

# APPENDIX 16

## COASTAL AVIFAUNA ASSESSMENT

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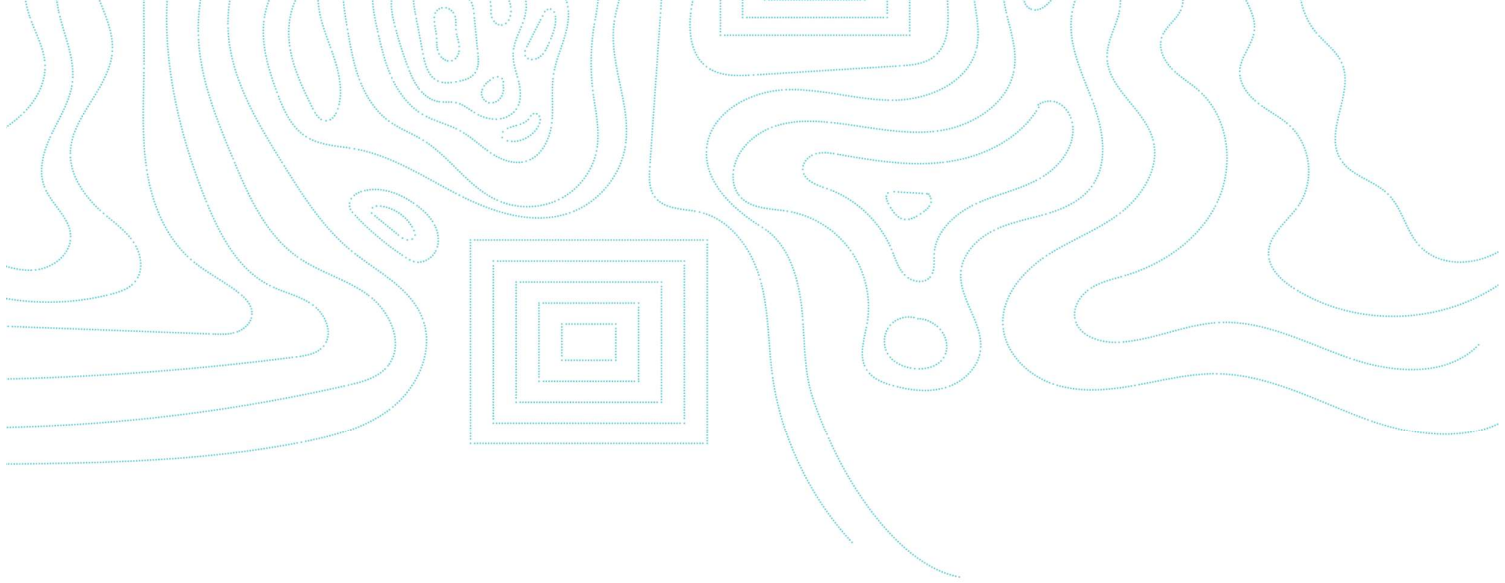
# BlueGreen



## Northland Shipyard & Drydock Project

Coastal Avifauna Assessment

Prepared for Ministry of Business, Innovation and Employment  
12 August 2026



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### Prepared by:

Dr Leigh Bull  
Senior Ecologist / Director  
BlueGreen Ecology Ltd

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*Cover photograph: Western edge of Northport looking back towards the coast*

## Executive Summary

### Project Details

- The Ministry of Business, Innovation and Employment (MBIE) is seeking consents to construct and operate the proposed shipyard and dry dock facility ("Project") abutting the western side of the existing Northport port facility at Marsden Point, Whangārei Harbour.
- The Project is listed in Schedule 2 of the Fast-track Approvals Act 2024 (FTAA), and includes the following key components:
  - reclamation of approximately 9.7ha;
  - a 'cutout' to the reclamation where a vessel haul out system is to be located, being a floating drydock or potentially shiplift or other lifting mechanism;
  - construction of a piled wharf structure to accommodate vessels either temporarily (before/after haul out), or for extended periods where works not requiring haul out can be undertaken;
  - capital and maintenance dredging associated with construction and ongoing operation of the marine maintenance operations facility, including a berth pocket and a vessel turning basin to provide for safe navigation;
  - fixed plant and buildings to accommodate marine maintenance activities and materials;
  - sufficient working and laydown areas for marine maintenance operations, including the ability to transfer vessels to hardstand;
  - access to and around the marine maintenance operations facility, including a landside area for staff carparking; and
  - public access around the edge of the reclamation to a public fishing platform.

### Methods

- Information was gathered on the coastal avifauna values (habitat and species) present at the project site and within the wider area through a combined desktop and field approach.
- The field investigations included:
  - High and low-mid tide wading bird surveys between 2017-2022, in summer and winter, spanning from the Channel Infrastructure NZ jetty in the east to the Marsden Yacht Club at One Tree Point in the west;
  - Nesting shorebird surveys; and
  - Little penguin / kororā surveys.



- The methodology used to undertake this assessment is consistent with the EIANZ guidelines for undertaking ecological impact assessment whereby a matrix combining the magnitude of the effect and ecological value are used to determine the overall level of ecological effect.
- For this assessment, a species (rather than habitat) approach was taken, and we determined the magnitude of effect at the local scale, that being the wider Whangārei Harbour which includes the coastline and harbour waters to the west of a line drawn from Busby Head in the north to Ruakākā Estuary in the south.

### **Existing Environment**

- The Whangārei Harbour waters, intertidal zone and surrounding coastline provides a variety of habitats for a number of *Threatened* and *At Risk* species. A number of these habitats have been identified as Significant by Northland Regional Council and / or the Department of Conservation.
- A total of 107 bird species, comprising 23 introduced, 75 native (including Threatened and At Risk), six migrant and three vagrant species, have been recorded in the wider Whangārei Harbour area.
- A subset of these species were recorded roosting, foraging and nesting within and adjacent to the Project site.

### **Assessment of Effects**

- The potential level of effect on the coastal avifauna species was assessed for the following: direct / permanent loss of habitat, injuries and / or mortalities, disturbance and displacement (effective habitat loss), food supply and foraging behaviour, artificial lighting, pollution, and relocating Northport's eastern expansion consented high tide roost.
- Following the application of effects management, the potential effects of the construction and operation of the proposed shipyard on coastal avifauna was determined to be Low to Very Low. The exception to this is northern NZ dotterel, for which it has been determined there will be a Moderate level of overall effect as a result of the proportion of the local population utilising the proposed reclamation area which will be subject to permanent habitat loss and temporary disturbance during the construction phase.
- A Moderate level of cumulative effects was also identified for northern NZ dotterel and kororā.

### **Consent Conditions**

- Proposed consent conditions have been drafted which ensure:
  - The impact management measures on which the Low to Very Low levels of effects on coastal avifauna were determined are implemented; and

- Residual and cumulative adverse effects on northern NZ dotterel and kororā as a result of the shipyard and drydock project to be addressed through the establishment of compensation fund and a process for allocating that funding for appropriate initiatives identified by tangata whenua and the community.

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## 1.0 Introduction

The Ministry of Business, Innovation and Employment (MBIE) is seeking consents to construct and operate the proposed shipyard and dry dock facility ("Project") abutting the western side of the existing Northport port facility at Marsden Point, Whangārei Harbour. The Project, listed in Schedule 2 of the Fast-track Approvals Act 2024 (FTAA), includes a reclamation, vessel haul-out system, and associated wharf structures, dredging, and supporting infrastructure. The location of the facility has been carefully selected for functional and operational requirements, including the need for deep water access, sheltered harbour conditions, proximity to existing port services, sea and land transport links, and integration with established and proposed marine and land based industrial infrastructure.

BlueGreen Ecology Ltd has been engaged to undertake an assessment of the potential effects on the coastal avifauna associated with the proposal. This report begins (Section 2.0) by outlining the report Author's qualifications and experience relevant to this Assessment. The methods that were used to collect information on which to base the assessment are then outlined (Section 3.0). A description of the existing Whangārei Harbour coastal avifauna is then provided (Section 4.0), followed by a summary of the ecological values and significance (Section 5.0). Key project features relevant to the coastal avifauna assessment are described (Section 6.0), followed by the assessment of potential effects of proposal (Section 7.0) and cumulative effects (Section 8.0). The application of the effects management hierarchy to the Project is then outlined (Section 9.0), followed by an assessment of the proposal in relation to relevant National and Regional Policies (Section 10.0). Recommendations are provided regarding residual effects (Section 11.0) and proposed consent conditions for the Project in relation to coastal avifauna (Section 12.0).

### 1.1 Existing Environment

We note that this assessment of effects has been undertaken in the context of the existing environment, which comprises two components:

- 1) Existing natural environment and built development features; overlaid by
- 2) Permitted (non-fanciful) activities and extant resource consents which are likely to be implemented.

As such, Table 1 identifies the coastal developments which have been considered as part of the existing environment for the purposes of this assessment.

*Table 1: Coastal developments within Whangārei Harbour considered as part of the existing environment for the purposes of this assessment.*

| EXISTING BUILT DEVELOPMENT                                                                                                                                                                                                                                                                                 | EXTANT RESOURCE CONSENTS                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Northport site</li><li>• CINZ site and wharves</li><li>• Marsden Cove residential / marina development</li><li>• Portland Cement</li><li>• Port Nikau and Whangārei town basin</li><li>• Parua Bay boat ramp and mooring</li><li>• Parua Bay oyster farm</li></ul> | <ul style="list-style-type: none"><li>• Northport's Berth 4 and eastern expansions</li><li>• Channel Infrastructure NZ (CINZ) channel optimisation project</li><li>• Port Nikau marina expansion</li><li>• Whangārei Marina Management Trust's new marina</li></ul> |



## 2.0 Qualifications and Experience

My name is Leigh Bull. I am a Director and Avifauna Ecologist with BlueGreen Ecology Limited. I hold the qualifications of Bachelor of Science (Zoology), Master of Science with Honours (Ecology) and PhD (Ecology) from Victoria University of Wellington. My area of specialisation is ornithology. I have worked as a professional ecologist for 20 years (not including 11 years of tertiary study).

My experience relevant to this application is as follows:

- Alternative to the Brynderwyn Hills Project, Brynderwyn Hills Section - Prepared the Assessment of Effects on Avifauna Ecology to support the FTAA Substantive Application for the Brynderwyn Hills section of the Project and developed methods and measures to avoid, minimise and mitigate potential effects.
- East West Link Road - Undertook field investigations, prepared the avifauna assessment and developed methods and measures to avoid, minimise and mitigate potential effects. Provided expert evidence on behalf of Waka Kotahi for the East-West Link Board of Inquiry Hearing.
- Ara Tūhono – Pūhoi to Warkworth motorway - Provided expert evidence on behalf of Waka Kotahi for the Board of Inquiry hearing.
- Ara Tūhono – Warkworth to Wellsford motorway - Prepared the avifauna assessment and developed methods and measures to avoid, minimise and mitigate potential effects. Provided expert evidence on behalf of Waka Kotahi for the Council hearing.
- NorthPort Expansion - Prepared an assessment of effects on coastal avifauna in relation to Northport's Eastern expansion (13 ha reclamation) and developed methods and measures to avoid, minimise and mitigate potential effects. Appeared as an expert witness during Council and Environment Court Hearings process.
- Nelson Airport runway extension, Waimea Inlet – Prepared the avifauna components of the Ecological Assessment to support the application by Nelson Airport Limited for a private plan change to the Nelson Resource Management Plan and notices of requirement to alter designations, as well as expert witness evidence for the hearing.
- Waitaki Power Scheme – Prepared avifauna evidence and appeared as an expert witness for Meridian Energy Limited in an Environment Court hearing for the consenting of the Waitaki Power Scheme.
- Tekapo Power Scheme - Prepared the Assessment of Effects on Avifauna Ecology to support the FTAA Substantive Application for the consenting of Gensis Energy Ltd's Tekapo Power Scheme.
- I have prepared Avifauna and Penguin Management Plans for a variety of large scale construction projects as well as implementing these plans during the construction activities (e.g. Transmission Gully, MacKays to Peka Peka Expressway, Kennedy Point Marina, Te Ara Tupa shared pathway, IReX Kaiwharawhara, Te Ara North and South Precincts).

- I have been undertaken research with noise experts from Marshall Day Acoustics to develop a method to minimise noise effects on korora / little penguin during coastal construction works. That research was presented at the *Effects of Noise on Aquatic Life* conference in Berlin (July 2022) and published in the conference proceedings (Lawrence et al., 2023).
- I am currently named on nine<sup>1</sup> Wildlife Act Authorisation for the capture, handle and translocation of kororā for the purposes of construction-related activities.

## 2.1 Code of Conduct

Although this Project is not being considered before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses as contained in section 9 of the Environment Court Practice Note 2023. I agree to comply with that Code. I am satisfied that the matters which I address in this assessment are within my area of expertise, except where I state that I am relying on information provided by another person or expert. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## 3.0 Methods

### 3.1 Desktop Investigation

A desktop investigation was undertaken to obtain information regarding historical and current avifauna assemblages (including seasonal distribution, abundance and diversity) associated with the Northport area and surrounding environments. The following sources were searched:

- Published literature (listed in Section 14.0);
- Unpublished reports (listed in Section 14.0);
- Relevant statutory documents (listed in Section 14.0);
- eBird:<sup>2</sup> Data were downloaded from the eBird website (refer to Map 1 for eBird data extent).
- Data were obtained from the NZ Birds Online website<sup>3</sup> 'Location' feature, whereby "Whangārei Harbour" was entered as the search location to obtain a list of species recorded at the location (including identification of breeding species);
- Information regarding primary and secondary habitat associations<sup>4</sup> was obtained for each species from Heather & Robertson (2005), along with each species' New Zealand threat status according to Robertson et al. (2021).

<sup>1</sup> Lyttelton Port (56585-FAU), Te Ara Tupua (91847-FAU), Tupua Horo Nuku (107320-FAU), IRex Kaiwharawhara (102324-FAU), Moncks' Bay coastal path (91425-FAU), Seaview wharf (118162-FAU), Frank Kitts park (18508-FAU), Massey Road seawall renewals (119153-FAU) CentrePort Cook Strait Interislander ferry terminal upgrade (125402-FAU).

<sup>2</sup> <https://ebird.org/home>

<sup>3</sup> <http://nzbirdsonline.org.nz/>

<sup>4</sup> For the purpose of this report, primary habitat refers to the habitat in which the species spends most of its time. Secondary habitats are other habitat types which the species may also utilise.

## 3.2 Field Investigations

### 3.2.1 Coastal Avifauna

Between 2017 and 2022, a series of coastal avifauna field surveys were undertaken by 4Sight Consulting Ltd (4Sight) for Northland Port Limited (NPL). These surveys were designed to collect data for three important activities in the lifecycle of a shorebird:

- Breeding – Nesting surveys;
- Roosting – High tide counts;
- Foraging – Mid and low tide counts.

The following sections provide a summary of the methods used to conduct those surveys, however a full description of the methods used can be found in the 4Sight reports which are included in Appendix 1 of Boffa Miskell (2022b).

#### 3.2.1.1 Nesting surveys

##### Shorebirds

Shorebird nesting surveys were undertaken by 4Sight during the 2018/19 and 2019/20 breeding seasons (4Sight Consulting, 2019, 2020). The surveys were undertaken in the following areas, as shown on Map 2:

- Eastern – included the area from the eastern edge of the Northport facility (including the tug bay revetments) to the CINZ emergency response boat ramp (refer to Appendix 1 Photo 3, Photo 4 and Photo 5). This site was further split into two zones, 1) the tug bay, and 2) the eastern beach and revetment.
- Western – encompassed the section of Marsden Bay from the western edge of the Northport boundary (including the western revetment; refer to Appendix 1 Photo 7) to the western edge of the Blacksmiths Creek high tide mangrove roost.
- Northport onsite – survey comprised four observation points within the port.

During each survey the observer spent 15-30<sup>5</sup> minutes at each pre-defined observation point scanning the area. Following the observation period, pre-defined routes were walked to provide high resolution coverage of the survey sites (Map 2). Where the survey routes passed through densely vegetated areas approximately 2-5 minutes was spent observing the area for breeding associated bird activity, followed by a visual inspection and search of the vegetation. Co-ordinates of bird nesting and breeding-associated activity were mapped following each survey.

On the eastern and western survey sites, a total of four and seven shorebird nesting surveys were conducted during the 2018/19 and 2019/20 breeding seasons respectively (Table 2). While on the Northport site, a total of one and seven surveys were conducted during the 2018/19 and 2019/20 breeding seasons respectively (Table 2).

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<sup>5</sup> ~5 minutes was spent at each observation point on the Northport site.

Table 2: Frequency of shorebird nesting surveys undertaken by 4Sight during the 2018/19 and 2019/20 breeding seasons.

| SURVEY SITE | 2018/19 SURVEYS                                                                            | 2019/20 SURVEYS                                                           |
|-------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Eastern     | Three surveys between 12 November and 10 December 2018, and one survey on 24 January 2019. | Seven surveys were undertaken between 30 October 2019 and 24 January 2020 |
| Western     | Three surveys between 12 November and 10 December 2018, and one survey on 24 January 2019. | Seven surveys were undertaken between 30 October 2019 and 24 January 2020 |
| Northport   | 24 January 2019                                                                            | Seven surveys were undertaken between 30 October 2019 and 24 January 2020 |

## Penguin

A little penguin / kororā (*Eudyptula minor*) survey was conducted on 12 December 2019 along the western and eastern riprap edges of the Northport site (refer to Map 2 and Appendix 1 Photo 6 and Photo 7). Two ecologists (the report author and a 4Sight Ecologist) scaled the riprap inspecting the interstitial spaces for the presence of kororā, or any signs of nesting or moulting birds.

A kororā survey was undertaken on 17 June 2021 along the western and eastern riprap edges of the Northport site using a DOC-certified conservation dog specifically trained in detecting kororā. A further survey of the western riprap edge of Northport site using a DOC-certified conservation dog specifically trained in detecting kororā was undertaken on 14 April 2026.

### 3.2.1.2 Wading bird surveys

All wading bird surveys were undertaken by 4Sight during the spring / summer of 2017/18 and 2019/20 and winter<sup>6</sup> of 2021 and 2022 (4Sight Consulting Ltd, 2019, 2020a, 2020b).

## Survey sites

The surveys were conducted over the following three sites, as shown on Map 2:

- Eastern zone – comprised the beach from the eastern boundary of the Northport facility to the Channel Infrastructure NZ<sup>7</sup> (CINZ) jetty (bound by the landward extent of the sand dunes and the MLWS mark) (refer to Appendix 1 Photo 3).
- Western zone – included the section of Marsden Bay from the western boundary of the Northport facility to the Marsden Cove Marina channel (refer to Appendix 1 Photo 8, Photo 11, Photo 12 and Photo 14).
- Expanded zone – an additional survey area added in December 2020 which included the coastline from the Marsden Cove Marina channel on the west side of the marina channel to the Marsden Yacht Club at One Tree Point (refer to Appendix 1 Photo 15 to Photo 18).

In the case of the Eastern and Western zones, each survey site was further broken into three compartments (East 1–3 and West 1–3), each of which was further divided into 'high water' (HW) and 'mid/low water' (LW) sub-compartments (refer to Map 2). The following discrete high-tide compartments were also identified, as shown on Map 2:

- Wildlife refuge (see Photo 13, Appendix 1);

<sup>6</sup> Report author advised on timing and frequency of the winter 2021 survey.

<sup>7</sup> Formerly Refining NZ

- Blacksmiths Creek - an area of mangrove edge and high shore zone at the outlet from the Blacksmiths Creek to Marsden Bay (see Photo 11, Appendix 2);
- Port – Areas within the Northport facility itself was also surveyed.

### Survey Effort

Wading bird surveys were by 4Sight Consulting Ltd and were conducted over the following seasons and dates (refer to Appendix 2 for a list of survey dates):

- Spring / summer - between 23 August 2017 to 12 March 2018 and between 25 September 2019 to 17 February 2020.
- Winter – between 4 June and 26 July 2021 and between 15 June and 15 August 2022.

A summary of the wading bird survey effort is provided in Table 3. Surveys were conducted according to the 'five minute bird count' specification of Hartley & Greene (2012). At each observation point the observer recorded weather conditions and human activity. The observer then counted all birds in the sub compartment being surveyed, keeping each count to approximately five minutes.

*Table 3: Frequency of wading bird surveys undertaken by 4Sight during the spring / summer and winter surveys.*

| SURVEY SITE | SPRING / SUMMER |              | WINTER      |             |
|-------------|-----------------|--------------|-------------|-------------|
|             | 2017/18         | 2019/20      | 2021        | 2022        |
| Eastern     | 18 high tide    | 16 high tide | 6 high tide | 6 high tide |
|             | 12 mid tide     | 16 mid tide  | 6 mid tide  | 6 mid tide  |
|             | 21 low tide     | 16 low tide  | 6 low tide  | 6 low tide  |
| Western     | 18 high tide    | 16 high tide | 6 high tide | 6 high tide |
|             | 12 mid tide     | 16 mid tide  | 6 mid tide  | 6 mid tide  |
|             | 21 low tide     | 16 low tide  | 6 low tide  | 6 low tide  |
| Expanded    | -               | 8 high tide  | 6 high tide | 6 high tide |
|             |                 | 8 mid tide   | 6 mid tide  | 6 mid tide  |
|             |                 | 8 low tide   | 6 low tide  | 6 low tide  |

### 3.2.2 Intertidal marine surveys

A qualitative intertidal survey was conducted on the 8 November 2021 by Coast & Catchment (2022), during which the length of Marsden Bay was walked over at low tide and notes were made on the presence of seagrass, macroalgae and other notable features. Fifty-four stations on the mid and lower intertidal zone were examined for cockles and pipis. In addition, a rapid quantitative survey for pipis and cockles was conducted between Northport and the Marsden Cove channel, whereby 18 stations between the mid and low tide level were sampled using a 13 cm diameter corer. Samples were sieved using a 4 mm sieve and the number of pipis and cockles present were counted. Pipi lengths were also measured.

To further assist with the coastal avifauna assessment, on 13 and 14 June 2022 Coast & Catchment (2022) collected 83 benthic ecological samples from the area between One Tree Point and the Channel Infrastructure (Marsden Refinery) wharf using a stratified random design, with sampling effort based on the size of the following intertidal zones:

- One Tree Point to the Marsden Cove Channel;
- Marsden Cove Channel to Northport;
- the proposed eastern reclamation area; and

- the area between the proposed eastern reclamation area and the Marsden Refinery wharf.

At each of the 83 sampling stations, a single 13 cm diameter × 15 cm deep core was obtained and sieved to 0.5 mm, preserved in isopropyl alcohol (IPA), and sent to an experienced taxonomist for sorting, identification and enumeration. General results were analysed using number of taxa and total counts of individuals.

### 3.2.3 High tide roost habitat

Consent conditions 45 to 50 for Northport's eastern expansion (AUT.005055.44.01) requires the re-creation of a high tide roost to the west of Northport. Due to the proximity of the roost site to the proposed shipyard reclamation (shown on Map 1), a site visit was undertaken by the report author with the Project marine ecology and coastal processes experts to investigate the potential relocation of the roost. The site visit was undertaken on 14 May 2026 at low tide.

## 3.3 Data Constraints

The following data constraints have been identified and taken into consideration for this assessment; however we note that these do not affect the report validity or conclusions reached:

- eBird: A citizen science, global, on-line checklist database programme. Observations of single birds through to checklists of all birds seen at a location are submitted to the website. As such, data is collected by a number of people with varying levels of species identification skills and there is no standardised method in terms of survey effort or coverage. Observation locations are also biased towards more accessible sites. Therefore, the absence of a species in a certain area may not be considered as a true absence of the species.
- POPULATION ESTIMATES: There is no single source for obtaining coastal and seabird population estimates, both local and national. Furthermore, population estimates are not available for some species, or in other cases only historic estimates are available. The population estimates reported here have been obtained from a number of sources which will have used a variety of survey techniques (including effort, time of year, count method etc). As such, these estimates should be viewed in the context of relative scales, not exact numbers.
- KORORĀ SURVEYS: While the timing of the December 2019 kororā survey coincided with the breeding season, the method relied solely on human observers. Conversely, the June 2021 and April 2026 survey used a DOC certified detector dog but did not coincide with the breeding season. Nevertheless, recent surveys<sup>8</sup> that the report author has conducted at other kororā colonies around the North Island have shown that birds return to land throughout much of the year, not just during the breeding season. Furthermore, kororā leave signs (e.g. guano, moult feathers, nest material) of having

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<sup>8</sup> Te Ara Tupua shared path (Wellington), Seaview wharf replacement (Wellington), Kennedy Point marina (Waiheke Island), Kaiwharawhara Ferry Terminal (Wellington), New Plymouth seawall.

been present; thus, while birds may not be on the land at the time, it is possible to identify if they have been there previously<sup>9</sup>.

### 3.4 Supporting Information

In addition to the information collected through the desktop (relevant literature and databases) and field investigations, this assessment makes use of the information provided in the following documents and plans associated with:

#### Northport's consented eastern expansion project

- Boffa Miskell (2022b). *Northport eastern expansion: Coastal avifauna assessment*. Report prepared by Boffa Miskell Limited for Northport Ltd.
- Boffa Miskell (2022a). *Northport eastern expansion: Additional winter 2022 avifauna data analysis*. Report prepared by Boffa Miskell Limited for Northport Ltd.
- MetOcean Solutions Ltd (2022a). *Dredging plume modelling: Dredging sediment plume dispersion over existing and proposed port configurations*. Report No. P051912 prepared by MetOcean Solutions Ltd for Northport Ltd.
- MetOcean Solutions Ltd (2022b) *Hydrodynamic modelling update: Effects of proposed reclamation and dredging layout on hydrodynamics*. Report No. P0519-10 prepared by MetOcean Solutions Ltd for Northport Ltd.
- MetOcean Solutions Ltd (2022c). *Morphodynamic modelling for Northport environment, modelling update: Predicted morphological response to proposed eastern land reclamation*. Report No. P0519-11 prepared by MetOcean Solutions Ltd for Northport Ltd.
- PDP (2020). *Air Quality Assessment – Northport proposed Eastern Expansion*. Report prepared by Pattle Delamore Partners Limited for Northport Ltd.
- Coast & Catchment (2022). *Northport expansion project: Assessment of marine ecological effects*. Report No. 2021-24 prepared by Coast & Catchment for Northport Ltd.
- WSP (2022). *Northport eastern extension (Berth 5) concept design report*. Prepared by WSP for Northport Ltd.
- Tonkin & Taylor (2022). *Vision for Growth port development: Coastal process assessment*. Report prepared by Tonkin & Taylor Ltd for Northport Ltd.

#### MBIE's proposed Northland shipyard and drydock project

- Tonkin & Taylor (2026). *Shipyard & dry dock facility at Marsden Point, Whangarei Harbour: Coastal Effects Assessment*. Report prepared by Tonkin & Taylor Ltd for the Ministry of Business, Innovation & Employment.
- Marshall Day (2026). *MBIE Northland shipyard and dry dock project*. Report No. Rp 001 20260242 prepared by Marshall Day Acoustics for the Ministry of Business, Innovation & Employment.
- MetOcean (2026a). *Dredge plume modelling: Dredging sediment plume dispersion over existing and proposed port configurations*. Report No. P0678-09 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.

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<sup>9</sup> The presence of guano above MHWS can persist for weeks.

- MetOcean (2026b). *Hydrodynamic modelling updated: Effects of the proposed reclamation and dredging layout on hydrodynamics*. Report No. P0678-06 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean (2026c). *Morphodynamic modelling for the Northport Environment - Modelling Update: Effects of the proposed reclamation and dredging layout on the morphodynamics*. Report No. P0578-08 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean (2026d). *Pipi larvae modelling: Effects of the proposed reclamation and dredging layout on hydrodynamics*. Report No. P0678-06 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- Coast & Catchment (2026). *Shipyard & Dry Dock Facility at Marsden Point: Assessment of Marine Ecological Effects*. Report No. 2026-09 prepared for the Ministry of Business, Innovation & Employment.
- Streamlined Environmental (2026). *Ecological risk assessment of antifouling chemicals for the Northport Shipyard and Drydock Project*. Report MBE2601 prepared for Ministry of Business, Innovation & Employment
- Blackburn (2026). *Stormwater and operational runoff management and discharge assessment for the proposed Northland shipyard and drydock project*. Report prepared for the Ministry of Business, Innovation & Employment.
- Styles Group (2026). *Assessment of underwater noise effects: Shipyard and drydock facility*. Report prepared by Styles Group for the Ministry of Business, Innovation & Employment
- PDP (2026). *Air Quality Impact Assessment – Development and Operation of Shipyard and Drydock facility at Marsden Point, Whangārei Harbour*. Report prepared by Pattle Delamore Partners Limited for the Ministry of Business, Innovation and Employment.
- Beca drawing set:
  - Drawing No. 3237966-CA-0001 '*General arrangement buildings*', Rev E dated 6/8/26.
  - Drawing No. 3237966-CA-0002 '*General arrangement spatial plan*', Rev E dated 6/8/26.
  - Drawing No. 3237966-CA-2000 '*Quaywall general arrangement*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-2002 '*Quaywall typical sections suspended deck*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-3000 '*Revetment typical sections*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-4000 '*Example dry dock arrangement*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-4002 '*Example shiplift arrangement*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-7000 '*External road layout*', Rev D dated 28/7/26.
  - Drawing No. 3237966-CA-8001 '*Construction Staging Plan: Stages 1 and 2*', Rev C dated 28/7/26.
  - Drawing No. 3237966-CA-8002 '*Construction Staging Plan: Stages 3 and 4*', Rev C dated 28/7/26.



- Drawing No. 3237966-CA-8003 '*Construction Staging Plan: Stages 5 and 6*', Rev C dated 28/7/26.
- Drawing No. 3237966-CA-8004 '*Construction Staging Plan: Stages 7 and 8*', Rev C dated 28/7/26.
- Drawing No. 3237966-CA-8005 '*Construction Staging Plan: Stage 9*', Rev C dated 28/7/26.
- Beca (2026). '*Marine Operations Maintenance Facility: Concept Design and Construction Report*'. Report prepared by Beca Ltd for Ministry of Business, Innovation & Employment.

### 3.5 Assessment Methodology

The following potential construction and operational phase effects (both direct and indirect) on coastal avifauna were considered for this assessment:

- Direct / permanent loss of habitat;
- Mortalities;
- Disturbance and displacement (effective habitat loss);
- Food supply and foraging ability;
- Artificial lighting;
- Pollution; and
- Cumulative effects.

Direct effects are those that have the potential to permanently remove habitat or result in injury or mortalities of birds, and where they occur are generally considered to have the greatest potential impact on the local or national population of the affected species. Indirect effects are those that may reduce available habitat, contaminate that habitat, or affect the ability of a species to forage, roost or nest effectively. These effects are harder to quantify, but we draw on information relating to matters such as existing disturbance, the extent of available habitat, and the known behaviours of the birds of concern to determine the likely magnitude of these effects on the species of concern.

The methodology used to undertake this assessment is consistent with the EIANZ guidelines for undertaking ecological impact assessments (Roper-Lindsay et al., 2018), whereby ecological values are assigned (Table 4) and the magnitude of effects identified (Table 5) in order to determine the overall level of effect of the proposal (Table 6).

The EIANZ guidelines allow either a species or habitat approach to be applied to impact assessments; on that basis, for the current assessment, a species approach has been applied in order to capture the potential impacts on individual species rather than the habitat as a whole. Given the diversity and high conservation values of the coastal avifauna inhabiting the Whangārei Harbour and potential the Project site, a species, rather than a habitat focus was considered to be a more conservative approach. Furthermore, it enables the teasing out of individual difference in risk profile.

With regard to a species approach, the EIANZ guidelines (Roper-Lindsay et al., 2018) use the New Zealand threat classification system as the criteria for assigning ecological value as outlined in Table 4. Robertson et al. (2021) provides the most recent threat classifications for avifauna and as such has been used to assign values to individual species. We note that threat classifications that are captured under the EIANZ Very High, High or Moderate ecological value

criteria, are the same as those identified in the New Zealand Coastal Policy Statement (DOC, 2025) Policy 11a(i), that is, *Threatened* or *At Risk* species in the New Zealand Threat Classifications System lists.

Table 4: Criteria for assigning ecological value to species (Roper-Lindsay et al., 2018).

| ECOLOGICAL VALUE  | SPECIES CLASSIFICATION                                                                                                                                                                                          |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very High</b>  | <i>Nationally Threatened</i> (Nationally Critical, Nationally Endangered, Nationally Vulnerable, Nationally Increasing <sup>10</sup> ) species found in the ZOI <sup>11</sup> either permanently or seasonally. |
| <b>High</b>       | Species listed as <i>At Risk – Declining</i> found in the ZOI either permanently or seasonally.                                                                                                                 |
| <b>Moderate</b>   | Species listed as any other category of <i>At Risk</i> (Recovering, Relict, Naturally Uncommon) found in the ZOI either permanently or seasonally; or Locally (ED) uncommon or distinctive species.             |
| <b>Low</b>        | Nationally and locally common indigenous species.                                                                                                                                                               |
| <b>Negligible</b> | Exotic species, including pests, species having recreational value.                                                                                                                                             |

Table 5 lists the criteria and descriptions for determining the magnitude of effect as described in the EIANZ guidelines (Roper-Lindsay et al., 2018). For the purpose of this assessment, we have determined the magnitude of effect at the local scale; that being the wider Whangārei Harbour. This area includes the coastline and harbour waters to the west of a line drawn from Busby Head in the north to Ruakākā Estuary in the south (refer to Map 1). This scale is deemed appropriate based on the habitat types within that area and the manner in which the species being assessed use those habitats and is consistent with the “system-wide approach” under Policy D.2.18(5) of the Northland Regional Plan (NRC, 2026). Given we have taken a species rather than habitat focus, the population criteria (text italicised and bolded in Table 5) has been applied for determining magnitude of effects. The population proportion thresholds that have been applied to each magnitude level are as follows:

- Very High: >50% of the population affected;
- High: 20-50% of the population affected;
- Moderate: 10-20% of the population affected;
- Low: 1-10% of the population affected;
- Negligible: <1% of the population affected.

According to Roper-Lindsay et al. (2018), Very High, High and Moderate effects are levels that are considered to be **adverse effects**, and that the overall level of effect (Table 6) can be used to guide the extent and nature of the ecological management response required (including the need for biodiversity offsetting or compensation) as follows:

<sup>10</sup> Nationally Increasing is category that was devised by DOC (Michel, 2021) in 2021 to resolve a problem that would arise if the population of a taxon assessed as At Risk Recovering A should stabilise. Threatened – Nationally Increasing is assigned to “Small population that have experienced a previous decline (or for which it is uncertain whether it has experienced a previous decline) and that is forecast to increase >10% over the next 10 years or 3 generations, whichever is longer” (Rolfe et al. 2021). Thus, while such a threat category is not identified in Roper-Lindsay et al. (2018), we have included it along with all other *Threatened* classifications in to the Very High ecological value category.

<sup>11</sup> Roper-Lindsay et al. (2018) define the Zone of Influence (ZOI) as “the areas/resources that may be affected by the biophysical changes caused by the proposed project and associated activities.”

- Very High adverse effects require a net biodiversity gain.<sup>12</sup>
- High and Moderate adverse effects require no net loss of biodiversity values.<sup>12</sup>
- Low and Very Low effects should not normally be a concern. If effects are assessed taking impact management developed during project shaping into consideration, then it is essential that prescribed impact management is carried out to ensure Low or Very Low effects.

Table 5: Criteria for describing magnitude of effect (Roper-Lindsay et al., 2018)

| MAGNITUDE         | DESCRIPTION                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Very High</b>  | Total loss of, or very major alteration, to key elements/ features of the baseline conditions such that the post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether; AND/OR<br><b>Loss<sup>13</sup> of a very high proportion of the known population</b> or range of the element / feature. |
| <b>High</b>       | Major loss or major alteration to key elements/ features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR<br><b>Loss<sup>13</sup> of a high proportion of the known population</b> or range of the element / feature.                                          |
| <b>Moderate</b>   | Loss or alteration to one or more key elements/features of the existing baseline conditions, such that post-development character, composition and/or attributes will be partially changed; AND/OR<br><b>Loss<sup>13</sup> of a moderate proportion of the known population</b> or range of the element / feature.                                              |
| <b>Low</b>        | Minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances/patterns; AND/OR<br><b>Having a minor effect on the known population</b> or range of the element / feature. |
| <b>Negligible</b> | Very slight change from existing baseline condition. Change barely distinguishable, approximating to the “no change” situation; AND/OR<br><b>Having a negligible effect on the known population</b> or range of the element / feature.                                                                                                                          |

Table 6: Criteria for describing the level of effect (Roper-Lindsay et al., 2018)

| LEVEL OF EFFECT  |                   | ECOLOGICAL AND / OR CONSERVATION VALUE |           |          |          |            |
|------------------|-------------------|----------------------------------------|-----------|----------|----------|------------|
|                  |                   | Very High                              | High      | Moderate | Low      | Negligible |
| <b>MAGNITUDE</b> | <b>Very High</b>  | Very High                              | Very High | High     | Moderate | Low        |
|                  | <b>High</b>       | Very High                              | Very High | Moderate | Low      | Very Low   |
|                  | <b>Moderate</b>   | High                                   | High      | Moderate | Low      | Very Low   |
|                  | <b>Low</b>        | Moderate                               | Low       | Low      | Very Low | Very Low   |
|                  | <b>Negligible</b> | Low                                    | Very Low  | Very Low | Very Low | Very Low   |
|                  | <b>Positive</b>   | Net gain                               | Net gain  | Net gain | Net gain | Net gain   |

<sup>12</sup> Though when ecological compensation is required because biodiversity offsetting is not possible, the principles of no-net-loss or net-gain do not apply (Maseyk et al., 2018).

<sup>13</sup> In the context of mobile fauna, the term “loss” can include displacement from an area.

### 3.6 Effects Management Hierarchy

According to the National Policy Statement for Indigenous Biodiversity (NPS-IB; MfE (2025)), effects management hierarchy means an approach to managing the adverse effects of an activity on indigenous biodiversity that requires that:

- (a) adverse effects are avoided where practicable; then
- (b) where adverse effects cannot be avoided, they are minimised where practicable; then
- (c) where adverse effects cannot be minimised, they are remedied where practicable; then
- (d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, biodiversity offsetting is provided where possible; then
- (e) where biodiversity offsetting of more than minor residual adverse effects is not possible, biodiversity compensation is provided; then
- (f) if biodiversity compensation is not appropriate, the activity itself is avoided.

An assessment of the proposal in relation to the NPS-IB is provided in Section 10.0. However, we note that the NPS-IB only applies in the terrestrial environment. Thus, given the majority of the Project is located within the Coastal Marine Area (CMA), the order of priority for ecological impact management we have applied to this assessment is outlined in Table 7. This process has followed the effects management hierarchy as described in Roper-Lindsay et al. (2018) and Maseyk et al. (2018).

