway, 2000). They are regularly seen at Waikanae Estuary, along the coast, and at the Pharazyn Reserve. They may utilise wetland and wet pasture areas at Ngarara Farms, including the Waimeha NDA, but the extent to which they do this is unknown.

3.2.5 North Island Fernbird (Declining)

The population of North Island Fernbird at Waikanae is highly significant, being the southernmost outpost of the subspecies; the nearest known population is at Foxton Beach. Boffa Miskell (2013) surveyed for North Island Fernbirds along the line of the proposed Mackays to Peka Peka Expressway using bioacoustic monitors, locating fernbirds at two sites, both within the Ngarara Farms boundary. Bull (unpubl.) has mapped these sites, adding a third area of confirmed fernbird habitat along the Ngarara Stream; this information has been incorporated into Figure 1. Monitoring of vegetation clearance undertaken at these sites for the expressway project did not detect any fernbirds. Fernbirds are also known from Waikanae Estuary (see footnotes, Table 1).

All sites within the Ngarara Farms boundary which have been confirmed as fernbird habitat to date are marginal, rather scrubby wetland sites. There do not appear as yet to be any records from the main body of the Kawakahia Wetland, or from the smaller (10.3 ha) wetland protected by a QE II covenant lying to its east (Figure 1), but their presence there is likely, and in the absence of detailed information on the area this should be assumed.

North Island Fernbirds are not confined to wetlands, but also occur in areas of scrubby vegetation, including areas with a high exotic component, particularly when adjoining wetlands (Robertson et al., 2007; *pers. obs.*). Areas of the Waimeha NDA bordering the wetland are characterised by Landcare/EOS (2014) as pasture and old growth exotic treeland, neither of which are likely to provide habitat for fernbirds.

3.2.6 New Zealand Pipit

Pipits probably benefited initially from forest clearance, but have declined as land-use has intensified (Beauchamp, 2013). They prefer areas of rough pasture, and wetlands with open vegetation, and are present in farmland and open country on the Kapiti Coast (Bull, 2011); little information is available on their abundance there, but they appear to be uncommon.

This species is potentially the most problematic in terms of the potential effects of the proposal, as it is the only one of the Threatened and at Risk species which has Farmland as its primary habitat (Table 1). Boffa Miskell (2008) regarded areas of pasture and “weedlands” as having no or minimal constraints and hence suitable for development. While this is undoubtedly true for the vegetation and most fauna, rough pasture is an important habitat for this species (Beauchamp,



2013). The Waimeha NDA includes an area of approximately 3.15 ha characterised by Boffa Miskell (2008) as pasture and wet weedy pasture.

Pipits do however seem to be uncommon around Waikanae. Only 0.23% of Bull's (2011) bird observations were of this species, less than 25% of record sheets in the OSNZ Atlas Scheme recorded pipits in the mapping square which contains Ngarara Farms (Robertson et al., 2007), and anecdotal reports⁹ speak of its scarcity.

4 Existing Habitats

Vegetation and habitat have been described by Boffa Miskell (2008); Smale and James (2014) provided additional information on the vegetation of the Waimeha NDA, which forms the south-western corner of the Ngarara Farms site, and which is the first neighbourhood scheduled for development. For detailed descriptions of the area's vegetation these documents should be referred to.

Ngarara Farms covers 280 ha. Boffa Miskell (2008) distinguish 20 vegetation communities within the larger Ngarara Farms site, which they group into four larger categories, namely grasslands and grass-rushlands (118.8 a), sedge and rush wetlands (40.8 ha), scrub and shrublands (47.5 ha), and forest and treelands (76.3 ha). Much of the eastern side of the Ngarara Farms block is dominated by pasture, some of it wet and weedy, and a band of pine plantation and old growth exotic treeland runs through the centre of the block from south-west to north-east. Gorse and other scrubby vegetation occupies some of the dry tops of the dune system on which the block lies.

Two QEII covenants are registered within the Ngarara Farms block. These are named by Boffa Miskell (2008) as the Ngarara Covenant (5/07/240A) (including Kawakahia wetland), Smith Covenant, and the Ngarara Covenant (5/07/240B). The former has an area of 43.7 ha and includes the main body of the Kawakahia Wetland with its coastal primary dune wetland, coastal forest and secondary scrub. Its vegetation is described by Boffa Miskell (2008) as mixed, and including raupo, toetoe, flax, mahoe, *Coprosma propinqua*, with some manuka, cabbage tree etc. This occupies most of the north-western side of the block.

The latter covenant (10.3 ha) has modified kahikatea wetland, regenerating shrubland / ti kouka-mahoe treeland, pine plantation, and a small area of primary swamp forest. Fernbirds were detected by bioacoustic monitoring close to this site (Bull, 2011).

