# EAST COAST PROTECTION GROUP

## *Birds and the Marlborough District Council East Coast Beach Vehicle Bylaw*

WMIL Wildlife Management International

TOITŪ CARBON ZERO ISO 14064-1 ORGANISATION

Birds and the Marlborough District Council East Coast Beach Vehicle Bylaw

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**Cover Image:** Tarāpuka/black-billed gull (*Larus bulleri*) Marlborough. © Dan Burgin

# EXECUTIVE SUMMARY

The East Coast Protection Group work to protect and enhance the coastal environment and biodiversity of the east coast of Marlborough. The group have engaged Wildlife Management International Limited (WMIL) to prepare a report on birds utilising the area, with a particular focus on the shorebirds that forage, nest, and roost there, to support their submission in support of Marlborough District Council's (MDC) proposed vehicle bylaw. MDC is proposing to prohibit all motor vehicles on the beach, dunes, and unformed legal roads to, and along, Marlborough's east coast between the Awatere River mouth and the Waima (Ure) River mouth, with exceptions for boats to launch at Marfells and Ward beaches.

This report focuses primarily on shorebird species as they are known to nest, forage, and roost along the east coast area, and are regarded as being particularly susceptible to human disturbance, especially through motor vehicle use. Eleven focus species of shorebird (six endemic and five native) that are known to utilise the east coast area are assessed along with migratory species of shorebird that also utilise the east coast area during their migratory life cycle.

The threats faced by birds on the east coast, and across New Zealand as a whole, are numerous and increasing. Many are related to anthropogenic activities, with both direct and indirect impacts that are subtle and often have negative consequence for shorebird species. The impacts of motor vehicles to shorebirds utilising coastal areas in New Zealand and around the globe, are well established in the scientific literature as being a negative source of disturbance, with deleterious impacts on breeding success and population declines. Motor vehicle use interacts with additional key impacts that negatively affect shorebirds on the east coast, including air, noise and plastic pollution, the influx of pet dogs, as well as the larger impacts of climate change to coastal habitats in New Zealand.

With all these threats considered, it is clearly vital that any opportunity to mitigate and manage known threats across a bird's lifecycle, are taken and implemented effectively to ensure success in New Zealand's bird conservation management efforts. Removing threats such as motor vehicles from critical habitat sites can have potentially vast benefits to the conservation of species, and the myriad other species that utilise the same habitats.

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# *Shorebirds and the East Coast Beach Vehicle Bylaw*

## 1. INTRODUCTION

The East Coast Protection Group work to protect and enhance the coastal environment and biodiversity of the east coast of Marlborough (Figure 1). The group work with DOC, local council, Iwi, fishermen, 4WD vehicle owners and other beach users, advocating for protection of the ecosystem along the coastline from Marfell's Beach to the Waima River.

The group have engaged Wildlife Management International Limited (WMIL) to prepare a report on birds utilising the area, with a particular focus on the shorebirds that forage, nest, and roost there, to support their submission to Marlborough District Council's (MDC) proposed vehicle bylaw. MDC is proposing to prohibit all motor vehicles on the beach, dunes, and unformed legal roads to, and along, Marlborough's east coast between the Awatere River mouth and the Waima (Ure) River mouth, with exceptions for boats to launch at Marfells and Ward beaches.


**Figure 1.** East Coast Area of Marlborough's Southeast Coast between the Awatare and Waima (Ure) River mouths included in the Marlborough District Council's proposed vehicle bylaw.

Even though the east coastline and its associated habitats have undergone dramatic change and degradation over many years, particularly in relation to indigenous flora and fauna, the coast from the Awatere River mouth to the Waima (Ure) River mouth, is known to contain a significant and diverse range of plant and animal life (MDC 2019).

## 2. SHOREBIRD SPECIES UTILISING THE EAST COAST

This report focuses primarily on shorebird species as they are known to nest, forage, and roost along the east coast area (MDC 2019), and ground-nesting species are regarded as being particularly susceptible to human disturbance (Pearce-Higgins et al. 2007). Table 1 summarises the 11 focus species of shorebird (six endemic and five native) that are known to utilise the east coast area highlighted above. The table also details each species' threat classification according to Robertson et al. (2017). Table 2 summarises the migratory species of shorebird that also utilise the east coast area during their migratory life cycle (eBird 2021), with their IUCN Red List (2021) threat classification also given. It is important to note that the classification "*least concern*" relates to the species lesser concern in terms of extinction risk, but importantly does not imply that these species are of no conservation concern (IUCN Standards and Petitions Committee 2019).

**Table 1.** Endemic and native shorebird species utilising the Marlborough east coast area.

| Species Name | | Threat classification (Robertson et al. 2017) | Endemic/Native |
|---|---|---|---|
| Tarāpuka/Black-billed gull | *Larus bulleri* | *Nationally Critical* | *Endemic* |
| Tōrea/South Island pied oystercatcher | *Haematopus finschi* | *At Risk: Declining* | *Endemic* |
| Tōrea pango/Variable oystercatcher | *Haematopus unicolor* | *At Risk: Recovering* | *Endemic* |
| Tūturiwhatu/Banded dotterel | *Charadrius bicinctus* | *Nationally Vulnerable* | *Endemic* |
| Tarapirohe/Black-fronted tern | *Chlidonias albostriatus* | *Nationally Endangered* | *Endemic* |
| Ngutuparore/Wrybill | *Anarhynchus frontalis* | *Nationally Vulnerable* | *Endemic* |
| Poaka/Pied stilt | *Himantopus himantopus* | *Not Threatened* | *Native* |
| Taranui/Caspian tern | *Hydroprogne caspia* | *Nationally Vulnerable* | *Native* |
| Tara/White-fronted tern | *Sterna striata* | *At Risk: Declining* | *Native* |
| Black-fronted dotterel | *Elseyornis melanops* | *Naturally Uncommon* | *Native* |
| Tarāpunga/Red-billed gull | *Chroicocephalus novaehollandiae scopulinus* | *At Risk: Declining* | *Native* |