*Table 7: Effects management hierarchy and terminology (Maseyk et al., 2018)*

| EFFECTS MANAGEMENT HIERARCHY  | DEFINITION                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) Avoidance                  | To modify a project proposal to prevent any environmental damage or loss of an ecological or environmental feature or function.                                                                                                                                                                                                                                                                             |
| 2) Remediation                | To reverse or stop any environmental damage.                                                                                                                                                                                                                                                                                                                                                                |
| 3) Mitigation                 | To alleviate, or to abate, or to moderate the severity of something (environmental damage), and typically occurs at the point of impact.                                                                                                                                                                                                                                                                    |
| 4) Biodiversity offset        | A measurable conservation outcome resulting from actions designed to compensate for residual, adverse biodiversity effects arising from activities after appropriate avoidance, remediation, and mitigation measures have been applied. The goal of a biodiversity offset is to achieve no-net-loss, and preferably a net-gain, of indigenous biodiversity values.                                          |
| 5) Environmental compensation | Non-quantified biodiversity benefits are offered to compensate for biodiversity losses. The compensation actions may benefit different biodiversity to that lost (out-of-kind compensation), including biodiversity of lesser conservation concern than that lost. Compensation is not quantified or balanced with losses and may involve subjective decision-making subject to socio-political influences. |

## 4.0 Whangārei Harbour Coastal Avifauna

Northport is located at the entrance of Whangārei Harbour, Northland, adjacent to Channel Infrastructure NZ. The site is situated within the Waipū Ecological District and Eastern Northland

Ecological Region (Lux et al., 2007). The Whangārei Harbour is approximately 100 km<sup>2</sup> in area and extends from the city of Whangārei to the Whangārei Heads (refer to Map 1).

There are several islands within the Whangārei Harbour which also provide habitat to a number of marine avifauna species. This includes Matakōhe / Limestone Island, located in the inner Harbour (Map 1), which contains a small population of breeding grey-faced petrel (*Pterodroma macroptera gouldi*; classified as *Not Threatened* (H. A. Robertson et al., 2021)); this species also breeds within the Bream Bay Head Reserve (refer to Map 1). Kororā / little penguin, classified as *At Risk – Declining* (H. A. Robertson et al., 2021), have been recorded breeding on several islands located within close proximity to shipyard and drydock site, including High and Calliope Islands (refer to Map 1). White-fronted tern and red-billed gull have both been recorded breeding on Frenchman Island (BioResearches, 2015).

In regard to pelagic seabirds such as other petrels and shearwaters, the majority of species recorded have been using the open water habitat of Bream Bay rather than the Whangārei Harbour waters (refer to Map 3). While Map 3 shows a cluster of eBird seabird records around the Marsden Cove development, this area does not provide any terrestrial habitat for these species. Rather, these are likely to be observations of birds traversing that location or foraging in the marina and canal system. As such, these birds will not be resident to that site.

Map 4 shows the distribution of eBird records of wading shorebird species around the Whangārei Harbour. There are a number of wading bird roost sites within the harbour, including Port Whangārei, Portland, Skull Creek, Takahiwai, Marsden Bay, Northern Harbour and Airport, and Ruakākā (Beauchamp & Parrish, 2007). Beauchamp & Parrish (2007) report that since the 1920s, major areas of wader habitat have been developed along the shores of Whangārei Harbour. These coastal developments have occurred in the upper, mid and lower Whangārei Harbour, and have included impacts on both the coastal edges, intertidal and subtidal habitats. Below is an excerpt taken from Beauchamp & Parrish (2007), summarising the location and changes in status of wading bird roosts sites around Whangārei Harbour. As identified in that table, there has been an incremental loss of roost sites in the area. This potential effect is particularly apparent when one considers the level of development that has occurred within Marsden Bay (refer to Appendix 3 for a series of historical (1942 – 2021) aerial images). The development of the Marsden Point oil refinery in 1964, and extensions in 1987, also removed a roost site, but some roosts remained nearby. Despite ongoing erosion, they were partly restored in the later 1990s. The development of Northport near Marsden Point removed c.5 ha of feeding habitat (Beauchamp & Parrish, 2007).

**Table 1** Location and changes in status of wading bird roost sites in and around Whangarei Harbour, Northland, New Zealand, 1973-2000.

| Roost site                   | Area            | NZMS 260 Q07                                   | Period                                                                                         |                                                                                                                  |                                                                                                                                                                                                                 |
|------------------------------|-----------------|------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                 |                                                | 1973-1980                                                                                      | 1981-1990                                                                                                        | 1991-2000                                                                                                                                                                                                       |
| Port Whangarei               | 50 ha (ponds)   | 325040                                         | Wall with spill areas onto mud flats of the harbour. Rough reclaimed land with weeds and ponds | Settlement ponds and reclaimed land with 5 ha of mud and shell used as a roost site                              | Reclaimed land with logs and port buildings. Settlement ponds with 1 ha of mud in original roost being filled by mangroves. Filled and mud ponds provide dry and shallow water roost areas during spring tides. |
| Portland                     | 20 ha (mudflat) | 308978                                         | Limestone slack muddy spring tide roost. Muddy area forms a neap roost                         | One spring tide roost area progressively grown over by mangroves.                                                | One spring tide roost overgrown, leaving muddy neap tide roost as only roost site. Site covered by largest spring tides.                                                                                        |
| Skull Creek                  | 20 ha           | 346979                                         | <i>Sarcicornia</i> and mud roost site                                                          | Unchanged                                                                                                        | Unchanged                                                                                                                                                                                                       |
| Takahiwai                    | 20 ha           | 373960                                         | <i>Sarcicornia</i> , mangrove and mud roost sites                                              | Unchanged                                                                                                        | Unchanged                                                                                                                                                                                                       |
| Marsden Bay                  | 2 ha            | 440951<br>463945                               | Long narrow tidal spit gradually eroding.                                                      | Eroding and shortening spit.                                                                                     | Tidal spit shortened before being eliminated in southeasterly gale in 1998. Replaced man-made island. Spring tide roost unchanged                                                                               |
| Northern Harbour and Airport | 30 ha           | 338023; 355037; 383014; 448020; 464985 493943. | Large grassed areas near runway.                                                               | Playing fields added in 2 areas providing more short grass, and closer access to roosting birds near the runway. | Area surrounding the airport occasionally used for hay production obscuring roosting birds. Full area available all tides.                                                                                      |
| Ruakaka                      | 5 ha            | 425875                                         | Estuary margin and sand bars                                                                   | Unchanged                                                                                                        | Unchanged and available in spring tides                                                                                                                                                                         |

The Whangārei Harbour coast and small areas within the river estuaries along Bream Bay have saltmarsh and mangrove communities that provide important breeding and feeding habitat for banded rail, fernbird, herons, and shag species (Lux et al., 2007). Maps 5 and 6 show the distribution of eBird records of shag and wetland bird species respectively around the Whangārei Harbour.

To the immediate west of Northport, a Significant Ecological Area (SEA; "Area C") has been identified in the Northland Regional Plan (NRC, 2026). Representative photos of Area C are provided in Appendix 1 (refer to Photo 8, Photo 12 and Photo 14 to Photo 18). The area is described as follows: *"This area comprises shallow intertidal and subtidal sandy soft bottom habitats stretching from One Tree Point to Marsden Bay. These habitats are flushed with considerable oceanic waters on incoming tides as well as the nutrients and plankton of the harbour waters. In the subtidal part of this area, in most years, scallops can be found there. Seagrass beds are returning to this area following a trend in the last four years in much of the harbour habitats suitable for seagrass. These shellfish and seagrass communities and associated benthic invertebrates are a major food source for shorebirds and a significant nursery and feeding area for many coastal fish species."* No specific details are provided in the Northland Regional Plan regarding the shorebird species utilising the area.

The Blacksmiths Creek Sandspit Government Purpose (Wildlife Management) Reserve ("Blacksmiths Creek Reserve") is situated almost immediately southwest of the Project. Blacksmiths Creek Estuary was identified by Lux (2007) as Recommended Area for Protection

(RAP Q07/144), with a total area of 22.0 ha (comprising 19.4 ha estuary, 2.4 ha shrubland, 0.3 ha wetland; refer to Photo 9 in Appendix 1). Lux (2007) noted that Blacksmiths Creek supports the third largest area of estuarine habitats in the ED, contains a diverse mosaic of estuarine, freshwater and terrestrial vegetation and is habitat for banded rail (*At Risk – Declining*) and Australasian bittern (*Threatened – Nationally Critical*). Within Blacksmiths Creek Reserve, the Northland Regional Plan denotes an area of Significant Bird Area – Critical Bird Habitat (*Australasian bittern*) (refer to Map 7). Other cryptic marshbird species recorded in Blacksmiths Creek Reserve include spotless crane (*At Risk – Declining*) and fernbird (*At Risk – Declining*) (refer to Map 6).

Given the diversity and extent of available habitat, it is not surprising that a total of 107 bird species, comprising 23 introduced, 75 native, six migrant and three vagrant species, have been recorded in the wider Whangārei Harbour area (refer to Appendix 4 for complete species list). Of the 84 non-introduced species, 63 are primarily associated with freshwater, coastal or oceanic habitats (refer to Appendix 4). Of those, a total of 22 species were recorded during the 4Sight surveys, including five species classified as *Threatened* and 12 classified as *At Risk* (Table 8).

In the following sections of this report, we provide a brief summary of individual species' ecology relevant to this assessment (Section 4.1), followed by a detailed analysis of how these species have been recorded utilising the coastal margin from One Tree Point to the CINZ jetty, as well as the Northport site (Sections 4.2 and 4.3).

*Table 8: Native species recorded during 4Sight wading birds (2017/18, 2019/20, 2021 and 2022)*

| SPECIES                         |                                                | SPECIES CODE | THREAT CLASSIFICATION <sup>14</sup>       |
|---------------------------------|------------------------------------------------|--------------|-------------------------------------------|
| Black-fronted tern              | <i>Chlidonias albostratus</i>                  |              | <i>Threatened - Nationally Endangered</i> |
| Reef heron                      | <i>Egretta sacra sacra</i>                     | RF           | <i>Threatened - Nationally Endangered</i> |
| Caspian tern                    | <i>Hydroprogne caspia</i>                      | CTe          | <i>Threatened - Nationally Vulnerable</i> |
| Northern NZ dotterel            | <i>Charadrius obscurus aquilonius</i>          | NZD          | <i>Threatened - Nationally Increasing</i> |
| Wrybill                         | <i>Anarhynchus frontalis</i>                   | Wry          | <i>Threatened - Nationally Increasing</i> |
| Banded dotterel                 | <i>Charadrius bicinctus bicinctus</i>          | BDo          | <i>At Risk - Declining</i>                |
| Bar-tailed godwit               | <i>Limosa lapponica baueri</i>                 | BtG          | <i>At Risk - Declining</i>                |
| Black-billed gull               | <i>Larus bulleri</i>                           |              | <i>At Risk - Declining</i>                |
| Lesser knot                     | <i>Calidris canutus rogersi</i>                | Lkn          | <i>At Risk - Declining</i>                |
| Red-billed gull                 | <i>Larus novaehollandiae scopulinus</i>        | RbG          | <i>At Risk - Declining</i>                |
| South Island pied oystercatcher | <i>Haematopus finschi</i>                      | SIPO         | <i>At Risk - Declining</i>                |
| White-fronted tern              | <i>Sterna s. striata</i>                       | WfT          | <i>At Risk - Declining</i>                |
| Pied shag                       | <i>Phalacrocorax varius varius</i>             | Psh          | <i>At Risk - Recovering</i>               |
| Variable oystercatcher          | <i>Haematopus unicolor</i>                     | VOC          | <i>At Risk - Recovering</i>               |
| Black shag                      | <i>Phalacrocorax carbo novaehollandiae</i>     | BSh          | <i>At Risk - Relict</i>                   |
| Little shag                     | <i>Phalacrocorax melanoleucos brevirostris</i> | LSh          | <i>At Risk - Relict</i>                   |
| Royal spoonbill                 | <i>Platalea regia</i>                          | RSp          | <i>At Risk - Naturally Uncommon</i>       |

<sup>14</sup> Robertson et al. (2021)

| SPECIES                    |                                     | SPECIES CODE | THREAT CLASSIFICATION <sup>14</sup> |
|----------------------------|-------------------------------------|--------------|-------------------------------------|
| Pied stilt                 | <i>Himantopus h. leucocephalus</i>  | PSt          | <i>Not Threatened</i>               |
| Southern black-backed gull | <i>Larus d. dominicanus</i>         | SBBG         | <i>Not Threatened</i>               |
| White-faced heron          | <i>Egretta novaehollandiae</i>      | WfH          | <i>Not Threatened</i>               |
| Asiatic whimbrel           | <i>Numenius phaeopus variegatus</i> | -            | <i>Migrant</i>                      |
| Eastern curlew             | <i>Numenius madagascariensis</i>    | -            | <i>Vagrant</i>                      |

## 4.1 Species Ecology

### 4.1.1 Cryptic marshbirds

A group of New Zealand birds which are elusive, rarely seen species hidden within dense wetlands, often identified by their calls rather than sightings.

#### 4.1.1.1 Australasian bittern

Australasian bittern is classified as *Threatened – Nationally Critical* (H. A. Robertson et al., 2021), with less than 1000 birds in New Zealand. They primarily inhabit wetlands, using a network of sites across the landscape, however they also forage in drains, flooded paddocks or roadsides. Map 6 shows the distribution of Australasian bittern eBird records around the Whangārei Harbour and surrounding landscape, including in the upstream reach of Blacksmiths Creek, Northport's stormwater ponds, and to the west of the proposed carpark.

Birds feed mainly on fish, including eels, but they also take spiders, insects, molluscs, worms, freshwater crayfish, frogs and lizards.<sup>15</sup>

The nest is a platform of reeds built among dense wetland vegetation, usually 20-30 cm above the water.

#### 4.1.1.2 Banded rail

The banded rail (*Hypotaenidia philippensis*) is classified as *At Risk – Declining* with a total New Zealand population of 5000–20 000 mature individuals (H. A. Robertson et al., 2021). About 80-90% of the New Zealand population is found around estuaries in the upper North Island. Map 6 shows the distribution of banded rail eBird records around the Whangārei Harbour and surrounding landscape.

Birds are mainly found in mangrove and saltmarsh vegetation. In the northern North Island rails spend 75% of their time feeding (snails, crabs, insects, worms and spiders) under mangrove cover, moving into this habitat as soon as the tide recedes. They seldom venture into the open, and then mainly at dawn and dusk.<sup>16</sup> Their nest is a rough platform of rush and reed fragments, usually in jointed rush thickets between 10 and 50 cm above ground or water.

#### 4.1.1.3 Spotless crake

The spotless crake (*Zapornia tabuensis*) is classified as *At Risk – Declining* with a total New Zealand population of 5000–20 000 mature individuals (H. A. Robertson et al., 2021). It is a cryptic bird of

<sup>15</sup> Williams, E. 2013 [updated 2022]. Australasian bittern | matuku-hūrepo. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>16</sup> Bellingham M. 2013 [updated 2024]. Banded rail | moho pererū. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)



freshwater wetlands (dominated by dense emergent vegetation, particularly raupo) found throughout the North Island.<sup>17</sup> Map 6 shows the distribution of spotless crane eBird records around the Whangārei Harbour and surrounding landscape.

They may forage on open mud near dense vegetation and have a diverse omnivorous diet which can include seeds, fruit and leaves of aquatic plants, and a wide variety of invertebrates including worms, snails, spiders, beetles and other insects.

When nesting in wetlands, the nest of woven grass and broken sedge leaves is built 30–70 cm above water level, often in a clump of *Carex* sedge. Several nest-like platforms are often built near the actual nest and are used for brooding chicks.<sup>17</sup>

#### 4.1.1.4 Fernbird

The North Island fernbird (*Poodytes punctatus vealeae*) is classified as *At Risk – Declining* with a total population size of 20 000–100 000 mature individuals. They prefer low, dense wetland vegetation (reeds, rushes) but also occupy manuka shrubland, and are poor fliers, typically scrambling through dense vegetation, though occasionally fly short distances. Map 6 shows the distribution of fernbird eBird records around the Whangārei Harbour and surrounding landscape.

Fernbird typically feed on insects (especially caterpillars, flies, beetles and moths), spiders and other small invertebrates. Their nest is a deep, woven, feather-lined cup of fine grass or sedge leaves in dense vegetation, usually less than 1 m above ground or water.

### 4.1.2 Charadriiformes

This group of birds includes:

- Waders: typical shorebirds, most of which feed by probing in the mud or picking items off the surface in both coastal and freshwater environments; and
- Gulls and terns: these are generally larger species which take fish from the sea.

#### 4.1.2.1 Northern NZ dotterel

Northern New Zealand dotterel (*Charadrius obscurus*), classified as *Threatened – Naturally Increasing* (H. A. Robertson et al., 2021), are found on or near the coast around much of the North Island and have an estimated population of 2,000 birds.<sup>18</sup>

Favoured breeding habitat includes sandy beaches (particularly at stream or river mouths), sand spits at the mouths of estuaries, and shell banks and sandbars in harbours, with approximately 48% of the breeding population concentrated in Northland (Dowding & Moore, 2006). The Whangārei Harbour was not listed amongst the sites identified by Dowding & Moore (2006) as being important breeding sites (i.e. regularly holding 1% of either the effective or total population); however, the harbour was identified as the eighth-most important wintering site for this species. Riegen & Sagar (2020) reported a mean winter count of 21 birds in the Whangārei Harbour and 27 birds in the Ruakākā and Waipū Estuaries. Map 4 shows the

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<sup>17</sup> Fitzgerald, N. 2013 [updated 2023]. Spotless crane | pūweto. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>18</sup> Dowding, J.E. 2013 [updated 2017]. New Zealand dotterel. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

distribution of northern New Zealand dotterel eBird records around the Whangārei Harbour and surrounding landscape.

New Zealand dotterels consume a wide range of suitably-sized marine, littoral, and terrestrial invertebrates, and occasionally small fish. Sandhoppers (amphipods) are a common prey item on beaches, and small mussels are taken from rocks. Small crabs and annelid worms are among prey on estuaries; on grass, crickets, flies, beetles, and earthworms have been recorded.<sup>18</sup>

#### 4.1.2.2 Banded dotterel

Banded dotterel (*Charadrius bicinctus*), classified as *At Risk - Declining* (H. A. Robertson et al., 2021), is found in the North, South and Stewart islands (Dowding & Moore, 2006). The national population is estimated to be approximately 50,000 birds.<sup>19</sup>

This species breeds throughout much of mainland New Zealand and on offshore and outlying islands; however, the main breeding concentrations are found in the shingle riverbeds of Hawke's Bay, Manawatu and the Wairarapa, and in the braided riverbeds of Marlborough, Canterbury, Otago and Southland (Dowding & Moore, 2006). Birds generally migrate to the northern North Island Harbours or Australia during the non-breeding season. Dowding & Moore (2006) identify the Whangārei Harbour as the seventh-most important wintering site in New Zealand, with counts ranging from 5-689 birds. Map 4 shows the distribution of banded dotterel eBird records around the Whangārei Harbour and surrounding landscape.

The coastal foraging zone includes the intertidal zone, with the diet comprising crustaceans, worms and flies.

#### 4.1.2.3 Wrybill

Wrybill (*Anarhynchus frontalis*) is classified as *Threatened - Nationally Increasing* (H. A. Robertson et al., 2021), with an estimated total population of 5000-5500 birds.<sup>20</sup> Wrybill breed only in braided riverbeds east of the main divide in Canterbury and Otago; after breeding birds migrate north and most individuals winter in the large harbours around Auckland (Dowding & Moore, 2006). Dowding & Moore (2006) identify the Whangārei Harbour as the sixth-most important wintering site, with counts ranging from 52-156 birds. Map 4 shows the distribution of wrybill eBird records around the Whangārei Harbour and surrounding landscape.

On wintering grounds, a range of small marine and littoral invertebrates are taken (including annelid and polychaete worms, small molluscs, and insects), and the occasional small fish.<sup>20</sup>

#### 4.1.2.4 Pied stilt

Pied stilt (*Himantopus himantopus leucocephalus*) is classified as *Not Threatened* (H. A. Robertson et al., 2021), with an estimated total New Zealand population of approximately 30,000 birds (Heather & Robertson, 2005). Pied stilts typically breed near shallow water in a wide variety of habitats throughout New Zealand; the main breeding locations in Northland include Awanui, Kawakawa, Dargaville and Naumai (Dowding & Moore, 2006).

In winter, pied stilts are widespread throughout both the North and South Islands. The highest numbers are consistently counted in the Firth of Thames, and Manukau and Kaipara Harbours (Southey, 2009). Dowding & Moore (2006) ranked the Whangārei Harbour as the tenth most

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<sup>19</sup> Pierce, R.J. 2013. Banded dotterel. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>20</sup> Dowding, J.E. 2013 [updated 2017]. Wrybill. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

important wintering site, with counts ranging from 47-816 birds. Map 4 shows the distribution of pied stilt eBird records around the Whangārei Harbour and surrounding landscape.

Diet is mainly aquatic and terrestrial invertebrates. In tidal areas the birds feed at low tide regardless of what time that occurs. Pied stilts primarily catch their food by sight, but when wading they may also probe and feel for food, especially when light is poor.<sup>21</sup>

#### 4.1.2.5 Bar-tailed godwit

Eastern bar-tailed godwit (*Limosa lapponica*), classified as *At Risk – Declining* (H. A. Robertson et al., 2021), breed in the Arctic and spend the non-breeding season (austral spring / summer) around New Zealand estuaries and harbours; though a small proportion of the population does overwinter here. This species is the most common Arctic migrant in New Zealand, with Riegen & Sagar (2020) reporting an average of 82,611 birds in New Zealand harbours between 2005-2019. At Whangārei Harbour, an average of 254 birds were recorded in the winter counts and 2,738 birds in the summer counts (Riegen & Sagar, 2020). Map 4 shows the distribution of bar-tailed godwit eBird records around the Whangārei Harbour and surrounding landscape.

On non-breeding grounds in New Zealand, bar-tailed godwits mainly eat polychaetes (probably over 70% of diet) but also small bivalves and crustaceans.<sup>22</sup>

#### 4.1.2.6 Lesser knot

Lesser knot (*Calidris canutus*), classified as *At Risk – Declining* (H. A. Robertson et al., 2021), breed in the Arctic and spend the non-breeding season (austral spring / summer) around New Zealand estuaries and harbours; though a small proportion of the population does overwinter in New Zealand. This species is the second most common Arctic migrant in New Zealand, with Riegen & Sagar (2020) reporting an average of 29,449 birds in New Zealand harbours between 2005-2019; at Whangārei Harbour, an average of 828 birds were recorded in the summer counts (Riegen & Sagar, 2020). Map 4 shows the distribution of lesser knot eBird records around the Whangārei Harbour and surrounding landscape.

Lesser knots mainly eat small molluscs, especially bivalve shellfish. Important prey in New Zealand includes pipi (*Paphies australis*), cockles/tuangi (*Austrovenus stutchburyi*), and nutshells (*Nucula hartvigiana*). They feed on open flats as well as seagrass beds, feeding principally by tactile means (probing, probably involving a remote pressure sense) but they also peck visually for surface prey such as gastropods. They can feed on small amphipods where prey densities are high enough.<sup>23</sup>

#### 4.1.2.7 South Island pied oystercatcher

South Island, also known as New Zealand pied oystercatcher (*Haematopus finschi*), classified as *At Risk – Declining* (H. A. Robertson et al., 2021), has an estimated national population of approximately 112,000 birds. Birds breed inland in the South Island on riverbeds and farmland; also known to breed on high country grasslands, and in coastal areas adjacent to estuaries and lagoons.<sup>24</sup>

Birds migrate to coastal areas of both the North and South Islands after breeding, including to Whangārei Harbour. Dowding & Moore (2006) identified the Manukau Harbour, Firth of Thames

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<sup>21</sup> Adams, R. 2013 [updated 2017]. Pied stilt. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>22</sup> Woodley, K. 2013 [updated 2017]. Bar-tailed godwit in Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>23</sup> Battley, P.F. 2013 [updated 2017]. Lesser knot. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>24</sup> Sagar, P.M. 2013. South Island pied oystercatcher in Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

and Kaipara Harbour as the most important wintering sites for this species, with some 63,500 pied oystercatchers being recorded at these three sites in June 2003. Whangārei Harbour was ranked ninth out of 10 winter sites, with an estimated 619–2548 birds recorded during counts (Dowding & Moore, 2006). Map 4 shows the distribution of pied oystercatcher eBird records around the Whangārei Harbour and surrounding landscape.

In coastal areas, birds feed mainly on molluscs and worms and have a strongly developed behaviour for preying on bivalves; other prey in coastal areas include crustaceans, cnidarians and fish. They feed by surface picking and deep probing in estuaries, on sandy shores, in pasture and on riverbeds (Heather & Robertson, 2005).

#### 4.1.2.8 Variable oystercatcher

Variable oystercatcher (*Haematopus unicolor*), classified as *At Risk – Recovering* (H. A. Robertson et al., 2021), are almost exclusively a coastal wader, favouring sandy and rocky shorelines around the North, South and Stewart Islands and their offshore islands (Crossland, 2001; Dowding & Moore, 2006). The national population is estimated to be approximately 5,000–6,000 birds,<sup>25</sup> with about two-thirds of that population occurring in the North Island, particularly in Northland, Coromandel Peninsula and Bay of Plenty (Dowding & Moore, 2006). Breeding and wintering distributions are similar.

Riegen & Sagar (2020) reported a mean of 205 birds in the Whangārei Harbour during the 2005–2019 winter counts, and mean of 147 birds in the Ruakākā and Waipū Estuaries. In terms of the harbour's importance as a wintering site for variable oystercatcher, the area is ranked as the third highest in New Zealand (Dowding & Moore, 2006; Riegen & Sagar, 2020). Map 4 shows the distribution of variable oystercatcher eBird records around the Whangārei Harbour and surrounding landscape.

Their diet includes a wide range of littoral<sup>26</sup> invertebrates, including molluscs, crustaceans, and annelids; foraging patterns are influenced by tidal cycles (Heather & Robertson, 2005).

#### 4.1.2.9 Southern black-backed gull

The southern black-backed gull (*Larus dominicanus*) is classified as *Not Threatened* (H. A. Robertson et al., 2021) and is common throughout New Zealand in most habitats; they are particularly abundant anywhere food scraps, offal and other organic waste that can be obtained.<sup>27</sup> Map 8 shows the distribution of southern black-backed gull eBird records around the Whangārei Harbour and surrounding landscape.

#### 4.1.2.10 Black-billed gull

Black-billed gull (*Larus bulleri*), classified as *At Risk – Declining* (H. A. Robertson et al., 2021), are typically found in the South Island, breeding on the gravel islands in braided riverbeds,<sup>28</sup> with only about 5% of the population in the North Island. During the breeding season, black-billed gulls feed primarily on invertebrates taken from rivers and adjacent pasture.

During the non-breeding season (April to July) most birds migrate to the coast and continue to use agricultural habitats but also feed in the coastal marine zone on fish and marine

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<sup>25</sup> Dowding, J.E. 2013 [updated 2017]. Variable oystercatcher. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>26</sup> Pertaining to the shore (Lincoln et al., 1998).

<sup>27</sup> Miskelly, C.M. 2013. Southern black-backed gull. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>28</sup> McClellan, R.K.; Habraken, A. 2013 [updated 2019]. Black-billed gull. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

invertebrates.<sup>28</sup> Map 8 shows the distribution of black-billed gull eBird records around the Whangārei Harbour and surrounding landscape.

#### 4.1.2.11 Red-billed gull

The red-billed gull is a very abundant species, but has been afforded a classification of *At Risk – Declining* due to the recent large declines at its three main breeding colonies (Three Kings Islands, Mokohinau Islands and Kaikoura Peninsula) (H. A. Robertson et al., 2021). This species nests in dense colonies, including at the Marsden Point refinery where the breeding colony is estimated to be 1,190 pairs (Frost & Taylor, 2018b). Map 8 shows the distribution of red-billed gull eBird records around the Whangārei Harbour and surrounding landscape.

During the breeding season, red-billed gull feed mainly in inshore waters on the planktonic euphausiid *Nyctiphanes australis*, although some other marine invertebrates and small fish are taken (Heather & Robertson, 2005). Birds disperse during the non-breeding season (Higgins & Davies, 1996).

#### 4.1.2.12 Black-fronted tern

Black-fronted tern (*Chlidonias albobristatus*), classified as *Threatened – Nationally Endangered* (H. A. Robertson et al., 2021), breed on the braided rivers of the eastern South Island. After breeding, most birds move to the coast where they feed in coastal waters up to 50 km from shore, taking mostly planktonic crustaceans. They also often feed over wet pasture on earthworms, especially during rough weather (Heather & Robertson, 2005).

#### 4.1.2.13 Caspian tern

Caspian tern (*Hydroprogne caspia*), classified as *Threatened – Nationally Vulnerable* (H. A. Robertson et al., 2021), remains uncommon in New Zealand with an estimated 1300-1400 breeding pairs (Bell & Bell, 2008). Bell & Bell (2008) estimated the Whangārei breeding population to be approximately 50-100 pairs. Map 8 shows the distribution of Caspian tern eBird records around the Whangārei Harbour and surrounding landscape.

This species associates mainly with coastal but also freshwater environments (Heather & Robertson, 2005). During the breeding season, birds from coastal colonies primarily forage inshore in harbours and estuaries. Caspian tern feed mostly on small surface-swimming fish such as yellow-eyed mullet, piper, and smelt; fish are caught by plunge-diving (Heather & Robertson, 2005).

#### 4.1.2.14 White-fronted tern

The white-fronted tern, while common all around New Zealand coasts, is classified as *At Risk – Declining* (H. A. Robertson et al., 2021). The national population is estimated to be 15,000-20,000 pairs (Heather & Robertson, 2005; Higgins & Davies, 1996). Breeding colonies are widely distributed around the coast of the North Island, with some concentration in natural harbours and large estuaries, including Whangārei Harbour (Beauchamp & Parrish, 1999; Frost, 2017; Pierce, et al., 2002). Beauchamp & Parrish (1999) reported frequent low numbers (~60 birds) of white-fronted tern at the Port Whangārei sedimentation pond and roost area. Map 8 shows the distribution of white-fronted tern eBird records around the Whangārei Harbour and surrounding landscape.

White-fronted tern feed on shoaling fish such as smelt and pilchard in coastal waters (Heather & Robertson, 2005). They catch small fish and crustaceans by plunging into the water from 5-10 m above the surface.

### 4.1.3 Pelecaniformes (herons, shags & spoonbill)

#### 4.1.3.1 Reef heron

In New Zealand, reef heron (*Ardea sacra*) are widespread in the North, South and Stewart islands (Edgar, 1978; Heather & Robertson, 2005; Robertson et al., 2007). This species is classified as *Threatened – Nationally Endangered* (H. A. Robertson et al., 2021), with an estimated national population of 300-500 birds (Bell, 2010). With respect to Whangārei Heads, Pierce et al. (2002) describes the reef heron as a rare resident that breeds in the caves of coastline and islands. Map 4 shows the distribution of reef heron eBird records around the Whangārei Harbour and surrounding landscape.

The reef heron is a bird of the rocky shore, where it stalks around rock pools and small rivulets of water that may carry fish. It can also be seen on estuary mudflats feeding at low tide and may occasionally be seen wading in the shallow waves on sandy beaches. Reef herons catch and eat small fish, crustaceans and worms.<sup>29</sup>

#### 4.1.3.2 White-faced heron

This widespread and common species is classified as *Not Threatened* (H. A. Robertson et al., 2021). Beauchamp & Parrish (1999) reported frequent low numbers (~60 birds) of white-faced heron at the Port Whangārei sedimentation pond and roost area. Map 4 shows the distribution of white-faced heron eBird records around the Whangārei Harbour and surrounding landscape.

Both saline and freshwater habitats are used for foraging, as indicated by the wide range of prey they consume: small fish, crabs, worms, insects, spiders, mice, lizards, tadpoles and frogs (Marchant et al., 1990). The white-faced heron is a predator that depends on vision and captures prey with a variety of methods; when foraging, they are essentially searchers, usually wading and walking, but occasionally standing and waiting for prey (Moore, 1984). Thus, they are coastal edge shallow-water foragers.

#### 4.1.3.3 Royal spoonbill

Royal spoonbill (*Platalea regia*), classified as *At Risk – Naturally Uncommon* (H. A. Robertson et al., 2021), has an estimated New Zealand population of 2360 birds.<sup>30</sup> In New Zealand, birds breed in coastal colonies around North and South Islands, and disperses widely around the country after breeding. Beauchamp & Parrish (1999) reported low numbers (~40 birds) of royal spoonbill as seasonal (autumn, winter, spring) visitors at the Port Whangārei sedimentation pond and roost area. Map 4 shows the distribution of royal spoonbill eBird records around the Whangārei Harbour and surrounding landscape.

Birds feed while wading in water during the day or night, whenever tide is suitable. They mainly eat fish in freshwater, and shrimps in tidal flats; also eat other crustaceans, aquatic insects and frogs. Bill structure limits it to feeding in water less than 40 cm deep over sand, mud or clay. Vibration detectors inside the bill can detect prey in murky water or darkness.<sup>30</sup>

#### 4.1.3.4 Black shag

Black shag (*Phalacrocorax carbo novaehollandiae*), classified as *At Risk – Relict* (H. A. Robertson et al., 2021), is sparsely widespread from Northland to Stewart Island and is found in a variety of habitats including coastal and freshwater systems (Heather & Robertson, 2005).

<sup>29</sup> Adams, R. 2013. Reef heron. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

<sup>30</sup> Szabo, M.J. 2013 [updated 2017]. Royal spoonbill. In Miskelly, C.M. (ed.) New Zealand Birds Online. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)

Heather & Robertson (2005) estimate the national population to be 5,000-10,000 pairs, with most nesting in small colonies of 5-20 pairs. Beauchamp & Parrish (1999) reported low numbers (2 birds) of black shag occasionally at the Port Whangārei sedimentation pond and roost area. Map 5 shows the distribution of black shag eBird records around the Whangārei Harbour and surrounding landscape.

Birds generally forage alone and the diet is mainly small and medium sized fish (<35 cm long), and may include (depending on habitat) mullet, wrasse, red cod, spotties, smelt, eels, bullies, galaxiids, trout and perch (Heather & Robertson, 2005; McKinnon et al., 2004).

Heather & Robertson (2005) report that black shags stay close inshore, mainly in water <3 m deep, but have been caught in crayfish pots set at 12 m deep.

#### 4.1.3.5 Little shag

Little shag (*Phalacrocorax melanoleucos*) are considered to be widespread and common, with a national population of 5,000-10,000 breeding pairs and are classified as *At Risk - Relict* (Heather & Robertson, 2005; H. A. Robertson et al., 2021). Beauchamp & Parrish (1999) reported low numbers (8 birds) of little shag occasionally at the Port Whangārei sedimentation pond and roost area. Map 5 shows the distribution of little shag eBird records around the Whangārei Harbour and surrounding landscape.

Little shag forage in sheltered coastal waters, estuaries and harbours, rivers and lakes. Diet varies greatly with habitat but is mainly small fish (<13 cm long). Little shag generally feed close to shore in waters less than 3 m deep (Heather & Robertson, 2005; Lalas, 1983).

#### 4.1.3.6 Pied shag

The pied shag (*Phalacrocorax varius*), classified as *At Risk - Relict* (H. A. Robertson et al., 2021), has a widespread breeding distribution roughly comprising three distinct areas: northern North Island (Wairoa up to the far North), central New Zealand and southern South Island (WMIL, 2013). With an estimated national population of approximately 6,400 breeding pairs, some 1,500 of those breeding pairs are located within the northern North Island area (WMIL, 2013). Beauchamp & Parrish (1999) reported low numbers (57 birds) of pied shag as resident at the Port Whangārei sedimentation pond and roost area. Map 5 shows the distribution of pied shag eBird records around the Whangārei Harbour and surrounding landscape.

Birds generally forage close to shore in shallow water less than 10 m deep and their diet is mainly 6-15 cm long fish (Heather & Robertson, 2005; Lalas, 1983).

### 4.1.4 Sphenisciformes

In terms of foraging distribution and technique, Shealer (2002) classifies the Spheniscidae family, which penguins belong to, as coastal-inshore pursuit divers.

#### 4.1.4.1 Northern little penguin / kororā

Little penguin are native to New Zealand and Australia; in New Zealand they are widely distributed along the coastlines of the North, South, Rakiura and Chatham islands and their offshore islands (Heather & Robertson, 2005; Marchant et al., 1990). The New Zealand population of little penguin is estimated to be c. 50,000-100,000, with approximately 5,000 – 10,000 breeding pairs of the northern form (C. J. R. Robertson & Bell, 1984). Robertson et al. (2021) have assigned an *At Risk - Declining* classification to the northern little penguin (*Eudyptula minor iredalei*). *Birds have been reported breeding along the north-eastern shoreline of the*

Whangārei Harbour entrance, including around Reotahi Bay to High Island area, Calliope Island, Home Point to Busby Head and Smugglers Bay (Munro, 1971; Parrish, 1985; Pierce, 2005). Map 3 shows the distribution of little penguin eBird records around the Whangārei Harbour.

Nests are situated relatively close to the sea in burrows excavated by the birds or other species, or in caves, rock crevices, under logs or in or under a variety of man-made structures including nest boxes, pipes, stacks of wood or timber, and buildings.<sup>31</sup> Adults are present at colonies throughout the year, though numbers are lowest between completion of moult (April) and start of breeding (August) (Marchant et al., 1990). For most colonies in New Zealand the breeding season begins around August and continues until January when chicks fledge (Davis & Renner, 2010).

During the breeding season, little penguin are near shore foragers, restricted to foraging areas close to their nest (Gaskin & Rayner, 2017). Numerous studies have found that little penguin generally travel no further than 20 km from the colony while feeding chicks (Cannell, 2016; Chiaradia & Kerry, 1999; Collins et al., 1999; Hoskins et al., 2008; Klomp & Wooller, 1988; Preston et al., 2008; Weavers, 1992).

Little penguin are visual feeders foraging by pursuit diving; consequently diving is exclusively diurnal, with a midday peak (Cannell & Cullen, 1998; Preston et al., 2008; Ropert-Coudert et al., 2003, 2006).

#### 4.1.5 Procellariidae (petrels)

##### 4.1.5.1 Grey-faced petrel

Grey-faced petrel (*Pterodroma macroptera gouldi*), classified as *Not Threatened* (H. A. Robertson et al., 2021), is a widespread endemic subspecies that breeds on numerous islands and some mainland locations. Locally, this species breeds on Matakohē / Limestone Island, located in the inner Harbour (Map 1) and within the Bream Bay Reserve. Small populations are also found on the Hen and Chickens (Taylor, 2000). Map 3 shows the distribution of grey-faced petrel eBird records around the Whangārei Harbour.

Gaskin & Rayner (2017) report that this species forages offshore in deep sub-tropical and temperate waters of the Tasman Sea and Pacific Ocean, and that recent dietary and tracking studies indicate the species to be an obligate deep-water specialist with > 80% of food, predominantly diurnally migrating species, predated or scavenged at night.

Grey-faced petrel are away from their colonies during the non-breeding season and disperse widely within the subtropical and temperate waters (Gaskin & Rayner, 2017).

#### 4.1.6 Species summary

Table 9 provides a summary of species threat classification, population sizes and feeding ecology for those coastal birds that were recorded during the 4Sight wading bird surveys (from Marsden Bay to One Tree Point), as well as little penguin and grey-faced petrel (also known to breed in the wider harbour).