The other fernbird record came from an area further east marked as "Reserve" on Figure 1 of Boffa Miskell (2008) though it appears to have no formal protection. This site includes a lowland semi-coastal modified primary forest remnant, palustrine flaxland wetland and some *Pinus radiata* forestry (Boffa Miskell, 2008).

Within the Waimeha NDA, Boffa Miskell (2008) identified five vegetation communities, namely pasture, wet weedy pasture, gorse scrub, pine plantation, mahoe scrub and old growth exotic treeland. Most of these habitats are unlikely to be utilised to any significant extent by any of the key species identified above. Pasture and wet weedy pasture may however be utilised by New Zealand Pipit; there is approximately 3.15 ha of these vegetation types within the NDA, of which approximately 0.28 ha is wet weedy pasture. This vegetation could possibly be utilised by Pied Stilt; very occasional visits by South Island Pied Oystercatcher, Red-billed Gull and Black-billed Gull are also possible, although this would not be prime habitat for them.

⁹ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=2711>



5 Development Proposal

5.1 Ecological Objectives of the Subdivision

The stated objective is for Ngarara Farms to “give form to the principles of healthy ecology and healthy community, while weaving together the settlements of Waikanae Township and Waikanae Beach” (Maypole Environmental Ltd, 2008). In line with this vision is a plan to develop a series of 11 “neighbourhoods”, each with their own character reflecting each site’s ecological values.

Boffa Miskell (2008) state that at this stage, “no significant indigenous vegetation will be directly affected as part of this proposed development, rather these areas will be enhanced by their protection, buffering, restoration planting and ongoing management.” Development of the residential neighbourhoods, which together occupy approximately 130 ha (Boffa Miskell, 2008) is to be largely confined to the areas of pasture, pine plantation, old growth exotic treelands and weed-dominated areas. Forest areas will therefore decline to approximately 35 ha, and pasture will decline to 37 ha. A 20-metre buffer around the wetlands is calculated to add approximately 22 ha to the areas classified as wetland. Boffa Miskell (2008) calculate that approximately 78 ha of the finished project will consist of wetlands. The 22 ha of buffers added to the 41ha of wetland that exists at present would make 63 ha; there is also about 5 ha of modified kahikatea wetland and primary swamp forest. Presumably the balance is made of from restoring areas which are at present wet pasture with *Juncus* spp. (4.4 ha), or creating new wetlands and ponds for stormwater management and landscaping purposes.

5.2 The Waimeha Neighbourhood Development Area (NDA)

Smale and James (2014) have assessed the effects of the Waimeha NDA proposal on the area’s vegetation. They identified the Kawakahia Wetland adjoining the northern end of the Waimeha NDA, due to its mosaic of sedgeland, reedland, flaxland and shrubland, as being of outstanding ecological value. Areas of mahoe-dominated scrub, although a common vegetation association, were considered to have high value because of their role in buffering part of the Kawakahia Wetland, and likely to succeed to taller native forest if weeds and pests are controlled. Remaining vegetation associations were considered to have no ecological value. These were dominated almost wholly by exotic species and were characterised as pasture, wet weedy pasture, gorse scrub, pine plantation and old-growth exotic treeland. They recommended augmenting the existing mahoe scrub buffer zone around the wetland by establishing additional indigenous species, controlling exotic weeds and pests, and adopting best-practice erosion and sediment control measures to prevent fine sediment entering the wetland.

Boffa Miskell (2008) also considered the Waimeha neighbourhood to be relatively free of ecological constraints. Their recommendations included designing stormwater and sewerage systems to avoid adverse impacts on the Kawakahia Wetland and Waimeha Stream, consideration of additional building setbacks adjacent to the wetland and stream, prohibition of groundwater bores, and consent conditions for management of potential contaminants such as cement waste, stored fuels and lubricants, paints and detergents.

6 Assessment of Effects on Avifauna

The Ngarara Farms proposal is complex and multi-faceted, and incorporates a range of actions which could potentially have both positive and negative impacts on various bird species. Among the potential negative effects are:

- Effects resulting from earthmoving, house construction and other activities during the project’s development stage;



- Effects resulting from the increased human population in the area, such as higher traffic volumes, disturbance of nesting and feeding areas, and higher numbers of domestic pets;
- Loss of habitat to houses, roading, and low-diversity lawns and parklands.

Potential positive effects of the proposal are:

- Enhancement of existing areas of indigenous vegetation due to weed control and supplementary plantings;
- Expansion and maintenance of indigenous vegetation from the 20-metre buffer and retention of the QEII covenant to be developed around wetland areas; and
- Control of mammalian pests associated with management of covenanted areas.