**Table 2.** Additional migratory shorebird species that utilise the Marlborough east coast area.

| Species Name | | Threat classification (IUCN Red List 2021) |
|---|---|---|
| Sharp-tailed sandpiper | *Calidris acuminata* | Least Concern |
| Pectoral sandpiper | *Calidris melanotos* | Least Concern |
| Bar-tailed godwit | *Limosa lapponica* | Near Threatened |
| Red knot | *Calidris canutus* | Near Threatened |
| Red-necked stint | *Calidris ruficollis* | Near Threatened |
| Pacific golden plover | *Pluvialis fulva* | Least Concern |
| Ruddy turnstone | *Arenaria interpres* | Least Concern |
| Whimbrel | *Numenius phaeopus* | Least Concern |

## 2.1 Marlborough's Southeast Coastal Habitat types

In order to better understand the importance of minimised disturbance on the east coast of Marlborough, it is crucial to address the different habitat types that are important areas for many of New Zealand's shorebirds and other species groups. To the casual coastline visitor, birds can often be easily overlooked and often end up out of mind. Figure 2 shows the different habitats found along the south-eastern coast of Marlborough and the variety of bird species that have been identified to utilise these habitats throughout their lifecycle for roosting, feeding and/or nesting. Terns, gulls, shags, oystercatchers, dotterels, and a variety of other species are all shown with their respective habitat use preferences. A summary of all the details shown in Figure 2 is also provided in Appendix 1.