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<sup>31</sup> Flemming, S.A. 2013. Little penguin. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. [www.nzbirdsonline.org.nz](http://www.nzbirdsonline.org.nz)



Table 9: Summary of population, foraging and dietary information for avifauna species within the shipyard project zone of influence<sup>1</sup>

| SPECIES                         | NZ CLASSIFICATION                  | IUCN CLASSIFICATION | EST. WHANGĀREI HBR POP | EST. NATIONAL POPULATION | FORAGING BEHAVIOUR                                             | DIET                                                                                        |
|---------------------------------|------------------------------------|---------------------|------------------------|--------------------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Cryptic Marshbirds</b>       |                                    |                     |                        |                          |                                                                |                                                                                             |
| Australasian bittern            | Threatened – Nationally Critical   | Vulnerable          | -                      | <1,000 birds             | Stalking in shallow water and dense reeds, drains and roadside | Mainly on fish but they also insects, frogs and lizards                                     |
| Banded rail                     | At Risk - Declining                | Least Concern       | -                      | 5,000–20,000 birds       | Within mangrove or salt marsh vegetation                       | Snails, crabs, insects, worms and spiders                                                   |
| Spotless crane                  | At Risk - Declining                | Least Concern       | -                      | 5,000–20,000 birds       | On open mud near dense vegetation                              | Omnivorous diet - aquatic plants and insects                                                |
| Fernbird                        | At Risk - Declining                | Least Concern       | -                      | 20,000–100,000 birds     | Insectivorous                                                  | Insects and invertebrates                                                                   |
| <b>CHARADRIIFORMES</b>          |                                    |                     |                        |                          |                                                                |                                                                                             |
| <b>Waders / Shorebirds</b>      |                                    |                     |                        |                          |                                                                |                                                                                             |
| Northern NZ dotterel            | Threatened – Nationally Increasing | Near Threatened     | ~80 birds              | ~2,000 birds             | Coastal wader                                                  | Wide range of marine invertebrates, particularly sandhoppers (amphipods). Also crabs worms. |
| Banded dotterel                 | At Risk – Declining                | Least Concern       | ~700 birds             | ~50,000 birds            | Coastal wader                                                  | Crustaceans, worms and flies.                                                               |
| Wrybill                         | Threatened – Nationally Increasing | Vulnerable          | ~150 birds             | 5,000–5,500 birds        | Coastal wader                                                  | Annelid and polychaete worms, small molluscs, and insects.                                  |
| Pied stilt                      | Not Threatened                     | Least Concern       | ~800 birds             | ~30,000 birds            | Coastal wader                                                  | Aquatic and terrestrial invertebrates.                                                      |
| Bar-tailed godwit               | At Risk – Declining                | Near Threatened     | ~2,800 birds           | ~83,000 birds            | Coastal wader                                                  | Mainly polychaetes (probably over 70% of diet) but also small bivalves and crustaceans.     |
| Lesser knot                     | At Risk – Declining                | Near Threatened     | ~800 birds             | ~30,000 birds            | Coastal wader                                                  | Mainly small molluscs. Important prey in NZ include pipi, cockles/tuangi and nutshells.     |
| South Island pied oystercatcher | At Risk – Declining                | Least Concern       | ~2,500 birds           | ~100,000 birds           | Coastal wader                                                  | Mainly on molluscs and worms, but also crustaceans, cnidarians and fish.                    |
| Variable oystercatcher          | At Risk - Recovering               | Least Concern       | ~350 birds             | ~5,000 birds             | Coastal wader                                                  | Invertebrates, including molluscs, crustaceans, and annelids.                               |
| <b>Gulls &amp; terns</b>        |                                    |                     |                        |                          |                                                                |                                                                                             |
| Black-backed gull               | Not Threatened                     | Least Concern       | Abundant               | >1,000,000 birds         | Surface seizer                                                 | Fish, as well as food scraps, offal and other organic waste that can be obtained.           |

| SPECIES                 | NZ CLASSIFICATION                  | IUCN CLASSIFICATION | EST. WHANGĀREI HBR POP | EST. NATIONAL POPULATION | FORAGING BEHAVIOUR                                           | DIET                                                                              |
|-------------------------|------------------------------------|---------------------|------------------------|--------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Black-billed gull       | At Risk - Declining                | Near Threatened     | -                      | ~60,000 pairs            | Coastal during non-breeding season                           | Small fish and invertebrates                                                      |
| Red-billed gull         | At Risk - Declining                | Least Concern       | >1,190 pairs           | ~28,000 pairs            | Surface seizer                                               | Mostly planktonic euphausiid, but also other marine invertebrates and small fish. |
| Black-fronted tern      | Threatened – Nationally Endangered | Endangered          | -                      | <10,000 birds            | Braided river and inshore waters                             | Small fish and invertebrates                                                      |
| Caspian tern            | Threatened – Nationally Vulnerable | Least Concern       | 50-100 pairs           | ~1,300 pairs             | Plunge-diving                                                | Small surface-swimming fish.                                                      |
| White-fronted tern      | At Risk – Declining                | Least Concern       | >100 birds             | ~20,000 pairs            | Plunge-diving                                                | Small shoaling fish.                                                              |
| <b>PELECANIFORMES</b>   |                                    |                     |                        |                          |                                                              |                                                                                   |
| Reef heron              | Threatened – Nationally Endangered | Least Concern       | >10 pairs?             | ~300-500 birds           | Stalks                                                       | Small fish, crustaceans and worms.                                                |
| White-faced heron       | Not Threatened                     | Least Concern       | ~100 birds             | Abundant                 | Coastal wader                                                | Small fish, crabs, worms, insects.                                                |
| Royal spoonbill         | At Risk – Naturally Uncommon       | Least Concern       | ~40 birds              | ~2,360 birds             | Coastal wader                                                | Mainly shrimp and crustaceans.                                                    |
| Black shag              | At Risk – Relict                   | Least Concern       | >10 birds              | 5,000-10,000 pairs       | Pursuit diver in water ≤3 m                                  | Small and medium sized fish (<35 cm long).                                        |
| Little shag             | At Risk – Relict                   | Least Concern       | >10 birds              | 5,000-10,000 pairs       | Pursuit diver in water ≤3 m                                  | Mainly small fish (<13 cm long).                                                  |
| Pied shag               | At Risk - Recovering               | Least Concern       | >50 birds              | ~6,400 pairs             | Pursuit diver in water ≤10 m                                 | Mainly small fish (6-15 cm long).                                                 |
| <b>SPHENISCIFORMES</b>  |                                    |                     |                        |                          |                                                              |                                                                                   |
| <b>Penguins</b>         |                                    |                     |                        |                          |                                                              |                                                                                   |
| Northern little penguin | At Risk - Declining                | Least Concern       | >100 birds             | ~10,000 pairs            | Pursuit diver with most foraging within 15 m of the surface. | Small inshore fish species                                                        |
| <b>PROCELLARIIDAE</b>   |                                    |                     |                        |                          |                                                              |                                                                                   |
| <b>Petrels</b>          |                                    |                     |                        |                          |                                                              |                                                                                   |
| Grey-faced petrel       | Not Threatened                     | Least Concern       | >100 pairs             | >100,000 pairs           | Pelagic (off-shore)                                          | Squid, crustaceans and fish                                                       |

## 4.2 Feeding Resources

### 4.2.1 Intertidal

Within the Whangārei Harbour, intertidal communities generally fall into one of three broad types: those of sheltered tidal creeks (upper harbour), semi-exposed sandflats (mid-harbour), and exposed sandflats (lower harbour). These community types are largely driven by substrate type and a change in community composition exists from muddy upper harbour to sandier lower harbour sites (Griffiths, 2012).

The area of intertidal foraging habitat within the Whangārei Harbour is vast, with approximately 4,600 ha of intertidal flats. Within the lower harbour, approximately 58% of the marine area habitat is intertidal flats (Coast & Catchment, 2022, 2026). The lower harbour supports extensive cockle (*Austrovenus stutchburyi*) and pipi (*Paphies australis*) beds (Pawley & Smith, 2014).

NRC macrofaunal data presented in Catchment & Coast (2026), and replicated in Figure 1 below, show that number of taxa (species richness) and individuals (abundance) at Marsden Bay were not the highest recorded around Whangārei Harbour. Further analysis of the harbour-wide macroinvertebrate data by Catchment & Coast (2026) identified eight (a-h) community compositions (clusters) around the harbour. The cluster type (h) identified at Marsden Bay, was in fact identified at a total of nine sites around Whangārei Harbour, including a number of NRC significant ecological areas (refer to Figure 2 below, sourced from Catchment & Coast (2026)). Catchment & Coast (2026) reported that sites from cluster h (which contained the intertidal sites closest to Northport) contained significantly fewer taxa than those in clusters a, f and c ( $p < 0.05$ ).

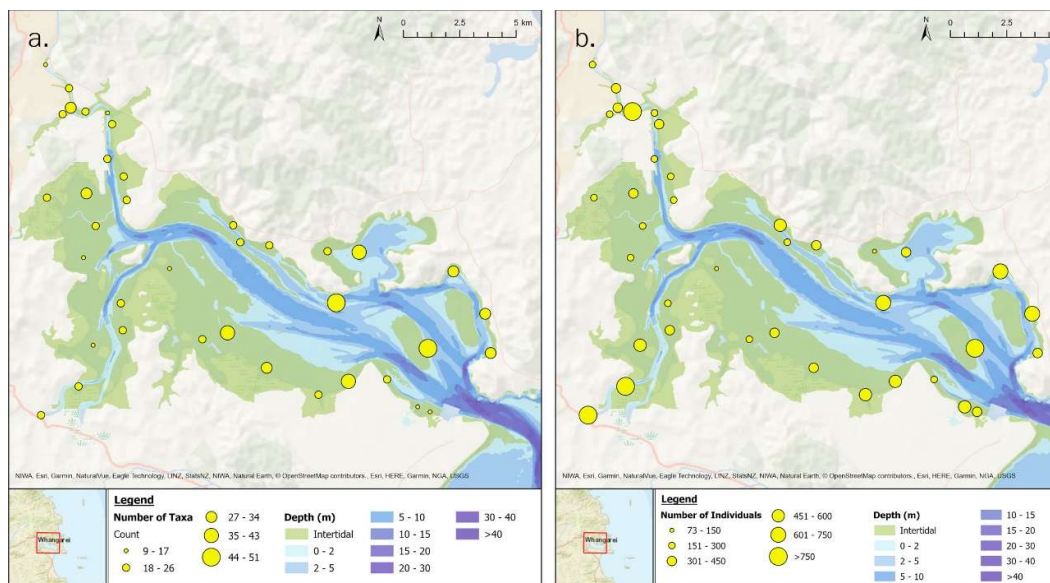


Figure 1: Bubble plots showing variation in a) numbers of taxa, and b) numbers of individuals in pooled benthic macrofaunal samples ( $n = 3$  cores per site). Data provided by NRC. (Source: Figure 22 in Catchment & Coast (2026))

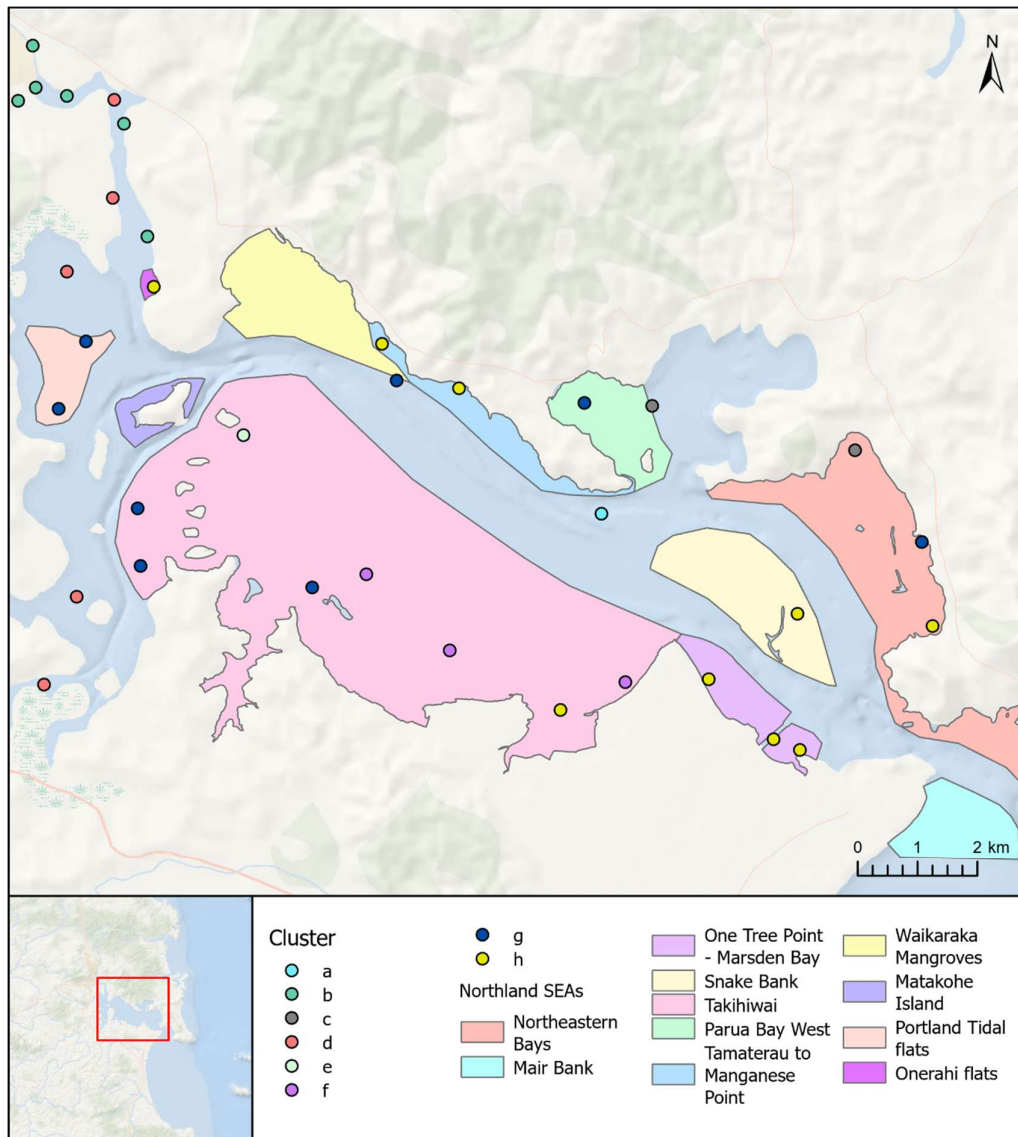


Figure 2: Map of multivariate site clusters of NRC harbour-wide macroinvertebrate data overlaid on significant ecological areas from the NRC coastal plan. (Source: Figure 26 in *Catchment & Coast* (2026))

Coast & Catchment (2022, 2026) characterise the intertidal sediments around Northport as predominantly sand, except for the area immediately west of the port, which is muddy sand. In terms of local feeding resources available to wading birds in the intertidal areas to the west and east of Northport, Coast & Catchment (2022, 2026) reported the following characteristics:

- The diversity and abundance of macroinvertebrates varied across the survey area with marked differences apparent between intertidal sites on the western and eastern side of Northport.
- Numbers of individuals were higher on the western side (refer to Figure 3) but counts varied along the shore.

- Numbers of taxa in core samples was uniformly high on the western side of the port compared to the eastern side (refer to Figure 4).
- Total counts of specimens from major taxa groups displayed substantial variation across the survey area.

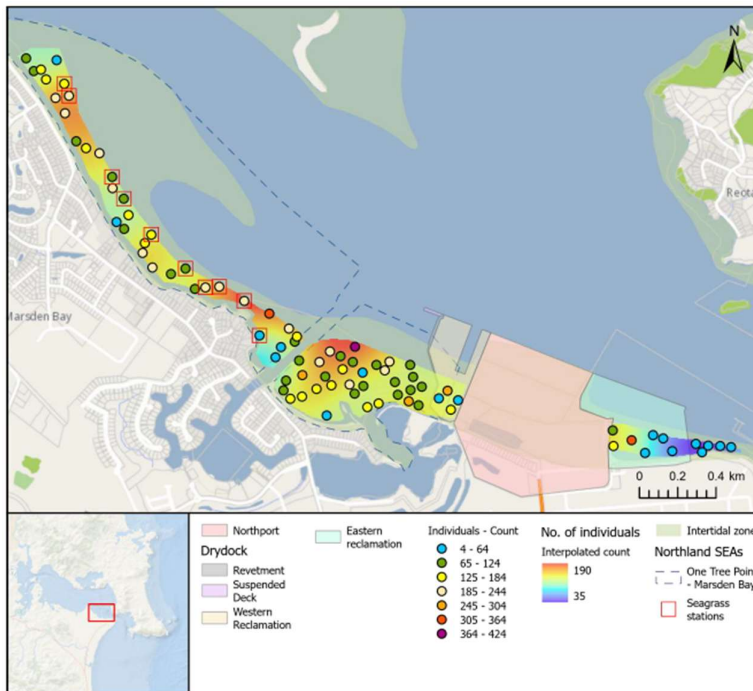


Figure 3: Benthic macroinvertebrate abundance results (Source: Figure 32 in Coast & Catchment (2026))

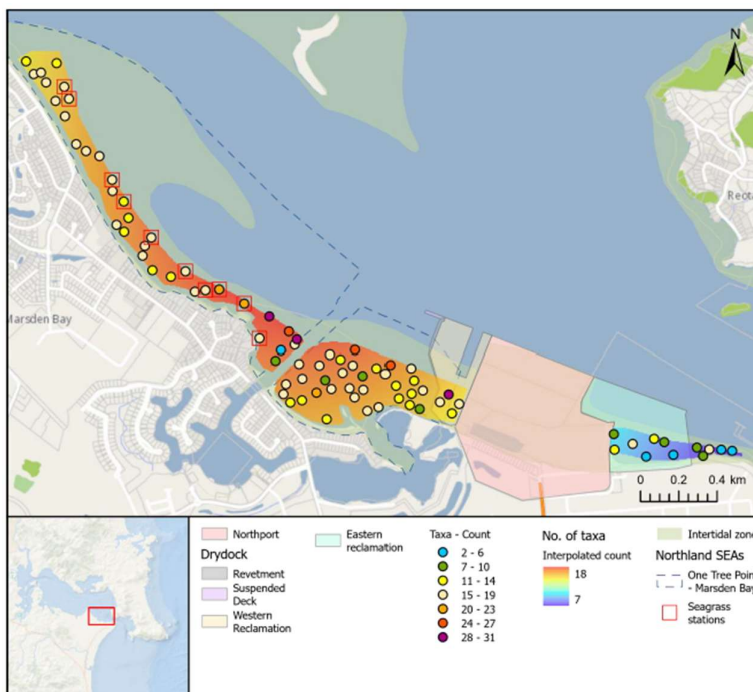


Figure 4: Benthic macroinvertebrate taxa diversity results (Source: Figure 31 in Coast & Catchment (2026))

#### 4.2.2 Pelagic

Coast & Catchment (2022, 2026) report that the fish communities around Northport appear to be similar to those that inhabit nearby reef areas, with leatherjackets, red moki, spotty, sweep, triplefin, kingfish, jack mackerel, two-spot demoiselle, and goatfish commonly observed around the rock revetments of Northport.

For visual pelagic foraging species, turbidity<sup>32</sup> in the water column can impact the ability to detect prey. Results from the State of the environment report (released in 2015) from Northland Regional Council on the water quality of Whangārei Harbour found that all five sample sites (Mair Bank, Marsden Point, Blacksmith Creek, Snake Bank and One Tree Point) in the immediate vicinity of Northport had turbidity medians between 0.6-0.9 NTU, well below the 10 NTU threshold recommended in the ANZ guideline (2018).

### 4.3 Habitat Use

Maps 9 to 14 provide a graphical presentation of the distribution and abundance of the major shorebird groups recorded during the 4Sight wading bird surveys. In summary:

- Dotterels were recorded along much of the coastal margin from One Tree Point to CINZ, as well as the Northport site (Map 9).
- International migrant waders (bar-tailed godwit and lesser knot) were recorded primarily around the Blacksmiths Creek area, though a few godwit were also recorded further west up to One Tree Point and to the east of Northport. A single eastern curlew was recorded at the northern most-end of One Tree Point (Map 10).
- Oystercatchers and stilt were primarily recorded to the east of Northport and adjacent to the Marsden Cove Marina channel but extended all the way to One Tree Point (Map 11).
- Gulls and terns were recorded dispersed along the coast, with large concentrations of red-billed gull to the east of Northport (Map 12).
- Heron and spoonbill were recorded in relatively low numbers along the coast, primarily to the west of Northport (Map 13).
- Shags were recorded in low numbers and primarily associated with the port, though a few birds were recorded in the Blacksmiths Creek / Wildlife Refuge area and along to One Tree Point (Map 14).

To further investigate the distribution of intertidal foraging species relative to available food supply, species count data was overlaid on to the macroinvertebrate abundance heat maps (refer to Maps 15 to 28).

The following sections of this report investigate in greater detail the spatial patterns of use recorded during the 4Sight wading bird surveys to the east (Section 4.3.1) and west (Section 4.3.3) of Northport, as well on the Northport site itself (Section 4.3.2). Four species (Asiatic whimbrel, eastern curlew, black-fronted tern and black-billed gull) were all observed in very low numbers over the course of the four survey periods and as such have not been included in any further data analysis.

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<sup>32</sup> A measure of the degree to which light is scattered in water by particles

### 4.3.1 East of Northport

To the immediate east of Northport, an approximately 750 m beach is bound to the east by the CINZ jetty. The landward extent of the coastal dune that runs behind this beach is approximately 20-30 m wide, with the vegetation cover including spinifex, lupin and pohutukawa. As shown on Map 7, Northport's eastern expansion project footprint will incorporate the majority of this area. An assessment of potential effects of the eastern expansion on coastal avifauna was undertaken as part of the consenting process for that project (Boffa Miskell Ltd, 2022b, 2022a).

Bioresearches (2015, 2020) reported the CINZ jetty as a key roosting area for white-fronted tern, with an average of 93 birds (maximum = 163) roosting during their counts.

Mair and Marsden banks, situated to the east of the jetty (refer to Map 7), have been identified as regionally significant shellfish beds. Bioresearches (2017) reported birds foraging in this area, with black-backed gull, red-billed gull and variable oystercatcher being the most abundant species recorded in the intertidal zone. This area however was not identified as a significant high tide roost.

#### 4.3.1.1 High tide activity

High numbers of shorebirds were recorded within compartments East 1 and East 2 (refer to Map 29 and Table 10), though the diversity of species recorded on the Eastern sites was lower than that recorded at the Western sites (refer to Table 14). Similar levels of densities of birds were recorded in East 1 and East 2 (refer Table 10 and Figure 5).

The species for which the highest mean abundance and densities were recorded in East 1 were SIPO (mean = 77 birds per count, Table 11; 33 birds per hectare; Figure 6) and variable oystercatcher (mean = 40 birds per count, Table 11; 17 birds per hectare, Figure 6). Red-billed gull recorded the highest mean abundance and densities in East 2 (mean = 76 birds per count, Table 11; 43 birds per hectare, Figure 6).

*Table 10: Number of coastal bird species recorded during all high tide eastern wading bird surveys*

| SURVEY LOCATION                                                                     |            | No. SPECIES | TOTAL ABUNDANCE | MEAN BIRD DENSITY (PER Ha) | SURVEY PERIOD                                                                                                                                                |
|-------------------------------------------------------------------------------------|------------|-------------|-----------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Northport  |             |                 |                            |                                                                                                                                                              |
|                                                                                     | HW East 1  | 11          | 6457            | 58.5                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                     | HW East 2  | 9           | 4443            | 53.8                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                     | HW East 3  | 5           | 493             | 8.2                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                     | CINZ jetty |             |                 |                            |                                                                                                                                                              |



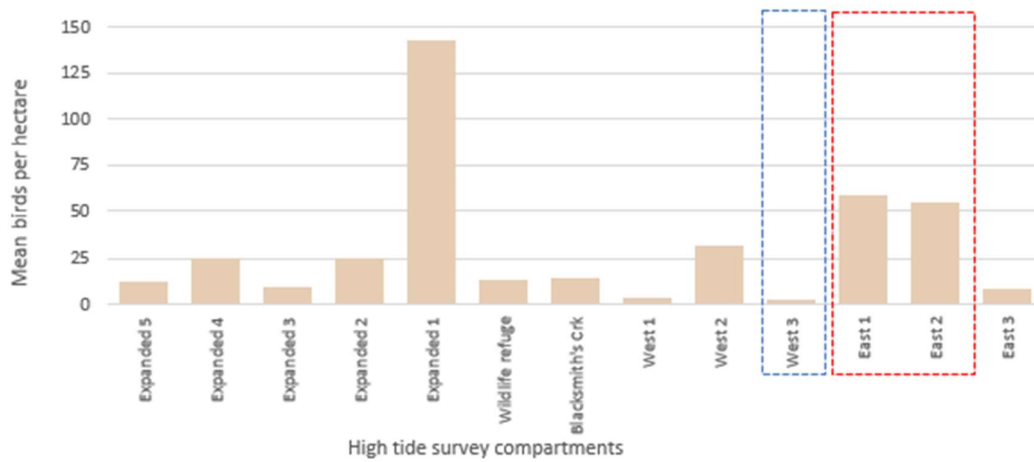


Figure 5: Mean density of birds recorded per hectare in each compartment during high tide for all surveys (Blue and red-dashed boxes denote the survey compartments in which the proposed (western) and consented (eastern) reclamations are located respectively).

Table 11: Mean number of birds recorded per survey session during the high tide wading bird surveys. (Blue and pink arrows denote the survey compartments in which the proposed (western) and consented (eastern) reclamations are located respectively)

| SPECIES            | MEAN No. BIRDS RECORDED PER SURVEY SESSION |       |       |       |       |               |               |        |        |        |        |        |        |
|--------------------|--------------------------------------------|-------|-------|-------|-------|---------------|---------------|--------|--------|--------|--------|--------|--------|
|                    | Exp 5                                      | Exp 4 | Exp 3 | Exp 2 | Exp 1 | W/life refuge | B/smith Creek | West 1 | West 2 | West 3 | East 1 | East 2 | East 3 |
| Banded dotterel    | 0                                          | 0     | 0     | 0     | 0     | 0             | 0             | 0      | 0      | 0      | 0      | 0      | 0      |
| Bar-tailed godwit  | 0                                          | 0     | 0     | 0     | 6.5   | 0             | 16.4          | 1.6    | 52.5   | 0.74   | 0      | 1.5    | 0      |
| Black shag         | 0                                          | 0     | 0     | 0     | 0     | 0             | 0             | 0      | 0      | 0      | 0      | 0      | 0      |
| Caspian tern       | 0                                          | 0     | 0     | 0     | 0.1   | 0             | 0.2           | 0      | 0.1    | 0.05   | 0.43   | 0.04   | 0      |
| Lesser knot        | 0.1                                        | 0.1   | 0.1   | 0.1   | 0.1   | 0             | 8.0           | 0      | 14.0   | 0.49   | 0      | 0      | 0      |
| Little shag        | 0                                          | 0     | 0     | 0.1   | 0     | 0.2           | 0             | 0      | 0      | 0.02   | 0.02   | 0      | 0      |
| NZ dotterel        | 0                                          | 1.4   | 1.9   | 0.5   | 0.3   | 0.0           | 0.1           | 0      | 0      | 0.02   | 0.85   | 0.43   | 0      |
| Pied shag          | 0.2                                        | 0.5   | 0.1   | 0.1   | 0.1   | 0.0           | 0.1           | 0      | 0      | 0      | 0.02   | 0      | 0      |
| Pied stilt         | 0                                          | 0     | 0.2   | 0     | 0.2   | 0.0           | 0.9           | 0      | 1.6    | 1.02   | 0.02   | 0      | 0      |
| Red-billed gull    | 17.4                                       | 20.3  | 12.8  | 7.0   | 22.6  | 0.5           | 3.9           | 5.8    | 1.2    | 0.74   | 18.1   | 76.3   | 12.0   |
| Reef heron         | 0                                          | 0     | 0     | 0     | 0     | 0.3           | 0             | 0      | 0      | 0      | 0.02   | 0      | 0      |
| Royal spoonbill    | 0.4                                        | 0.2   | 0.2   | 0.1   | 0     | 0             | 0.1           | 0      | 0      | 0      | 0      | 0      | 0      |
| SBBG               | 0.3                                        | 0.1   | 0.1   | 0     | 0.6   | 0.9           | 1.8           | 0      | 0.3    | 0.16   | 0.26   | 0.2    | 0.1    |
| SIPO               | 2.1                                        | 0.2   | 2.7   | 0     | 82.5  | 0             | 0             | 0.5    | 0      | 0.02   | 77.4   | 8.0    | 0      |
| VOC                | 1.9                                        | 0     | 0.3   | 0.1   | 6.4   | 1.1           | 1.0           | 0.5    | 0.1    | 0.60   | 40.2   | 9.8    | 0.1    |
| White-faced heron  | 0.2                                        | 0.1   | 0.6   | 0.1   | 0.1   | 1.9           | 0.8           | 0      | 0      | 0.21   | 0      | 0      | 0      |
| White-fronted tern | 0                                          | 0     | 0     | 0     | 0     | 0             | 0             | 0      | 0      | 0      | 0      | 0.1    | 0      |
| Wrybill            | 0                                          | 0     | 0     | 0     | 0     | 0             | 0             | 0      | 0      | 0      | 0.02   | 0.02   | 0.03   |



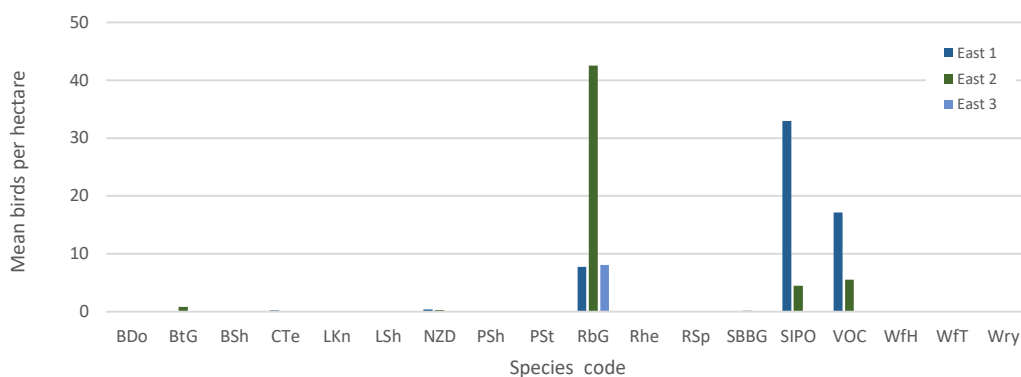


Figure 6: Mean birds recorded per hectare during high tide surveys at the eastern sites over all survey periods (Refer to Table 8 for species codes)

#### 4.3.1.2 Low – mid tide activity

Of the three eastern compartments, the highest number (n=8841) and mean density (34.1 birds per hectare) of birds was recorded in East 2 during the low-mid tide surveys (refer to Map 30, Table 12 and Figure 7). The highest species richness (n=13) was recorded in East 2 and the lowest (n=7) in East 3 (refer to Map 24 and Table 12).

The most abundant species recorded in East 1 were SIPO (mean = 36 birds per count; Table 13), followed by red-billed gull (mean = 34 birds per count; Table 13) and variable oystercatcher (mean = 20 birds per count; Table 13). Red-billed gull was the most abundant species recorded in East 2 (mean = 104 birds per count) (refer to Map 24 and Table 13). The same patterns were observed in the density of these species recorded at those sites (refer to Figure 8).

Table 12: Number of coastal bird species recorded during the low and mid tide eastern wading bird surveys

| SURVEY LOCATION                                                                                                |           | No. SPECIES | TOTAL ABUNDANCE | MEAN BIRD DENSITY (PER Ha) | SURVEY PERIOD                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------|-----------|-------------|-----------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Northport<br><br>CINZ jetty | LW East 1 | 13          | 7293            | 16.0                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                | LW East 2 | 12          | 8814            | 34.1                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                | LW East 3 | 7           | 1861            | 14.1                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |

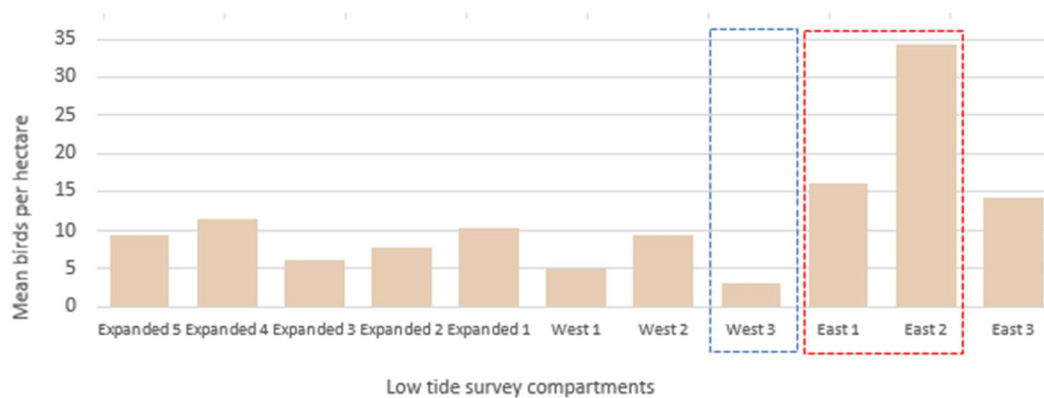


Figure 7: Mean density of birds recorded during low/mid tide surveys over all the survey periods. (Blue and red-dashed boxes denote the survey compartments in which the proposed (western) and consented (eastern) reclamations are located respectively).

Table 13: Mean number of birds recorded per survey session during the low-mid tide wading bird surveys. (Blue and pink arrows denote the survey compartments in which the proposed (western) and consented (eastern) reclamations are located respectively)

| SPECIES            | MEAN No. BIRDS RECORDED PER SURVEY SESSION |       |       |       |       |        |        |        |        |        |        |
|--------------------|--------------------------------------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
|                    | Exp 5                                      | Exp 4 | Exp 3 | Exp 2 | Exp 1 | West 1 | West 2 | West 3 | East 1 | East 2 | East 3 |
| Banded dotterel    | 0.0                                        | 0.08  | 0     | 0     | 0.19  | 2.00   | 0.71   | 0      | 0.03   | 0.01   | 0.00   |
| Bar-tailed godwit  | 7.89                                       | 2.27  | 8.11  | 0.41  | 7.52  | 19.27  | 30.97  | 3.00   | 0      | 0.03   | 0.00   |
| Black shag         | 0.07                                       | 0     | 0     | 0     | 0     | 0.01   | 0      | 0      | 0      | 0      | 0      |
| Caspian tern       | 0.78                                       | 0.08  | 0     | 0.03  | 0.04  | 0.14   | 0.38   | 0.15   | 0.22   | 0.13   | 0.01   |
| Lesser knot        | 0.11                                       | 0.15  | 0.19  | 0.10  | 0.04  | 22.22  | 44.38  | 6.42   | 0      | 0      | 0      |
| Little shag        | 1.04                                       | 0.08  | 0.19  | 0.14  | 0     | 0      | 0.18   | 0      | 0      | 0      | 0      |
| NZ dotterel        | 0.93                                       | 1.42  | 3.04  | 1.21  | 2.20  | 4.43   | 6.38   | 2.28   | 2.26   | 0.59   | 0.04   |
| Pied shag          | 1.00                                       | 0.23  | 0.41  | 0.24  | 0.19  | 0.09   | 0.15   | 0.03   | 0.01   | 0.04   | 0.03   |
| Pied stilt         | 2.26                                       | 1.73  | 2.26  | 0.38  | 0.26  | 0.68   | 1.58   | 0.97   | 0.09   | 0      | 0      |
| Red-billed gull    | 57.74                                      | 41.69 | 35.37 | 7.10  | 9.30  | 16.81  | 28.68  | 10.04  | 34.08  | 103.61 | 23.61  |
| Reef heron         | 0.04                                       | 0.04  | 0.07  | 0.10  | 0     | 0.09   | 0.11   | 0.06   | 0.04   | 0      | 0      |
| Royal spoonbill    | 0.93                                       | 0.65  | 0.63  | 0.59  | 0.07  | 0.04   | 0.32   | 0.16   | 0      | 0      | 0      |
| SBBG               | 14.00                                      | 8.81  | 4.07  | 0.14  | 1.48  | 1.84   | 6.04   | 0.42   | 0.83   | 0.80   | 0.37   |
| SIPO               | 17.30                                      | 10.88 | 7.93  | 1.28  | 42.96 | 8.85   | 3.89   | 0.13   | 36.03  | 4.61   | 0.04   |
| VOC                | 2.00                                       | 4.88  | 1.93  | 0.38  | 3.41  | 1.65   | 2.77   | 1.54   | 19.73  | 6.09   | 0.39   |
| White-faced heron  | 3.81                                       | 1.54  | 3.41  | 0.86  | 0.78  | 0.56   | 2.06   | 0.72   | 0.09   | 0.04   | 0      |
| White-fronted tern | 0.48                                       | 0     | 0     | 0     | 0     | 0.06   | 2.18   | 0.01   | 1.30   | 0.01   | 0      |
| Wrybill            | 0.04                                       | 0     | 0.26  | 0     | 0.04  | 0      | 0      | 0      | 0.01   | 0.01   | 0      |

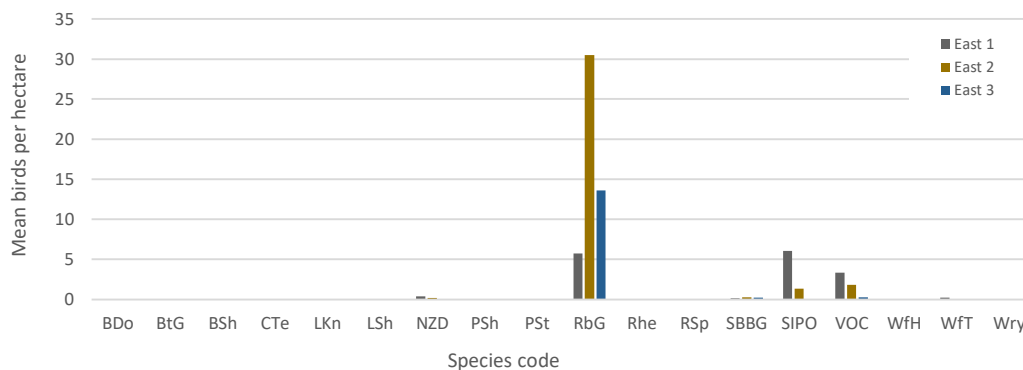


Figure 8: Mean birds recorded per hectare during low and mid tide surveys at the eastern sites over all the survey periods. (Refer to Table 8 for species codes)

Coast & Catchment (2022) reported marked differences between intertidal sites on the western and eastern side of Northport; both the number of individuals (abundance) and taxa (diversity) being higher on the western side (refer to Figure 3 and Figure 4 on page 30). Furthermore, on the eastern side, the intertidal benthic surveys showed a general decrease in macroinvertebrate diversity and abundance moving eastward (refer to Figure 3 and Figure 4 on page 30).

#### 4.3.1.3 Nesting

No nesting wading or shorebird species were recorded during either the 2018/19 or 2019/20 season.