6.1 Construction effects

A major issue during many major suburban development projects is run-off from the site into nearby water bodies. During house construction care will be needed to prevent silt and concrete from directly discharging into waterways as these contaminants could adversely affect habitat for key bird species. Silt control measures in accordance with Wellington Regional Council best practice guidelines should be adopted. This should be adequate in terms of filtering most of the coarse sediments arising from run-off during construction. In addition to the sediment ponds and other temporary sediment control structures employed, erosion protection by top-soiling and replanting of suitable vegetation on exposed banks should be undertaken as soon as possible.

The establishment of a 20-metre buffer around wetland areas will also help mitigate surface run-off, as well as shielding birds from sound and visual disturbance. Provided these procedures are followed construction effects are unlikely to cause significant adverse effects on key bird species.

6.2 Hydrological effects

Suburban development leads to an increase in hard surfaces such as roofing and roading, which can result in greater fluctuations in water flows compared to those that would occur naturally. This in turn can wash contaminants into sensitive areas. It is noted however that the Ngarara Farms proposal includes conditions on housing in areas adjoining wetlands to minimise such effects.

The bulk of the Waimeha NDA drains to the less sensitive Waimeha Stream rather than the highly sensitive Kawakahia Wetland, so the range of conditions in place for this NDA are not as restrictive as for some of the neighbourhood proposals. Management activities for the Waimeha NDA include building setbacks and a minimum 20-metre buffer zone bordering high constraint areas (in this case the Kawakahia Wetland), restrictions on groundwater bores (studies have indicated that groundwater abstraction has led to a recession of groundwater levels in Kapiti Coast aquifers, which could have an impact on wetland vegetation), and design of stormwater through low impact design and sewerage systems to avoid adverse hydrological impacts. Features which have been proposed include permeable pavements, rain gardens and swales to slow the rate of run-off during rainfall events, and disposal of stormwater through soakage pits. If these proposals are followed then adverse effects on bird habitats resulting from hydrological changes should be less than minor.

6.3 Habitat changes

6.3.1 New Zealand Pipit

One of the main impacts on wildlife from urban development is loss of habitat resulting from the replacement of vegetation by buildings and associated hard surfaces. In the case of Ngarara Farms the main vegetation types that will be reduced are pasture, pine plantation, exotic old growth treeland and various weedy assemblages dominated by species such as gorse and blackberry. The birds using these habitats on the Kapiti Coast are primarily



common species, most of them exotic. The one exception is New Zealand Pipit, a species categorised as At Risk: Declining (Robertson et al., 2013). Rough and wet pasture is an important habitat for this species, so adverse effects on it are possible. Approximately 3.15 ha of pasture and wet pasture are scheduled to be lost in the Waimeha NDA.

Little is known about New Zealand Pipit abundance and distribution in the Waikanae area and the Ngarara Farms site specifically, but on the information that is available they appear to be quite uncommon. Their scarcity in the southern North Island is corroborated by Beauchamp (1995), who surveyed pipits in the Wellington area (southwards from Titahi Bay and Pauatahanui) in 1987-89; this provides the best estimates of pipit population densities in this part of the country. He calculated that where populations were densest (the hills west and south of Karori and Makara Beach, and along the exposed south and west coastlines), pipit densities were approximately 2.5 individuals per km². Elsewhere (Eastbourne and Orongorongo) densities ranged as low as 1 individual per km². Population densities in rural areas around Waikanae are likely to be in this range, in which case they are probably not being limited by habitat availability, and the loss of 3.15 ha of pasture communities within the Waimeha NDA would result in an impact on New Zealand Pipit which would be no more than minor, affecting at most a single pair.

Wet pasture in the North Island is also a minor habitat for Pied Stilt, South Island Pied Oystercatcher, Red-billed Gull and Black-billed Gull, although only 0.28 ha of this habitat type occurs within the Waimeha NDA, so effects on these species are likely to be less than minor.

6.3.2 Water birds

At present there is very little habitat available for birds which require open water for feeding. Such areas are confined to the small Totara Lagoon in the centre of the Kawakahia Wetland, and possibly some parts of the Ngarara Stream which are not part of the Waimeha NDA. Ornithological records such as eBird show that large populations of open water species such as dabchick, shags and ducks occur at nearby sites such as Pharazyn Reserve, Nga Manu Nature Reserve and the Waikanae Estuary; these include a number of threatened and at risk species (see Table 1). There are no proposed stormwater operation ponds provided for in the Waimeha NDA, so water birds are likely to stay within the wetland and related waterways. The Waimeha NDA proposal is unlikely to have any significant effects on waterbird populations, either positive or negative.