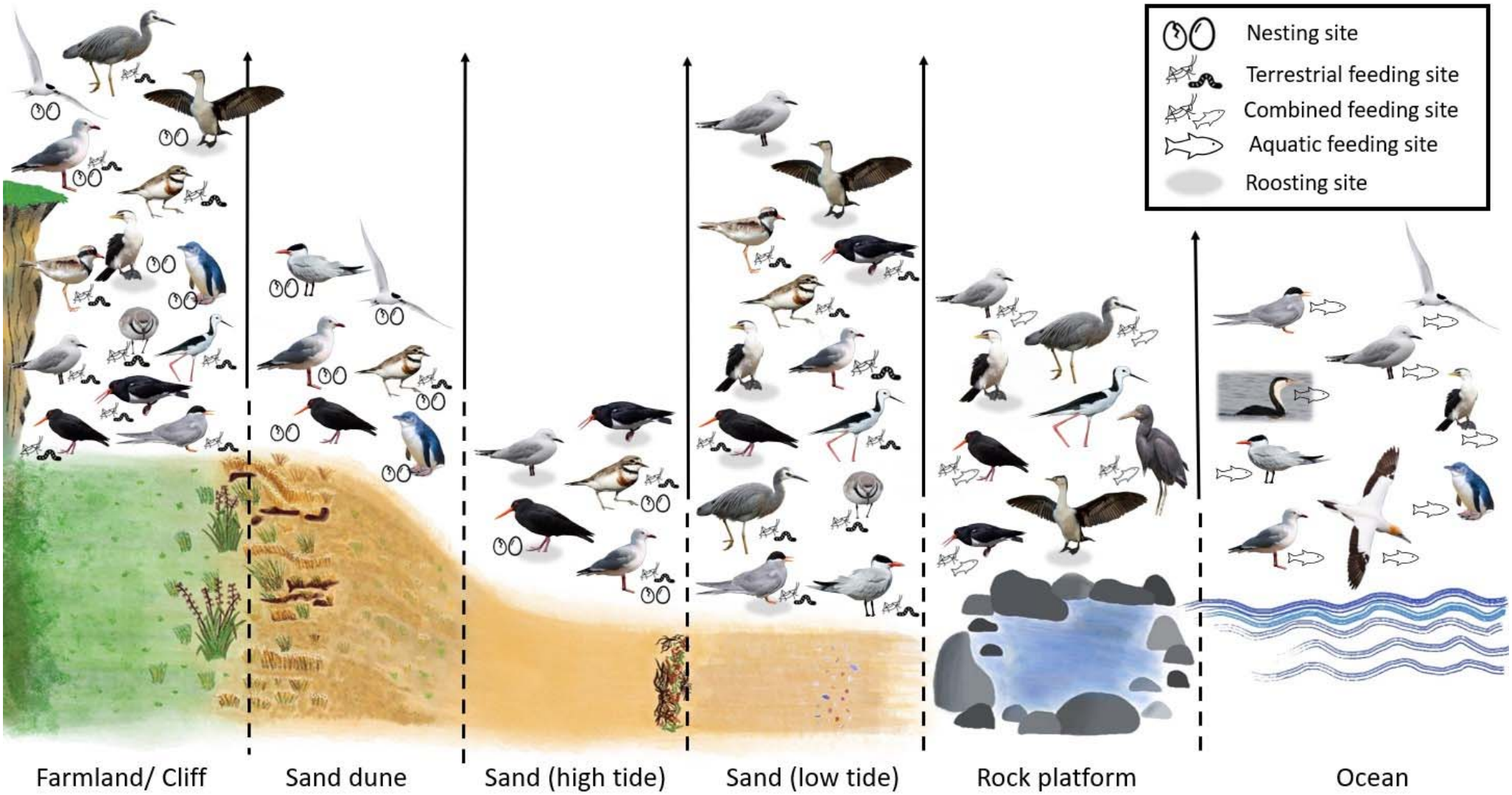


**Figure 2.** Diagram showing Marlborough's south-eastern coastal habitat types and their uses by shorebirds.

# 3. THREATS FACED BY BIRDS

The threats faced by birds on the east coast, and across New Zealand as a whole, are numerous and increasing. Many are related to anthropogenic activities, with both direct and indirect impacts that are subtle and often have negative consequences particularly for shorebird species (Pierce 2000; Schlacher et al. 2013). Whilst much conservation research and management to mitigate known impacts has been undertaken on shorebird breeding grounds, threats are likely experienced throughout a shorebird's lifecycle. Furthermore, these threats are likely interacting together in a complex web, rarely acting independently (O'Donnell 2000). We review the impacts of motor vehicles to shorebirds that utilise the east coast area in Marlborough and discuss how these link to other additional key impacts that will interact with motor vehicle use in Marlborough and throughout New Zealand. This discussion is also linked to the other species groups utilising the east coast area (Appendix 2). These include kororā/little penguin and five species of shag, which all utilise the coast during parts of their lifecycle. They too are negatively impacted by motor vehicle use for many of the reasons detailed below. All of these threats and shorebird species accounts are summarised in Appendix 3 for quick reference.

## 3.1 Motor Vehicles

The use and presence of motor vehicles on shorebird habitat has been shown to negatively impact shorebirds in New Zealand (Kearvell et al. 2011) and globally (Pfister et al. 1992; Yasué & Dearden 2009; Schlacher et al. 2013; Borgman 2014), throughout their life cycle. Motor vehicles that are known to disturb shorebirds include cars, motorbikes, and off-road vehicles such as 4WD vehicles, ATVs, or quads. Vehicle presence on beaches and rivers has been shown to create considerable disturbance and cause abandonment of areas by shorebirds, as well as abandonment of and even destruction of nests in New Zealand (O'Donnell 2000, Kearvell et al. 2011, Willis et al. 2003). Direct impacts can arise through avoiding collision with the traffic (Schlacher et al. 2013), with mortality from vehicle collisions recorded for shorebirds, including black-billed gull in Invercargill (Taylor 1996), wrybill in Auckland (Riegen & Dowding 2003), and overseas where tern, plover and oystercatcher adults and chicks have been run over by 4WDs, quads and motorbikes (McGowan 2004, Yasué & Dearden 2009; Buchanan 2011, Schlacher et al. 2013). This likely represents an underestimated or poorly documented mortality rate for New Zealand shorebirds. Species such as Australian pied oystercatcher (*Haematopus longirostris*) have been observed using vehicle ruts on beaches to rest or take cover, increasing their risk of being run over as they become less visible to drivers who utilise already formed tracks on the beach (Schlacher et al. 2013). Overseas, shorebird species have also been documented running or flying directly at vehicle headlights during the breeding season (Schulte & Simon 2015), whether this is true for breeding shorebirds in New Zealand is not known but represents a further potential impact from vehicle use in coastal areas, particularly between dusk and dawn. Motor vehicles are often driven along the wet part of the beach, 'migrating' up and down the beach up shore of this 'swashline' (Schlacher & Thompson 2007). Unfortunately, these movements are also mirrored by birds when foraging and roosting, placing them in the direct path of vehicle traffic (Schlacher et al. 2013).

During the breeding season, disturbance from vehicles can reduce the productivity and reproductive fitness of adults by reducing the time they spend on their nest incubating, with follow on impacts through unattended eggs being exposed to predation or excessive heat (Baudains & Lloyd 2007, McGowans & Simon 2006). Disturbed nests were hypothesised to also provide more olfactory clues to where the cryptic nest lies for mammalian predators (McGowans & Simon 2006). Many species of shorebird utilise coastal areas for foraging throughout their life cycle, and so any disturbance that could prevent shorebirds foraging will likely have negative consequences in terms of needed weight gain for adults and chicks by altering their foraging activity (Lord et al. 1997, Burger et al. 2004, Tarr et al. 2010, Borgman 2014). Human activities on beaches, especially motor vehicles can alter habitat selection by birds over large scales (Meager et al. 2012) and create negative impacts by displacing

them altogether from preferred, or highly productive feeding and roosting areas (Schlacher et al. 2013; Britton & Hunter 2016). Motor vehicles have also been shown to impact the benthic invertebrate and macrobenthic assemblages within coastal habitats overseas (Schlacher & Thompson 2007, Schlacher et al. 2008), with potential negative impacts on food availability for shorebirds. This is likely to be occurring in New Zealand coastal habitats too and remains a high priority topic of future research.