### 4.3.2 Northport

Despite Northport being an active port site, it contains areas of potential shorebird habitat, including large areas of open space, lawns and riprap edges. Surveys of both shorebird nesting and high tide roosts were conducted on the Northport site.

#### 4.3.2.1 High tide activity

Eleven species were recorded on the Northport site during high tide counts (refer to Map 29 and Figure 9), of which, red-billed gull (mean = 19 birds per count) were the most abundant, followed by northern NZ dotterel (mean = 7 birds per count) and variable oystercatcher (mean = 4 birds per count).

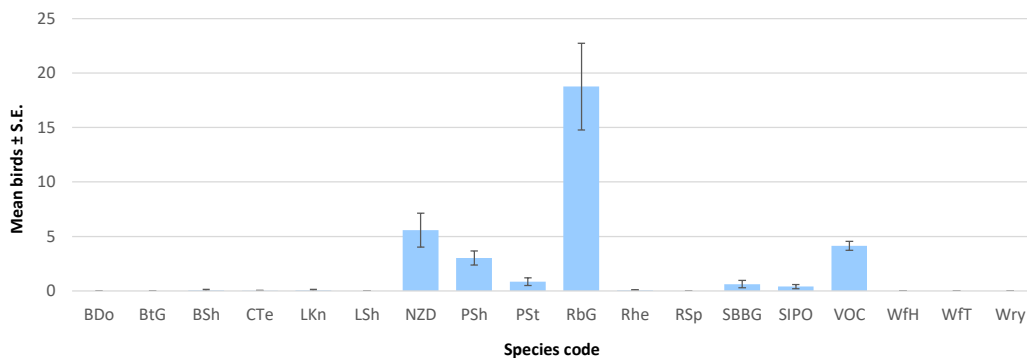


Figure 9: Mean (± S.E.) birds recorded during high tide surveys at Northport survey sites during all the survey periods (Refer to Table 8 for species codes)

#### 4.3.2.2 Nesting

During the 2018/19 survey, variable oystercatchers were recorded breeding on top of the tug bay revetment at the Eastern Site (refer to Map 33). Later in the season (24/1/19), two pairs of variable oystercatcher (each with one chick) and one pair of New Zealand dotterel (with three chicks) were recorded on the Northport site.

During the 2019/20 survey, the Port site had the highest number of nesting birds recorded. This included a pair of northern NZ dotterel successfully raising chicks on top of the coal pile, a pair of variable oystercatcher were seen with chicks on the tug revetment, and a pied stilt was seen on a nest with four eggs next to the molasses pond (refer to Map 33).

The December 2019 kororā survey along the eastern and western riprap of the Northport site detected no sign of nesting birds. While outside of the breeding season, the June 2021 survey of the same area using a DOC-certified conservation dog gave three weak indications along the western riprap (refer to Map 33). Exploration of the crevices that the dog indicated on found no sign of birds or feathers. Another survey of the western revetment using a DOC-certified conservation in March 2026 resulted in no indications of kororā, nor were any signs of kororā (e.g. guano or feathers) observed. Based on the results of these three kororā surveys, spread over a period of six years, we conclude that while potential habitat is present, kororā are currently not nesting in the riprap on Northport's western revetment.

#### 4.3.3 West of Northport

To the west of Northport, an approximately 3.5 km long shoreline extends from One Tree Point to Marsden Bay (refer to Map 2). This area comprises 198 ha of shallow intertidal and subtidal sandy soft bottom habitats.<sup>33</sup> The shellfish, seagrass communities and associated benthic invertebrates have been reported to be a major food source for shorebirds.<sup>33</sup>

Snake Bank, situated to the north-west of Marsden Bay (refer to Map 7), is an extensive fine sand and shell shallow bank which contain a cockle population (Morrison & Parkinson, 2001). Bioresarches (2017) reported an average of 39 birds on the bank, with birds (predominantly SIPO, black-backed gull and variable oystercatcher) common during the low tide period. Snake Bank does not provide a high tide roost.

Urban residential development abuts much of this coastline (see Map 2), and the Marsden Cove Marina channel exits the coast along this stretch of shoreline, as does Blacksmiths Creek. A Department of Conservation (DOC) wildlife refuge (approximately 0.05 ha) is located to the immediate west of the Blacksmiths Creek Estuary mouth (Map 7). Blacksmiths Creek Estuary has been classified as a Protected Natural Area; the 22 ha area contains a diverse mosaic of estuarine and terrestrial vegetation comprising mangrove shrubland, searush-oioi rushland, glasswort herbfield and marsh clubrush sedgeland (Lux et al., 2007). *Threatened* and *At Risk* cryptic marshbirds recorded within Blacksmiths Creek estuary wetland include Australasian bittern, banded rail, spotless crane and North Island fernbird (see Map 6).

##### 4.3.3.1 High tide activity

For the five high tide survey compartments (West 1-3, Blacksmiths Creek and Wildlife Refuge) for which wading bird data was collected over four seasons (summer 2017/18 and 2019/20, and winter 2021 and 2022), Blacksmiths Creek high tide roost recorded the highest species richness

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<sup>33</sup> Significant Ecological Marine Area Assessment Sheet, Whangārei Harbour Marine Values: Area C One Tree Point to Marsden Bay.

(n=14) (refer to Table 14 and Map 29). In terms of overall bird abundance, West 2 recorded the greatest number of birds (n=2999) and highest mean density (31.4 birds per ha; Figure 10) during high tide counts over the four seasons (Table 14).

However, when the data collected from the Expanded survey areas over three seasons (summer 2019/20, and winter 2021 and 2022) are included, the highest mean density of birds (142 birds per ha) overall was recorded at Expanded 1 site (refer to Table 14 and Figure 10).

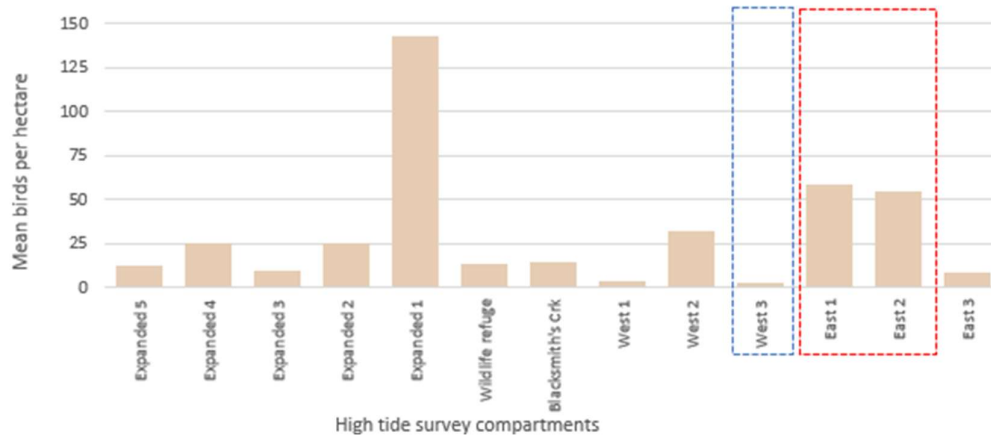


Figure 10: Mean density of birds recorded per hectare in each compartment during high tide for all surveys (Blue and red-dashed boxes denote the survey compartments in which the proposed (western) and consented (eastern) reclamations are located respectively).

Map 29 provides an overall (cumulative) picture of high tide activity based on all data collected during high tide counts, while the mean number of birds recorded during each high tide survey session is provided in Table 11. Notably, bar-tailed godwit and lesser knot were the most abundant species recorded in the high tide roosting flocks at compartment West 2 and Blacksmiths Creek (refer to Map 23, Table 11 and Figure 11).

Map 31 presents the high tide data that were collected during the spring / summer 2019/20 and winter 2021 and 2022, as these were the time periods over which data were also collected for the Expanded area. SIPO were the most abundant species recorded during the high tide counts, with the majority recorded within compartment Expanded 1 (refer to Table 11 and Figure 12), adjacent to the Marsden Cove Marina Channel; notably, this high tide roost is in close proximity to Snake Bank which has been identified as an important foraging site for SIPO (Bioresarches, 2017). With the exception of low numbers of red-billed gull, very few birds were recorded roosting in the remaining Expanded survey areas (refer to Map 30 and Figure 12).

Table 14: Number of coastal bird species recorded during the high tide western (and expanded) wading bird surveys

| SURVEY LOCATION                                                                                                                   |                   | No. SPECIES | TOTAL ABUNDANCE | MEAN BIRD DENSITY (PER Ha) | SURVEY PERIOD                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------|-----------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>One tree Point</div>  <div>Northport</div> | Expanded 5        | 8           | 363             | 11.8                       | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                                                                                                   | Expanded 4        | 8           | 387             | 24.7                       | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                                                                                                   | Expanded 3        | 10          | 322             | 9.6                        | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                                                                                                   | Expanded 2        | 8           | 15              | 25                         | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                                                                                                   | Expanded 1        | 11          | 2033            | 142.4                      | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                                                                                                   | Wildlife refuge   | 9           | 218             | 13.3                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                                   | Blacksmiths Creek | 14          | 1570            | 14.3                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                                   | HW West 1         | 5           | 377             | 2.9                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                                   | HW West 2         | 10          | 2999            | 31.4                       | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                                                                                                   | HW West 3         | 11          | 176             | 2.7                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |

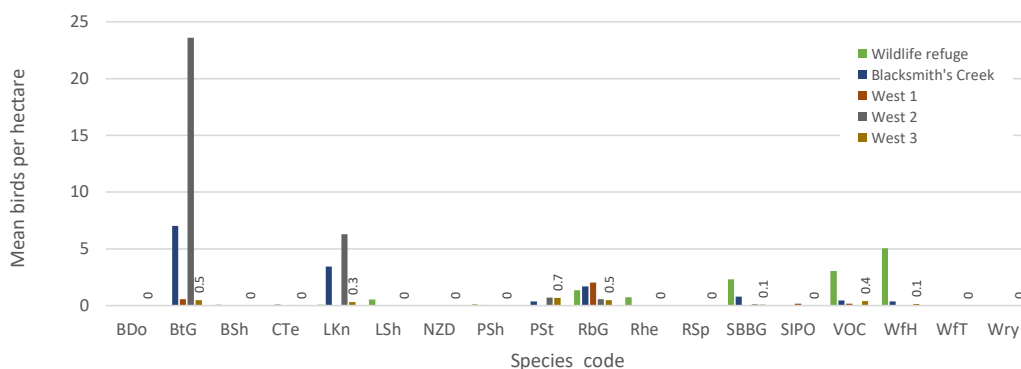


Figure 11: Mean birds per hectare for each species recorded during high tide surveys at the western sites (Refer to Table 8 for species codes)

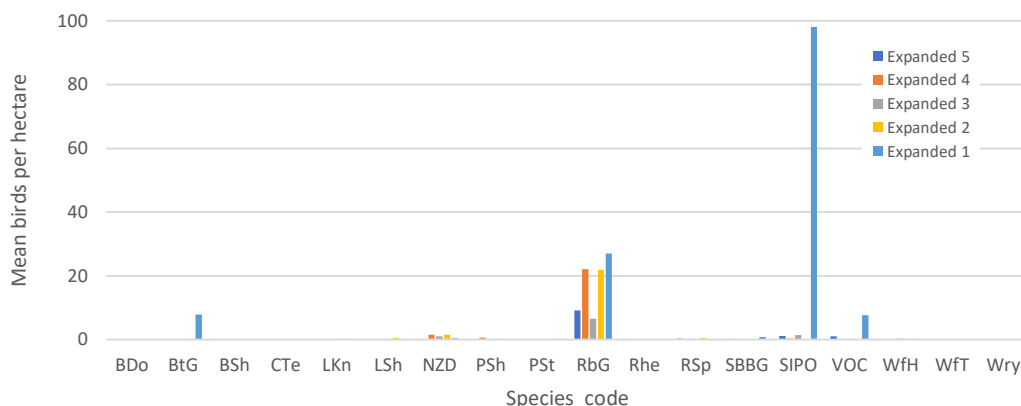


Figure 12: Mean birds per hectare recorded during high tide surveys at the expanded sites during summer 2019/20 and winter 2021 and 2022 survey periods. (Refer to Table 8 for species codes)

#### 4.3.3.2 Low – mid tide activity

For the three compartments (West 1-3) for which wading bird data was collected during the low and mid-tide phases over four seasons (spring / summer 2017/18 and 2019/20, and winter 2021 and 2022), highest species richness ( $n=16$ ) and total bird abundance ( $n=10,332$ ) were recorded at West 2 (Table 15). Over the same period, the least number of birds ( $n=2049$ ) were recorded in West 3, the survey compartment immediately adjacent to the port (Table 15).

Figure 7 (page 35) shows the mean number of birds recorded per hectare at each of the sites during low-mid tide surveys. Thus, even when accounting for differences in the size of the various compartments, the lowest density of birds was recorded within West 3, immediately adjacent to Northport. Of the western sites, the greatest density of birds was recorded in compartment Expanded 4 (Table 15 and Figure 7).

Map 30 provides an overall picture of activity based on all data collected over the low and mid-tide counts. Lesser knot were the most abundant species recorded, and while observed utilising all three western compartments, their average numbers (mean = 44 birds; Table 13) and densities (3.1 birds per hectare; Figure 13) were highest in West 2. Bar-tailed godwit were also prevalent in compartments West 1 and West 2 (refer to Table 13 and Figure 13). Northern NZ

dotterel were recorded in all western compartments, but in relatively low numbers (refer to Table 13 and Figure 13).

Table 15: Number of coastal bird species recorded during the low and mid tide western (and expanded) wading bird surveys

| SURVEY LOCATION                                             |            | No. SPECIES | TOTAL ABUNDANCE | MEAN BIRD DENSITY (PER Ha) | SURVEY PERIOD                                                                                                                                                |
|-------------------------------------------------------------|------------|-------------|-----------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>One Tree Point</div> <div>↓</div> <div>Northport</div> | Expanded 5 | 17          | 2981            | 9.4                        | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                             | Expanded 4 | 15          | 1938            | 11.4                       | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                             | Expanded 3 | 14          | 1832            | 6.1                        | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                             | Expanded 2 | 14          | 376             | 7.7                        | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                             | Expanded 1 | 15          | 1712            | 10.1                       | <ul style="list-style-type: none"> <li>• Summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul>                                             |
|                                                             | LW West 1  | 16          | 6219            | 4.9                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                             | LW West 2  | 16          | 10,332          | 9.2                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |
|                                                             | LW West 3  | 14          | 2049            | 2.9                        | <ul style="list-style-type: none"> <li>• Spring / summer 2017/18</li> <li>• Spring / summer 2019/20</li> <li>• Winter 2021</li> <li>• Winter 2022</li> </ul> |

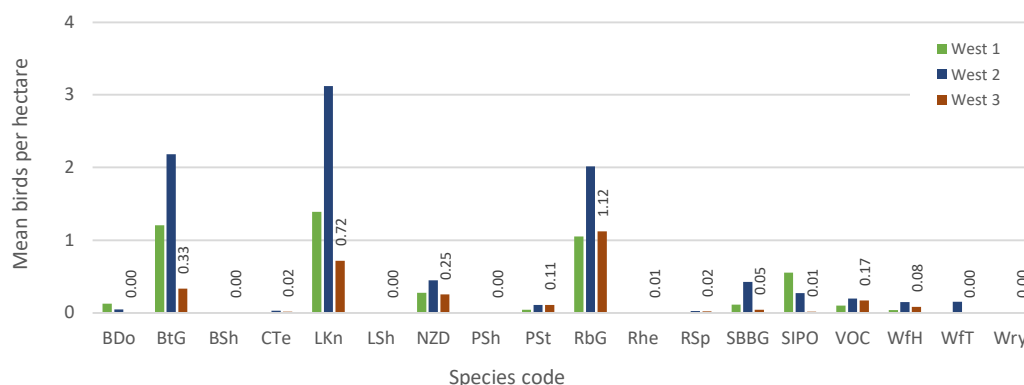


Figure 13: Mean birds recorded per hectare during low and mid tide surveys at the west (1-3) sites over all survey periods. (Refer to Table 8 for species codes)



Map 32 presents the low and mid-tide data that was collected during the spring / summer 2019/20 and winter 2021 and 2022 surveys, as these were the time periods over which data were also collected for the Expanded area. All Expanded areas were utilised during these tidal phases, however the mean bird density differed between the compartments; the highest mean bird density was recorded in Expanded 4 (11.4 birds per hectare) and the lowest in Expanded 3 (6.1 birds per hectare; Table 15). Red-billed gull were the predominant species recorded at Expanded Areas 2-5, while SIPO was the predominant species recorded at Expanded Area 1 (refer to Figure 14 and Map 32).

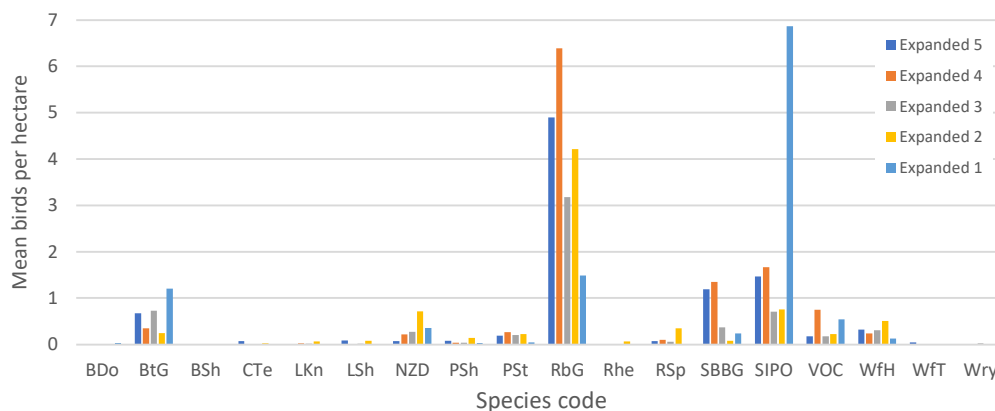


Figure 14: Mean birds recorded per hectare during low and mid tide surveys at the expanded sites during summer 2019/20 and winter 2021 and 2022 survey periods. (Refer to Table 8 for species codes)

#### 4.3.3.3 Nesting

Variable oystercatcher were confirmed breeding within the Blacksmiths Creek mangrove survey area during both the 2018/19 and 2019/20 seasons, as well as on the Northport west revetment in 2019/20 (refer to Map 33).

#### 4.3.4 Wider lower harbour

Beauchamp & Parrish (2007) identified Marsden Bay and Ruakākā Estuary as wading bird roosting sites within the lower (outer) Whangārei Harbour. Marsden Bay was reported to be an important (having >75% of a species total count at one location during any high tide) roosting site for SIPO, while Ruakākā Estuary was identified as an important roosting site for SIPO, variable oystercatcher, northern NZ dotterel, banded dotterel and ruddy turnstone. Beauchamp & Parrish (2007) reported that based on the wading bird counts since 1970's, the loss of a roost site was not critical to SIPO, variable oystercatcher, pied stilt, lesser knot or bar-tailed godwits because they were all well distributed amongst the roosts sites around the Whangārei Harbour at high tide. However, for some species, such as royal spoonbill, wrybill, banded dotterel, and Pacific golden plover, that use only a few sites, the loss of a single site may be more problematic. In terms of feeding resources, Beauchamp & Parrish (2007) report that the wading bird count data from the Whangārei Harbour and Ruakākā Estuary suggests that food resources are not limiting birds there.

Channel Infrastructure's Marsden Point site provides safe breeding habitat for northern New Zealand dotterel (>20 pairs) as well as red-billed gulls (>1,000 pairs) (Frost & Taylor, 2018a; Northland OSNZ, 2013).

Bioresearches' (2017) coastal bird surveys at eight locations around the wider lower harbour identified the relative importance of each of these locations as feeding and roosting habitat for gulls and wading birds (refer to Table 16). The key findings at each of those sites are as follows:

- Bream Bay beach:
  - Low species diversity (n=6) – Red-billed gull (53.3%), black-backed gull (20.7%), variable oyster catcher (13.3%), white-fronted tern, Caspian tern and Australasian gannet.
  - Primarily used by gulls as a resting / roosting habitat (Table 16).
- Mair Bank (refer to Map 7):
  - Moderate species diversity (n=10) – Black-backed gull (max = 196), red-billed gull (max = 70), variable oystercatcher (max = 66), Caspian tern, little shag, northern NZ dotterel, pied shag, pied stilt, SIPO and white-faced heron.
  - Predominant habitat use was resting (Table 16), primarily black-backed gull and but occasional Caspian tern, red-billed gull and variable oystercatcher.
  - Of the few feeding records, 5.7% were on the beach, 19.9% on the inner bank and 74.4% on the outer bank.
- CINZ jetty to Northport:
  - Moderate species diversity (n=10) – SIPO (max = 437), red-billed gull (max = 154), variable oystercatcher (max = 60), black-backed gull, Caspian tern, northern NZ dotterel, pied shag, pied stilt, spur-wing plover, white-fronted tern.
  - Dominant habitat use was resting rather than feeding (Table 16).
- One Tree Point refer to Map 2):
  - High species diversity (n = 15) – Black-backed gull (max = 114), white-fronted tern (max = 71), bar-tailed godwit (max = 60), red-billed gull (max = 58), variable oystercatcher (max = 54), lesser knot (max = 37), Caspian tern, curlew, little shag, mallard, northern NZ dotterel, paradise shelduck, pied stilt, SIPO and white-faced heron.
  - Approximately equal use for feeding and resting (Table 16), but no high tide wading roost habitat.
- Snake Bank (refer to Map 7):
  - Moderate species diversity (n = 8) – SIPO (max = 63), black-backed gull, bar-tailed godwit, little shag, red-billed gull, variable oystercatcher, white-faced heron and white-fronted tern.
  - Feeding the predominant activity (Table 16), and primarily by SIPO.
  - Differs from Mair Bank in that black-backed and red-billed gulls were not as prominent, and SIPO rather than variable oystercatcher was the most common oystercatcher species.
  - This site is a shore commute from birds roosting at Marsden Bay.
- Reotahi Bay:
  - Low species diversity (n = 6) – red-billed gull (77.6%), white-fronted tern (10%), black-backed gull, Caspian tern, white-faced heron and variable oystercatcher.
  - Almost exclusively (98.2%; Table 16) for resting (in the intertidal area) or roosting on poles, boulders and trees.

- Taurikura Bay:
  - Moderate species diversity (n = 11) – red-billed gull (~75%), Australasian gannet, black-backed gull, Caspian tern, kingfisher, little shag, pied shag, red-billed gull, reef heron, spur-wing plover, variable oystercatcher and white-faced heron.
  - Primarily resting habitat (Table 16).
- Urquharts Bay (refer to Map 1):
  - Moderate – high species diversity (n = 12) - Australasian gannet, black-backed gull, Caspian tern, little shag, pied shag, red-billed gull, reef heron, SIPO, spur-winged plover, variable oystercatcher, white-faced heron and white-fronted tern.
  - Main activity recorded was resting and roosting, primarily by gulls.

Table 16: Comparative population composition and habitat use (source: Table 1 in Bioresearches (2017))

|                      | Bream Bay Beach | Mair Bank | CINZ jetty to Northport | One Tree Point | Snake Bank | Reotahi Bay | Taurikura Bay | Urquharts Bay |
|----------------------|-----------------|-----------|-------------------------|----------------|------------|-------------|---------------|---------------|
| % feeding            | 11.8            | 17.5      | 1.5                     | 47.6           | 63.5       | 1.8         | 20.9          | 23.3          |
| % resting / roosting | 88.2            | 83.5      | 98.5                    | 52.4           | 36.5       | 98.2        | 79.1          | 76.7          |
| % wading birds       | 13.3            | 16.1      | 65.1                    | 34.4           | 84.2       | 4.2         | 12.1          | 23.9          |
| % gulls              | 74.0            | 82.9      | 31.0                    | 42.3           | 12.9       | 84.4        | 81.1          | 68.2          |

## 5.0 Summary of Ecological Values & Significance

An assessment of effects is informed by the relevant statutory planning framework. Relevantly here, Appendix 5 of the Northland Regional Policy Statement (NRPS; NRC (2016)) outlines the criteria (representativeness, rarity / distinctiveness, diversity and pattern, ecological context) on which sites in Northland are assessed for ecological significance. On the basis of those criteria, the 198 ha area ("Area C"<sup>34</sup>) of shallow intertidal and subtidal sandy soft bottom habitats stretching from One Tree Point to Marsden Bay has been identified as a Significant Ecological Area (SEA). This area has been identified as Significant Bird Area in the Northland Regional Plan as shown in Map 1.

Blacksmiths Creek Estuary was identified by Lux (2007) as Recommended Area for Protection (RAP Q07/144), with a total area of 22.0 ha (comprising 19.4 ha estuary, 2.4 ha shrubland, 0.3 ha wetland). Lux (2007) noted that Blacksmiths Creek supports the third largest area of estuarine habitats in the ED, contains a diverse mosaic of estuarine, freshwater and terrestrial vegetation and is habitat for a banded rail and Australasian bittern. Within Blacksmiths Creek Reserve, the Northland Regional Plan denotes an area of Significant Bird Area – Critical Bird Habitat (Australasian bittern) (shown in Map 7).

With regard to ecological value, all New Zealand biota have been assessed by DOC against a standard set of criteria (described in Townsend et al. (2008)) and lists published for each taxonomic group. This provides a consistent basis on which to assign ecological value for individual species. In Table 17 below, ecological values have been assigned using the EIANZ criteria (refer to Table 4) to each of the coastal and estuarine avifauna species which have been

<sup>34</sup> Significant Ecological Marine Area Assessment Sheet

recorded present in the wider Marsden Bay and Blacksmiths Creek areas. The 13 native species recorded utilising the West 3 compartment comprises three species that are considered to have Very High value, three species of High value, three species of Moderate value and four species of Low value (Table 17).

Table 17: Coastal and estuarine avifauna species values for birds recorded within the zone of influence<sup>11</sup>

| SPECIES                    | THREAT CLASSIFICATION                     | ECOLOGICAL VALUE <sup>35</sup> | WEST 3 |         |
|----------------------------|-------------------------------------------|--------------------------------|--------|---------|
|                            |                                           |                                | High   | Low-mid |
| Australasian bittern       | <i>Threatened - Nationally Critical</i>   | Very High                      |        |         |
| Reef heron                 | <i>Threatened - Nationally Endangered</i> | Very High                      |        | ✓       |
| Caspian tern               | <i>Threatened - Nationally Vulnerable</i> | Very High                      | ✓      | ✓       |
| Northern NZ dotterel       | <i>Threatened - Nationally Increasing</i> | Very High                      | ✓      | ✓       |
| Wrybill                    | <i>Threatened - Nationally Increasing</i> | Very High                      |        |         |
| Banded dotterel            | <i>At Risk - Declining</i>                | High                           |        |         |
| Banded rail                | <i>At Risk - Declining</i>                | High                           |        |         |
| Bar-tailed godwit          | <i>At Risk - Declining</i>                | High                           | ✓      | ✓       |
| Lesser knot                | <i>At Risk - Declining</i>                | High                           | ✓      | ✓       |
| North Island fernbird      | <i>At Risk - Declining</i>                | High                           |        |         |
| Red-billed gull            | <i>At Risk - Declining</i>                | High                           | ✓      | ✓       |
| SIPO                       | <i>At Risk - Declining</i>                | High                           | ✓      | ✓       |
| Spotless crake             | <i>At Risk - Declining</i>                | High                           |        |         |
| White-fronted tern         | <i>At Risk - Declining</i>                | High                           |        |         |
| Pied shag                  | <i>At Risk - Recovering</i>               | Moderate                       |        |         |
| Variable oystercatcher     | <i>At Risk - Recovering</i>               | Moderate                       | ✓      | ✓       |
| Black shag                 | <i>At Risk - Relict</i>                   | Moderate                       |        |         |
| Little shag                | <i>At Risk - Relict</i>                   | Moderate                       | ✓      |         |
| Royal spoonbill            | <i>At Risk - Naturally Uncommon</i>       | Moderate                       |        | ✓       |
| Pied stilt                 | <i>Not Threatened</i>                     | Low                            | ✓      | ✓       |
| Southern black-backed gull | <i>Not Threatened</i>                     | Low                            | ✓      | ✓       |
| White-faced heron          | <i>Not Threatened</i>                     | Low                            | ✓      | ✓       |

## 6.0 Project Description

The information presented in this Section of the report has been taken from Beca (2026).

The key components of the Project include:

- reclamation of approximately 9.7 ha;
- a 'cutout' to the reclamation where a vessel haul out system is to be located, being a floating drydock or potentially shiplift or other lifting mechanism;
- construction of a piled wharf structure to accommodate vessels either temporarily (before/after haul out), or for extended periods where works not requiring haul out can be undertaken;

<sup>35</sup> As per the EIANZ criteria defined in Table 4

- capital and maintenance dredging associated with construction and ongoing operation of the marine maintenance operations facility, including a berth pocket and a vessel turning basin to provide for safe navigation;
- fixed plant and buildings to accommodate marine maintenance activities and materials;
- sufficient working and laydown areas for marine maintenance operations, including the ability to transfer vessels to hardstand;
- access to and around the marine maintenance operations facility, including a landside area for staff carparking; and
- public access around the edge of the reclamation to a public fishing platform.

## 6.1 Construction Phase Sequence & Methods

The construction will require the following main components:

- Dredged turning circle including berthing area
- Dredged lift device pocket
- Reclamation of seabed for hardstand and facilities, contained by:
  - Piled quay walls
  - Sloped rock revetments
- Open piled finger pier jetty for berthing on the northern face.
- Road access including the provision of services and utilities to the site
- Paving, drainage, lighting and utility provision across the site
- Associated buildings and facilities.

The overall construction period is approximately 3 years from mobilisation to completion of the civil infrastructure work. It is expected that there would be a further or overlapping period of approximately 12 to 18 months to complete the development of the buildings for the initial NDD establishment. Following the civil infrastructure completion, allowance of a period of approximately 6 months for the installation and commissioning of the shiplift device. Figure 15 below shows an Indicative Construction Programme Gantt Chart for the Project.



Figure 15: Indicative Construction Programme Gantt Chart (Source: Beca (2026))

### 6.1.1 Site Investigations

- Marine and landside boreholes and testing.

### 6.1.2 Site Establishment and Clearance

- An area close to the site on either Northport or Marsden Maritime land would be required for the contractor's site and offices.
- The Perimeter Road access along the SW boundary of Northport land would be created and the movement of the ISPS fencing and services and utility changes undertaken.

### 6.1.3 Reclamation Containment Structures

#### 6.1.3.1 Rock revetment

- This structure will typically be constructed from landside and be formed by either placing cement stabilised silt-clay dredgings or end tipping of locally quarried rock core material with an outer perimeter rock armour protection. As this structure reaches the deeper water an element of the structure may be constructed using marine split hopper barges to place larger quantities of material on the base and avoid road haulage.
- The inner face of this structure would typically be lined with a geofabric to contain the fill placed during the dredge and reclaim phase.
- There is a potential that the beach and bed profile that will form the substructure for this structure may require some grading and preparation and this would likely be undertaken by excavator/backhoe and materials moved to disposal of containment areas.

#### 6.1.3.2 Piled structures

Two alternatives are presented for the piled wall perimeter wall:

- Conventional Construction Methodology
  - The remainder of the reclamation containment will likely be formed by the installation of an 'Anchored Combi-Wall' type structure which would essentially be constructed of a steel tube and sheet piled front wall with steel tie rods running back through the reclamation to a rear sheet piled anchor wall.
  - It is anticipated that piling work will be undertaken from marine plant. However, some contractors may elect to build a temporary work platform to allow the construction to proceed without floating plant. This work platform would be moved along the wharf face as it is constructed.
  - As the foundation materials are generally soils (i.e. not rock) piles would be installed using Vibratory hammer driving techniques. Some piles will need to also be driven with an impact hammer to confirm their load capacity and/or reach final embedment depth where pile is "hung up" on a very dense sand layer.
  - With the front wall in place the dredge and reclaim activity can commence and the two activities will overlap so that the rear anchor wall can be placed using landside plant on the first phase of the reclamation. With the anchor wall

installed the remainder of the dredging will be undertaken and the fill level brought up to final formation level.

- Co-ordinated Construction Methodology for Drydock Berth Slot
  - An alternative construction methodology can be considered, provided there is well planned coordination between the piling and dredging activities. This option requires the development of working platforms for the piling activity with dredged fill, some of which will have to be removed after the combi-wall is complete. This is particularly applicable to the drydock berth slot. The existing water depth in this area is generally between 5m and 10m below Chart Datum. This area would be filled to say 1m above MHWS in an area inside the area contained by the combi wall for a work area for the crane. The fill would be placed at its natural angle of repose resulting in some being deposited in the drydock slot area.
  - As the combi-wall proceeds, the rear anchor wall can follow behind using landside plant. Once a sufficient length of the wall is completed, the berth slot can be dredged to design depth and the material used to bring the area behind the wall to final level.

#### **6.1.4 Dredging and reclamation**

- Based on the information available the dredge materials are likely to be suitable for the formation of the reclamation, and the aim is to find a cut and fill balance that leaves little to no offsite disposal.
- The dredging work will potentially be phased but based on the project being completed in one phase the work is likely to be undertaken using the combination of a cutter suction dredger and a backhoe dredger. All materials would be pumped into the containment area or cut and placed in barges for controlled bottom dumping using split hopper barges.
- It is likely that in order for the site (reclamation area) to be functional in the time periods required that there would need to be a ground improvement activity in order to reduce post construction settlement and also to meet liquefaction risk requirements. This activity is likely to involve one or other of the following:
  - Vibrocore / vibro replacement compaction
  - Wick drain installation
  - Rolling overburden (short term excess loading)
  - Roller compaction.

#### **6.1.5 Jetty Structure**

- The jetty structure will be an open piled structure formed of driven steel pile reinforced concrete piles supporting a reinforced concrete deck structure. The piles will be driven using vibro hammer techniques with final driving undertaken with hammer technique.
- These piles will be installed either from working out from land or by marine plant with the deck structure formed with either precast and in-situ slab or in-situ only concrete slab.

### **6.1.6 Lift device**

#### **6.1.6.1 Floating Dry Dock**

- It is expected that the floating drydock would be fabricated in a major far east shipyard, followed by systems tests at the dockyard. The drydock would then be towed to site, installed and final commissioning testing undertaken.

#### **6.1.6.2 Shiplift**

- It is expected that the lift platform would be fabricated offsite then barged or shipped to site, assembled and installed before final commissioning tests would be undertaken.

### **6.1.7 Paving, Utilities and Services**

- On completion of the placement and improvement of the reclamation service and utility trenches and corridors will be established prior to the placement of paving and the development of and lighting and other such above grade services.

### **6.1.8 Buildings**

- Buildings will likely require piled or slab foundations designed and constructed to meet any settlement requirements.
- The buildings will likely include offices and industrial steel framed sheds all of which will likely have all materials delivered by road.

## **6.2 Operational Activities**

### **6.2.1 Vessel size & type**

The facility has design capacity to accommodate vessels ~50-230 m in length with displacement between 500-28,000 tonne.

The frequency and type of vessels will vary. It is anticipated that RNZN logistics vessels and Cook Strait ferries being regular dockings, with foreign going vessels dockings varying due to vessel schedule and charter changes. Other vessel types will include Navy logistics ship or fleet tanker, Ro-Ro passenger ferry, cargo ship / bulker, commercial tanker, small cruise ship, research vessel, offshore supply boat, superyacht, fishing vessel, barge / workboat.

Vessels will be docked for up to 21 days on average. This means that approximately 12-24 vessels per year per dock/hardstand location may be handled. The variance is due to individual vessel requirements, for instance, a 3-month RNZN vessel docking could materially impact the schedule.

### **6.2.2 Types of work undertaken**

Vessels will be either to undertake work, or in some cases, worked on while berthed at the jetty structure. Activities undertaken will include all necessary maintenance, repairs, and servicing including but not limited to fabrication, mechanical fitting, blasting, and painting. Of note:



- Vessels will generally not be encapsulated, except in unusual circumstances (i.e. when docked for a period longer than 21 days). In those circumstances, vessels may be encapsulated utilising scaffolding and plastic wrap.
- Blasting will either be water blasting, wet abrasive blasting, and in some cases vacuum blasting will be used.

External painting will be by spraying for underwater hull areas, within the floating drydock. Continuous (real time) monitoring and adherence to atmospheric conditions will be required to avoid paint overspray. For all other parts of vessels (upper hull and superstructure), paint will be applied using roller/brush, unless encapsulated. Note that if a shiplift were utilised instead of a floating drydock, and on the hard stand, all external painting will be by brush/roller, unless encapsulated.

Work will be facilitated by a range of fixed and mobile plant, including the floating drydock (or shiplift), mobile cranes, travelling, or gantry crane (if fitted), elevated work platforms/booms/skyjacks, forklifts, vacuum suction trucks, diesel and electric air compressors, diesel generators, and diesel drive high pressure blasting equipment.

- Noise generating activities will include berthing / departure, dock / undock process, tug movements, movement of floating drydock (or shiplift), crane movements (including warning tones), high-pressure water blasting, ultra-high-pressure water blasting, wet-abrasive blasting, vacuum blasting, spray painting (including relief valves), diesel and electric air compressors (prime mover plus relief valves), diesel generators, diesel drive blasting equipment, portable ventilation fans, elevated work platforms (including warning tones), forklifts (including warning tones), car and truck traffic noise, and ships installed ventilation systems (running alongside and when docked).
- Physical noise attenuation is not proposed, except through design such as locating buildings on the western/southern edge of the reclamation, to provide some acoustic attenuation for the Albany Road residents. Beyond this, noise will principally be managed using procedural controls.
- Primary traffic-generating activities will be employee and contractor vehicles, material deliveries, waste removal trucks, occasional surge traffic for visiting vessels/major projects/operational activities, and service vehicles such as couriers.
- There will be some hazardous substances stored on site. Paint will be delivered to order. Fuel will be removed from vessels prior to haul out.
- General operational stormwater runoff associated with rainfall will be collected, pre-treated and discharged to an extension of the Northport collection canals network. Whereas runoff generated from specific activities such as water blasting, pressure washing or wet-blasting will be routed to containment for discharge to the Whangarei District Council wastewater system under a trade waste license.

### 6.2.3 Operating hours

The facility requires the ability to operate 24 hours a day, seven days a week, 365 days of the year, as required, noting that:

- Normal working operations will be based on 7am-6pm, 7 days. Sunday working will be required for 'time critical' dockings, but for longer repair periods, i.e. vessels docked for

greater than 21 days, Mon-Sat will suffice. There needs to be the ability to move to two shifts (likely 2x 10hrs) where necessary.

- High noise-generating activities such as hull preparation and grinding will be restricted to 7am-6pm.
- Other works, including managed fabrication (welding) can occur beyond these times but restricted to maximum noise levels.
- Vessel docking/undocking will need to be completed when environmental conditions (tides, wind) allow.

## 7.0 Assessment of Potential Effects of the Proposal

The following potential construction and operational phase effects (both direct and indirect) on coastal avifauna were considered for this assessment:

- Direct / permanent loss of habitat (Section 7.1);
- Mortalities (Section 7.2);
- Disturbance and displacement (effective habitat loss) (Section 7.3);
- Food supply and foraging ability (Section 7.4);
- Artificial lighting (Section 7.5);
- Pollution (Section 7.6); and
- Relocation of the consented high tide roost (Section 7.7).