6.3.3 Habitat creation/restoration

A significant part of the Ngarara Farms proposal is the restoration of degraded habitats and the creation of new areas of indigenous vegetation. These areas include 20-metre buffers around wetland areas, riparian plantings along streams and bush corridors. Though they will likely be of benefit to birdlife generally, these areas will probably be little used by the At Risk and Threatened species discussed above, although they could help to protect core habitat areas such as the Kawakahia Wetland from outside disturbances including human-generated noise, wandering pets and surface stormwater run-off. Weed control and, where necessary, supplementary plantings of locally sourced wetland plants could also provide benefits to the key species.

6.4 Domestic pets

Cats and dogs can be significant predators of indigenous birds. While cats also prey on smaller predators, Landcare Research scientist John Innes says the research to clarify whether the negative effects of cats outweigh the positive effects of their predation on ship rats, Norway rats and mice has not been done¹⁰.

¹⁰ <http://www.sciencemediacentre.co.nz/2013/01/23/cats-impact-on-native-wildlife-experts-respond/>



Several of the key indigenous birds found in this area, such as fernbirds and crakes, are reluctant to take to the air, and could be adversely affected if numbers of domestic pets increase. For the Waimeha NDA only a few of the neighbourhood's residential sections lie close to the wetland, so the increase in domestic animals wandering into it is likely to be minor. As such, methods such as pet-free covenants in the Waimeha NDA would likely have limited effect. The proposed buffer of indigenous vegetation should further limit incursion by wandering domestic animals.

Any potential impacts arising from increased predation due to higher numbers of domestic animals would be better addressed through mitigation through a programme of trapping (probably more appropriate than poisoning in locations close to residential areas) to control other predatory mammals such as rats, possums and mustelids in natural areas adjacent to the subdivision. There are many examples of community-operated landcare groups¹¹ in which volunteers carry out such programmes to protect the natural values of the areas in which they live, and responsibility for ongoing pest management could likely be handed over to local residents in the long term.

Impacts from pets could be further minimised through advocacy and education, ensuring residents are aware of the significance of the areas they are living beside, and encouraging them to adopt practices such as keeping cats indoors at night.

6.5 Traffic

For most of the key species traffic would be only a minor concern, given that vehicle densities are likely to be light through most of the Ngarara Farms area, and roading mostly away from sensitive areas. It may however be an issue for Australasian Bittern; while these are good fliers, they often fly low and are vulnerable to traffic when roads pass by their habitats. Consideration could be given to installing signs¹², or planting taller vegetation alongside roads at sites where bitterns are likely to fly over when moving between one wetland site and another, such as along the ridge between the two QEII covenants; this would force the bitterns to fly higher and over vehicles. This scenario does not eventuate in the Waimeha NDA, but will need to be addressed when the Ti Kouka NDA is developed. Overall the effects for the Waimeha NDA are likely to be less than minor.

6.6 Human disturbance

The proposal includes plans to increase public access to the wetlands, which could potentially lead to greater disturbance of the wetland birds. However as long as access is along clearly defined and well-constructed boardwalks any disturbance should be more than compensated for by increased awareness and "ownership" of the wetland areas and their inhabitants by residents. Buffer zones between residential areas and wetlands should also help to keep human access into the wetland areas along well-defined paths.

7 Conclusions & Recommendations

7.1 Key species

Key bird species identified as being of primary interest at Ngarara Farms are:

- **Australasian Bittern:** This Nationally Critical species has a precarious status on the Kapiti Coast, and the Kawakahia Wetland appears to be an important site for it. It should

¹¹ <http://www.landcare.org.nz>

¹² <http://www.imagoborealis.com/image/nz-attention-bittern-crossing-road-sign-on-white-2/>



not be adversely affected by this proposal if planned measures to protect its wetland habitat are adopted.

- **North Island Fernbird:** The Waikanae population is highly significant as it is the southernmost population of the subspecies, and well separated from the next most southerly known population. Though it should not be adversely affected by this proposal if planned measures to protect its wetland habitat are adopted, further surveying to clarify its local abundance and distribution at Ngarara Farms would be desirable. In particular, its status in Kawakahia Wetland and the neighbouring 10.3 ha QE II covenant, and the extent to which (if at all) it utilises the marginal scrub vegetation should be determined.
- **New Zealand Pipit:** This species is of some concern as it is the only one of the identified key species for whom farmland (dominant in the Waimeha NDA) is a major habitat. The available information however indicates it is uncommon in the Wellington/Kapiti Coast area, and the loss of approximately 3.15 ha of pasture vegetation communities in the Waimeha NDA in the first stage of the development would likely have an effect on at most a single pair of this species.
- **Pied Stilt:** Though a wetland bird, the Pied Stilt does utilise wet pasture, although the extent to which it does this at Ngarara Farms is unknown. With specific reference to the Waimeha NDA, only 0.28 ha of wet pasture are scheduled for conversion in this proposal, so effects on this species and others which utilise wet pasture are expected to be less than minor.
- **Spotless Crake and Marsh Crake:** These are highly secretive species and not often seen, but there is one record of Spotless Crake at Ngarara Farms, and one record of Marsh Crake nearby at Waikanae Estuary. While they should not be adversely affected by this proposal if planned measures to protect their wetland habitat are adopted, further surveys to clarify their status at Ngarara Farms would be desirable.