Vehicles effectively extend the impact zone of human disturbance into areas that would normally be too distant for access on foot (Priskin 2003), affecting bird habitats that have traditionally provided safety from human threats due to their isolation (Williams et al. 2004, Schlacher et al. 2013). Overall, it is clear from research in New Zealand and overseas, that vehicles on beaches provide a multitude of negative stimuli that produce strong adverse cumulative impacts for shorebird species (Schlacher et al. 2013). Motor vehicle bans on beaches have proven highly effective conservation measures to protect shorebirds overseas both during the breeding and wintering seasons (Braby et al. 2001, Williams et al. 2004, Braby et al. 2009, Weston et al. 2012). However, many of these exclusion zones are then utilised by people to swim or exercise their dogs (Schlacher et al. 2013), leading to follow on impacts discussed below.

## 3.2 Pet Dogs

Walking dogs whilst on the beach is undertaken by many New Zealand residents, consummate with high dog ownership in New Zealand (Local Councils 2021). Dogs being walked on beaches during the shorebird breeding season likely reduces the breeding success of New Zealand shorebirds, as was found for New Zealand dotterel when birds were flushed off their nests by dogs (Lord et al. 2001). By increasing the amount of time spent off the nest, dogs increased the amount of time the eggs were exposed to thermal stress and further predation (Lord et al. 2001). Dogs off the leash present a direct threat to shorebirds by being able to chase and attack both adults and juveniles (Lord et al. 2001, Baudains & Lloyd 2007). Dogs can also be major agents of disturbance during winter by flushing shorebirds gathered in large roosts, increasing their energy expenditure (Lilleyman et al. 2016, Kaldor 2019). Ultimately any disruption or loss of wintering grounds due to presence of dogs will have negative implications on breeding and therefore population longevity of shorebirds in New Zealand as has been shown in the growing global literature on dog disturbance (Kirby et al. 1993, Dolman & Sutherland 1994, Lord et al. 2001, Burger & Niles 2013, Weston & Stankowich 2014).

## 3.3 Invasive Species

Vehicles are effective at spreading invasive species of plants and organisms between habitats over vast distances (Gray et al. 2018) not least due to their ability to extend the footprint of humans into areas that were traditionally isolated (Priskin 2003). Encroaching weed species can reduce available nesting habitat on rivers (O'Donnell 2000) and coastlines for species, as documented for Caspian terns in Invercargill estuary, where they were forced closer to lower beach sites by encroaching vegetation, where they were more vulnerable to washouts (Barlow 1995). Invasive or pest plants can therefore alter habitats, with potential knock-on impacts that may negatively impact food supplies for birds (Kaldor 2019).

## 3.4 Pollution

Vehicles contribute towards air and noise pollution, as well as plastic pollution. Air pollution from vehicles is well studied, particularly regarding human health (Costa et al. 2017), because of particulate pollution from vehicle emissions. Studies on birds show responses to air pollution include respiratory illness, elevated stress, immunosuppression, behavioural changes, and impaired reproduction rates (Llacuna et al. 1993; Isaksson et al. 2005; Sanderfoot & Holloway 2017); however, there is a lack of research on air pollution impacts on shorebirds in New Zealand. Noise pollution from vehicles can

present an invisible source of habitat degradation (Ware et al. 2015) presenting a novel acoustic source (Slabbekoorn & Ripmeester 2007) impacting species via hearing loss, increased production of stress hormones and hypertension (Wright et al. 2010). Noise from vehicles can mask bird calls, and reduce their efficiency (Schroeder et al. 2012), with potential reduced ability to perceive predator presence (Quinn et al. 2006; Wright et al. 2010), masking communication between parents and chicks (Shroeder et al. 2012) and impacts on reproductive success (Francis et al. 2009; Halfwerk et al. 2011).

Finally, plastic pollution from vehicles, either through abrasion of tyres or components (Ziajahromi et al. 2020), as well as littering behaviour, will likely have negative impacts on shorebirds utilising the habitat (Crossland et al. 2014) especially as it can present an entanglement risk (Weston et al. 2009). Plastic pollution is postulated as having an impact of similar magnitude to climate change due to its adverse impacts on biological systems (Whitehead et al. 2019). Plastics have been detected along New Zealand's coastlines and marine environments since the 1970s (Gregory 1977; Gregory 1978; Gregory 1996; Gregory 1999; Young & Adams 2010; Yeo et al. 2015; Clunies-Ross et al. 2016). The deposition of microplastic within intertidal sediments (Claessens et al. 2011), and consequent uptake in macroinvertebrates is a potential threat to shorebirds through primary and secondary consumption (Lourenço et al. 2017; Rossi et al. 2019) with potential adverse impacts on their deposition of fat (Connors & Smith 1982). Car components, but particularly tyres, are now a known contribution to microplastic pollution in ecosystems (Ziajahromi et al. 2020). Ingestion of plastic fragments can also result in potential blocking or perforating of the inner digestive tracts (Whitehead et al. 2019) with deleterious effects from not being able to obtain the necessary nutrition for activity and growth (Clunies-Ross et al. 2016).