We have determined the magnitude of effect at the local scale; that being the wider Whangārei Harbour. This includes the coastline and harbour waters to the west of a line drawn from Busby Head in the north to Ruakākā Estuary in the south (refer to Map 1). We present the overall level of each of these potential effects, taking into account impact management developed during project shaping.

The results of this assessment are then used to inform an assessment of cumulative effects which is provided in Section 8.0 below.

### 7.1 Direct / Permanent Loss of Habitat

#### 7.1.1 Potential construction effects

The Project will result in permanent loss of coastal / marine and terrestrial habitats associated with the reclamation and carpark respectively.

The proposed carpark footprint is approximately 1.28 ha and comprises mown exotic grass (see Appendix 1, Photo 19) which may provide foraging habitat for native *Not Threatened* species such as pukeko, white-faced heron and paradise shelduck. Given there is extensive similar habitat in the wider area, the permanent loss of this habitat will not impact these species.

The eBird data included a record of an Australasian bittern in the roadside drain to the west of the proposed carpark (refer to Map 6 for location and Photo 1 below of that location). This drain provides ideal foraging habitat for Australasian bittern; however, the side of the road on which the proposed carpark is located contains no such drain structure (see Appendix 1, Photo

19). As such, the loss of the terrestrial habitat within the carpark footprint will not impact Australasian bittern.

In terms of the coastal marine environment, the Project reclamation and dredging will result in the permanent loss of approximately 5.5 ha of intertidal foraging habitat which equates to ~0.12% of the intertidal area within the wider Whangārei Harbour.



*Photo 1: Roadside drain on opposite (western) side of road to the proposed car park*

The mean number of shorebirds recorded during each low-mid tide survey session is provided in Table 13; it is during this tidal phase that the intertidal foraging habitat is available to birds. A total of 14 species were recorded in compartment West 3 during low-mid tide survey, and it is those species which will be directly impacted by the reclamation footprint. However, as shown in Table 18, the number of birds recorded in West 3 was generally only a small proportion of the mean of all birds recorded across the entire survey sites, and an even smaller proportion of the local Whangārei Harbour populations. In the case of northern NZ dotterel, on average 9.2% of the birds recorded during a survey were observed in compartment West 3, but those birds recorded in West 3 comprised 2.85% of the local Whangārei Harbour population.

*Table 18: Mean number of birds recorded in compartment West 3 (W3) during the low-mid tide wading bird surveys, and that as a proportion of the sum of the means of birds recorded across all survey sites and the Whangārei Harbour populations.*

| SPECIES           | EST. WHANGĀREI HBR POP | LOW-MID TIDE         |                               |                      |                                   |
|-------------------|------------------------|----------------------|-------------------------------|----------------------|-----------------------------------|
|                   |                        | Mean No. birds in W3 | Sum of means all survey sites | % of birds within W3 | % of Whangārei Hbr pop. within W3 |
| Banded dotterel   | ~700 birds             | 0.00                 | 3.0                           | 0.00%                | 0                                 |
| Bar-tailed godwit | ~2,800 birds           | 3.00                 | 79.5                          | 3.78%                | 0.11%                             |
| Black shag        | >10 birds              | 0.00                 | 0.1                           | 0.00%                | 0                                 |

| SPECIES            | EST. WHANGĀREI HBR POP | LOW-MID TIDE         |                               |                      |                                   |
|--------------------|------------------------|----------------------|-------------------------------|----------------------|-----------------------------------|
|                    |                        | Mean No. birds in W3 | Sum of means all survey sites | % of birds within W3 | % of Whangārei Hbr pop. within W3 |
| Caspian tern       | 50-100 pairs           | 0.15                 | 2.0                           | 7.74%                | 0.15%                             |
| Lesser knot        | ~800 birds             | 6.42                 | 73.6                          | 8.72%                | 0.80%                             |
| Little shag        | >10 birds              | 0.00                 | 1.6                           | 0.00%                | 0                                 |
| NZ dotterel        | ~80 birds              | 2.28                 | 24.8                          | 9.20%                | 2.85%                             |
| Pied shag          | >50 birds              | 0.03                 | 2.4                           | 1.05%                | 0.05%                             |
| Pied stilt         | ~800 birds             | 0.97                 | 10.2                          | 9.54%                | 0.12%                             |
| Red-billed gull    | >1,190 pairs           | 10.04                | 368.0                         | 2.73%                | 0.42%                             |
| Reef heron         | >10 pairs?             | 0.06                 | 0.6                           | 11.35%               | 0.32%                             |
| Royal spoonbill    | ~40 birds              | 0.16                 | 3.4                           | 4.86%                | 0.41%                             |
| SBBG               | Abundant               | 0.42                 | 38.8                          | 1.08%                | 0.04%                             |
| SIPO               | ~2,500 birds           | 0.13                 | 133.9                         | 0.09%                | 0.01%                             |
| VOC                | ~350 birds             | 1.54                 | 44.8                          | 3.45%                | 0.44%                             |
| White-faced heron  | ~100 birds             | 0.72                 | 13.9                          | 5.20%                | 0.72%                             |
| White-fronted tern | >100 birds             | 0.01                 | 4.0                           | 0.31%                | 0.01%                             |
| Wrybill            | ~150 birds             | 0.00                 | 0.4                           | 0.00%                | 0                                 |

Regarding roosting birds, the mean species abundance recorded during high tide counts at each site are provided in Table 14 (page 39). A total of 11 species (Table 19) were recorded utilising the high tide area in compartment West 3. While approximately 27% of pied stilt recorded during the high tide surveys were observed in West 3, this only represents 0.13% of the local Whangārei Harbour population.

*Table 19: Mean number of birds recorded in compartment West 3 (W3) during the high tide wading bird surveys, and that as a proportion of the sum of the means of birds recorded across all survey sites and the Whangārei Harbour populations.*

| SPECIES           | EST. WHANGĀREI HBR POP | HIGH TIDE            |                               |                      |                                   |
|-------------------|------------------------|----------------------|-------------------------------|----------------------|-----------------------------------|
|                   |                        | Mean No. birds in W3 | Sum of means all survey sites | % of birds within W3 | % of Whangārei Hbr pop. within W3 |
| Banded dotterel   | ~700 birds             | 0                    | 0                             | 0                    | 0                                 |
| Bar-tailed godwit | ~2,800 birds           | 0.74                 | 79.2                          | 0.94%                | 0.03%                             |
| Black shag        | >10 birds              | 0                    | 0                             | 0                    | 0                                 |
| Caspian tern      | 50-100 pairs           | 0.05                 | 0.8                           | 5.55%                | 0.05%                             |
| Lesser knot       | ~800 birds             | 0.49                 | 22.9                          | 2.13%                | 0.06%                             |
| Little shag       | >10 birds              | 0.02                 | 0.4                           | 5.47%                | 0.23%                             |
| NZ dotterel       | ~80 birds              | 0.02                 | 5.6                           | 0.42%                | 0.03%                             |
| Pied shag         | >50 birds              | 0.00                 | 1.1                           | 0.00%                | 0.00%                             |
| Pied stilt        | ~800 birds             | 1.02                 | 3.8                           | 26.73%               | 0.13%                             |
| Red-billed gull   | >1,190 pairs           | 0.74                 | 198.8                         | 0.37%                | 0.03%                             |
| Reef heron        | >10 pairs?             | 0.00                 | 0.4                           | 0.00%                | 0                                 |

| SPECIES            | EST. WHANGĀREI<br>HBR POP | HIGH TIDE               |                                  |                         |                                      |
|--------------------|---------------------------|-------------------------|----------------------------------|-------------------------|--------------------------------------|
|                    |                           | Mean No. birds<br>in W3 | Sum of means<br>all survey sites | % of birds<br>within W3 | % of Whangārei Hbr<br>pop. within W3 |
| Royal spoonbill    | ~40 birds                 | 0.00                    | 1.0                              | 0.00%                   | 0                                    |
| SBBG               | Abundant                  | 0.16                    | 4.8                              | 3.37%                   | 0.02%                                |
| SIPO               | ~2,500 birds              | 0.02                    | 173.5                            | 0.01%                   | 0.00%                                |
| VOC                | ~350 birds                | 0.60                    | 62.3                             | 0.97%                   | 0.17%                                |
| White-faced heron  | ~100 birds                | 0.21                    | 4.0                              | 5.28%                   | 0.21%                                |
| White-fronted tern | >100 birds                | 0.00                    | 0.1                              | 0.00%                   | 0                                    |
| Wrybill            | ~150 birds                | 0.00                    | 0.1                              | 0.00%                   | 0                                    |

While several species have been reported nesting on the Northport site itself (refer to Section 4.3.2.2 above), there is only one record of birds nesting under the shipyard reclamation footprint; 4Sight (2019) reported a pair of variable oystercatcher successfully nesting and raising two chicks along the existing Northport west revetment (refer to Map 33).

#### 7.1.1.1 Effects management & level of effects

The direct effect of permanent habitat loss associated with the proposed reclamation cannot be avoided, nor remedied or mitigated<sup>36</sup> due to the nature of the activity (reclamation) which will permanently remove all existing habitat beneath the proposed project footprint.

The shipyard reclamation footprint provides potential foraging habitat for 11 *Threatened* or *At Risk* species. Given the area of permanent habitat loss that will occur relative to the wider available area, and the level of low-mid tide and high-tide activity by species in compartment West 3, we have determined the potential effects of the permanent habitat loss on the local (Whangārei Harbour) coastal avifauna populations of species utilising that area as outlined in Table 20. We note that it is likely the same birds that are present on the intertidal flats during low-mid tide may roost in the high tide compartment. As such, rather than taking a cumulative approach to the proportion of the population affected, we have based our assessment on the higher of the two (low-mid or high tide) and identified these in red text in Table 20.

Nesting habitat for a single pair of variable oystercatcher will be lost under the footprint of the shipyard reclamation. Based on an estimated Whangārei Harbour population of ~350 birds, we have taken a conservative approach and assumed this includes 50 pairs to inform the magnitude of effect associated with the loss breeding habitat for a single pair. Thus, the loss of breeding habitat for 2% of the breeding population equates to Low magnitude of effect.

Based on the area of permanent foraging, nesting and roosting habitat loss that will occur relative to the what will remain available in the wider harbour, and the level of foraging roosting and nesting activity by species in compartment West 3 in the context of their local populations, we consider the magnitude of effects (as defined in Table 5) to be Low (*Having a minor effect on the known population*) or Negligible (*Having a negligible effect on the known population*).

<sup>36</sup> Refer to definitions provided in Table 7 on page 13

Thus, we have determined the potential level of effects (combining ecological value and magnitude of effects) of the permanent habitat loss on the local (wider Whangārei Harbour) coastal avifauna populations of species utilising that area as outlined in Table 20.

*Table 20: Assessment of potential effects of permanent habitat loss on the local coastal avifauna populations following effects management*

| SPECIES            | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP WITHIN W3 |           | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|-------------------------------------|-----------|--------------------------------|-----------------------------------|-------------------------------|
|                    |                        | Low-mid tide                        | High tide |                                |                                   |                               |
| Banded dotterel    | ~700 birds             | 0                                   | 0         | -                              | -                                 | -                             |
| Bar-tailed godwit  | ~2,800 birds           | 0.11%                               | 0.03%     | High                           | Negligible                        | Very Low                      |
| Black shag         | >10 birds              | 0                                   | 0         | -                              | -                                 | -                             |
| Caspian tern       | 50-100 pairs           | 0.15%                               | 0.05%     | Very High                      | Negligible                        | Low                           |
| Lesser knot        | ~800 birds             | 0.80%                               | 0.06%     | High                           | Negligible                        | Very Low                      |
| Little shag        | >10 birds              | 0                                   | 0.23%     | -                              | -                                 | -                             |
| NZ dotterel        | ~80 birds              | 2.85%                               | 0.03%     | Very High                      | Low                               | Moderate                      |
| Pied shag          | >50 birds              | 0.05%                               | 0.00%     | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt         | ~800 birds             | 0.12%                               | 0.13%     | Low                            | Negligible                        | Very Low                      |
| Red-billed gull    | >1,190 pairs           | 0.42%                               | 0.03%     | High                           | Negligible                        | Very Low                      |
| Reef heron         | >10 pairs?             | 0.32%                               | 0         | Very High                      | Negligible                        | Low                           |
| Royal spoonbill    | ~40 birds              | 0.41%                               | 0         | Moderate                       | Negligible                        | Very Low                      |
| SBBG               | Abundant               | 0.04%                               | 0.02%     | Low                            | Negligible                        | Very Low                      |
| SIPO               | ~2,500 birds           | 0.01%                               | 0.00%     | High                           | Negligible                        | Very Low                      |
| VOC                | ~350 birds             | 0.44%                               | 0.17%     | Moderate                       | Low <sup>40</sup>                 | Low                           |
| White-faced heron  | ~100 birds             | 0.72%                               | 0.21%     | Low                            | Negligible                        | Very Low                      |
| White-fronted tern | >100 birds             | 0.01%                               | 0         | High                           | Negligible                        | Very Low                      |
| Wrybill            | ~150 birds             | 0                                   | 0         | -                              | -                                 | -                             |

## 7.2 Injuries and / or Mortalities

### 7.2.1 Potential construction effects

The mobile nature of most avifauna species means that the potential for direct mortalities associated with construction activities are likely to be confined to birds that may be nesting or with young chicks or, in the case of kororā / little penguin, moulting at which time they are unable to swim. Furthermore, kororā may be present on land within their burrows during the day at any time of the year, including during the non-breeding and non-moulting season. A wildlife approval for managing potential effects on kororā / little penguin is sought as part of the

<sup>37</sup> Refer to Table 4, page 11

<sup>38</sup> Refer to Table 5, page 12

<sup>39</sup> Refer to Table 6, page 12

<sup>40</sup> While the magnitude of effect associated with the loss of foraging habitat is considered Negligible, the loss of breeding habitat for 2% of the breeding population is considered to be a Low magnitude based on the population proportion thresholds outlined in Section 3.5

current application. That application proposes conditions to appropriately address pre-survey and any accidental discovery during construction works.

The riprap edge along the western boundary of the Northport site was identified as potential habitat for kororā, however no birds, no sign of birds, were detected during any of the three surveys (refer to Section 3.2.1.1 above) of this area. Nevertheless, the riprap does provide potential habitat, and kororā have been recorded in the surrounding waters (see Map 3).

There is only one record of birds nesting under the shipyard reclamation footprint; 4Sight (2019) reported a pair of variable oystercatcher successfully nesting and raising two chicks along the existing Northport west revetment (refer to Map 33). However, other shorebirds that have been recorded nesting in the wider area include pied stilt and northern NZ dotterel (refer to Map 33). Given that these species have similar nesting habits to variable oystercatcher, we have assumed that all three shorebird species could nest in areas of the Project footprint that are currently above MHWS.

#### 7.2.1.1 Effects management & level of effects

Potential mortalities of coastal avifauna during the construction phase will be avoided through the preparation of an Avifauna Management Plan which will outline measures to avoid direct impacts and manage kororā and nesting shorebirds. This will include:

- For kororā:
  - Pre-construction (including rock removal) surveys by a suitably qualified and experienced coastal ornithologist to determine the presence of kororā within the western boundary riprap revetment; and
  - Establishment of exclusion zones around nesting and / or moulting birds<sup>41</sup>.
- For shorebirds (variable oystercatcher, northern NZ dotterel and pied stilt):
  - If construction works are to occur within 20 m of an area identified as potential shorebird nesting habitat during the breeding season, a suitably qualified and experienced coastal ornithologist should check for the presence of active nests.
  - If an active nest is detected, a 20 m exclusion zone should be established around the nest to ensure machinery and personnel do not come within 20 m of the nesting bird.

With the implementation of the above measures, we consider the magnitude of adverse effects (as defined in Table 5) on nesting and moulting species to be Negligible (*Having a negligible effect on the known population*) and short term (i.e. limited to the period of construction).

Thus, we have determined the potential level of effects of mortalities on local (wider Whangārei Harbour) coastal avifauna species as outlined in Table 21.

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<sup>41</sup> Under no circumstances should nesting birds, nest contents or moulting penguins be moved. Furthermore, a DOC Wildlife Act permit is required to handle species listed in the Wildlife Act (1954).

Table 21: Assessment of potential effects of construction mortalities on the local coastal avifauna populations following effects management

| SPECIES        | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|----------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Little penguin | >100 birds             | High                           | Negligible                        | Very Low                      |
| NZ dotterel    | ~80 birds              | Very High                      | Negligible                        | Low                           |
| Pied stilt     | ~800 birds             | Low                            | Negligible                        | Very Low                      |
| VOC            | ~350 birds             | Moderate                       | Negligible                        | Very Low                      |

### 7.2.2 Potential operational effect

Similar to potential construction effects, the mobile nature of most avifauna species means that the potential for direct mortalities associated with operational activities are likely to be confined to birds that may be nesting or with young chicks. To date, variable oystercatcher, pied stilt and northern NZ dotterel have all been recorded breeding on the existing and operational Northport site (refer Section 4.3.2.2 above and Map 33). As such, it is possible that these species will also nest on the shipyard reclamation when it is operational.

#### 7.2.2.1 Effects management & level of effects

Efforts should be made to avoid direct impacts on birds nesting on the shipyard reclamation once it becomes operational. This could include measures such as identifying and demarcating an area around any nesting birds that are found. However, this may not always be possible and as such we have assumed that mortalities of nesting birds may happen on occasion during the operational phase of the project; and we have assumed that these potential mortalities could be of species previously recorded nesting on the adjacent Northport site.

However, given the unknown frequency that such events may occur, the relatively low numbers of birds nesting on the existing adjacent Northport site, and the ability of those birds to successfully raise chicks (refer Section 4.3.2.2), we consider the magnitude of effects (as defined in Table 5) to be Negligible (*Having a negligible effect on the known population*).

Thus, we have determined the potential level of effects (combining ecological value and magnitude of effects) of mortalities during the operational phase on the local (wider Whangārei Harbour) coastal avifauna populations of species breeding on the proposed site as outlined in Table 22.

Table 22: Assessment of potential effects of operational mortalities of nesting birds on local coastal avifauna populations following effects management

| SPECIES     | EST. WHANGĀREI HBR POP | BREEDING ON NORTHPORT | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------|------------------------|-----------------------|--------------------------------|-----------------------------------|-------------------------------|
| NZ dotterel | ~80 birds              | 1 pair                | Very High                      | Negligible                        | Low                           |
| Pied stilt  | ~800 birds             | 1 pair                | Low                            | Negligible                        | Very Low                      |
| VOC         | ~350 birds             | 2 pairs               | Moderate                       | Negligible                        | Very Low                      |

### 7.3 Disturbance and / or Displacement

Disturbance activities could occur during both the construction and operational phases of the Project. Disturbance to avifauna may result in short- or long-term displacement, decreased



feeding rates, unattended nests (leading to incubation failure and increased opportunities for predators), and energy and time costs (Borgmann, 2010; Bowles, 1995; Kaldor, 2019; Lord et al., 2001; Price, 2008; Walls, 1999).

Numerous studies have reported various distances at which various bird species are disturbed by human activities (Glover et al., 2011; Goss-Custard et al., 2006; Haase, 1995; Rodgers & Schwikert, 2002; Rodgers & Smith, 1995; Thomas et al., 2003; Weston et al., 2012). The distance at which a bird flees from perceived danger is referred to as the flight initiation distance (FID).

Weston et al.'s (2012) review of FIDs included 15 species recorded within or adjacent to the proposed reclamation, thus providing the most relevant measures for this project on which to base potential disturbance distances (Table 23). Bar-tailed godwit was recorded as having the highest mean FID distance (59.5 m), followed closely by royal spoonbill (44.4 m), shags and herons. Of the coastal birds, red-billed gull were reported as having the lowest FID of 16.8 m; however, banded rail and Australasian bittern, which are confined to freshwater and estuarine marsh habitat, have even lower FIDs of 8.0 m and 10.0 m respectively. However, it is likely that 10.0 m FID for Australasian bittern is in part due to their "frozen" responses, whereby when a bird is alarmed or disturbed, it freezes. While no measure is available for spotless crane, Weston et al. (2012) record a mean FID of 8.2 m for marsh crane, another New Zealand cryptic marshbird. Also, no FID is available for variable oystercatcher, however Walls (1999) noted that breeding success of variable oystercatcher is impaired by disturbance from people and dogs.

Based on the FIDs of species known to utilise the Project footprint, we have calculated the area of effective habitat loss based on a 60 m disturbance zone around that. The proposed reclamation ZOI for coastal avifauna therefore includes the Project footprint and a 60 m disturbance zone.

*Table 23: Mean flight initiation distances (FID; as reported in Weston et al. (2012)) for species within and adjacent to the Project site*

| SPECIES              |                                   | MEAN FID <sup>42</sup> (m) |
|----------------------|-----------------------------------|----------------------------|
| Bar-tailed godwit    | <i>Limosa lapponica</i>           | 59.5                       |
| Royal spoonbill      | <i>Platalea regia</i>             | 44.4                       |
| Pied stilt           | <i>Himantopus himantopus</i>      | 43.5                       |
| Caspian tern         | <i>Hydroprogne caspia</i>         | 35.0                       |
| Black shag           | <i>Phalacrocorax carbo</i>        | 32.3                       |
| Pied shag            | <i>Phalacrocorax varius</i>       | 31.3                       |
| White-faced heron    | <i>Egretta novaehollandiae</i>    | 31.2                       |
| Reef heron           | <i>Egretta sacra</i>              | 31.1                       |
| SBBG                 | <i>Larus dominicanus</i>          | 24.4                       |
| Banded dotterel      | <i>Charadrius bicinctus</i>       | 32.1                       |
| Lesser knot          | <i>Calidris canutus</i>           | 21.3                       |
| Little shag          | <i>Phalacrocorax melanoleucos</i> | 19.8                       |
| Red-billed gull      | <i>Larus novaehollandiae</i>      | 16.8                       |
| Australasian bittern | <i>Botaurus poiciloptilus</i>     | 10.0                       |
| Banded rail          | <i>Gallirallus philippensis</i>   | 8.0                        |

<sup>42</sup> When multiple FIDs were provided for a single species, the highest FID is reported here

Another form of disturbance / displacement to birds during the construction phase relates to underwater noise levels from such works as impact and vibro-piling. All seabirds obtain their food from the marine environment; however, they differ in the methods used to obtain their prey (refer to Figure 16). These various methods differ in the amount of time individuals spend under water, with underwater pursuit species such as penguins, shearwaters, diving petrels and shags spending the greatest amount of time underwater relative to other seabird species.

With respect to underwater noise impacts, a study of the foraging behaviour of African penguins (*Spheniscus demersus*) found that when birds were exposed to seismic surveys they foraged in less-preferred areas that were further away from the colony, thereby expending more energy (Pichegru et al., 2017). Furthermore, once the seismic survey had ceased, the penguins returned to their preferred feeding area. Gentoo penguins (*Pygoscelis papua*) have also been shown to detect and respond to underwater sound (Sørensen et al., 2020). Wei & Erbe (Wei & Erbe, 2024, 2026) reported that the predicted in-air and underwater audiograms of little penguin indicate that their hearing range overlaps with many anthropogenic noise sources such as vessel traffic, port operations, and nearshore construction. Such air borne noises may interfere with communication at colonies, whereas under water noise may mask prey cues, orientation signals, or predator sounds during foraging dives (Wei & Erbe, 2026).

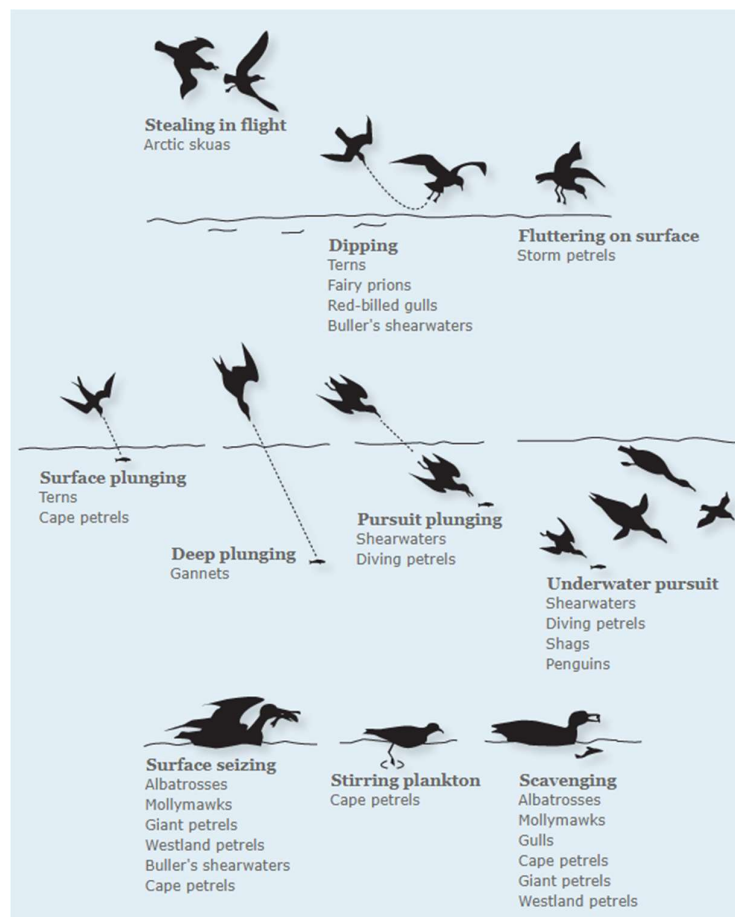


Figure 16: Seabird feeding methods (Source: [Te Ara – Encyclopaedia of New Zealand](#))

### 7.3.1 Potential construction effects

Indirect disturbance to foraging, roosting or nesting avifauna is a potential adverse effect that may arise as a result of construction activities such as noise, vibration and plant movement.

Based on a 60 m disturbance zone around the Project footprint, disturbance from construction of the Project could result in a temporary additional effective loss of 2.68 ha of intertidal foraging habitat (refer to Map 34). Thus, the zone of influence associated with construction disturbance will potentially effect species utilising compartment West 3, the species and proportion of their local Whangārei populations utilising these compartments during low-mid and high tide are provided in Table 18 (page 52) and Table 19 (page 53) respectively. The high tide roosts at Blacksmiths Creek, Wildlife Refuge and West 2 are beyond the 60 m disturbance zone.

The following coastal bird nesting locations outside of the Project footprint have been confirmed (as shown on Map 33):

- Blacksmiths Creek mangrove survey area – variable oystercatcher; and
- Northport site – northern NZ dotterel, variable oystercatcher and pied stilt.

Banded rail have been reported within the Blacksmiths Creek Estuary (Lux et al., 2007), and while not confirmed, this area does provide potential nesting habitat for this species. Australasian bittern, fernbird and spotless crane have also been recorded in Blacksmiths Creek Estuary (refer to Map 6), but all such eBird records are outside of the 60 m disturbance buffer. Nevertheless, there is potential cryptic marshbird habitat within the 60 m disturbance buffer that falls within Blacksmiths Creek Reserve (refer to Map 34 and Photo 2).



*Photo 2: Blacksmiths Creek cryptic marshbird habitat within the 60 m construction ZOI*

Styles Group (2026) modelled the listening space reductions (LSR) for kororā based on the largest of the proposed piles, using impact driven method and without any noise mitigation measures, as shown in Figure 17 and Table 24 below. The acoustic habitat loss, as proxied by LSR (Hendricks et al., 2025), provides a quantifiable metric to infer spatial effects from noise. The results of that model show that within approximate 1.16 km of the piling activity modelled, there will be a 75% LSR for kororā. Furthermore, the underwater audible range of the modelled activity is 8,088 m (Styles Group, 2026). With regards to underwater noise disturbance associated with the different dredging methods, Styles Group (2026) reported that backhoe dredging will result lower LSRs for kororā compared to cutter-suction and trail-suction hopper methods (refer to Table 25). As noted previously, kororā have been reported breeding along the north-eastern shoreline of the Whangārei Harbour entrance, including around Reotahi Bay to High Island area, Calliope Island, Home Point to Busby Head and Smugglers Bay (Munro, 1971; Parrish, 1985; Pierce, 2005) (refer to Map 3). Birds from breeding colonies in the vicinity of the harbour entrance (i.e. around Reotahi Bay to High Island area) will be exposed to 50%, or in some cases, 75% LSRs due to the proximity of those contours.

*Table 24: Listening space reduction (LSR) distances for kororā based on the largest of the proposed piles, impact driven method and without any noise mitigation measures (Source: Styles Group (2026))*

| LISTENING SPACE REDUCTION (LSR) | DISTANCE (m) |
|---------------------------------|--------------|
| <b>25%</b> LSR contour          | 5,263.2      |
| <b>50%</b> LSR contour          | 3,678.9      |
| <b>75%</b> LSR contour          | 1,163.9      |

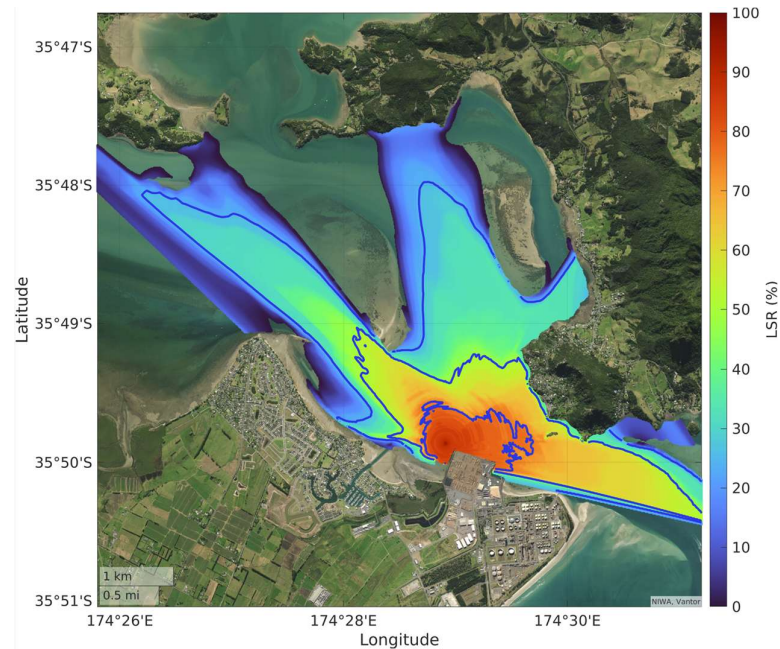


Table 25: Listening space reduction (LSR) distances for kororā for different dredging methods (Source: Styles Group (2026))

| LISTENING SPACE REDUCTION (LSR) | DREDGING METHOD      |                |         |
|---------------------------------|----------------------|----------------|---------|
|                                 | Trail-suction-hopper | Cutter suction | Backhoe |
| 0% LSR contour                  | 4,448 m              | 4376 m         | 2446 m  |
| 25% LSR contour                 | 1034 m               | 511 m          | 604 m   |
| 50% LSR contour                 | 269 m                | 64 m           | 46 m    |
| 75% LSR contour                 | 21 m                 | -              | -       |

#### 7.3.1.1 Effects management & level of effects

The potential adverse effects of disturbance to foraging and roosting birds during construction cannot be avoided; however, there are other nearby areas of habitat to undertake these activities beyond the disturbance zone. Furthermore, construction-related disturbance is temporary in nature.

Those species nesting on the Northport site are already subject to high levels of disturbance due to it being a working port, and this is likely to increase with the construction of the proposed shipyard on the adjacent site. Outside of the port, there is cryptic marshbird habitat in Blacksmiths Creek Reserve within the 60 m disturbance buffer (Zone of Influence), however this area is relatively low in habitat quality compared to the wider reserve. Thus, based on the location of the cryptic marshbird eBird records all outside of the ZOI, and the low quality habitat within the ZOI, cryptic marshbirds are unlikely to be impacted by the construction activities. Variable oystercatcher have been recorded nesting on the beach above MHWS at Blacksmith Creek (refer to Map 33). This location is outside the ZOI and as such these birds are not likely to be impacted by the construction activities.

Given the area of habitat that will be disturbed during construction relative to the wider available area, and the level of foraging and roosting activity by species in compartment West 3, we have determined the potential effects of construction disturbance and displacement on the local (Whangārei Harbour) coastal avifauna populations of species utilising that area as outlined in Table 27. We note that it is likely the same birds that forage or rest in the low-mid tide compartments may roost in the high tide compartments. As such, we have based our assessment on the higher of the two potential effects (low-mid or high tide) and identified these in red text in Table 27. Further, it is important to note that these potential effects of disturbance and displacement will be temporary for the duration of the construction.

We consider the magnitude of adverse effect (as defined in Table 5) to be Low (*Having a minor effect on the known population*) or Negligible (*Having a negligible effect on the known population*). As such, we have determined the potential level of effects of construction disturbance and displacement on local (wider Whangārei Harbour) coastal avifauna species as outlined in below in Table 27, noting this is a temporary effect for the duration of the construction phase.

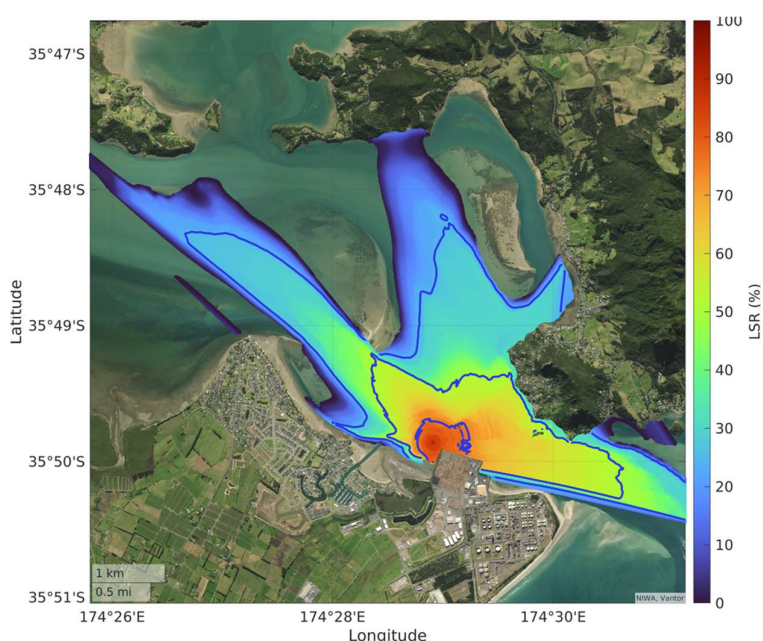
With respect to underwater noise disturbance associated with piling and dredging activities, foraging kororā will be exposed to the greatest disturbance due to the amount of time they spend underwater. We note that the proposed piling methodology (as outlined in Section 6.1) involves the use of vibrohammer in the first instance, then swapping to hydraulic impact hammer for the final phase. The underwater noise levels emitted by vibro-hammer are



significantly lower than that of hydraulic impact hammer; as such it is during the later stages of the piling when the hydraulic impact hammer is being used that kororā may experience underwater noise disturbance. Styles Group (2026) modelled the listening space reductions (LSR) for kororā based on the largest of the proposed piles, using impact driven method, with and without any noise mitigation measures (refer to Table 26, Figure 17 and Figure 18). The application of a bubble curtain as a form of noise mitigation reduces the 25%, 50% and 75% LSR's contours by 16%, 28% and 57% respectively.

*Table 26: Listening space reduction (LSR) distances for kororā based on the largest of the proposed piles impact driven (Source: Styles Group (2026))*

| LISTENING SPACE REDUCTION (LSR) | DISTANCE           |                                  |
|---------------------------------|--------------------|----------------------------------|
|                                 | Without mitigation | With mitigation (bubble curtain) |
| <b>25% LSR contour</b>          | 5,263.2 m          | 4,428.1 m                        |
| <b>50% LSR contour</b>          | 3,678.9 m          | 2,664.4 m                        |
| <b>75% LSR contour</b>          | 1,163.9 m          | 505.8 m                          |
| <b>AUDIBILITY RANGE</b>         | 8,088 m            | 6,700.4 m                        |



*Figure 18: Map showing the extent of listening space reductions (LSR, %) for little penguins during impact piling of largest proposed pile size and with mitigation (bubble curtain). (Source: Styles Group (2026))*

As noted previously, kororā have been reported breeding along the north-eastern shoreline of the Whangārei Harbour entrance, including around Reotahi Bay to High Island area, Calliope Island, Home Point to Busby Head and Smugglers Bay (Munro, 1971; Parrish, 1985; Pierce, 2005) (refer to Map 3). The application of noise mitigation measures such as bubble curtains will reduce, but not eliminate, the LSRs. While it is likely that most birds forage outside of the harbour, and that only a small proportion of the population would forage within the Whangārei Harbour, birds would nevertheless be exposed to LSRs. During the breeding season, little penguin are near shore foragers, restricted to foraging areas close to their nest (Gaskin & Rayner, 2017). Numerous studies have found that little penguin generally travel no further than 20 km from

the colony while feeding chicks (Cannell, 2016; Chiaradia & Kerry, 1999; Collins et al., 1999; Hoskins et al., 2008; Klomp & Wooller, 1988; Preston et al., 2008; Weavers, 1992). Styles Group (2026) reported the audible range of piling activity under the modelled scenario to be approximately 6.7 km when a bubble curtain is applied. Therefore, marine waters beyond the distance of 6.7 km are still within the foraging range of breeding birds and outside the ZOI of underwater noise disturbance.

We consider the magnitude of effect on kororā to be Low (*Having a minor effect on the known population*) based on the following assumptions<sup>43</sup>:

- Piles would be installed using vibro-hammer techniques with a small percentage of the piles being hammered to for final driving in order to determine their load capacity;
- Bubble curtains would be used as noise mitigation when piles are being hammered;
- Piling is a temporary activity for a period no longer than 5 years.

Based on a Low magnitude of effect, the overall level of effect of underwater noise disturbance on kororā is considered to be Low (Table 27). We consider there will be a Negligible magnitude of effect on shags and terns due to these species spending less time submerged underwater compared to kororā. As such, we have determined the potential level of effects of construction underwater disturbance and displacement on local (wider Whangārei Harbour) seabird species as outlined in below in Table 27, noting this is a temporary effect for the duration of the construction phase.