7.2 Key Avoidance, Remediation and Mitigation Measures

The main vegetation types that will be reduced by the development of the Waimeha NDA are pasture, wet weedy pasture, gorse scrub, pine plantation, mahoe scrub and old growth exotic treeland. Most of these vegetation communities are little utilised by threatened and at risk birds in the area, but rough and wet pasture is an important habitat for NZ Pipit, so adverse effects on it are possible. Pipits are however uncommon in the Wellington/Kapiti Coast area, and the amount of habitat to be lost (approximately 3.15 ha) would have at most a minor effect on a species which probably occurs at a density of no more than 2.5 individuals per km² (Beauchamp, 1995). Any effect could be mitigated by a programme to control predators such as rats and mustelids (see below), which are likely to be more responsible for limiting of pipit numbers (and bird numbers generally) than is habitat availability.

The Ngarara Farms proposals involve the construction of a number of ponds to clean and attenuate runoff, and create attractive landscape features. At present there is very little habitat available for birds which require open water for feeding so these newly constructed features will result in creation of new habitat for species such as dabchick, shags and ducks. Careful design of the ponds to enhance marginal feeding and loafing habit could further increase their value for water birds. In the first stage of the Ngarara Farms proposal at the Waimeha NDA, however, there are no open water areas planned, so effects on waterbirds from this initial stage, either positive or negative, are not expected.

A significant part of the Ngarara Farms proposal is the restoration of degraded habitats and the creation of new areas of indigenous vegetation. These areas include 20-metre buffers around wetland areas, riparian plantings along streams and bush corridors. They will likely be of benefit to birdlife generally, though are unlikely to be of direct benefit to the core species identified in this report as the species of main concern primarily inhabit wetlands or open country rather than forest or shrubland. These areas could however help to protect core habitat areas (primarily the wetlands) from outside human and animal disturbance.



Increased numbers of domestic animals, particularly dogs and cats, may lead to increased predation pressure on sensitive wetland species such as bittern, fernbirds and crakes. This potential effect could be mitigated by instituting a programme of trapping to control other mammalian predators such as rats, possums and stoats in wetland and other natural and restored vegetation areas. Smale and James (2014) also recommend pest control, along with weed control, to help in maintaining the integrity of existing natural vegetation adjacent the proposed Waimeha NDA (Kawakahia Wetland and fringing māhoe scrub) and in allowing further natural successional development of the māhoe scrub and proposed fasciated mānuka scrub to kohekohe forest. They recommend any pest control plan be created in consultation with the GWRC, which has an ongoing pest control programme in the wetland. Such a plan would have considerable benefits for birds as well as for plants.

In addition, the impacts from pets could be minimised through advocacy and education, ensuring residents are aware of the significance of the areas they are living beside. Initiatives such as keeping cats indoors at night and encouraging community involvement in pest control projects could do a great deal towards minimising human impacts on species which are sensitive to predation.

Traffic may be an issue for Australasian Bittern along roads near wetlands. Consideration could be given to installing road signs alerting drivers to their presence, or planting taller vegetation alongside roads at sites where bitterns are likely to fly over when moving between one wetland site and another; this would force the bitterns to fly higher and over vehicles. Within the Waimeha NDA there are probably no roads where this would be an issue, however, and no specific measures are recommended for this stage of the Ngarara Farms proposal.

The proposal includes plans to increase public access to the wetlands, which could potentially lead to greater disturbance of the wetland birds. However as long as access is along clearly defined and well-constructed boardwalks any disturbance should be more than compensated for by increased awareness and “ownership” of the wetland areas and their inhabitants by residents. Buffer zones between residential areas and wetlands should also help to keep human access into the wetland areas along well-defined paths.