## 3.5 Climate Change

Anthropogenic caused climate change will likely interact with all of the threats discussed above (Galbraith et al. 2002; Root et al. 2003; Lundquist et al. 2011) and vehicle use is inherently linked to climate change through the combustion of fossil fuels. The effects of climate change in New Zealand are likely to be different over a range of spatial and temporal scales (Nottage et al. 2010; McGlone & Walker 2011), as predicted globally (IPCC 2014). Changes to rainfall and temperature regimes (Salinger & Griffiths 2001), as well as wind regimes are all likely to impact shorebirds in New Zealand. Sea-level rise will impact shorebirds by potentially reducing or removing habitat entirely (Iwamura et al. 2013), with predicted increases of 0.2–0.3 metres by 2040, and 0.4–0.9 metres by 2090, depending upon global greenhouse gas emission levels (Ministry for the Environment 2017). Through this potential loss or degradation of habitat, remaining coastal areas will likely become increasingly important to shorebird species. Coastal dune systems are likely to be impacted by increased magnitude and frequency of storm events from climate change with reductions in their ability to recover from anthropogenic impacts such as vehicle damage (Thompson & Schlacher 2008). Therefore, any reductions in vehicle use and traffic can benefit efforts to reduce emissions and increase coastal resilience to climate change impacts.

# 4. OTHER SPECIES GROUPS

Many of the threats above will negatively impact other species, such as the known penguin, shag and other species groups that utilise the east coast area, as has been shown overseas (Borgman 2014). Shags and penguin species descriptions and threats have been summarised in Appendix 4.

# 5. CONCLUSION

The above threats are just some of the myriad facing shorebirds and all bird species, in Marlborough and across New Zealand, including endemic, native and migratory species. These threats will likely continue to increase across their breeding habitat, flyways, and wintering grounds (Pearce-Higgins et al. 2017) and the importance of them being able to utilise the east coast area during their lifecycle

must be taken into account. These areas are potentially critical as staging, stopover, and wintering sites to forage and roost on before many species undertake further migratory movements (Burger & Niles 2013; Iwamura et al. 2013). Protecting these habitats from disturbance and loss is an important conservation concern. It is vital therefore, that any opportunity to mitigate and manage known threats across a bird's lifecycle, are taken and implemented effectively to ensure success in New Zealand's bird conservation management efforts. Motor vehicles are clearly a large threat to New Zealand birds, particularly shorebirds, when they encroach on their habitat throughout their lifecycle. By removing that threat there are a plethora of potential benefits to the conservation of these species, the myriad other species that utilise these areas, and the ecosystems they reside in.

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# 8. APPENDICES

## 8.1 Appendix 1: Additional information on shorebird habitat uses along the South-eastern Marlborough coastline.

| Endemic and native shorebird coastal habitat use | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Species name** | **Inland farmland** | **Cliff** | **Sand dunes** | **Sand (high tide)** | **Sand (Low tide)** | **Rock platform** | **Ocean** |
| Tarāpuka/Black-billed gull (*Larus bulleri*) | Forage on insects in agricultural habitats (McClellan & Habraken 2019). | - | - | Roosting site. | Roosting site. | Forage on fish and marine invertebrates. | Forage on fish and marine invertebrates. |
| Tōrea/South Island pied oystercatcher (*Haematopus finschi)* | Forage on earthworms and beetle larvae (Sagar 2013). | - | - | Roosting site. | Roosting site and forage on molluscs, worms, and fish. | Forage on bivalves, crustaceans, and fish. | - |
| Tōrea pango/Variable oystercatcher (*Haematopus unicolor)* | Forage on terrestrial invertebrates, e.g., earthworms (Dowding 2017). | - | Nesting site. | Nesting and roosting site. | Roosting site and forage on littoral invertebrates. | Forage on littoral invertebrates, particularly bivalve molluscs. | - |
| Tūturiwhatu/Banded dotterel (*Charadrius bicinctus*) | Nest and forage on insects, worms and on occasion, berries from shrubs (Pierce 2013). | - | Nesting site. | Nest and forage on crustaceans, worms, and flies. | Forage on crustaceans and flies. | - | - |
| Tarapirohe/Black-fronted tern (*Chlidonias albostriatus*) | Forage on insects in agricultural habitats (Bell 2019). | - | - | - | Roosting site. | - | Forage on planktonic crustaceans and small fish. |

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|---|---|---|---|---|---|---|---|
| Ngutuparore/Wrybill (*Anarhynchus frontalis*) | Roost and forage on small marine and littoral invertebrates at coastal lakes and estuaries during migration (Dowding 2017). | - | - | - | Forage on aquatic insects at river mouths. | - | - |
| Poaka/Pied stilt (*Calidris acuminata*) | Forage on terrestrial insects and worms (Adams 2017). | - | - | - | Forage on aquatic insects and larvae. | - | - |
| Taranui/Caspian tern (*Hydroprogne caspia*) | - | - | Nest on sparsely vegetated flat areas with sand, shells, pebbles, gravel, or dirt (Fitzgerald 2013). | - | Forage on marine worms. | - | Forage on small surface-swimming fish. |
| Tara/White-fronted tern (*Sterna striata*) | - | Nesting site (Mills 2020). | Nesting site. | - | - | - | Forage in shoaling fish swarms. |
| Black-fronted dotterel (*Elseyornis melanops*) | Forage on small invertebrates, worms, snails, crustaceans and spiders around estuaries, coastal lake edges (Armitage 2017). | - | - | - | Forage on small invertebrates. | - | - |