*Table 27: Assessment of potential effects of construction disturbance and displacement on the local coastal avifauna populations following effects management*

| SPECIES           | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP WITHIN W3 |           | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|-------------------------------------|-----------|--------------------------------|-----------------------------------|-------------------------------|
|                   |                        | Low-mid tide                        | High tide |                                |                                   |                               |
| Banded dotterel   | ~700 birds             | 0                                   | 0         | -                              | -                                 | -                             |
| Bar-tailed godwit | ~2,800 birds           | 0.11%                               | 0.03%     | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | 0                                   | 0         | Moderate                       | Negligible                        | Very Low                      |
| Caspian tern      | 50-100 pairs           | 0.15%                               | 0.05%     | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | 0.80%                               | 0.06%     | High                           | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | 0                                   | 0.23%     | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel       | ~80 birds              | 2.85%                               | 0.03%     | Very High                      | Low                               | Moderate                      |
| Pied shag         | >50 birds              | 0.05%                               | 0.00%     | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | 0.12%                               | 0.13%     | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | 0.42%                               | 0.03%     | High                           | Negligible                        | Very Low                      |
| Reef heron        | >10 pairs?             | 0.32%                               | 0         | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | 0.41%                               | 0         | Moderate                       | Negligible                        | Very Low                      |
| SBBG              | Abundant               | 0.04%                               | 0.02%     | Low                            | Negligible                        | Very Low                      |
| SIPO              | ~2,500 birds           | 0.01%                               | 0.00%     | High                           | Negligible                        | Very Low                      |
| VOC               | ~350 birds             | 0.44%                               | 0.17%     | Moderate                       | Negligible                        | Very Low                      |
| White-faced heron | ~100 birds             | 0.72%                               | 0.21%     | Low                            | Negligible                        | Very Low                      |

<sup>43</sup> We note that if any of the listed assumptions are not correct, the magnitude of effect relating to underwater noise disturbance on kororā would increase from Low to Moderate.

| SPECIES               | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP WITHIN W3 |           | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-----------------------|------------------------|-------------------------------------|-----------|--------------------------------|-----------------------------------|-------------------------------|
|                       |                        | Low-mid tide                        | High tide |                                |                                   |                               |
| White-fronted tern    | >100 birds             | 0.01%                               | 0         | High                           | Negligible                        | Very Low                      |
| Wrybill               | ~150 birds             | 0                                   | 0         | -                              | -                                 | -                             |
| Kororā                | >100 birds             | -                                   | -         | High                           | Low <sup>44</sup>                 | Low                           |
| Australasian bittern  |                        |                                     |           | Very High                      | Negligible                        | Low                           |
| Banded rail           |                        |                                     |           | High                           | Negligible                        | Very Low                      |
| Spotless crane        |                        |                                     |           | High                           | Negligible                        | Very Low                      |
| North Island fernbird |                        |                                     |           | High                           | Negligible                        | Very Low                      |

### 7.3.2 Potential operational effects

Operational disturbance to avifauna is a potential adverse effect that may arise by way of an effective loss of habitat (both terrestrial and intertidal) as a result of noise, or increased activities (e.g. recreational users, including the presence of dogs) (Hockin et al., 1992).

Based on a 60 m disturbance zone around the Project footprint, we have calculated the area of 2.68 ha of effective intertidal foraging habitat loss (refer to Map 34). Low numbers of the following species were observed foraging within the intertidal ZOI: northern New Zealand dotterel (Map 9), bar-tailed godwit (Map 10), lesser knot (Map 10), variable oystercatcher (Map 11), Caspian tern (Map 12), red-billed gull (Map 12) and white-faced heron (Map 13). In addition, there may also be an effect on those currently roosting and / or foraging within compartment West 2 due to displacement by birds from compartment West 3.

The wading bird surveys recorded 10 species utilising compartment West 2 during high tide, but only small proportions of their local Whangārei populations (Table 28). In terms of low-mid tide use, 16 species were recorded within compartment West 2 (Table 29); except for northern New Zealand dotterel, only a small proportion of their local Whangārei populations were recorded in West 2.

No cryptic marshbirds have been recorded within the 60 m operational ZOI (refer to Map 6), and as noted above, the Blacksmiths Creek Reserve habitat within this ZOI is of lower quality than the wider reserve. In addition, variable oystercatcher nesting on the beach above MHWS at Blacksmiths Creek is outside the 60 m operational ZOI (refer to Map 33).

*Table 28: Mean number of birds recorded in compartment West 2 (W2) during the high tide wading bird surveys, and that as a proportion of the sum of the means of birds recorded across all survey sites and the Whangārei Harbour populations.*

| SPECIES           | EST. WHANGĀREI HBR POP | HIGH TIDE            |                               |                      |                                |
|-------------------|------------------------|----------------------|-------------------------------|----------------------|--------------------------------|
|                   |                        | Mean No. birds in W2 | Sum of means all survey sites | % of birds within W2 | % of Whang. Hbr pop. within W2 |
| Banded dotterel   | ~700 birds             | 0                    | 0                             | 0                    | 0                              |
| Bar-tailed godwit | ~2,800 birds           | 52.49                | 79.2                          | 66.24%               | 1.87%                          |

<sup>44</sup> Based on the following assumptions.

- Piles would be installed using vibro-hammer techniques with a small percentage of the piles being hammered to for final driving in order to determine their load capacity;
- Bubble curtains would be used as noise mitigation when piles are being hammered;
- Piling is a temporary activity for a period no longer than 5 years.



| SPECIES            | EST. WHANGĀREI HBR POP | HIGH TIDE            |                               |                      |                                |
|--------------------|------------------------|----------------------|-------------------------------|----------------------|--------------------------------|
|                    |                        | Mean No. birds in W2 | Sum of means all survey sites | % of birds within W2 | % of Whang. Hbr pop. within W2 |
| Black shag         | >10 birds              | 0                    | 0                             | 0                    | 0                              |
| Caspian tern       | 50-100 pairs           | 0.09                 | 0.8                           | 11.11%               | 0.09%                          |
| Lesser knot        | ~800 birds             | 13.95                | 22.9                          | 60.90%               | 1.74%                          |
| Little shag        | >10 birds              | 0                    | 0.4                           | 0                    | 0                              |
| NZ dotterel        | ~80 birds              | 0                    | 5.6                           | 0                    | 0                              |
| Pied shag          | >50 birds              | 0.02                 | 1.1                           | 2.16%                | 0.05%                          |
| Pied stilt         | ~800 birds             | 1.56                 | 3.8                           | 40.70%               | 0.19%                          |
| Red-billed gull    | >1,190 pairs           | 1.23                 | 198.8                         | 0.62%                | 0.05%                          |
| Reef heron         | >10 pairs?             | 0.02                 | 0.4                           | 6.46%                | 0.12%                          |
| Royal spoonbill    | ~40 birds              | 0                    | 1.0                           | 0.00%                | 0.00%                          |
| SBBG               | Abundant               | 0.26                 | 4.8                           | 5.30%                | 0.03%                          |
| SIPO               | ~2,500 birds           | 0                    | 173.5                         | 0                    | 0                              |
| VOC                | ~350 birds             | 0.09                 | 62.3                          | 0.15%                | 0.03%                          |
| White-faced heron  | ~100 birds             | 0.02                 | 4.0                           | 0.59%                | 0.02%                          |
| White-fronted tern | >100 birds             | 0                    | 0.1                           | 0                    | 0                              |
| Wrybill            | ~150 birds             | 0                    | 0.1                           | 0                    | 0                              |

Table 29: Mean number of birds recorded in compartment West 2 (W2) during the low-mid tide wading bird surveys, and that as a proportion of the sum of the means of birds recorded across all survey sites and the Whangārei Harbour populations.

| SPECIES           | EST. WHANGĀREI HBR POP | LOW-MID TIDE         |                               |                      |                                |
|-------------------|------------------------|----------------------|-------------------------------|----------------------|--------------------------------|
|                   |                        | Mean No. birds in W2 | Sum of means all survey sites | % of birds within W2 | % of Whang. Hbr pop. within W2 |
| Banded dotterel   | ~700 birds             | 0.71                 | 3.0                           | 23.55%               | 0.10%                          |
| Bar-tailed godwit | ~2,800 birds           | 30.97                | 79.5                          | 38.98%               | 1.11%                          |
| Black shag        | >10 birds              | 0                    | 0.1                           | 0                    | 0                              |
| Caspian tern      | 50-100 pairs           | 0.38                 | 2.0                           | 19.35%               | 0.38%                          |
| Lesser knot       | ~800 birds             | 44.38                | 73.6                          | 60.30%               | 5.55%                          |
| Little shag       | >10 birds              | 0.18                 | 1.6                           | 10.98%               | 1.77%                          |
| NZ dotterel       | ~80 birds              | 6.38                 | 24.8                          | 25.75%               | 7.97%                          |
| Pied shag         | >50 birds              | 0.15                 | 2.4                           | 6.30%                | 0.30%                          |
| Pied stilt        | ~800 birds             | 1.58                 | 10.2                          | 15.48%               | 0.20%                          |
| Red-billed gull   | >1,190 pairs           | 28.68                | 368.0                         | 7.79%                | 1.21%                          |
| Reef heron        | >10 pairs?             | 0.11                 | 0.6                           | 20.42%               | 0.57%                          |
| Royal spoonbill   | ~40 birds              | 0.32                 | 3.4                           | 9.34%                | 0.79%                          |
| SBBG              | Abundant               | 6.04                 | 38.8                          | 15.56%               | 0.60%                          |
| SIPO              | ~2,500 birds           | 3.89                 | 133.9                         | 2.90%                | 0.16%                          |
| VOC               | ~350 birds             | 2.77                 | 44.8                          | 6.19%                | 0.79%                          |

| SPECIES            | EST. WHANGĀREI<br>HBR POP | LOW-MID TIDE            |                                  |                         |                                   |
|--------------------|---------------------------|-------------------------|----------------------------------|-------------------------|-----------------------------------|
|                    |                           | Mean No. birds<br>in W2 | Sum of means<br>all survey sites | % of birds<br>within W2 | % of Whang. Hbr<br>pop. within W2 |
| White-faced heron  | ~100 birds                | 2.06                    | 13.9                             | 14.87%                  | 2.06%                             |
| White-fronted tern | >100 birds                | 2.18                    | 4.0                              | 53.80%                  | 2.18%                             |
| Wrybill            | ~150 birds                | 0                       | 0.4                              | 0                       | 0                                 |

### 7.3.2.1 Effects management & level of effect

The potential adverse effects of disturbance to foraging and roosting birds during operation cannot be avoided; however, there are other nearby areas of habitat to undertake these activities beyond the disturbance zone. Furthermore, as shown in Maps 9-14, a number of birds were recorded on the intertidal flats immediately adjacent to Northport (i.e. within 60 m of the existing operational port). Smit & Visser (1993) reported that waders learn to be tolerant of disturbance that is frequent and not particularly dangerous; we consider that such disturbance would be characteristic of the existing port and proposed shipyard operational activities.

Northport has a 4 m high noise wall on its western edge, and the proposed Project will also have 4 m high noise wall on the western edge of the facility, along with several buildings proposed to support landside infrastructure approximately 8 m high (Marshall Day, 2026). While the current and proposed noise walls are for the purpose of mitigating noise received by dwellings in Albany Road and beyond, they will also serve to reduce noise levels for birds foraging and roosting on the western side. In addition, the noise wall forms a visual barrier for those birds in terms of the operational activities.

In terms of disturbance to nesting birds associated with the operation of the shipyard, all nesting is either beyond the likely disturbance zone or already on the operating port (refer to Map 33).

The proportion of the Whangarei populations of species recorded foraging or roosting within the 60 m operational disturbance zone or compartment West 2 is outlined below in Table 30. We note that it is likely the same birds that forage in the low-mid tide compartments may roost in the high tide compartments, and as such the higher value of the two values is shown in red. We have based our assessment on the higher of the two potential effects (low-mid or high tide) and identified these in red text in Table 30. However, we consider the presence of a 4 m high noise wall will serve to mitigate the levels of operational disturbance experienced by those birds

*Table 30: Assessment of potential effects of operational disturbance and displacement on the local coastal avifauna populations (red text identifies the higher population proportion) following effects management.*

| SPECIES           | EST.<br>WHANGĀREI<br>HBR POP | PROPORTION WHANG.<br>HBR POP WITHIN W2 |           | ECOLOGICAL<br>VALUE <sup>37</sup> | MAGNITUDE<br>OF EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|-------------------|------------------------------|----------------------------------------|-----------|-----------------------------------|--------------------------------------|----------------------------------|
|                   |                              | Low-mid<br>tide                        | High tide |                                   |                                      |                                  |
| Banded dotterel   | ~700 birds                   | 0.10%                                  | 0         | High                              | Negligible                           | Very Low                         |
| Bar-tailed godwit | ~2,800 birds                 | 1.11%                                  | 1.87%     | High                              | Negligible <sup>45</sup>             | Very Low                         |
| Black shag        | >10 birds                    | 0                                      | 0         | -                                 | -                                    | -                                |
| Caspian tern      | 50-100 pairs                 | 0.38%                                  | 0.09%     | Very High                         | Negligible                           | Low                              |
| Lesser knot       | ~800 birds                   | 5.55%                                  | 1.74%     | High                              | Negligible <sup>45</sup>             | Very Low                         |

<sup>45</sup> Magnitude of effect reduced based on the implementation of noise mitigation through the presence of a 4m high noise wall

| SPECIES               | EST.<br>WHANGĀREI<br>HBR POP | PROPORTION WHANG.<br>HBR POP WITHIN W2 |           | ECOLOGICAL<br>VALUE <sup>37</sup> | MAGNITUDE<br>OF EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|-----------------------|------------------------------|----------------------------------------|-----------|-----------------------------------|--------------------------------------|----------------------------------|
|                       |                              | Low-mid<br>tide                        | High tide |                                   |                                      |                                  |
| Little shag           | >10 birds                    | 1.77%                                  | 0         | Moderate                          | Negligible <sup>45</sup>             | Very Low                         |
| NZ dotterel           | ~80 birds                    | 7.97%                                  | 0         | Very High                         | Negligible <sup>45</sup>             | Low                              |
| Pied shag             | >50 birds                    | 0.30%                                  | 0.05%     | Moderate                          | Negligible                           | Very Low                         |
| Pied stilt            | ~800 birds                   | 0.20%                                  | 0.19%     | Low                               | Negligible                           | Very Low                         |
| Red-billed gull       | >1,190 pairs                 | 1.21%                                  | 0.05%     | High                              | Negligible <sup>45</sup>             | Very Low                         |
| Reef heron            | >10 pairs?                   | 0.57%                                  | 0.12%     | Very High                         | Negligible                           | Low                              |
| Royal spoonbill       | ~40 birds                    | 0.79%                                  | 0.00%     | Moderate                          | Negligible                           | Very Low                         |
| SBBG                  | Abundant                     | 0.60%                                  | 0.03%     | Low                               | Negligible                           | Very Low                         |
| SIPO                  | ~2,500 birds                 | 0.16%                                  | 0         | High                              | Negligible                           | Very Low                         |
| VOC                   | ~350 birds                   | 0.79%                                  | 0.03%     | Moderate                          | Negligible                           | Very Low                         |
| White-faced heron     | ~100 birds                   | 2.06%                                  | 0.02%     | Low                               | Negligible <sup>45</sup>             | Very Low                         |
| White-fronted tern    | >100 birds                   | 2.18%                                  | 0         | High                              | Negligible <sup>45</sup>             | Very Low                         |
| Wrybill               | ~150 birds                   | 0                                      | 0         | -                                 | -                                    | -                                |
| Australasian bittern  |                              |                                        |           | Very High                         | Negligible                           | Low                              |
| Banded rail           |                              |                                        |           | High                              | Negligible                           | Very Low                         |
| Spotless crane        |                              |                                        |           | High                              | Negligible                           | Very Low                         |
| North Island fernbird |                              |                                        |           | High                              | Negligible                           | Very Low                         |

## 7.4 Food Supply and / or Foraging Ability

Impacts on food supply or the ability of visual foragers to locate prey items can have flow-on effects to avifauna through reduced foraging resources.

### 7.4.1 Potential construction effects

Dredging is to occur in three locations: the 'cutout', the berth pocket in front of the jetty structure, and the turning basin. Sediment mobilisation and increased turbidity generated by the dredging process has the potential to adversely affect marine biota in surrounding areas ((Coast & Catchment, 2026).

There is the potential for adverse effects on marine water quality through increased suspended sediment and on marine invertebrates from the clogging of fine structures (such as gills) and smothering of benthic organisms (prey species) from deposited sediment. Impacts on benthic and fish communities can affect food supply for coastal and oceanic avifauna. In addition, increased water turbidity can impact on the foraging ability of visual foragers (e.g. penguin, shags, terns and herons) to locate prey items.

As such, the potential indirect effects on coastal avifauna associated with the Project are:

- Food supply – Changes in ability of wading shorebirds to access food or a decrease in food supply due to the deposition of sediment in the intertidal foraging areas; and / or
- Foraging ability – Changes in the ability of visual predators (divers) to detect prey in the water due to increased suspended sediment (TSS) in the water column.

Key findings from the MetOcean (2026a) dredge plume modelling included:

- Plume dispersion and deposition footprints generally align along a distinct northwest-southeast axis.
- Under existing bathymetric conditions, plumes extend further westward. However, the proposed structural designs have a tendency to confine sediment plumes within the dredged footprints or redirect their transport eastward, suggesting that as the dredging process advances the plume extension will be reduced.
- Exceedance durations for the 2, 5 and 10 mg L<sup>-1</sup> TSS thresholds are highest within the channel region, where tidal currents restrict and advect the sediment plumes.

Thus, the MetOcean (2026a) model predictions suggest there will be little, if any, overlap between dredging-related sediment plumes or sediment deposition and intertidal habitats. Consequently, Catchment & Coast (2026) reported that dredging-related effects on intertidal ecology are expected to be Negligible.

#### 7.4.1.1 Effects management & level of effects

It is expected that the effects can be minimised through good plume management/monitoring (in real time) and use of silt curtains in the shallower high-risk areas.

Based on the depth and duration of the suspended and deposited sediment associated with the proposed dredging, and the effects of this on the marine fauna that form the diet of the coastal birds, we consider the magnitude of effects (as defined in Table 5) to be Negligible (*Having a negligible effect on the known population*) for all species.

As such, we have determined the potential effects on food supply and foraging activity on local (wider Whangārei Harbour) coastal avifauna species as outlined below in Table 31.

*Table 31: Assessment of potential construction effects of sediment suspension and deposition on food supply and foraging activity of local coastal avifauna populations following effects management*

| SPECIES           | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit | ~2,800 birds           | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| Caspian tern      | 50-100 pairs           | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | Moderate                       | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel       | ~80 birds              | Very High                      | Negligible                        | Low                           |
| Pied shag         | >50 birds              | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | High                           | Negligible                        | Very Low                      |
| Reef heron        | >10 pairs?             | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | Moderate                       | Negligible                        | Very Low                      |
| SBBG              | Abundant               | Low                            | Negligible                        | Very Low                      |
| SIPO              | ~2,500 birds           | High                           | Negligible                        | Very Low                      |
| VOC               | ~350 birds             | Moderate                       | Negligible                        | Very Low                      |
| White-faced heron | ~100 birds             | Low                            | Negligible                        | Very Low                      |

| SPECIES            | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| White-fronted tern | >100 birds             | High                           | Negligible                        | Very Low                      |
| Wrybill            | ~150 birds             | Very High                      | Negligible                        | Low                           |
| Kororā             | >100 birds             | High                           | Negligible                        | Very Low                      |

#### 7.4.2 Potential operational effects

Maintenance dredging will be necessary, particularly within the first few years following the capital dredging as side slopes settle.

MetOcean (2026c) morphodynamic modelling predicted depth changes after 1 year and 5 years for the current Project (refer to Figure 19 below) as well as for the combination of the current Project and Northport's eastern reclamation (Figure 20). A reduction in transport rates associated with changes in current velocities due to reclamation sheltering effects resulted in small, localised increases in sediment deposition. In general, MetOcean (2026c) consider that the depth changes associated with the design configurations are expected to be predominantly limited to the immediate port environs, with only subtle modifications to overall sediment dynamics within the broader region.

##### 7.4.2.1 Effects management & level of effects

Based on the depth and duration of the suspended and deposited sediment likely to occur as a result of maintenance dredging for the Project, and the small, localised increases in sediment deposition as a result of morphodynamic changes, we consider the magnitude of effects (as defined in Table 5) will be Negligible (*Having a negligible effect on the known population*) for all coastal avifauna species.

As such, we have determined the potential effects on food supply and foraging activity on local (wider Whangārei Harbour) coastal avifauna species as outlined below in Table 32.

*Table 32: Assessment of potential operation effects of sediment suspension and deposition on food supply and foraging activity of local coastal avifauna populations following effects management*

| SPECIES           | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit | ~2,800 birds           | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| Caspian tern      | 50-100 pairs           | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | Moderate                       | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel       | ~80 birds              | Very High                      | Negligible                        | Low                           |
| Pied shag         | >50 birds              | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | High                           | Negligible                        | Very Low                      |
| Reef heron        | >10 pairs?             | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | Moderate                       | Negligible                        | Very Low                      |

| SPECIES            | EST.<br>WHANGĀREI<br>HBR POP | ECOLOGICAL<br>VALUE <sup>37</sup> | MAGNITUDE OF<br>EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------------|-----------------------------------|--------------------------------------|-------------------------------|
| SBBG               | Abundant                     | Low                               | Negligible                           | Very Low                      |
| SIPO               | ~2,500 birds                 | High                              | Negligible                           | Very Low                      |
| VOC                | ~350 birds                   | Moderate                          | Negligible                           | Very Low                      |
| White-faced heron  | ~100 birds                   | Low                               | Negligible                           | Very Low                      |
| White-fronted tern | >100 birds                   | High                              | Negligible                           | Very Low                      |
| Wrybill            | ~150 birds                   | Very High                         | Negligible                           | Low                           |
| Kororā             | >100 birds                   | High                              | Negligible                           | Very Low                      |



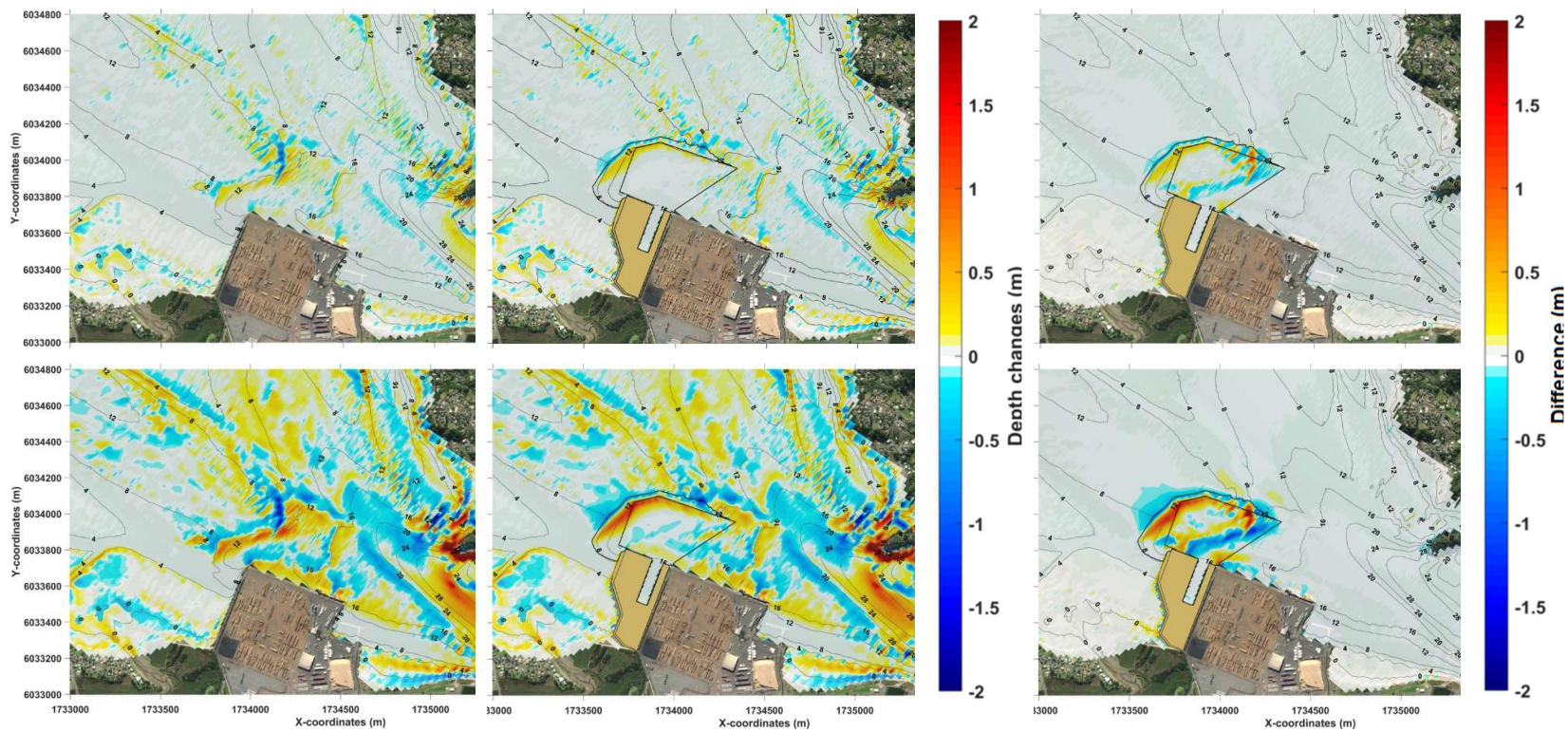


Figure 19: Predicted depth change at Northport for the **Existing** (left column) and the **Design West** (middle column) cases for the **1<sup>st</sup> year** and **5<sup>th</sup> year** (bottom) simulations. The difference between the design and existing cases is shown in the right column. Solid black lines represent the design footprint. (Source: Figure 4-2 in MetOcean (2026c))

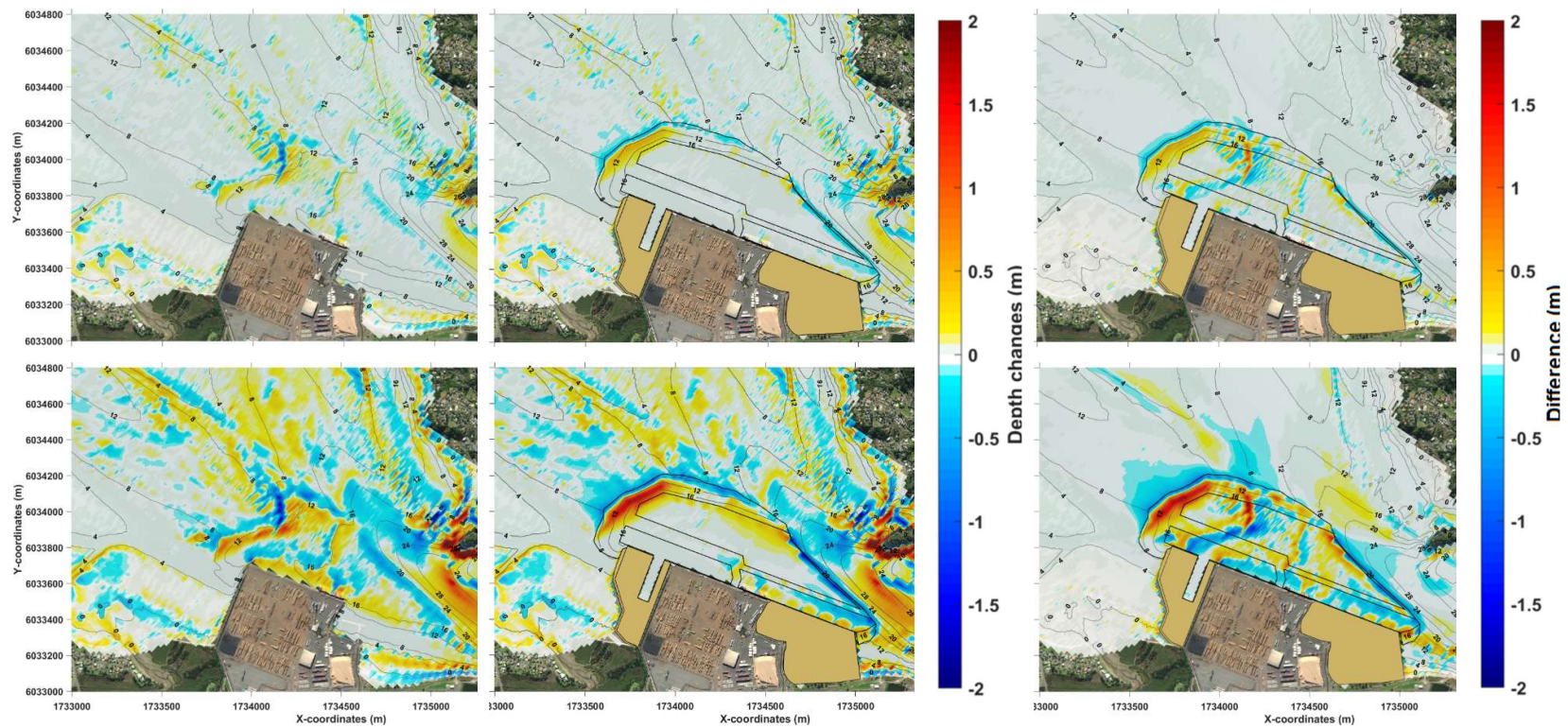


Figure 20: Predicted depth change at Northport for the **Existing** (left column) and the **Design East and West** (middle column) cases for the **1<sup>st</sup> year** (top) and **5<sup>th</sup> year** (bottom) simulations. The difference between the design and existing cases is shown in the right column. Solid black line polygons represent the design footprint. (Source: Figure 4-3 in MetOcean (2026c))



## 7.5 Artificial Lighting

An increase in artificial lighting associated with the Project is unlikely to impact on the nocturnal foraging of waders. In fact, Santos et al. (2010) found that artificial illumination from urban areas and roads had a positive effect on nocturnal foraging of waders whereby visual foragers increased their foraging effort in illuminated areas, and mixed foragers changed to more efficient visual foraging strategies. These behavioural shifts improved prey intake rate by an average of 83% in visual and mixed foragers (Santos et al., 2010).

Light-induced mortalities have been recorded for a number of seabirds, particularly petrels, whereby they are attracted to artificial light sources and either collide with structures or are vulnerable to predation when on land (Black, 2005; Deppe et al., 2017; Le Corre et al., 2002, 2003; Montevecchi, 2006; Reed et al., 1985; Rodríguez et al., 2012; Rodríguez & Rodríguez, 2009). Another potential effect of attraction to artificial lights is that birds are temporarily diverted towards the light(s) and away from other areas (e.g. breeding colonies). The potential for either of these effects has been considered for this assessment. Incidences of attraction to artificial lights and strike have been attributed to low levels of moonlight and inclement weather resulting in poor visibility (Deppe et al., 2017; Poot et al., 2008; Reed et al., 1985; Rodríguez & Rodríguez, 2009).

While shags have been recorded foraging at night, we found no records of species being attracted to artificial lights.

### 7.5.1 Potential construction effects

Dredging may occur during night-time hours, and as such artificial lighting will be required for those activities. Grey-faced petrel breeding colonies are located on Matakohē / Limestone Island in the inner Harbour as well as within the Bream Bay Reserve, and as such it is possible that during the breeding season,<sup>46</sup> petrels returning to their colonies at night may be attracted to the lighting associated with the dredging.

#### 7.5.1.1 Effects management & level of effects

During night-time dredging activities, there will be a small cumulative increase in lighting on the coastal margin and as a matter of good practice we recommend efforts to minimise construction lighting where it can reasonably be carried out. This would include:

- Lighting should be kept to the minimum required for safe operation; and
- Wherever practicable lighting should be directed downwards and shielded to reduce light projecting horizontally towards coastal waters and avoid light projecting vertically to passing birds.

Thus, based on the existing lighting on the Port and the nearby proximity of the dredging activities to that, we have determined the potential effects of attraction to artificial lighting causing fatalities or impacting foraging of local (wider Whangārei Harbour) population of grey-faced petrel during the construction phase as outlined in Table 34.

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<sup>46</sup> Grey-faced petrel are away from their colonies during the non-breeding season and disperse widely within the subtropical and temperate waters (Gaskin & Rayner, 2017).

Table 33: Assessment of potential effects of attraction to construction artificial lighting causing fatalities on local populations of grey-faced petrel following effects management

| SPECIES           | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Grey-faced petrel | <100 pairs             | Low                            | Negligible                        | Very Low                      |

## 7.5.2 Potential operational effects

### 7.5.2.1 Effects management & level of effects

There is already a level of artificial lighting present in the existing environment (e.g. Northport, CINZ and residential development) and the proposed lighting for the shipyard project will not significantly increase the existing ambient levels or increase the range of species that might be affected.

However, there will be a small cumulative increase in lighting on the coastal margin and as a matter of good practice we recommend efforts to minimise operational lighting where it can reasonably be carried out. This would include:

- Lighting should be kept to the minimum required for safe operation; and
- Wherever practicable lighting should be directed downwards and shielded to reduce light projecting horizontally towards coastal waters and avoid light projecting vertically to passing birds.

Based on the above measures, we consider the magnitude of potential adverse effect (as defined in Table 5) to be Negligible (*Having a negligible effect on the known population*) for all species.

As such, we have determined the potential effects of attraction to artificial lighting causing fatalities or impacting foraging of local (wider Whangārei Harbour) populations of coastal avifauna species as outlined in Table 34.

Table 34: Assessment of potential effects of attraction to operational artificial lighting causing fatalities on local populations of coastal avifauna following effects management

| SPECIES           | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit | ~2,800 birds           | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| Caspian tern      | 50-100 pairs           | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | Moderate                       | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel       | ~80 birds              | Very High                      | Negligible                        | Low                           |
| Pied shag         | >50 birds              | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | High                           | Negligible                        | Very Low                      |
| Reef heron        | >10 pairs?             | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | Moderate                       | Negligible                        | Very Low                      |
| SBBG              | Abundant               | Low                            | Negligible                        | Very Low                      |

| SPECIES            | EST. WHANGĀREI<br>HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF<br>EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|--------------------|---------------------------|--------------------------------|--------------------------------------|----------------------------------|
| SIPO               | ~2,500 birds              | High                           | Negligible                           | Very Low                         |
| VOC                | ~350 birds                | Moderate                       | Negligible                           | Very Low                         |
| White-faced heron  | ~100 birds                | Low                            | Negligible                           | Very Low                         |
| White-fronted tern | >100 birds                | High                           | Negligible                           | Very Low                         |
| Wrybill            | ~150 birds                | Very High                      | Negligible                           | Low                              |
| Grey-faced petrel  | <100 pairs                | Low                            | Negligible                           | Very Low                         |

## 7.6 Pollution

Marine pollutants include hydrocarbons, heavy metals, hydrophobic persistent organic pollutants and small plastic debris. The location of coastal and seabirds at or near the top of the marine food web makes them particularly sensitive to these pollutants (Burger & Gochfeld, 2002; Furness & Camphuysen, 1997). Some toxins can have a range of effects on seabirds, including affecting development, physiology and behaviour, reproductive performance and survival rates (Burger et al., 1992; Burger & Gochfeld, 1993; Finkelstein et al., 2006; Fry, 1995; Howarth et al., 1982).

### 7.6.1 Potential construction effects

Dredging operations can potentially release toxins into the marine environment through the remobilisation of contaminated sediments (Nayar et al., 2004; Su et al., 2002; Sundberg et al., 2007).

#### 7.6.1.1 Effects management & level of effects

Section 5.1.1 of the Marine Ecology Assessment (Coast & Catchment, 2026) provides a summary of contaminants and sediment quality within the Whangarei Harbour. Apart from moderately elevated concentrations of the key urban stormwater contaminants (copper, lead and zinc) in the upper harbour sediments near Whangārei, sediment concentrations of heavy metals in the harbour are generally low and below the NRC standards for sediment quality. Furthermore, relatively low sediment concentrations of organic carbon, nitrogen and phosphorus have been recorded around Northport.

Thus, based on the low contaminant concentrations reported around Northport, and the temporary nature of dredging operations, we consider the magnitude of potential adverse effect (as defined in Table 5) to be Negligible (*Having a negligible effect on the known population*) for all species.

As such, we have determined the potential effects of construction-related pollution on local (wider Whangārei Harbour) populations of coastal avifauna species as outlined in Table 35.

*Table 35: Assessment of potential effects of construction-related pollution on local populations of coastal avifauna following effects management*

| SPECIES           | EST. WHANGĀREI<br>HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF<br>EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|-------------------|---------------------------|--------------------------------|--------------------------------------|----------------------------------|
| Banded dotterel   | ~700 birds                | High                           | Negligible                           | Very Low                         |
| Bar-tailed godwit | ~2,800 birds              | High                           | Negligible                           | Very Low                         |

| SPECIES            | EST. WHANGĀREI<br>HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF<br>EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|--------------------|---------------------------|--------------------------------|--------------------------------------|----------------------------------|
| Black shag         | >10 birds                 | Moderate                       | Negligible                           | Very Low                         |
| Caspian tern       | 50-100 pairs              | Very High                      | Negligible                           | Low                              |
| Lesser knot        | ~800 birds                | Moderate                       | Negligible                           | Very Low                         |
| Little shag        | >10 birds                 | Moderate                       | Negligible                           | Very Low                         |
| NZ dotterel        | ~80 birds                 | Very High                      | Negligible                           | Low                              |
| Pied shag          | >50 birds                 | Moderate                       | Negligible                           | Very Low                         |
| Pied stilt         | ~800 birds                | Low                            | Negligible                           | Very Low                         |
| Red-billed gull    | >1,190 pairs              | High                           | Negligible                           | Very Low                         |
| Reef heron         | >10 pairs?                | Very High                      | Negligible                           | Low                              |
| Royal spoonbill    | ~40 birds                 | Moderate                       | Negligible                           | Very Low                         |
| SBBG               | Abundant                  | Low                            | Negligible                           | Very Low                         |
| SIPO               | ~2,500 birds              | High                           | Negligible                           | Very Low                         |
| VOC                | ~350 birds                | Moderate                       | Negligible                           | Very Low                         |
| White-faced heron  | ~100 birds                | Low                            | Negligible                           | Very Low                         |
| White-fronted tern | >100 birds                | High                           | Negligible                           | Very Low                         |
| Wrybill            | ~150 birds                | Very High                      | Negligible                           | Low                              |
| Little penguin     | >100 birds                | High                           | Negligible                           | Very Low                         |
| Grey-faced petrel  | <100 pairs                | Low                            | Negligible                           | Very Low                         |

## 7.6.2 Potential operational effects

Drydock operations can potentially release toxins into the marine environment through the generation of new pollutants and transport through stormwater (Host, 1996) and also airborne through the air (PDP, 2026).

The contaminant sources associated with the Project can be divided into general operational runoff associated with rainfall and activity specific runoff (Blackburn, 2026).

Blackburn (2026) notes that the contaminant risk profile for the non-industrial areas of the proposal (i.e. not proposed to be trade waste connected) is expected to be the same or lower than that associated with the existing and consented extensions to the Northport facility, given the absence of cargo handling and bulk stored goods (including logs).

### 7.6.2.1 Effects management & level of effects

Coast & Catchment's (2026) review of NorthPort's existing stormwater discharges reported that overall the available information indicated that these stormwater discharges posed little ecological risk (refer to Section 7.4.1 of Marine Ecology Assessment). Furthermore, given no changes are proposed to stormwater discharge standards, apart from the addition of tin to the list of monitoring parameters, Coast & Catchment's (2026) concluded that the stormwater discharge effects from the dry-dock facility are not expected to cause any additional adverse ecological effects.

There is already a level of pollution generated within the existing environment (e.g. Northport, CINZ and residential development) which the proposed shipyard project will not significantly increase based on features of the current design that will capture and treat runoff (refer to

Section 6.0 and Blackburn (2026)). Blackburn (2026) notes that the existing Northport pond has sufficient capacity to treat “standard” runoff contaminant loads from the proposed facility and remain compliant with the existing discharge consent analyte thresholds.

Furthermore, runoff generated from water blasting, pressure washing or wet-blasting) will be routed to containment for discharge to the Whangarei District Council waste water system under a trade waste license (Blackburn, 2026). Vessel discharge water (bilge washing, tank flushing, etc) will also be fully contained and discharged to the waste water network or (where appropriate) transported to a specialist disposal facility (Blackburn, 2026).