7.3 Monitoring

The design and implementation of a detailed monitoring programme to understand how the populations of these bird species and the effects of the subdivisions and their associated mitigation measures is required, the precise details of which could be determined following an initial site visit. The information already available on the birdlife of the area is considered sufficient to assess the effects of the Waimeha NDA phase of the project, and this site visit should not be required until closer to the time when more sensitive areas are scheduled to be developed. The primary focus of the initial visit would be on bird playback surveys (Bull, 2011). These involve playing back recordings of cryptic wetland birds (i.e. bittern, fernbird and crakes) on the edge of suitable habitat and noting any responses. Counts of waterbirds on the Totara Lagoon could be carried out to determine baseline populations, and the initial survey should include a line transect count¹³ to determine the abundance of Pied Stilts and New Zealand Pipits in a representative area of open country.

¹³ <http://www.doc.govt.nz/Documents/science-and-technical/inventory-monitoring/im-toolbox-birds-incomplete-line-transect-counts.pdf>



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Appendix I: Threatened and At Risk Species

Of the 67 species identified in Table 1 as found in the vicinity of Ngarara Farms, 23 have an At Risk or Threatened status.

New Zealand Dabchick (Nationally Vulnerable)

Formerly widespread throughout the country, this species disappeared from the South Island in the mid-20th century (Heather and Robertson 2005). In recent years however it appears to have expanded its range (Robertson et al., 2007), and was recorded as breeding again in the South Island in 2012 (Szabo, 2013a). Up to 115 have been seen (probably a post-breeding flock) on the Pharazyn Reserve ponds¹⁴ which is a significant number for a species whose total population is thought to be 1900-2000 individuals (Szabo, 2013a).

Dabchicks are strongly aquatic and require open water in which to hunt for aquatic invertebrates and fish. While the Kapiti and Manawatu coastal dune lakes appear to hold a substantial population, the only suitable habitat for them at present within the Ngarara Farms site would be the very small Totara Lagoon (approximately 63 m x 26 m in extent) in the centre of the Kawakahia Wetland. There is probably no habitat for them within the Waimeha NDA.

Black Shag (Naturally Uncommon)

This is a species which occurs widely but sparsely throughout New Zealand and several countries overseas in a range of freshwater and coastal open water habitats. It is regularly recorded at the Waikanae Estuary and Pharazyn Reserve. This and other shag species feed primarily on fish, and require at least a moderate depth of water in which to hunt. The only suitable habitat at Ngarara Farms currently is the Totara Lagoon, and possibly the Ngarara Stream. There is probably no significant habitat for them within the Waimeha NDA.

Pied Shag (Nationally Vulnerable)

The Pied Shag population in central New Zealand has been expanding at 5.4% per annum in recent decades (Bell, 2013). Though it mostly breeds at coastal sites there is a small colony at Pharazyn Reserve¹⁵ a short distance inland. The only suitable habitat at Ngarara Farms currently is the Totara Lagoon, and possibly the Ngarara Stream. There is probably no significant habitat for them within the Waimeha NDA.

Little Shag (Naturally Uncommon)

This is the most widely distributed New Zealand shag in both freshwater and coastal habitats, and while it is declining in the Auckland region it is reported to be increasing in the southern North Island (Taylor, 2013). The only suitable habitat at Ngarara Farms currently is the Totara Lagoon, and possibly the Ngarara Stream. There is probably no significant habitat for them within the Waimeha NDA.

Little Black Shag (Naturally Uncommon)

Thought to be a recent colonist whose distribution is still increasing, Little Black Shags occur mostly in the North Island. The only suitable habitat at Ngarara Farms currently is the Totara Lagoon, and possibly the Ngarara Stream. There is probably no significant habitat for them within the Waimeha NDA.

¹⁴ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=3362&p=14735#p15568>

¹⁵ <http://ebird.org/ebird/newzealand/view/checklist?subID=S18692296>



White Heron (Nationally Critical)

White Herons have a single breeding colony on the South Island's West Coast, from which they disperse widely in the non-breeding season to feed in freshwater wetlands and estuaries, and along the fringes of lakes, ponds and slow-flowing streams. They are occasionally recorded from the Waikanae area (up to two were present at the estuary in April-May 2014), and could possibly visit Ngarara Farms, including the lower reaches of the Waimeha Stream in the Waimeha NDA but their occurrence there would be a very rare event.

Australasian Bittern (Nationally Critical)

Australasian Bitterns have declined greatly because of habitat loss, and are now thought to number fewer than 900 individuals in New Zealand, and little more in Australia (Williams, 2013a). Though they are difficult to count because of their secretive habitats, there appears to have been an ongoing decline between the OSNZ atlas schemes of 1969-1979 and 1999-2004 (Bull et al., 1985; Robertson et al., 2007). The earlier scheme recorded bitterns right down the Kapiti coast, while the more recent one did not record them south of Levin, despite comparable surveying effort.