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|---|---|---|---|---|---|---|---|
| Tarāpunga/Red-billed gull (*Chroicocephalus novaehollandiae scopulinus*) | Forage on terrestrial invertebrates and worms (Mills 2018). | Nesting site. | Nesting site. | Nesting site and forage on kelp flies. | - | - | Forage on krill and small fish. |
| Kororā/Little Penguin (Eudyptula minor) | - | Nesting site in burrows or caves (Flemming 2020). | Nesting site in burrows. | - | - | - | Forage on squid, crustacean species, and shoaling fish. |
| Kāruhiruhi/Pied Shag (*Phalacrocorax varius*) | Nesting and roosting site (Powlesland 2017). | Nesting site. | - | - | Roosting site. | Roosting site. | Forage on fish and occasionally crustaceans. |
| Kawau paka/Little Pied Shag (*Phalacrocorax melanoleucos*) | Nesting and roosting site (Taylor 2013). | Nesting site. | - | - | Roosting site. | Roosting site. | Forage on small fish, eels, crustaceans, and insects. |
| Matuku moana/White-faced Heron (*Egretta novaehollandiae*) | Forage on insects, spiders, worms, mice, and lizards (Adams 2017). | - | - | - | Forage on worms and insects. | Forage on fish, aquatic insects, and crabs. | - |
| Matuku moana/Reef Heron (*Egretta sacra*) | - | - | - | - | - | Forage on small fish, crustaceans, and worms Adams 2013). | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tākapu/Australasian Gannet (*Morus serrator*) | - | - | - | - | - | - | Forage on fish, particularly pilchards, mackerel, anchovies, and barracouta (Ismar 2013). |

## 8.2 Appendix 2: Additional endemic and native bird species that have been detected utilising the Marlborough east coast area.

| Species Name | | Threat classification (Robertson et al. 2017) | Endemic/Native |
|---|---|---|---|
| Kororā/Little Penguin | *Eudyptula minor* | *Declining* | *Native* |
| Matuku moana/White-faced Heron | *Egretta novaehollandiae* | *Not Threatened* | *Native* |
| Kōtuku/White Heron | *Ardea alba* | *Nationally Critical* | *Native* |
| Matuku moana/Reef Heron | *Egretta sacra* | *Nationally Endangered* | *Native* |
| Pukeko/Australasian Swamphen | *Porphyrio melanotus* | *Not Threatened* | *Native* |
| Kāruhiruhi/Pied Shag | *Phalacrocorax varius* | *Recovering* | *Native* |
| Kawau/Black Shag | *Phalacrocorax carbo* | *Naturally Uncommon* | *Native* |
| Kawau paka/Little Pied Shag | *Phalacrocorax melanoleucos* | *Not Threatened* | *Native* |
| Kawau tūi/Little Black Shag | *Phalacrocorax sulcirostris* | *Naturally Uncommon* | *Native* |
| Parekareka/Spotted Shag | *Stictocarbo punctatus* | *Not Threatened* | *Endemic* |
| Kōtuku ngutupapa/Royal Spoonbill | *Platalea regia* | *Naturally Uncommon* | *Native* |
| Tākapu/Australasian Gannet | *Morus serrator* | *Not Threatened* | *Native* |
| Kāhu/Australasian Harrier | *Circus approximans* | *Not Threatened* | *Native* |

| Species Name | | Threat classification (Robertson et al. 2017) | Endemic/Native |
|---|---|---|---|
| Warou/Welcome Swallow | *Hirundo neoxena* | *Not Threatened* | *Native* |
| Kōtare/Sacred Kingfisher | *Todiramphus sanctus* | *Not Threatened* | *Native* |
| Pīhoihoi/Australasian Pipit | *Anthus novaeseelandiae* | *Declining* | *Native* |
| Korimako/Bellbird | *Anthornis melanura* | *Not Threatened* | *Endemic* |
| Tauhou/Silvereye | *Zosterops lateralis* | *Not Threatened* | *Native* |
| Pīwakawaka/New Zealand Fantail | *Rhipidura fuliginosa* | *Not Threatened* | *Endemic* |
| Riroriro/Grey Warbler | *Gerygone igata* | *Not Threatened* | *Endemic* |
| Tētē moroiti/Grey Teal | *Anas gracilis* | *Not Threatened* | *Native* |
| Kuruwhengi/Australasian Shoveler | *Spatula rhynchotis* | *Not Threatened* | *Native* |
| Pārera/Grey Duck | *Anas superciliosa* | *Nationally Critical* | *Native* |
| Pūtangitangi/Paradise Shelduck | *Tadorna variegata* | *Not Threatened* | *Endemic* |
| Kakīānau/Black Swan | *Cygnus atratus* | *Not Threatened* | *Native* |

## 8.3 Appendix 3: Threat summary table for New Zealand endemic, native and migratory shorebirds known to use the Marlborough east coast area.

| Endemic and native shorebird threat summary table | | | | |
|---|---|---|---|---|
| **Species name and threat classification (Robertson et al. 2017)** | **Endemic /Native** | **Description** | **Habitat use on East coast** | **Key threats impacting this species** |
| Tarāpuka/Black-billed gull (*Larus bulleri*) *Nationally Critical* | *Endemic* | Breeds mostly on sparsely vegetated gravels on inland riverbeds (McClellan & Habraken 2019). | Migrates to east coast after breeding. | Disturbance by people, vehicles, and pets. Predation by introduced mammals. Habitat Loss Pollution Climate Change |
| Tōrea/South Island pied oystercatcher (*Haematopus finschi)* *At Risk: Declining* | *Endemic* | Breeds inland in the South Island, with occasional breeding records on the coast in areas adjacent to estuaries and lagoons (Sagar 2013). | Migrates to east coast after breeding. | Disturbance by people, vehicles, and pets. Predation by introduced mammals. Habitat Loss Pollution Climate Change |
| Tōrea pango/Variable oystercatcher (*Haematopus unicolor)* *At Risk: Recovering* | *Endemic* | Found around most of New Zealand's coastline and use | Scattered along the east coast in low numbers, breeding on sand and pea | Disturbance by people, vehicles, and pets. |