As noted in the report prepared by Streamlined Environmental (2026), antifouling chemicals contained in spray drift from unencapsulated painting will lead to extremely low concentrations being deposited to the CMA. High tidal currents will ensure rapid dilution of water soluble antifouling chemicals with the largest residual risk being accumulation of antifouling chemicals in surficial intertidal sediment in proximity to the Shipyard and Drydock facility. According to Streamlined Environmental (2026), the range of time required for sediment accumulation to reach ecological thresholds is between 101 years and 278,331 years. On this basis, Coast & Catchment (2026) concluded that the risk from the drift of unencapsulated painting was considered to result in Negligible ecological effects on intertidal sediments near the Shipyard and Dry Dock.

Section 12 of the Air Quality Impact Assessment for the Project (PDP, 2026) provides details regarding mitigation measures that will be used to control the effects of discharges to air as a result of this project (including during the operational phase), and therefore the intertidal zone.

Thus, based on the above measures, we consider the magnitude of potential adverse effect (as defined in Table 5) to be Negligible (*Having a negligible effect on the known population*) for all species.

As such, we have determined the potential effects of operation air- and waterborne pollution on local (wider Whangārei Harbour) populations of coastal avifauna species as outlined in Table 36.

*Table 36: Assessment of potential effects of operational-related pollution on local populations of coastal avifauna following effects management*

| SPECIES           | EST. WHANGĀREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit | ~2,800 birds           | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| Caspian tern      | 50-100 pairs           | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | Moderate                       | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel       | ~80 birds              | Very High                      | Negligible                        | Low                           |
| Pied shag         | >50 birds              | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | High                           | Negligible                        | Very Low                      |
| Reef heron        | >10 pairs?             | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | Moderate                       | Negligible                        | Very Low                      |
| SBBG              | Abundant               | Low                            | Negligible                        | Very Low                      |

| SPECIES            | EST. WHANGĀREI<br>HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF<br>EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|--------------------|---------------------------|--------------------------------|--------------------------------------|----------------------------------|
| SIPO               | ~2,500 birds              | High                           | Negligible                           | Very Low                         |
| VOC                | ~350 birds                | Moderate                       | Negligible                           | Very Low                         |
| White-faced heron  | ~100 birds                | Low                            | Negligible                           | Very Low                         |
| White-fronted tern | >100 birds                | High                           | Negligible                           | Very Low                         |
| Wrybill            | ~150 birds                | Very High                      | Negligible                           | Low                              |
| Little penguin     | >100 birds                | High                           | Negligible                           | Very Low                         |
| Grey-faced petrel  | <100 pairs                | Low                            | Negligible                           | Very Low                         |

## 7.7 Relocating the Consented High Tide Roost

The re-creation and ongoing maintenance of the sandbank on the western side of Northport (prior to construction) is required by conditions of the extant resource consent for Northport's eastern expansion to address the potential effects of permanent loss of high tide habitat associated with the future construction of the eastern reclamation (Boffa Miskell Ltd, 2022b, 2022a).

While the location of that high tide roost is outside the footprint of the shipyard project, it is located within the 60 m disturbance zone (refer to Map 35). Accordingly, application is being made to vary the conditions of the Northport resource consent to slightly modify the location and shape of the sand bank roost.

### 7.7.1 Potential effects

The location of the consented high tide roost within the 60 m disturbance zone may make it less attractive to birds. As such, it is proposed that the high tide roost be relocated outside of the disturbance zone. In addition, due to the changes in coastal processes associated with the shipyard footprint, it has been proposed that the shape of the high tide roost be changed from an elongated roost to a circular result and subsequently reshaped (Tonkin & Taylor Ltd, 2026). The new location is overlapping the current proposed location of the high tide roost – the change is negligible. With regard to the change in shape of the high tide roost, the splash zone within the interior of a rounded high tide roost is reduced compared to a thin elongated design.

The design features of both the consented and proposed high tide roost are provided in Table 37 below.

*Table 37: Consented and proposed re-created high tide roost design features*

| ROOST FEATURE                           | CONSENTED DESIGN     | PROPOSED DESIGN      |
|-----------------------------------------|----------------------|----------------------|
| Location                                | Refer to Map 35      |                      |
| Shape                                   | Elongated            | Circular             |
| Initial side slopes                     | 4(H):1(V)            | 8(H):1(V)            |
| Area above MHWS                         | 2,703 m <sup>2</sup> | 2,700 m <sup>2</sup> |
| Height above MHWS                       | 0.6 m                | 0.6 m                |
| Footprint                               | 4,573 m <sup>2</sup> | 7,480 m <sup>2</sup> |
| Distance from landward side of the spit | 100 m                | 100 m                |

| ROOST FEATURE | CONSENTED DESIGN    | PROPOSED DESIGN      |
|---------------|---------------------|----------------------|
| Sand volume   | 7,400m <sup>3</sup> | 7,200 m <sup>2</sup> |

### 7.7.2 Effects management & level of effects

The construction of the high tide roost within the intertidal zone will result in the removal of an area of foraging habitat. The level of this effect for the consented footprint was determined by overlaying that with the coastal avifauna and benthic macro-invertebrate maps (Maps 9-22) for wading and shorebird species that primarily forage in the intertidal zone (Table 38). The level of effect on those shorebird species recorded foraging under the consented high tide roost footprint was determined based on the proportion of the Whangarei population that represented (Table 39). This exercise has been repeated based on the proposed alternative high tide roost (refer to Table 40 and Table 41). We note that fewer birds were recorded under the proposed high roost footprint (Table 40) than the consented high tide roost footprint (Table 38).

*Table 38: Species and number of coastal birds recorded within the consented roost footprint. (Source: (Boffa Miskell Ltd, 2022a))*

| SPECIES                    | No. BIRDS | DATE OBSERVED |
|----------------------------|-----------|---------------|
| Lesser knot                | 30        | 20/12/2017    |
| Lesser knot                | 50        | 6/11/2019     |
| Pied stilt                 | 1         | 4/06/2021     |
| White-faced heron          | 1         | 28/06/2021    |
| NZ dotterel                | 2         | 5/07/2021     |
| Southern black-backed gull | 11        | 13/07/2021    |
| Caspian tern               | 1         | 20/07/2021    |
| Caspian tern               | 1         | 25/07/2021    |
| Bar-tailed godwit          | 1         | 29/6/22       |
| <b>TOTAL BIRDS</b>         | <b>98</b> |               |

*Table 39: Assessment of potential effects of construction and loss of foraging habitat associated with the consented high tide roost on local populations of coastal avifauna (Source:(Boffa Miskell Ltd, 2022a))*

| SPECIES           | EST. WHANGAREI HBR POP | MAX No. WITHIN FOOTPRINT | % WHANGAREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------|---------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | -                        | -                   | High                           | -                                 | -                             |
| Bar-tailed godwit | ~2,800 birds           | 1                        | 0.04%               | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| Caspian tern      | 50-100 pairs           | 1                        | 1% <sup>47</sup>    | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | 50                       | 6%                  | High                           | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| NZ dotterel       | ~80 birds              | 2                        | 2.5%                | Very High                      | Negligible                        | Low                           |
| Pied shag         | >50 birds              | -                        | -                   | Moderate                       | -                                 | -                             |

<sup>47</sup> Based on a conservative approach of assuming 50 pairs (i.e. the lower range of the estimated Whangarei Harbour population)

| SPECIES            | EST. WHANGAREI HBR POP | MAX No. WITHIN FOOTPRINT | % WHANGAREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|--------------------------|---------------------|--------------------------------|-----------------------------------|-------------------------------|
| Pied stilt         | ~800 birds             | 1                        | 0.1%                | Low                            | Negligible                        | Very Low                      |
| Red-billed gull    | >1,190 pairs           | -                        | -                   | High                           | -                                 | -                             |
| Reef heron         | >10 pairs?             | -                        | -                   | Very High                      | -                                 | -                             |
| Royal spoonbill    | ~40 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| SBBG               | Abundant               | 11                       | >1%                 | Low                            | Negligible                        | Very Low                      |
| SIPO               | ~2,500 birds           | -                        | -                   | High                           | -                                 | -                             |
| VOC                | ~350 birds             | -                        | -                   | Moderate                       | -                                 | -                             |
| White-faced heron  | ~100 birds             | 1                        | 1%                  | Low                            | Negligible                        | Very Low                      |
| White-fronted tern | >100 birds             | -                        | -                   | High                           | -                                 | -                             |
| Wrybill            | ~150 birds             | -                        | -                   | Very High                      | -                                 | -                             |

Table 40: Species and number of coastal birds recorded within the proposed roost footprint

| SPECIES            | No. BIRDS | DATE OBSERVED |
|--------------------|-----------|---------------|
| Lesser knot        | 50        | 6/11/2019     |
| Caspian tern       | 1         | 20/07/2021    |
| Caspian tern       | 1         | 25/07/2021    |
| <b>TOTAL BIRDS</b> | <b>52</b> |               |

Table 41: Assessment of potential effects of construction and loss of foraging habitat associated with the relocated proposed high tide roost on local populations of coastal avifauna

| SPECIES           | EST. WHANGAREI HBR POP | MAX No. WITHIN FOOTPRINT | % WHANGAREI HBR POP | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|--------------------------|---------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel   | ~700 birds             | -                        | -                   | High                           | -                                 | -                             |
| Bar-tailed godwit | ~2,800 birds           | -                        | -                   | High                           | -                                 | -                             |
| Black shag        | >10 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| Caspian tern      | 50-100 pairs           | 1                        | 1% <sup>48</sup>    | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | 50                       | 6%                  | High                           | Low                               | Low                           |
| Little shag       | >10 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| NZ dotterel       | ~80 birds              | -                        | -                   | Very High                      | -                                 | -                             |
| Pied shag         | >50 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| Pied stilt        | ~800 birds             | -                        | -                   | Low                            | -                                 | -                             |
| Red-billed gull   | >1,190 pairs           | -                        | -                   | High                           | -                                 | -                             |
| Reef heron        | >10 pairs?             | -                        | -                   | Very High                      | -                                 | -                             |
| Royal spoonbill   | ~40 birds              | -                        | -                   | Moderate                       | -                                 | -                             |
| SBBG              | Abundant               | -                        | -                   | Low                            | -                                 | -                             |
| SIPO              | ~2,500 birds           | -                        | -                   | High                           | -                                 | -                             |

<sup>48</sup> Based on a conservative approach of assuming 50 pairs (i.e. the lower range of the estimated Whangarei Harbour population)



| SPECIES            | EST.<br>WHANGAREI<br>HBR POP | MAX No.<br>WITHIN<br>FOOTPRINT | %<br>WHANGAREI<br>HBR POP | ECOLOGICAL<br>VALUE <sup>37</sup> | MAGNITUDE<br>OF EFFECT <sup>38</sup> | LEVEL OF<br>EFFECT <sup>39</sup> |
|--------------------|------------------------------|--------------------------------|---------------------------|-----------------------------------|--------------------------------------|----------------------------------|
| VOC                | ~350 birds                   | -                              | -                         | Moderate                          | -                                    | -                                |
| White-faced heron  | ~100 birds                   | -                              | -                         | Low                               | -                                    | -                                |
| White-fronted tern | >100 birds                   | -                              | -                         | High                              | -                                    | -                                |
| Wrybill            | ~150 birds                   | -                              | -                         | Very High                         | -                                    | -                                |

## 7.8 Summary of Potential Effects of the Proposal

A summary of the potential effects from the proposal identified in Sections 7.1-7.7 is provided in Table 42. For all coastal avifauna species, the potential overall effects of the construction and operation of the proposed shipyard will be Low to Very Low. The exception to this is northern NZ dotterel, for which it has been determined there will be a Moderate level of overall effect. This is a result of the proportion of the local population utilising the proposed reclamation area which will be subject to permanent habitat loss and temporary disturbance during the construction phase.

Table 42: Summary of potential effects associated with the construction (Con.) and operation (Op.) of the proposed shipyard and drydock project following effects management

| SPECIES               | PERMANENT HABITAT LOSS |     | MORTALITIES |          | DISTURBANCE & DISPLACEMENT |          | FOOD SUPPLY & FORAGING ABILITY |          | ARTIFICIAL LIGHTING |          | POLLUTION |          | RELOCATING HIGH TIDE ROOST |     |
|-----------------------|------------------------|-----|-------------|----------|----------------------------|----------|--------------------------------|----------|---------------------|----------|-----------|----------|----------------------------|-----|
|                       | Con.                   | Op. | Con.        | Op.      | Con.                       | Op.      | Con.                           | Op.      | Con.                | Op.      | Con.      | Op.      | Con.                       | Op. |
| Banded dotterel       | -                      | -   | -           | -        | -                          | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Bar-tailed godwit     | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Black shag            | -                      | -   | -           | -        | Very Low                   | -        | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Caspian tern          | Low                    | -   | -           | -        | Low                        | Low      | Low                            | Low      | -                   | Low      | Low       | Low      | Low                        | -   |
| Lesser knot           | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | Low                        | -   |
| Little shag           | -                      | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| NZ dotterel           | Moderate               | -   | Low         | Low      | Moderate                   | Low      | Low                            | Low      | -                   | Low      | Low       | Low      | -                          | -   |
| Pied shag             | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Pied stilt            | Very Low               | -   | Very Low    | Very Low | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Red-billed gull       | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Reef heron            | Low                    | -   | -           | -        | Low                        | Low      | Low                            | Low      | -                   | Low      | Low       | Low      | -                          | -   |
| Royal spoonbill       | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| SBBG                  | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| SIPO                  | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| VOC                   | Low                    | -   | Very Low    | Very Low | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| White-faced heron     | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| White-fronted tern    | Very Low               | -   | -           | -        | Very Low                   | Very Low | Very Low                       | Very Low | -                   | Very Low | Very Low  | Very Low | -                          | -   |
| Wrybill               | -                      | -   | -           | -        | -                          | -        | Low                            | Low      | -                   | Low      | Low       | Low      | -                          | -   |
| Little penguin        | -                      | -   | Very Low    | -        | Low                        | -        | Very Low                       | Very Low | -                   | -        | -         | -        | -                          | -   |
| Grey-faced petrel     | -                      | -   | -           | -        | -                          | Very Low | -                              | -        | Very Low            | Very Low | Very Low  | Very Low | -                          | -   |
| Australasian bittern  | -                      | -   | -           | -        | Low                        | Very Low | -                              | -        | -                   | -        | -         | -        | -                          | -   |
| Banded rail           | -                      | -   | -           | -        | Very Low                   | Very Low | -                              | -        | -                   | -        | -         | -        | -                          | -   |
| Spotless crane        | -                      | -   | -           | -        | Very Low                   | Very Low | -                              | -        | -                   | -        | -         | -        | -                          | -   |
| North Island fernbird | -                      | -   | -           | -        | Very Low                   | Very Low | -                              | -        | -                   | -        | -         | -        | -                          | -   |

## 8.0 Cumulative Effects

As outlined in Section 1.0 above, for the context of this assessment the “existing” environment comprises both the built developments and extant resource consents that are listed in Table 1.

Cumulative effects are concerned with things that will occur, and include two components:

- Effects arising / building up over time; and
- Effects arising in combination with other effects.

Therefore, cumulative effects are not limited to those arising from the proposed activity but include the effects of the proposed activity in combination with “existing” effects, whether arising from existing uses, permitted activities, and consented and probable uses.

We have determined that the appropriate spatial scale for consideration of cumulative effects is the Whangārei Harbour and considered the potential cumulative effect of those coastal developments listed in Table 43 in conjunction with the current proposal for the shipyard and drydock project.

*Table 43: Coastal developments within Whangārei Harbour for which cumulative effects have been considered.*

| EXTANT RESOURCE CONSENTS                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Northport’s Berth 4 and eastern expansions</li><li>• Channel Infrastructure NZ (CINZ) channel optimisation project</li><li>• Port Nikau marina expansion</li><li>• Whangārei Marina Management Trust’s new marina</li></ul> |

The following effects on coastal avifauna arising in combination with those developments listed in Table 43 have been considered (and summarised in Table 44):

- Northport’s Berth 4 Expansion:
  - Effects on coastal avifauna related to discharges to the marine environment and increased lighting.
- Northport’s eastern expansion (Boffa Miskell Ltd, 2022a, 2022b):
  - Effects on coastal avifauna related permanent habitat loss as well as construction related disturbance / displacement.
  - Based on the implementation of effects management and mitigation measures, the overall levels of effect on coastal avifauna were considered to be Low to Very Low.
- Channel optimisation (Bioresarches, 2017):
  - Project-generated effects on shorebird habitats were considered high at Mair Bank and low-moderate at Reotahi Bay as a result of their proximity to the works.
  - The species most susceptible to a turbidity increase in the dredging area was considered to be little penguin; the concern was disruption of its passage between shoreline nesting areas, specifically those within the Harbour and the nearby open water.
  - Vessel lighting would likely attract seabird and result in collisions with dredging vessels.

- Port Nikau marina:
  - Creation of a mixed use development in an area that was historically used for port related activities, but which has largely become redundant due to the relocation of the majority of the port related activities to Marsden Point.
  - Adjacent to wading bird foraging habitat (mudflats).
- Whangārei marina (4Sight Consulting, 2017):
  - A less than minor effect on banded rail due to small amount of habitat (mangrove) loss and the fact that this habitat lies at the margin of what is likely to constitute the preferred habitat, based on known habitat preferences.

*Table 44: Coastal avifauna effects from each of the coastal developments within Whangārei Harbour for which cumulative effects have been considered*

| PROJECT                       | SPECIES AFFECTED       | EFFECT                                                                                             | LEVEL OF EFFECT                                   |
|-------------------------------|------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Northport Berth 4 expansion   | Not identified         | Effects on coastal avifauna related to discharges to the marine environment and increased lighting | Not identified                                    |
| Northport's eastern expansion | Variable oystercatcher | Permanent habitat loss as well as construction and operational disturbance / displacement          | Low                                               |
|                               | Northern NZ dotterel   | Permanent habitat loss as well as construction and operational disturbance / displacement          | Low                                               |
|                               | Kororā                 | Underwater noise effects associated with construction piling                                       | Low                                               |
| CINZ channel optimisation     | Shorebirds             | Project-generated effects on shorebird habitats                                                    | High at Mair Bank and low-moderate at Reotahi Bay |
|                               | Kororā                 | Disruption to passage between shoreline nesting areas due to increased water turbidity             | Less than minor                                   |
| Port Nikau marina             | Not identified         | Disturbance to foraging wading birds                                                               | Not identified                                    |
| Whangārei marina              | Banded rail            | Permanent habitat loss                                                                             | Less than minor                                   |
| Shipyard & drydock            | Northern NZ dotterel   | Permanent habitat loss as well as construction and operational disturbance / displacement          | Moderate                                          |
|                               | Kororā                 | Underwater noise effects associated with construction piling and dredging                          | Low                                               |

With the exception of the coastal bird assessment for Northport's eastern expansion, the remainder of the other ecological assessments listed above did not quantify the proportion of the population of the various coastal birds that would be affected by the respective development, thereby making it difficult to determine the cumulative effects of these activities. Nevertheless, Northport's eastern expansion and the proposed shipyard and drydock projects

have identified similar effects in regard to permanent habitat loss as well as construction and operational disturbance / displacement (refer to Table 44).

## 8.1 Permanent Habitat Loss

The magnitude of effect in relation to the permanent loss of foraging habitat has been determined by cumulative proportion of the local Whangārei Harbour population affected by the two reclamations as identified in Table 45 below. With respect to northern NZ dotterel, 2.85% and 3.60% of the Whangārei Harbour population will be affected by the eastern and shipyard reclamations respectively. Thus combined the two projects will impact 6.45% of the northern NZ dotterel Whangārei Harbour population, which, equates to a Low magnitude (1-10% of population affected). As such, the overall cumulative effects of these projects on northern New Zealand dotterel is considered to be Moderate and Low to Very Low for all other coastal avifauna species (refer to Table 45 below).

In terms of the permanent loss of roosting habitat, the effects of the eastern reclamation were addressed through the creation of a high tide roost on the western side of Northport. As such, the cumulative effect of the loss of roosting habitat associated with the shipyard and drydock project is considered to be Negligible based on the very low proportion of populations recorded at that location (W3) during the high tide surveys (refer to Table 46).

*Table 45: Assessment of potential cumulative effects of permanent foraging habitat loss on the local coastal avifauna populations based on the proportion of birds recorded in low-mid tide survey compartments*

| SPECIES           | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP. AFFECTED |                                 | CUMULATIVE PROPORTION OF POP. | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|-------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|--------------------------------|-----------------------------------|-------------------------------|
|                   |                        | Western (W3) <sup>49</sup>          | Eastern (E1 & E2) <sup>50</sup> |                               |                                |                                   |                               |
| Banded dotterel   | ~700 birds             | 0                                   | 0.01%                           | 0.01%                         | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit | ~2,800 birds           | 0.11%                               | 0.00%                           | 0.11%                         | High                           | Negligible                        | Very Low                      |
| Black shag        | >10 birds              | 0                                   | 0                               | 0                             | Moderate                       | -                                 | -                             |
| Caspian tern      | 50-100 pairs           | 0.15%                               | 0.35%                           | 0.5%                          | Very High                      | Negligible                        | Low                           |
| Lesser knot       | ~800 birds             | 0.80%                               | 0                               | 0.80%                         | High                           | Negligible                        | Very Low                      |
| Little shag       | >10 birds              | 0                                   | 0                               | 0                             | Moderate                       | -                                 | -                             |
| NZ dotterel       | ~80 birds              | 2.85%                               | 3.6%                            | 6.45%                         | Very High                      | Low                               | Moderate                      |
| Pied shag         | >50 birds              | 0.05%                               | 0.1%                            | 0.15%                         | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt        | ~800 birds             | 0.12%                               | 0.01%                           | 0.13%                         | Low                            | Negligible                        | Very Low                      |
| Red-billed gull   | >1,190 pairs           | 0.42%                               | 5.8%                            | 6.22%                         | High                           | Low                               | Low                           |
| Reef heron        | >10 pairs?             | 0.32%                               | 0.2%                            | 0.54%                         | Very High                      | Negligible                        | Low                           |
| Royal spoonbill   | ~40 birds              | 0.41%                               | 0                               | 0.41%                         | Moderate                       | Negligible                        | Very Low                      |
| SBBG              | Abundant               | 0.04%                               | 0.16%                           | 0.20%                         | Low                            | Negligible                        | Very Low                      |
| SIPO              | ~2,500 birds           | 0.01%                               | 1.6%                            | 1.61%                         | High                           | Low                               | Low                           |
| VOC               | ~350 birds             | 0.44%                               | 7.4%                            | 7.81%                         | Moderate                       | Low                               | Low                           |
| White-faced heron | ~100 birds             | 0.72%                               | 0.1%                            | 0.73%                         | Low                            | Negligible                        | Very Low                      |

<sup>49</sup> Taken from Table 20 (page 55) of this current assessment

<sup>50</sup> Taken from Table 13 in Boffa Miskell (2022a)

| SPECIES            | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP. AFFECTED |                                 | CUMULATIVE PROPORTION OF POP. | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|-------------------------------------|---------------------------------|-------------------------------|--------------------------------|-----------------------------------|-------------------------------|
|                    |                        | Western (W3) <sup>49</sup>          | Eastern (E1 & E2) <sup>50</sup> |                               |                                |                                   |                               |
| White-fronted tern | >100 birds             | 0.01%                               | 1.3%                            | 1.31%                         | High                           | Low                               | Low                           |
| Wrybill            | ~150 birds             | 0                                   | 0.02%                           | 0.02%                         | Very High                      | Negligible                        | Low                           |

*Table 46: Assessment of potential cumulative effects of roosting habitat loss on the local coastal avifauna populations based on the proportion of birds recorded in high tide survey compartments*

| SPECIES            | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP WITHIN W3 | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|-------------------------------------|--------------------------------|-----------------------------------|-------------------------------|
| Banded dotterel    | ~700 birds             | 0                                   | High                           | -                                 | -                             |
| Bar-tailed godwit  | ~2,800 birds           | 0.03%                               | High                           | Negligible                        | Very Low                      |
| Black shag         | >10 birds              | 0                                   | Moderate                       | -                                 | -                             |
| Caspian tern       | 50-100 pairs           | 0.05%                               | Very High                      | Negligible                        | Low                           |
| Lesser knot        | ~800 birds             | 0.06%                               | High                           | Negligible                        | Very Low                      |
| Little shag        | >10 birds              | 0.23%                               | Moderate                       | Negligible                        | Very Low                      |
| NZ dotterel        | ~80 birds              | 0.03%                               | Very High                      | Negligible                        | Low                           |
| Pied shag          | >50 birds              | 0.00%                               | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt         | ~800 birds             | 0.13%                               | Low                            | Negligible                        | Very Low                      |
| Red-billed gull    | >1,190 pairs           | 0.03%                               | High                           | Negligible                        | Very Low                      |
| Reef heron         | >10 pairs?             | 0                                   | Very High                      | -                                 | -                             |
| Royal spoonbill    | ~40 birds              | 0                                   | Moderate                       | -                                 | -                             |
| SBBG               | Abundant               | 0.02%                               | Low                            | Negligible                        | Very Low                      |
| SIPO               | ~2,500 birds           | 0.00%                               | High                           | Negligible                        | Very Low                      |
| VOC                | ~350 birds             | 0.17%                               | Moderate                       | Negligible                        | Very Low                      |
| White-faced heron  | ~100 birds             | 0.21%                               | Low                            | Negligible                        | Very Low                      |
| White-fronted tern | >100 birds             | 0                                   | High                           | -                                 | -                             |
| Wrybill            | ~150 birds             | 0                                   | Very High                      | -                                 | -                             |

## 8.2 Disturbance and / or Displacement

### 8.2.1 Construction phase

Disturbance will occur to birds foraging or roosting within the eastern (E1 and E2) and western zones (W3) in which the eastern expansion and shipyard projects are occurring respectively. Thus, the proportion of populations affected, and the level of cumulative effects of construction related disturbance on foraging and roosting birds are the same as identified above in Table 45 and Table 46 respectively. The overall cumulative effects associated with construction related disturbance on northern New Zealand dotterel is considered to be Moderate and Low to Very Low for all other coastal avifauna species.

Three projects have underwater impacts on kororā: Northport eastern expansion, CINZ optimisation project and the proposed shipyard project. Based on these levels of effect and the

close proximity of all these projects, the overall cumulative effects associated with construction related underwater disturbance is considered to be Moderate for kororā.

## 8.2.2 Operational phase

Operational phase disturbance may well occur for birds utilising the areas adjacent to the eastern reclamation and shipyard (i.e. E3 and W2 respectively). Thus combined the two projects will impact approximately 8% of the northern NZ dotterel Whangārei Harbour population, which, equates to a Low magnitude (1-10% of population affected). As such, the overall cumulative operational disturbance effects of these projects on northern New Zealand dotterel is considered to be Moderate and Low to Very Low for all other coastal avifauna species (refer to Table 47 below).

*Table 47: Assessment of potential cumulative effects of operational disturbance on the local coastal avifauna populations based on the proportion of the highest proportion of birds recorded in the areas adjacent to the shipyard and eastern reclamations (i.e. W2 and E3 respectively).*

| SPECIES            | EST. WHANGĀREI HBR POP | PROPORTION WHANG. HBR POP. AFFECTED |                  | CUMULATIVE PROPORTION OF POP. | ECOLOGICAL VALUE <sup>37</sup> | MAGNITUDE OF EFFECT <sup>38</sup> | LEVEL OF EFFECT <sup>39</sup> |
|--------------------|------------------------|-------------------------------------|------------------|-------------------------------|--------------------------------|-----------------------------------|-------------------------------|
|                    |                        | W2 <sup>51</sup>                    | E3 <sup>52</sup> |                               |                                |                                   |                               |
| Banded dotterel    | ~700 birds             | 0.10%                               | 0                | 0.10%                         | High                           | Negligible                        | Very Low                      |
| Bar-tailed godwit  | ~2,800 birds           | 1.87%                               | 0                | 1.87%                         | High                           | Low                               | Low                           |
| Black shag         | >10 birds              | 0                                   | 0                | 0                             | Moderate                       | -                                 | -                             |
| Caspian tern       | 50-100 pairs           | 0.38%                               | 0.013%           | 0.31%                         | Very High                      | Negligible                        | Low                           |
| Lesser knot        | ~800 birds             | 5.55%                               | 0                | 5.55%                         | High                           | Low                               | Low                           |
| Little shag        | >10 birds              | 1.77%                               | 0                | 1.77%                         | Moderate                       | Low                               | Low                           |
| NZ dotterel        | ~80 birds              | 7.97%                               | 0.05%            | 8.02%                         | Very High                      | Low                               | Moderate                      |
| Pied shag          | >50 birds              | 0.30%                               | 0.05%            | 0.35%                         | Moderate                       | Negligible                        | Very Low                      |
| Pied stilt         | ~800 birds             | 0.20%                               | 0                | 0.20%                         | Low                            | Negligible                        | Very Low                      |
| Red-billed gull    | >1,190 pairs           | 1.21%                               | 0.99%            | 2.2%                          | High                           | Low                               | Low                           |
| Reef heron         | >10 pairs?             | 0.57%                               | 0                | 0.57%                         | Very High                      | Negligible                        | Low                           |
| Royal spoonbill    | ~40 birds              | 0.79%                               | 0                | 0.79%                         | Moderate                       | Negligible                        | Very Low                      |
| SBBG               | Abundant               | 0.60%                               | 0.04%            | 0.64%                         | Low                            | Negligible                        | Very Low                      |
| SIPO               | ~2,500 birds           | 0.16%                               | 0.002%           | 0.162%                        | High                           | Negligible                        | Very Low                      |
| VOC                | ~350 birds             | 0.79%                               | 0.113%           | 0.9%                          | Moderate                       | Negligible                        | Very Low                      |
| White-faced heron  | ~100 birds             | 2.06%                               | 0                | 2.06%                         | Low                            | Low                               | Very Low                      |
| White-fronted tern | >100 birds             | 2.18%                               | 0                | 2.18%                         | High                           | Low                               | Low                           |
| Wrybill            | ~150 birds             | 0                                   | 0.017%           | 0.017%                        | Very High                      | Negligible                        | Low                           |

## 8.3 Summary

In summary, the cumulative effects of the projects listed in Table 44 will be:

<sup>51</sup> Highest population proportion value taken from the low/mid or high tide counts in W2 shown in Table 30 on page 61

<sup>52</sup> Highest population proportion value taken from the low/mid or high tide counts in E3 shown in Table 19 in Boffa Miskell (2022a)

- Moderate for northern NZ dotterel in relation to permanent foraging habitat loss, construction and operational disturbance.
- Moderate for kororā in relation to construction underwater noise disturbance.
- Low to Very for all other coastal avifauna in relation to permanent habitat loss, construction and operational disturbance.
- Low to Very Low for all coastal avifauna species in relation to discharges into the marine environment;
- Low to Very Low for all coastal avifauna species in relation to lighting on the coastal margin.

## 9.0 Application of the Effects Management Hierarchy

The effects management hierarchy, as outlined in Table 7 (page 13) requires the following: avoidance, remediation, mitigation, offset then compensation. Below we outline how the avoid, remedy and mitigate components of the effects management hierarchy have been applied to this Project in relation to coastal avifauna.

According to Roper-Lindsay et al. (2018), the overall level of effect can then be used to guide the extent and nature of the ecological management response required (including the need for biodiversity offsetting):

- Very High adverse effects require a net biodiversity gain.<sup>53</sup>
- High and Moderate adverse effects require no net loss of biodiversity values.
- Low and Very Low effects should not normally be a concern. If effects are assessed taking impact management developed during project shaping into consideration, then it is essential that prescribed impact management is carried out to ensure Low or Very Low effects.

### 9.1 Permanent Loss of Habitat

With regards to the permanent loss of coastal marine foraging habitat through the construction of the reclamation, this effect cannot be avoided, remedied nor mitigated. On this basis, a Moderate level of effect was determined for northern NZ dotterel (Table 20, page 55), which we recommend be addressed through biodiversity offsetting or compensation. A Low or Very Low level of effect was determined for all other species, therefore not requiring biodiversity offsetting or compensation.

### 9.2 Injuries and / or Mortalities

Potential injuries and / or mortalities of coastal avifauna during the construction phase will be avoided through the preparation of an Avifauna Management Plan which will outline measures to avoid direct impacts and manage kororā and nesting shorebirds. On this basis, Low or Very

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<sup>53</sup> Though when ecological compensation is required because biodiversity offsetting is not possible, the principles of no-net-loss or net-gain do not apply (Maseyk et al., 2018).



Low levels of effect were determined (refer to Table 21 and Table 22 on pages 57 and 57 respectively) and therefore do not requiring biodiversity offsetting or compensation.

### **9.3 Disturbance and / or Displacement**

We note that construction-related disturbance / displacement is a temporary effect, that being for the duration of the construction period. Nevertheless, this effect cannot be avoided. On this basis, a Moderate level of effect was determined for northern NZ dotterel (refer to Table 27, page 64), which we recommend be addressed through biodiversity offsetting or compensation.

Kororā will be exposed to underwater noise disturbance associated with piling activities. The use of vibro-piling as much as possible will reduce this level of disturbance, and the underwater noise mitigation measures can be applied (e.g. bubble curtains). On this basis, a Low level of effect was determined for kororā (refer to Table 27, page 64) for the current project. However, when the cumulative effects of construction underwater noise disturbance are considered in relation to Northport's eastern expansion, CINZ optimisation project and the proposed shipyard project, this results in a Moderate level of effect on kororā (refer to Section 8.2.1) which we recommend be addressed through biodiversity offsetting or compensation.

A Low or Very Low level of effect construction-related disturbance was determined for all other species (refer to Table 27, page 64), therefore not requiring biodiversity offsetting or compensation.

With regards to operational related disturbance, while this effect cannot be avoided. However, the level of effect can be mitigated through the Project having a 4 m noise wall on the western boundary. On the basis a Low to Very Low level of effect from operational disturbance was determined for all species (refer to Table 30, page 67), therefore not requiring biodiversity offsetting or compensation.

### **9.4 Food Supply and / or Foraging Ability**

The deposition and suspension of sediments through the construction phase cannot be avoided. However, the effects can be mitigated through good plume management/monitoring (in real time) and use of silt curtains in the shallower high-risk areas. On this basis, a Low to Very Low level of effect on food supply and foraging ability during the construction phase was determined for all species (refer to Table 31, page 69), therefore not requiring biodiversity offsetting or compensation.

The level of effect through deposition and suspension of sediments during maintenance dredging was determined to be Low to Very Low for all species (refer to Table 32, page 70), therefore not requiring biodiversity offsetting or compensation.

### **9.5 Artificial Lighting**

For health and safety reasons, the use of artificial lighting cannot be avoided, however its potential effect on avifauna can be mitigated as follows:

- Kept to the minimum required for safe operation; and

- Wherever practicable lighting should be directed downwards and shielded to reduce light projecting horizontally towards coastal waters and avoid light projecting vertically to passing birds.

On this basis, a Low to Very Low level of effect from artificial lighting was determined for all species (refer to Table 33 and Table 34), therefore not requiring biodiversity offsetting or compensation.

## 9.6 Pollution

Potential effects of air- and waterborne contaminants will be mitigated through:

- The quality of stormwater runoff from the remaining dry-dock areas will be similar to or better than runoff from Northport; and
- The application of the measures outlined Section 12 of the Air Quality Impact Assessment for the Project (PDP, 2026).

## 9.7 Relocation of the Consented High Tide Roost

Due to the proximity of the consented high tide roost (i.e. within the 60 m of the Project), it has been proposed to be relocated so as to avoid disturbance effects to birds that may use it.

As a result of the proposed location, the shape of high tide roost has also been changed from elongated to circular to accommodate the coastal process conditions at that site.

Areas of high marine invertebrate abundance and density have also been avoided at the new location, and fewer birds have been recorded foraging within the footprint of the proposed site compared to the consented site (Table 38, page 80).

As was the case of the consented high tide roost site (Table 39, page 80), the level of effect of the proposed roost site was determined to be Low (Table 41, page 81) and therefore not requiring biodiversity offsetting or compensation.

# 10.0 National and Regional Policies

## 10.1 New Zealand Coastal Policy Statement (NZCPS)

The New Zealand Coastal Policy Statement (NZCPS; DOC (2025) relates specifically to the coastal environment. Policy 11 of the NZCPS relates to '*Indigenous Biological Diversity (biodiversity)*', with Policy 11(a)(i) requiring the **avoidance of adverse effects** on species listed as *Threatened* or *At Risk* in the NZ Threat Classification System.

According to the EIANZ guidelines (Roper-Lindsay et al., 2018), Very High, High and Moderate levels of effect are considered to be adverse. As outlined in Section 9.0 above, this Project has not been able to avoid adverse effects (Moderate) on northern NZ dotterel (permanent habitat loss, temporary construction disturbance and cumulative effects) and kororā (cumulative construction effects from underwater noise), both of which are classified as *At Risk*.

Because of the avoidance directive, the NZCPS is silent in regard to the need to offset or compensate for activities that result in an adverse effects on Threatened or At Risk species in the coastal environment.

## 10.2 National Policy Statement for Indigenous Biodiversity (NPS-IB)

The following broad points guide an assessment under the NPS-IB (MfE, 2025):

- 1) The NPS-IB only applies in the terrestrial environment, with few exceptions; and
- 2) The NPS-IB contains specific requirements relating to indigenous biodiversity within and outside of Significant Natural Areas (SNAs).

Given the NPS-IB only applies to the terrestrial environment, an analysis of the coastal avifauna data was undertaken to determine which species were recorded above MHWS in areas to be directly affected by the proposal. A total of five species were recorded (shown on Map 36) in the existing terrestrial environment section of the proposed shipyard project footprint: Red-billed gull, pied shag, southern black-backed gull, variable oystercatcher and northern NZ dotterel.

There are no terrestrial SNAs affected by the proposed shipyard and drydock project (refer to Map 36). Consequently, it is clause 3.16 (Indigenous biodiversity outside SNAs) that is of primary relevance to the current proposal, whereby:

- a) any significant adverse effects must be managed by applying the effects management hierarchy; and
- b) any other effects must be managed to give effect to the objective and policies of the NPS-IB.

We consider that potential effects identified as either High or Very High levels through the EIANZ impact assessment method to represent significant adverse effects. As outlined in Section 7.0 above identified, no such levels were identified for this Project.

Low to Very Low levels of effect were determined for red-billed gull, southern black-backed gull, variable oystercatcher and pied shag recorded in the existing terrestrial environment section of the proposed shipyard project footprint, and a Moderate level of effect on Northern NZ dotterel in relation to permanent foraging habitat loss (marine intertidal zone), temporary construction disturbance (marine intertidal zone; refer to Table 27 on page 64) and cumulative effect. On that basis, the NPS-IB requires that effects which are not considered to be significantly adverse must be managed to give effect to the objective and policies of the NPS-IB.

Policy 8 of the NPS-IB specifies that *"The importance of maintaining indigenous biodiversity outside SNAs is recognised and provided for"*.