The new electronic eBird scheme has however more recently collated two records from the Kawakahia Wetland (Nikki McArthur, 16/9/2011, and Susanne Govella, 18/2/2013). Bull (2011) also reported one heard at the south end of Kawakahia Wetland, near the edge of the Waimeha NDA. There are additional recent eBird records from the Waikanae Estuary (OSNZ Wellington, 30/8/2012) and eastern Waikanae (Stuart Nicholson, 11/9/2008). Boffa Miskell (2008) reported that a 2006 Wildlands survey recorded bittern "in the area of Harakeke Stream". The status of bittern in the area is however clearly precarious, and the Kawakahia Wetland appears to be an important site for them regionally.

Royal Spoonbill (Naturally Uncommon)

While still uncommon in New Zealand, Royal Spoonbills have increased from an estimated 52 birds in 1977 to 959 in 1996, and probably more today. They have been breeding on Kapiti Island since 1994 (Szabo, 2013b). These birds catch their food by sweeping their bills from side to side while standing in shallow water. Habitat at Ngarara Farm would be very limited, probably confined to the Totara Lagoon and possibly the Ngarara Stream. There is probably no significant habitat for them within the Waimeha NDA.

Grey Duck (Nationally Critical)

Formerly the most abundant native duck, Grey Ducks have been largely displaced by competition with Mallards; there has also been extensive hybridisation between the two species (Williams, 2013b). Currently most pure-bred birds are to be found in remote high country lakes, though some, probably semi-domesticated, are present at the Nga Manu Nature Reserve adjacent to Ngarara Farms¹⁶. From there they may occasionally disperse to Ngarara Farms but the limited extent of open water habitat there probably means that numbers visiting will be low and sporadic. There is probably no significant habitat for them within the Waimeha NDA.

Brown teal (Recovering)

By the 1970s Brown Teal were largely confined to Great Barrier Island and a couple of sites in Northland, but reintroductions have been made since then to other sites including Kapiti and Mana Islands (Williams 2013c). From there birds regularly disperse to Waikanae, and they are also present at Nga Manu Nature Reserve¹⁷. The limited range of suitable open water habitat at Ngarara Farms probably means that few are likely to visit there however.

¹⁶ <http://ebird.org/ebird/view/checklist?subID=S13564342>

¹⁷ <http://ebird.org/ebird/view/checklist?subID=S14847346>



Bush Falcon (Nationally Vulnerable)

Mainly a forest species, the Bush Falcon (the form of falcon which occurs in the North Island and western South Island) also hunts in open country. It appears to be resident in the Tararua Ranges adjacent to Waikanae and is occasionally seen in the eastern part of the town¹⁸. It has also been recorded at Otaihanga Rd¹⁹, the Greendale Reserve²⁰, and Waikanae Estuary²¹. While there are probably no falcons resident at Ngarara Farms it is likely that birds may visit occasionally.

Spotless Crake (Relict)

This is a small wetland rail, predominantly occupying areas of tall, dense vegetation, particularly raupo. While records of Spotless Crake in the southern North Island are scarce (Robertson et al., 2007), Boffa Miskell (2008) reported that Wildlands staff heard the species “in the area of Harakeke Stream” in 2006. This is a secretive bird that is difficult to detect, but this record indicates it has recently been present at Ngarara Farms; its continued presence is likely. Boffa Miskell (2008) mapped several small patches of raupo around the fringes of the Kawakahia Wetland; these would probably be the best places to search for this species, although they do occur in other assemblages of dense wetland vegetation.

Marsh Crake (Relict)

Another small wetland rail, the Marsh Crake is found in similar habitats to the Spotless Crake but is less frequently encountered, particularly in the North Island (O'Donnell, 2013). There is one recent (August 2013) record from the south side of the Waikanae Estuary, which indicates their presence in the region. They may be present in dense vegetation of the Kawakahia Wetland, though their secretiveness makes them likely to be overlooked.

South Island Pied Oystercatcher (Declining)

In the North Island South Island Pied Oystercatcher is mainly a bird of estuaries and harbours (Robertson et al., 2007). It is regular at Waikanae Estuary and along the coast, and is occasionally recorded inland in the region. On wet pasture in coastal areas they feed mainly on earthworms and beetle larvae (Sagar, 2013). It is possible that this species may utilise wet pasture areas at Ngarara Farms, including the Waimeha NDA, though the extent to which they do this (if at all) is unknown. Bull (2011) did not record them in areas along the line of the proposed Mackays to Peka Peka Expressway.