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| | | the coast all year round (Dowding 2017). | gravel beaches, feeding on water's edge and reef platforms (MDC 2019). | Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Tūturiwhatu/Banded dotterel (*Charadrius bicinctus*)<br>*Nationally Vulnerable* | *Endemic* | Breeds in a variety of habitats including inland riverbeds, farmland, coastal beaches and lagoons. Migrate to harbours, estuaries, and coastal areas within New Zealand and to Australia (Pierce 2013). | Important east coast breeding areas include Mussel Point, the Airstrip, Long Point, Ward Beach to Chancet Rocks and Waima (Ure) River mouth to The Needles (MDC 2019) | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Tarapirohe/Black-fronted tern (*Chlidonias albostriatus*)<br>*Nationally Endangered* | *Endemic* | Breeds on braided rivers of the South Island (Bell 2019). | Over winter they migrate to the east coast area. Feeds along the coast during the winter, roosting on rocks and sand along the coast and at Lake Grassmere after breeding (MDC 2019). | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Ngutuparore/Wrybill (*Anarhynchus frontalis*)<br>*Nationally Vulnerable* | *Endemic* | Breeds on braided rivers of the South Island (Dowding 2017). | After breeding most birds migrate to the North of the North Island, with few remaining on the South Island (Riegen & Sagar 2020). However, some are known to stop along the east area during their migration, and wrybill are detected | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss |

| | | | | |
|---|---|---|---|---|
| | | | around the Lake Grassmere area throughout the year (eBird 2021). | Pollution<br>Climate Change |
| Poaka/Pied stilt (*Calidris acuminata*)<br>*Not Threatened* | *Native* | Found in a variety of habitats including braided rivers, estuaries and lakes (Adams 2017). | After breeding they migrate to more coastal areas in the North where they will feed and roost in groups (Adams 2017). | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Taranui/Caspian tern (*Hydroprogne caspia*)<br>*Nationally Vulnerable* | *Native* | Breeds mostly on coastal shellbanks and sandspits in pairs or colonies (Fitzgerald 2013). | Roost in small flocks along the east coast. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Tara/White-fronted tern (*Sterna striata*)<br>*At Risk: Declining* | *Native* | Common around New Zealand coast nesting and roosting in colonies (Mills 2020). | Nesting sites vary each year, but are known to have nested at Awatere, Flaxbourne, and Waima (Ure) River mouths, Lake Grassmere and beaches at Cape Campbell (MDC, 2019). Winters along the east coast. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |

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|---|---|---|---|---|
| Black-fronted dotterel (*Elseyornis melanops*)<br>*Naturally Uncommon* | *Native* | Reasonably recent coloniser, found at estuaries, gravel riverbeds and muddy edges of lakes and ponds with occasional sightings on coasts (Armitage 2017). | Records of birds at Wharanui Beach, Waima (Ure) River mouth; Ward Beach; South of Ward beach, Marfells Beach and Lake Grassmere (eBird 2021). | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| Tarāpunga/Red-billed gull (*Chroicocephalus novaehollandiae scopulinus*)<br>*At Risk: Declining* | *Native* | Breed in colonies on rock stacks, cliffs, river mouths and found feeding offshore (Mills 2018). | Have nested on beaches at Cape Campbell, rocks at The Needles and Ward beach, also Waima (Ure), Flaxbourne and Awatere River mouths (MDC 2019).<br>Also roost in large flocks on beaches and rocks along the coast. Including Marfells Beach, Mussel Point, Cape Campbell, Long point and Chancet (MDC 2019) | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Pollution<br>Climate Change |
| **Migratory Shorebird Species** | | | | |
| **Species and threat classification (IUCN Red List 2021)** | | **Description** | **Habitat (feeding and roosting) used eBird locations on East Coast** | **Potential Threats** |
| Sharp-tailed sandpiper (*Calidris acuminata*)<br>*Least Concern* | | After breeding this species migrates from Siberia to Australasia (90% of population). In New Zealand they are mainly seen at the coast in tidal harbours and | Recorded at Lake Grassmere outlet (eBird 2021). | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |

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|---|---|---|---|
| | shallows of lowland lakes (Walker 2013). | | |
| Pectoral sandpiper (*Calidris melanotos*)<br>*Least Concern* | Arctic breeder which mostly migrates to South America but also to Australasia in smaller numbers. About 10-20 birds seen in NZ each year at estuaries, rivermouths and on the edges of lowland lakes (Saunders 2019). | Recorded at Lake Grassmere outlet (eBird 2021) | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |
| Bar-tailed godwit (*Limosa lapponica*)<br>*Near Threatened* | Most common Arctic migrant to New Zealand. Mostly seen at estuaries and harbours in flocks. At low tide they forage in the intertidal zone (Woodley 2017). | Recorded on the coast North of Ward Beach, Cape Campbell, Marfells Beach and Lake Grassmere outlet (eBird 2021). | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |
| Red knot (*Calidris canutus*)<br>*Near Threatened* | Migrate to New Zealand from breeding sites in the Arctic. In New Zealand red knots are mainly found around harbours and estuaries, areas with sandflats and mudflats and roost on shellbanks and sandspits (Battley 2017). | Recorded on the East Coast at near Cape Campbell, Marfells Beach and Lake Grassmere outlet (eBird 2021) | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |
| Red-necked stint (*Calidris ruficollis*)<br>*Near Threatened* | Breeds mostly in Siberia and migrates to south-east Asia, Australia and New Zealand. | Recorded at Lake Grassmere outlet (eBird 2021) | Disturbance by people, vehicles, and pets. |

| | | | |
|---|---|---|---|
| | Found in coastal sites in New Zealand on estuaries with large mudflats, lakes with salt marshes and will roost on shellbanks and sandspits (Miskelly 2013). | | Pollution<br>Habitat Loss<br>Climate Change |
| Pacific golden plover (*Pluvialis fulva*)<br>*Least Concern* | Breeds on the Arctic Tundra and then migrates to Australasia and Oceania. Usually seen in small flocks at harbours and estuaries in New Zealand (Szabo 2017a). | Recorded at Lake Grassmere oulet (eBird 2021) | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |
| Ruddy turnstone (*Arenaria interpres*)<br>*Least Concern* | Arctic breeder which migrates to New Zealand. Usually found in small flocks near New Zealand's coast (Szabo 2017b). | Recorded on coast north of Ward beach, around Cape Campbell, Marfells Beach and Lake Grassmere outlet (eBird 2021) | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |
| Whimbrel (*Numenius phaeopus*)<br>*Least Concern* | Arctic breeder which migrates to New Zealand in low numbers where it is found on estuaries either in small flocks or as individuals (Melville 2013) | Recorded at Cape Campbell (eBird 2021) | Disturbance by people, vehicles, and pets.<br>Pollution<br>Habitat Loss<br>Climate Change |

## 8.4 Appendix 4: Little Penguin & Shag species summary threats table

| Little penguin and shag threat summary table | | | | |
|---|---|---|---|---|
| **Species name and threat classification (Robertson et al. 2017)** | **Endemic /Native** | **Description** | **Habitat use on East coast** | **Key threats impacting this species** |
| Kororā/Little Penguin<br>(*Eudyptula minor)*<br>*At Risk: Declining* | *Native* | Found all over New Zealand nesting in burrows along the coast in rocks or under logs and vegetation. Mainly found within 25km of the coast during the breeding season (Fleming 2020). | Resident breeder along the east coast albeit in low numbers from Cape Campbell to Wharanui but not well documented (MDC 2019). | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational & Commercial Fishing<br>Pollution<br>Climate Change |
| Kāruhiruhi/Pied Shag<br>(*Phalacrocorax varius*)<br>*Recovering* | *Native* | Often single birds are seen or in small groups roosting on rocky headlands, trees or even artificial structures (Powlesland 2017). | Breeds at Marfells Beach and Long Point, and utilises the rest of the coast, often seen drying their wings on beaches or flying up and down the coast as well as foraging in the water (MDC 2019). | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational Fishing<br>Pollution<br>Climate Change |

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|---|---|---|---|---|
| Kawau/Black Shag<br>(*Phalacrocorax carbo)*<br>*Naturally Uncommon* | *Native* | Often single birds are seen or in small groups roosting on rocky headlands, in trees or even artificial structures and usually forages alone (Powlesland 2013). | Utilises the east coast, often seen drying their wings on beaches or flying up and down the coast as well as foraging in the water near estuaries and inlets. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational Fishing<br>Pollution<br>Climate Change |
| Kawau paka/Little Pied Shag<br>*(Phalacrocorax melanoleucos)*<br>*Not Threatened* | *Native* | Found in both marine and freshwater habitats, on the coast as well as on inland lakes, ponds, rivers, and streams (Taylor 2013). | Utilises the east coast, often seen drying their wings on beaches or flying up and down the coast as well as foraging in the water near estuaries and inlets. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational Fishing<br>Pollution<br>Climate Change |
| Kawau tūi/Little Black Shag<br>*(Phalacrocorax sulcirostris)*<br>*Naturally Uncommon* | *Native* | Occur in harbours, lakes, estuaries, and coastal inlets. They are gregarious when feeding and roosting and are the only New Zealand shag species that routinely forages co-operatively in flocks (Armitage 2017). | Utilises the east coast, often seen drying their wings on beaches or flying up and down the coast as well as foraging in the water near estuaries and inlets. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational Fishing<br>Pollution<br>Climate Change |

| | | | | |
|---|---|---|---|---|
| Parekareka/Spotted Shag<br>*(Stictocarbo punctatus)*<br>*Not Threatened* | *Endemic* | Entirely marine shag, breeding on the coasts of the North, South and Stewart Islands, and feeding in waters out to 16 km. Outside the breeding season, form large feeding and roosting flocks of up to 2000 birds (Szabo 2017c). | Utilises the east coast, often seen drying their wings on rocky outcrops or flying up and down the coast as they forage along the coastal waters. | Disturbance by people, vehicles, and pets.<br>Predation by introduced mammals.<br>Habitat Loss<br>Recreational & Commercial Fishing<br>Pollution<br>Climate Change |