Variable Oystercatcher (Recovering)

This species is more strictly coastal than the South Island Pied Oystercatcher. They are not usually seen far from the coast, but will forage in paddocks, and occasionally nest a short distance inland (Dowding, 2013). It is possible that they may visit and forage at Ngarara Farms occasionally, but this would not be primary habitat for them.

Pied Stilt (Declining)

Pied Stilts utilise a range of coastal and freshwater wetland habitats (Adams, 2013), and can sometimes be seen feeding on wet pasture in coastal locations (Medway, 2000). They are regularly seen at Waikanae Estuary, along the coast, and at the Pharazyn Reserve. They may utilise wetland and wet pasture areas at Ngarara Farms, including the Waimeha NDA, but the extent to which they do this is unknown.

¹⁸ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=1806&p=8061>

¹⁹ <http://ebird.org/ebird/view/checklist?subID=S5716085>

²⁰ <http://ebird.org/ebird/view/checklist?subID=S6236222>

²¹ <http://ebird.org/ebird/view/checklist?subID=S14799837>



Red-billed Gull (Nationally Vulnerable)

Though still common and widespread, the Red-billed Gull is considered Nationally Vulnerable because the largest colonies (i.e. Kaikoura, Three Kings and Mokohinau Island) have recently exhibited a marked decline in numbers (Mills, 2013a). It is primarily a coastal species, but occasionally feeds on wet pasture inland. They may do this at Ngarara Farms, but the extent of any such behaviour is unknown.

Black-billed Gull (Nationally Critical)

Considered to be the most threatened gull species in the world the Black-billed gull has declined rapidly in its national stronghold of Southland and elsewhere in the South Island. There has however been an expansion of its range in the North Island (where about 5% of the population breeds) though there is no evidence for an overall increase in the North Island population (McClellan and Habraken, 2013).

Black-billed Gulls are considered to be a predominantly inland species, though in the North Island their distribution is more associated with the coast and larger lakes (Robertson et al., 2007). In the Waikanae region it has been recorded inland at Lion Bush²² as well as at Peka Peka Beach and the Waikanae Estuary, though it appears to be only irregular at the latter site²³, and uncommon in the region generally. It is known to feed on wet pastures; the extent to which it does this at Ngarara Farms is unknown, but is likely to be at most sporadic and irregular.

Caspian Tern (Nationally Vulnerable)

This is primarily a coastal species, though it also occurs on larger rivers and lakes (Fitzgerald, 2013). It is regular on the Kapiti Coast but its presence at Ngarara Farms is probably largely confined to occasional overflights.

White-fronted Tern (Declining)

Although still the commonest tern in New Zealand, the White-fronted Tern has declined markedly in the past 40 years (Mills, 2013b). It is predominantly coastal and feeds primarily on small fish. It is regular on the Kapiti Coast but its presence at Ngarara Farms is probably largely confined to occasional overflights.

Red-crowned Parakeet (Relict)

This is a forest species which is common on Kapiti Island and also held at Nga Manu Nature Reserve. There is a single record from Otaihanga²⁴, which probably originates from one of these sources. It is unlikely to be anything but a very rare visitor to Ngarara Farms.

New Zealand Pipit (Declining)

Pipits probably benefited initially from forest clearance, but have declined as land-use has intensified (Beauchamp, 2013). They prefer areas of rough pasture, and wetlands with open vegetation. It is present in farmland and open country on the Kapiti Coast (Bull, 2011); little information is available on its abundance, but it appears to be uncommon.

North Island Fernbird (Declining)

The population of North Island Fernbird at Waikanae is highly significant, being the southernmost outpost of the subspecies; the nearest known population is at Foxton Beach. Boffa Miskell (2013) surveyed for North Island Fernbirds along the line of the proposed Mackays to Peka Peka Expressway using bioacoustic monitors, locating fernbirds at two sites, both within the Ngarara

²² <http://ebird.org/ebird/newzealand/view/checklist?subID=S13196422>

²³ <http://www.birdingnz.net/forum/viewtopic.php?f=9&t=2713>

²⁴ <http://ebird.org/ebird/view/checklist?subID=S5916047>



Farms boundary. Bull (unpubl.) has mapped these sites, adding a third area of confirmed fernbird habitat along the Ngarara Stream; this information has been incorporated into Figure 1. Fernbirds are also known from Waikanae Estuary (see footnotes, Table 1). Monitoring of vegetation clearance undertaken at these sites for the expressway project did not detect any fernbirds.

All sites within the Ngarara Farms boundary which have been confirmed as fernbird habitat to date are marginal, rather scrubby wetland sites. There do not appear as yet to be any records from the main body of the Kawakahia Wetland, or from the smaller (10.3 ha) wetland protected by a QE II covenant lying to its east (Figure 1), but their presence there is likely.