Policy 15 of the NPS-IB specifies that *"Areas outside SNAs that support specified highly mobile fauna are identified and managed to maintain their populations across their natural range, and information and awareness of highly mobile fauna is improved"*. With the exception of southern black-backed gull, all other species (red-billed gull, variable oystercatcher and pied shag) are listed as highly mobile fauna in Appendix 2 of the NPS-IB. The majority of these species were recorded along the crest of Northport's existing western revetment (refer to Map 36). The western revetment edge of the shipyard and drydock will provide the same habitat that is lost, and as such will continue to support those highly mobile fauna.

For the various reasons stated above, we consider that the proposal appropriately manages adverse effects on indigenous biodiversity (specifically coastal avifauna) in the terrestrial environment in a manner that gives effect to the objective and policies of the NPS-IB.

### 10.3 Northland Regional Plan (NRP)

Northland Regional Plan (NRC, 2026) Policy D.2.18 '*Managing adverse effects on indigenous biodiversity*' includes separate clauses for in- and outside of the coastal environment.

In line with NZCPS Policy 11a(i), Policy D.2.18 1)a)i) of the NRP requires the avoiding adverse effects on Threatened and At Risk species in the coastal environment. As noted previously, this Project has not been able to avoid adverse effects (Moderate) on northern NZ dotterel and kororā, both of which are classified as *At Risk*, in the CMA. Because of the avoidance directive, the NRP is silent in regard to the need to offset or compensate for activities that result in an adverse effects on Threatened or At Risk species in the coastal environment.

Outside the coastal environment, Policy D.2.18 2)a)i) of the NRP requires the avoidance, remediation or mitigation of adverse effects so they are no more than minor. As outlined previously (refer to Sections 7.0 to 9.0 above), this assessment has determined that there will be no adverse (i.e. Moderate, High or Very High) effects on species within the terrestrial environment.

## 11.0 Residual Effects

Despite the various measures recommended and proposed to avoid, remedy or mitigate the ecological effects of the Project, because it involves a reclamation, permanent residual effects of reclamation construction on northern NZ dotterel are inevitable, as are the cumulative effects on both northern NZ dotterel and kororā. As such effects are located within the coastal environment, and have been assessed as Moderate levels of effect, which are considered to be adverse effects.

While there is the requirement under the NPS-IB and NRP (Policy D.2.18 2)a)i)) to address such levels of effect through biodiversity offset and / or compensation in the terrestrial environment, there is no such requirement under the NZCPS and NRP (Policy D.2.18 1)a)i)) in relation to effects in the marine environment due to the avoidance directives of these later policies.

Nevertheless, we recommend that some measures are implemented to address the Moderate levels of effects identified as a result of the construction of the Project. Consideration has been given to whether an offsetting regime might be feasible, but identifying any specific proposals has proved to be challenging. For instance, it is not possible to recreate an area of intertidal foraging habitat to offset the area permanently lost under the reclamation. Nor can the quantity of quality of intertidal food supply be increased elsewhere within the Harbour to offset the permanent loss of prey under the reclamation.

Accordingly, the only practical way of contributing to a “no net loss of ecological values” outcome would be to establish an ecological compensation fund and a process for allocating that funding for appropriate initiatives identified by tangata whenua and the community.

## 12.0 Proposed Consent Conditions

As noted previously, it is imperative that the impact management measures on which the above assessment are based, are implemented. As such, consent conditions are required which address:

- The preparation of an Avifauna Management Plan that outlines the measures that will be implemented to avoid direct and indirect construction effects on avifauna for the species that have been identified as breeding or potentially breeding within and adjacent to the Project site (identified in Sections 7.2.1.1 and 7.3.1 above).
- The requirement for underwater noise management measures to reduce the impacts of piling activities on diving seabirds, particularly kororā.
- Operational lighting to be hooded and orientated downwards to avoid attraction and potential mortalities of seabirds on the Project site (Section 7.5.2.1).
- Measures to address the residual and cumulative effects on northern NZ dotterel and kororā through the establishment of compensation fund and a process for allocating that funding for appropriate initiatives identified by tangata whenua and the community.

## 13.0 Conclusions

- The Whangārei Harbour waters, intertidal zone and surrounding coastline provides a variety of habitats for a number of *Threatened* and *At Risk* species. A number of these habitats have been identified as Significant by Northland Regional Council and / or the Department of Conservation.
- A total of 107 bird species, comprising 23 introduced, 75 native (including Threatened and At Risk), six migrant and three vagrant species, have been recorded in the wider Whangārei Harbour area. A subset of these species were recorded roosting, foraging and nesting within and adjacent to the Project site.
- The potential level of effect of the proposed shipyard project on the coastal avifauna species was assessed for the following: direct / permanent loss of habitat, injuries and / or mortalities, disturbance and displacement (effective habitat loss), food supply and foraging behaviour, artificial lighting, pollution, and relocating Northport's eastern expansion consented high tide roost.
- Following the application of effects management, the potential effects of the construction and operation of the proposed shipyard on coastal avifauna was determined to be Low to Very Low. The exception to this is northern NZ dotterel, for which it has been determined there will be a Moderate level of overall effect as a result of the proportion of the local population utilising the proposed reclamation area which will be subject to permanent habitat loss and temporary disturbance during the construction phase. Furthermore, a Moderate level of cumulative effects were also identified for northern NZ dotterel and kororā.

- Proposed consent conditions have been drafted which ensure the impact management measures on which the Low to Very Low levels of effects on coastal avifauna were determined are implemented.
- We recommended that the residual and cumulative adverse effects on northern NZ dotterel and kororā be addressed through the establishment of compensation fund and a process for allocating that funding for appropriate initiatives identified by tangata whenua and the community.

## 14.0 References

- 4Sight Consulting. (2017). *Okara marina, Whangarei: Ecology and water quality assessment*. Prepared by 4Sight Consulting for Whangarei Marina New Zealand.
- 4Sight Consulting. (2019). *Baseline nesting bird survey November 2018—January 2019*. Prepared by 4Sight Consulting for Northport Ltd.
- 4Sight Consulting. (2020). *Baseline nesting bird survey October 2019—January 2020*. Prepared by 4Sight Consulting for Northport Ltd.
- 4Sight Consulting Ltd. (2019). *Wading bird survey September 2017—March 2018* [Prepared by 4Sight Consulting for Northport Ltd].
- 4Sight Consulting Ltd. (2020a). *Wading bird survey October 2019—February 2020* [Report prepared by 4Sight Consulting for Northport Ltd].
- 4Sight Consulting Ltd. (2020b). *Wading bird survey—Expanded Areas: December 2019—February 2020* [Report prepared by 4Sight Consulting for Northport Ltd].
- Australian and New Zealand Governments. (2018). *Australian & New Zealand guidelines for fresh & marine water quality*. [www.waterquality.gov.au/anz-guidelines](http://www.waterquality.gov.au/anz-guidelines)
- Beauchamp, A. J., & Parrish, G. R. (1999). Bird use of the sediment settlement ponds and roost areas at Port Whangarei. *Notornis*, 46(4), 470–483.
- Beauchamp, A. J., & Parrish, G. R. (2007). Wader (*Charadriiformes*) and royal spoonbill (*Platalea regia*) use of roosts in Whangarei Harbour and Ruakaka Estuary, Northland, 1973-2000. *Notornis*, 54(2), 83–91.
- Beca. (2026). *Marine Operations Maintenance Facility: Concept Design and Construction Report*. Report prepared by Beca Ltd for Ministry of Business, Innovation & Employment.
- Bell, M. (2010). A census of reef herons (*Ardea sacra*) in the Marlborough Sounds. *Notornis*, 57(3), 152–155.
- Bell, M., & Bell, B. D. (2008). Population numbers of the Caspian tern (*Sterna caspia*) in New Zealand. *Notornis*, 55(2), 84–88.
- Bioresearches. (2015). *A review of literature on the marine natural environment of Whangarei Heads, Bream Bay and its adjacent coastline*. Prepared by Bioresearches Group Ltd for Refining NZ.
- Bioresearches. (2017). *Refining NZ crude shipping project AEE report coastal birds*. Prepared by Bioresearches Group Ltd for Refining NZ.
- Bioresearches. (2020). *Refining NZ reconsenting application: Coastal bird assessment*. Prepared by Bioresearches Group Ltd for Refining NZ.
- Black, A. (2005). Light induced seabird mortality on vessels operating in the Southern Ocean: Incidents and mitigation measures. *Antarctic Science*, 17(01), 67–68.
- Blackburn, J. (2026). *Stormwater and operational runoff management and discharge assessment for the proposed Northland shipyard and drydock project*. Report prepared for the Ministry of Business, Innovation & Employment.
- Boffa Miskell Ltd. (2022a). *Northport Eastern Expansion: Additional Winter 2022 Avifauna Data Analysis*. Report prepared by Boffa Miskell Limited for Northport Ltd.
- Boffa Miskell Ltd. (2022b). *Northport Eastern Expansion: Coastal Avifauna Assessment*. Report prepared by Boffa Miskell Limited for Northport Ltd.
- Borgmann, K. L. (2010). *A review of human disturbance impacts on waterbirds*. Audubon California. <http://www.audubon.org/sites/default/files/documents/humandisturbanceimpactsreportfinal.pdf>
- Bowles, A. E. (1995). Responses of wildlife to noise. In *Wildlife and Recreationists: Coexistence Through Management and Research* (pp. 109–156). Island Press.

- Burger, J., & Gochfeld, M. (1993). Lead and cadmium accumulation in eggs and fledgling seabirds in the New York Bight. *Environmental Toxicology and Chemistry*, 12(2), 261–267.
- Burger, J., & Gochfeld, M. (2002). Effects of chemicals and pollution on seabirds. In *Biology of Marine Birds* (pp. 485–526). CRC Press.
- Burger, J., Schreiber, E. A., & Gochfeld, M. (1992). Lead, cadmium, selenium and mercury in seabird feathers from the tropical mid-pacific. *Environmental Toxicology and Chemistry*, 11(6), 815–822.
- Cannell, B. L. (2016). *How resilient are the little penguins and the coastal marine habitats they use?* Prepared for City of Rockingham, Fremantle Ports.
- Cannell, B. L., & Cullen, J. M. (1998). The foraging behaviour of little penguins *Eudyptula minor* at different light levels. *Ibis*, 140(3), 467–471.
- Chiaradia, A., & Kerry, K. R. (1999). Daily nest attendance and breeding performance in the little penguin *Eudyptula minor* at Phillip Island, Australia. *Marine Ornithology*, 27(1–2), 13–20.
- Coast & Catchment. (2022). *Northport expansion project: Assessment of marine ecological effects*. Report No. 2021-24 prepared by Coast & Catchment for Northport Ltd.
- Coast & Catchment. (2026). *Shipyard & Dry Dock Facility at Marsden Point: Assessment of Marine Ecological Effects*. Report No. 2026-09 prepared for the Ministry of Business, Innovation & Employment.
- Collins, M., Cullen, J. M., & Dann, P. (1999). Seasonal and annual foraging movements of little penguins from Phillip Island, Victoria. *Wildlife Research*, 26(6), 705–721.
- Crossland, A. C. (2001). Long-term changes in numbers of variable oystercatchers (*Haematopus unicolor*) at two wintering sites in Canterbury, South Island, New Zealand. *The Stilt*, 40, 2–6.
- Davis, L. S., & Renner, M. (2010). *Penguins*. Bloomsbury Publishing.
- Deppe, L., Rowley, O., Rowe, L. K., Shi, N., Gooday, O., & Goldstien, S. J. (2017). Investigation of fallout events in Hutton's shearwaters (*Puffinus huttoni*) associated with artificial lighting. *Notornis*, 64(4), 181–191.
- DOC. (2025). *New Zealand Coastal Policy Statement*. Department of Conservation.
- Dowding, J. E., & Moore, S. J. (2006). *Habitat networks of indigenous shorebirds in New Zealand* (Science for Conservation No. 261). Department of Conservation.
- Edgar, A. T. (1978). The reef heron (*Egretta sacra*) in New Zealand. *Notornis*, 25(1), 25–58.
- Finkelstein, M., Keitt, B. S., Croll, D. A., Tershy, B., Jarman, W. M., Rodriguez-Pastor, S., Anderson, D. J., Sievert, P. R., & Smith, D. R. (2006). Albatross species demonstrate regional differences in North Pacific marine contamination. *Ecological Applications*, 16(2), 678–686.
- Frost, P. G. H. (2017). *Population status and trends of selected seabirds in northern New Zealand*. Prepared for the Conservation Services Programme, Department of Conservation.
- Frost, P. G. H., & Taylor, G. A. (2018a). *Report on the national red-billed gull survey, 2014-2016*.
- Frost, P. G. H., & Taylor, G. A. (2018b). The status of the red-billed gull (*Larus novaehollandiae scopulinus*) in New Zealand, 2014–2016. *Notornis*, 65(1), 1–13.
- Fry, D. M. (1995). Reproductive effects in birds exposed to pesticides and industrial chemicals. *Environmental Health Perspectives*, 103(Suppl 7), 165.
- Furness, R. W., & Camphuysen, K. C. J. (1997). Seabirds as monitors of the marine environment. *ICES Journal of Marine Science: Journal Du Conseil*, 54(4), 726–737.
- Gaskin, C. P., & Rayner, M. J. (2017). *Seabirds of the Hauraki Gulf: Natural history, research and conservation*. Hauraki Gulf Forum.
- Glover, H. K., Weston, M. A., Maguire, G. S., Miller, K. K., & Christie, B. A. (2011). Towards ecologically meaningful and socially acceptable buffers: Response distances of shorebirds in Victoria, Australia, to human disturbance. *Landscape and Urban Planning*, 103(3), 326–334.



- Goss-Custard, J. D., Triplet, P., Sueur, F., & West, A. D. (2006). Critical thresholds of disturbance by people and raptors in foraging wading birds. *Biological Conservation*, 127(1), 88–97.
- Griffiths, R. (2012). *Whangarei Harbour Estuary Monitoring Programme 2012*. Northland Regional Council. <https://www.nrc.govt.nz/media/hc5ghq1n/whangareiharbourestuarymonitoringprogramme2012website.pdf>
- Haase, L. J. (1995). *The effects of disturbance on estuarine birds* [Unpublished Master of Science in Zoology thesis]. University of Canterbury.
- Hartley, L., & Greene, T. (2012). *Incomplete counts: Five-minute bird counts* (Inventory and Monitoring Toolbox: Birds DOCDM-534972). Department of Conservation. <https://www.doc.govt.nz/globalassets/documents/science-and-technical/inventory-monitoring/im-toolbox-birds-incomplete-five-min-counts.pdf>
- Heather, B. D., & Robertson, H. A. (2005). *The field guide to the birds of New Zealand*. Penguin Books.
- Hendricks, B., Pine, M. K., Baer, G., Welton, M., Symonds, H. K., Dakin, D. T., Alidina, H. M., Picard, C. R., & Wray, J. (2025). Quantifying vessel noise and acoustic habitat loss in marine soundscape. *Marine Pollution Bulletin*, 219, 118150.
- Higgins, P. J., & Davies, S. J. J. F. (Eds.). (1996). *Handbook of Australian, New Zealand and Antarctic birds: Volume 3, Snipe to pigeons*. Oxford University Press.
- Hockin, D., Ounsted, M., Anthony, M., Hill, D., Keller, V., & Barker, M. A. (1992). Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. *Journal of Environmental Management*, 36(4), 253–286.
- Hoskins, A. J., Dann, P., Ropert-Coudert, Y., Kato, A., Chiaradia, A., Costa, D. P., & Arnould, J. P. Y. (2008). Foraging behaviour and habitat selection of the little penguin *Eudyptula minor* during early chick rearing in Bass Strait, Australia. *Marine Ecology Progress Series*, 366, 293–303.
- Host, P. M. (1996). Drydock water pollution control efforts at Norfolk Naval Shipyard. *Naval Engineers Journal*, 108(2), 57–64.
- Howarth, D. M., Grant, T. R., & Hulbert, A. J. (1982). A comparative study of heavy metal accumulation in tissues of the crested tern, *Sterna bergii* breeding near an industrial port before and after harbour dredging and ocean dumping. *Wildlife Research*, 9(3), 571–577.
- Kaldor, B. (2019). *Bird disturbance from human activity: Potential effects from recreational activities on sea and shore birds*. Avon-Heathcote Estuary Ihutai Trust.
- Klomp, N. I., & Wooller, R. D. (1988). Diet of little penguins, *Eudyptula minor*, from Penguin Island, Western Australia. *Marine and Freshwater Research*, 39(5), 633–639.
- Lalas, C. (1983). *Comparative feeding ecology of New Zealand marine shags (Phalacrocoracidae)*. University of Otago.
- Lawrence, B. C., Bull, L. S., Arden, S. C., & Warren, V. E. (2023). Effects of piling on little blue penguins. In *The Effects of Noise on Aquatic Life*. Springer Nature.
- Le Corre, M., Ghestemme, T., Salamolard, M., & Couzi, F.-X. (2003). Rescue of the Mascarene petrel, a critically endangered seabird of Réunion Island, Indian Ocean. *The Condor*, 105(2), 387–391.
- Le Corre, M., Ollivier, A., Ribes, S., & Jouventin, P. (2002). Light-induced mortality of petrels: A 4-year study from Réunion Island (Indian Ocean). *Biological Conservation*, 105(1), 93–102.
- Lincoln, R., Boxshall, G., & Clark, P. (1998). *A dictionary of ecology, evolution and systematics*. Cambridge University Press.
- Lord, A., Waas, J. R., Innes, J., & Whittingham, M. J. (2001). Effects of human approaches to nests of northern New Zealand dotterels. *Biological Conservation*, 98(2), 233–240.
- Lux, J., Martin, T., & Beadel, S. (2007). *Natural areas of Waipu Ecological District: Reconnaissance survey report for the Protected Natural Areas Programme* [New Zealand Protected Natural Areas Programme]. Wildland Consultants Ltd for Department of Conservation, Northland Conservancy.

- Marchant, S., Ambrose, S. J., Higgins, P. J., Davies, J. N., & Sharp, M. (1990). *Handbook of Australian, New Zealand and Antarctic birds: Volume 1, Ratites to ducks*. Oxford University Press.
- Marshall Day. (2026). *MBIE Northland shipyard and dry dock project* [Report No. Rp 001 20260242 prepared by Marshall Day Acoustics for the Ministry of Business, Innovation & Employment].
- Maseyk, F. J. F., Ussher, G. T., Kessels, G., Christensen, M., & Brown, M. (2018). *Biodiversity offsetting under the Resource Management Act: A guidance document*. Prepared for the Biodiversity Working Group on behalf of the BioManagers Group.
- McKinnon, H. L., Fordham, R. A., & Lalas, C. (2004). Diet of coastal black shags (*Phalacrocorax carbo*). *Notornis*, 51(1), 16–20.
- MetOcean. (2026a). *Dredge plume modelling: Dredging sediment plume dispersion over existing and proposed port configurations*. Report P0678-09 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean. (2026b). *Hydrodynamic modelling updated: Effects of the proposed reclamation and dredging layout on hydrodynamics*. Report No. P0678-06 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean. (2026c). *Morphodynamic modelling for the Northport Environment—Modelling Update: Effects of the proposed reclamation and dredging layout on the morphodynamics*. Report No. P0519-03 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean. (2026d). *Pipi larvae modelling: Effects of the proposed reclamation and dredging layout on hydrodynamics*. Report No. P0678 - 02 prepared by MetOcean Solutions for the Ministry of Business, Innovation & Employment.
- MetOcean Solutions Ltd. (2022a). *Dredging plume modelling: Dredging sediment plume dispersion over existing and proposed port configurations* (Report No. P051912). Prepared by MetOcean Solutions Ltd for Northport Ltd.
- MetOcean Solutions Ltd. (2022b). *Hydrodynamic modelling update: Effects of proposed reclamation and dredging layout on hydrodynamics* (Report Nos. P0519-10). Prepared by MetOcean Solutions Ltd for Northport Ltd.
- MetOcean Solutions Ltd. (2022c). *Morphodynamic modelling for Northport environment, modeling update: Predicted morphological response to proposed eastern land reclamation* (Report Nos. P0519-11). Prepared by MetOcean Solutions Ltd for Northport Ltd.
- MfE. (2025). *National Policy Statement for Indigenous Biodiversity*. Ministry for the Environment.
- Michel, P. (2021). *Supplement to the New Zealand Threat Classification System manual 2008: Revised categories 2021*. Department of Conservation.
- Montevecchi, W. A. (2006). Influences of artificial light on marine birds. In *Ecological Consequences of Artificial Night Lighting* (pp. 94–113). Island Press.
- Moore, P. J. (1984). Foraging and social behaviour of the white-faced heron at Pauatahanui inlet. *Notornis*, 31(4), 285–299.
- Morrison, M., & Parkinson, D. (2001). *Stock assessment of cockles on Snake and McDonald Banks, Whangarei Harbour, 2000* (New Zealand Fisheries Assessment Report No. 2001/19). Prepared by NIWA for the Ministry for Fisheries.
- Munro, M. (1971). Birds of Whangarei Harbour. *Notornis*, 18(3), 202–206.
- Nayar, S., Goh, B. P. L., & Chou, L. M. (2004). Environmental impact of heavy metals from dredged and resuspended sediments on phytoplankton and bacteria assessed in situ mesocosms. *Ecotoxicology and Environmental Safety*, 59(3), 349–369.
- Northland OSNZ. (2013). *Amokura 107* (July issue). Newsletter of the Northland Region of the Ornithological Society of New Zealand.
- Northland Regional Council. (2016). *Regional policy statement for Northland*. Northland Regional Council.

- NRC. (2026). *Regional Plan for Northland*. Northland Regional Council.
- Parrish, G. R. (1985). *Whangarei Harbour wildlife survey* (NZ Wildlife Service Technical Report No. 8). New Zealand Wildlife Service, Department of Internal Affairs.
- Pattle Delamore Partners Ltd. (2020). *Air quality assessment – Northport proposed Eastern Expansion*. Prepared by Pattle Delamore Partners Ltd for Northport Ltd.
- Pawley, M. D. M., & Smith, A. N. H. (2014). *The distribution and abundance of pipis and cockles in the Northland, Auckland and Bay of Plenty regions, 2013* (New Zealand Fisheries Assessment Report No. 2014/29).
- PDP. (2026). *Air Quality Impact Assessment – Development and Operation of Shipyard and Drydock facility at Marsden Point, Whangarei Harbour*. Report prepared by Pattle Delamore Partners Limited for the Ministry of Business, Innovation and Employment.
- Pichegru, L., Nyengera, R., McInnes, A. M., & Pistorius, P. (2017). Avoidance of seismic survey activities by penguins. *Science Report*, 7, 16305.
- Pierce, R. J. (2005). *General patterns of bird use of Whangarei Harbour, March 2005* (Wildland Consultants Report No. 1047). Prepared by Wildland Consultants Ltd for Northland Regional Council.
- Pierce, R. J., Coulter, G. W., & Moodie, H. G. (2002). *Biodiversity values and opportunities for restoration at Whangarei Heads*. Prepared by Wildlands Consultants Ltd for Whangarei Heads Landcare Forum.
- Poot, H., Ens, B. J., de Vries, H., Donners, M. A. H., Wernand, M. R., & Marquenie, J. M. (2008). Green light for nocturnally migrating birds. *Ecology and Society*, 13(2).
- Preston, T. J., Ropert-Coudert, Y., Kato, A., Chiaradia, A., Kirkwood, R., Dann, P., & Reina, R. D. (2008). Foraging behaviour of little penguins *Eudyptula minor* in an artificially modified environment. *Endangered Species Research*, 4(1), 95–103.
- Price, M. (2008). The impact of human disturbance on birds: A selective review. In *Too Close for Comfort: Contentious Issues in Human–Wildlife Encounters*. (Eds D. Lunney, A. Munn and W. Meikle.) pp (pp. 163–196).
- Reed, J. R., Sincok, J. L., & Hailman, J. P. (1985). Light attraction in endangered procellariiform birds: Reduction by shielding upward radiation. *The Auk*, 377–383.
- Riegen, A. C., & Sagar, P. M. (2020). Distribution and numbers of waders in New Zealand 2005–2019. *Notornis*, 67(4), 591–634.
- Robertson, C. J. R., & Bell, B. D. (1984). Seabird status and conservation in the New Zealand region. In *Status and conservation of the world's seabirds* (pp. 573–586). ICBP Technical Publication.
- Robertson, H. A., Baird, K. A., Elliott, G. P., Hitchmough, R. A., McArthur, N., Makan, T. D., Miskelly, C. M., Sagar, P. M., Scofield, R. P., Taylor, G. A., & Michel, P. (2021). *Conservation status of New Zealand birds, 2021* (New Zealand Threat Classification Series No. 36). Department of Conservation.
- Robertson, Hyvonen, P., Fraser, M. J., & Pickard, C. J. (2007). *Atlas of bird distribution in New Zealand: 1999–2004*. Ornithological Society of New Zealand.
- Rodgers, J. A., & Schwikert, S. T. (2002). Buffer-zone distances to protect foraging and loafing waterbirds from disturbance by personal watercraft and outboard-powered boats. *Conservation Biology*, 16(1), 216–224.
- Rodgers, J. A., & Smith, H. T. (1995). Set-back distances to protect nesting bird colonies from human disturbance in Florida. *Conservation Biology*, 9(1), 89–99.
- Rodríguez, A., & Rodríguez, B. (2009). Attraction of petrels to artificial lights in the Canary Islands: Effects of the moon phase and age class. *Ibis*, 151(2), 299–310.
- Rodríguez, A., Rodríguez, B., & Lucas, M. P. (2012). Trends in numbers of petrels attracted to artificial lights suggest population declines in Tenerife, Canary Islands. *Ibis*, 154(1), 167–172.

- Roper-Lindsay, J., Fuller, S. A., Hooson, S., Sanders, M. D., & Ussher, G. T. (2018). *Ecological impact assessment (EIA). EIANZ guidelines for use in New Zealand: Terrestrial and freshwater ecosystems* (2nd ed.). Environment Institute of Australia and New Zealand.
- Robert-Coudert, Y., Kato, A., Naito, Y., & Cannell, B. L. (2003). Individual diving strategies in the little penguin. *Waterbirds*, 26(4), 403–408.
- Robert-Coudert, Y., Kato, A., Wilson, R. P., & Cannell, B. (2006). Foraging strategies and prey encounter rate of free-ranging little penguins. *Marine Biology*, 149(2), 139–148.
- Santos, C. D., Miranda, A. C., Granadeiro, J. P., Lourenço, P. M., Saraiva, S., & Palmeirim, J. M. (2010). Effects of artificial illumination on the nocturnal foraging of waders. *Acta Oecologica*, 36(2), 166–172.
- Shealer, D. A. (2002). Foraging behaviour and food of seabirds. In *Biology of Marine Birds* (pp. 137–178). CRC Press.
- Smit, C. J., & Visser, G. J. (1993). Effects of disturbance on shorebirds: A summary of existing knowledge from the Dutch Wadden Sea and Delta area. *Wader Study Group Bulletin*, 68(1), 3.
- Sørensen, K., Neumann, C., Dähne, M., Hansen, K. A., & Wahlberg, M. (2020). Gentoo penguins (*Pygoscelis papua*) react to underwater sounds. *Royal Society Open Science*, 7(2), 191988.
- Southey, I. (2009). *Numbers of waders in New Zealand 1994-2003* (DOC Research & Development Series No. 308). Department of Conservation.
- Streamlined Environmental. (2026). *Ecological risk assessment of antifouling chemicals for the Northport Shipyard and Drydock Project*. Report MBE2601 prepared for Ministry of Business, Innovation & Employment.
- Styles Group. (2026). *Assessment of underwater noise effects: Shipyard and drydock facility*.
- Su, S. H., Pearlman, L. C., Rothrock, J. A., Iannuzzi, T. J., & Finley, B. L. (2002). Potential long-term ecological impacts caused by disturbance of contaminated sediments: A case study. *Environmental Management*, 29(2), 234–249.
- Sundberg, H., Hanson, M., Liewenborg, B., Zebühr, Y., Broman, D., & Balk, L. (2007). Dredging associated effects: Maternally transferred pollutants and DNA adducts in feral fish. *Environmental Science & Technology*, 41(8), 2972–2977.
- Taylor, G. A. (2000). *Action plan for seabird conservation in New Zealand. Part B: Non-Threatened seabirds* (Threatened Species Occasional Publication No. 17). Department of Conservation.
- Thomas, K., Kvitek, R. G., & Bretz, C. (2003). Effects of human activity on the foraging behavior of sanderlings *Calidris alba*. *Biological Conservation*, 109(1), 67–71.
- Tonkin & Taylor. (2022). *Vision for Growth port development: Coastal process assessment*. Report prepared by Tonkin & Taylor Ltd for NorthPort.
- Tonkin & Taylor Ltd. (2026). *Northland Shipyard & Dry Dock Project: Coastal Effects Assessment*. Report prepared by Tonkin & Taylor Ltd for the Ministry of Business, Innovation & Employment.
- Townsend, A. J., de Lange, P. J., Duffy, C. A. J., Miskelly, C. M., Molloy, J., & Norton, D. A. (2008). *New Zealand threat classification system manual*. Department of Conservation.
- Walls, G. (1999). *Visitor impacts on freshwater avifauna in New Zealand* (Conservation Advisory Science Notes No. 240). Department of Conservation.
- Weavers, B. W. (1992). Seasonal foraging ranges and travels at sea of little penguins *Eudyptula minor*, determined by radiotracking. *Emu*, 91(5), 302–317.
- Wei, C., & Erbe, C. (2024). Sound reception and hearing capabilities in the Little Penguin (*Eudyptula minor*): First predicted in-air and underwater audiograms. *Royal Society Open Science*, 11, 240593.
- Wei, C., & Erbe, C. (2026). Predicting Hearing Capabilities of the Little Penguin (*Eudyptula minor*): Finite Element Modeling Predictions and Experimental Validation. In *The Effects of Noise on Aquatic Life IV*.

- Weston, M. A., McLeod, E. M., Blumstein, D. T., & Guay, P.-J. (2012). A review of flight-initiation distances and their application to managing disturbance to Australian birds. *Emu-Austral Ornithology*, 112(4), 269–286.
- WMIL. (2013). *Pied shag: A national population review*. Prepared by Wildlife Management International Ltd for the Department of Conservation, Contract 4349: POP2011-07.
- WSP. (2022). *Northport eastern extension (Berth 5) concept design report*. Report prepared by WSP for NorthPort.

## Appendix 1: Representative site photos



*Photo 3: View west towards Northport of wading bird survey areas East 1, 2 and 3.*



*Photo 4: View towards CINZ overlooking the dune component of the eastern nesting survey site.*





*Photo 5: View of the riprap revetment along the eastern boundary of Northport boundary*

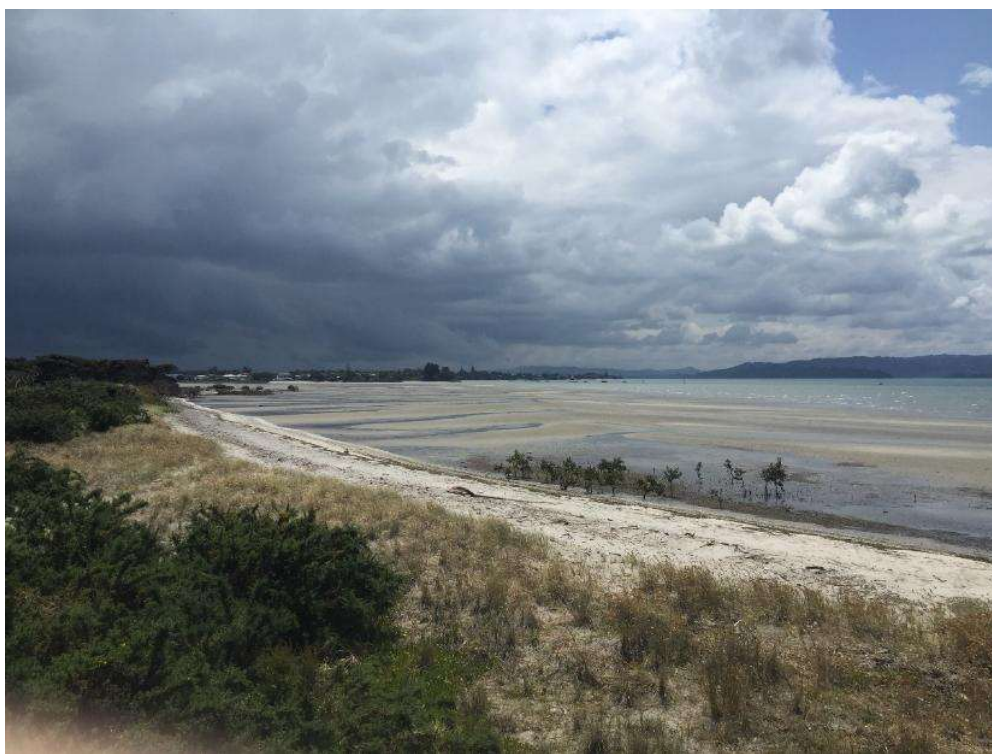


*Photo 6: Riprap along the edge of Berth 3*





*Photo 7: Riprap revetment along Northport western boundary*



*Photo 8: View west overlooking wading bird survey areas West 1 and 2.*





*Photo 9: Blacksmiths Creek wetland*

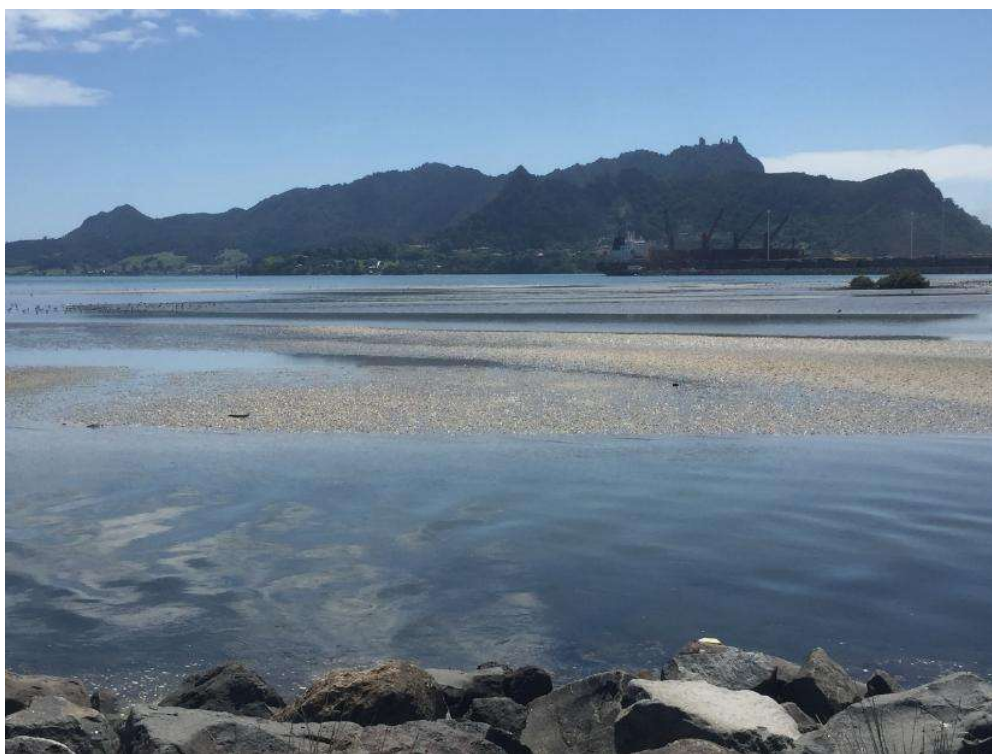


*Photo 10: Mangroves within Blacksmiths Creek wetland*





*Photo 11: View west overlooking wading bird survey area West 2*



*Photo 12: View east towards Northport overlooking wading bird survey area West 2*



*Photo 13: DOC Wildlife refuge*



*Photo 14: View west overlooking wading bird survey area West 1*





*Photo 15: Wading bird survey – Expanded area 1*



*Photo 16: Wading bird survey – Expanded area 2*



*Photo 17: Wading bird survey – Expanded area 3*



*Photo 18: Wading bird survey – Expanded area 4*





*Photo 19: Proposed carpark site*

## Appendix 2: Wading bird survey dates





| SUMMER 2017/18     |             |           |           |
|--------------------|-------------|-----------|-----------|
| Survey Date        | Tidal Phase |           |           |
|                    | High        | Mid       | Low       |
| 23/08/2017         |             |           | ✓         |
| 24/08/2017         | ✓           |           |           |
| 29/08/2017         | ✓           |           |           |
| 7/09/2017          | ✓           |           | ✓         |
| 8/09/2017          | ✓           |           | ✓         |
| 22/09/2017         | ✓           |           | ✓         |
| 12/10/2017         | ✓           |           | ✓         |
| 13/10/2017         | ✓           |           | ✓         |
| 19/10/2017         | ✓           | ✓         | ✓         |
| 13/11/2017         | ✓           | ✓         | ✓         |
| 14/11/2017         | ✓           | ✓         | ✓         |
| 20/11/2017         | ✓           | ✓         | ✓         |
| 12/12/2017         | ✓           | ✓         | ✓         |
| 19/12/2017         | ✓           | ✓         | ✓         |
| 20/12/2017         | ✓           | ✓         | ✓         |
| 11/01/2018         | ✓           | ✓         | ✓         |
| 17/01/2018         | ✓           | ✓         | ✓         |
| 26/01/2018         | ✓           | ✓         | ✓         |
| 2/02/2018          | ✓           | ✓         | ✓         |
| 19/02/2018         |             | ✓         | ✓         |
| 26/02/2018         |             |           | ✓         |
| 2/03/2018          |             |           | ✓         |
| 12/03/2018         |             |           | ✓         |
| <b>No. surveys</b> | <b>18</b>   | <b>12</b> | <b>21</b> |

| SUMMER 2019/20 |             |     |     |
|----------------|-------------|-----|-----|
| Survey Date    | Tidal Phase |     |     |
|                | High        | Mid | Low |
| 25/09/2019     | ✓           | ✓   | ✓   |
| 15/10/2019     | ✓           | ✓   | ✓   |
| 23/10/2019     | ✓           | ✓   | ✓   |
| 30/10/2019     | ✓           | ✓   | ✓   |
| 6/11/2019      | ✓           | ✓   | ✓   |
| 13/11/2019     | ✓           | ✓   | ✓   |
| 21/11/2019     | ✓           | ✓   | ✓   |
| 5/12/2019      | ✓           | ✓   | ✓   |
| 12/12/2020     | ✓           | ✓   | ✓   |
| 20/12/2020     | ✓           | ✓   | ✓   |
| 6/01/2020      | ✓           | ✓   | ✓   |

| SUMMER 2019/20     |             |           |           |
|--------------------|-------------|-----------|-----------|
| Survey Date        | Tidal Phase |           |           |
|                    | High        | Mid       | Low       |
| 10/01/2020         | ✓           | ✓         | ✓         |
| 21/01/2020         | ✓           | ✓         | ✓         |
| 4/02/2020          | ✓           | ✓         | ✓         |
| 11/02/2020         | ✓           | ✓         | ✓         |
| 17/02/2020         | ✓           | ✓         | ✓         |
| <b>No. surveys</b> | <b>16</b>   | <b>16</b> | <b>16</b> |

| WINTER 2021        |             |          |          |
|--------------------|-------------|----------|----------|
| Survey Date        | Tidal Phase |          |          |
|                    | High        | Mid      | Low      |
| 4/06/2021          | ✓           | ✓        | ✓        |
| 28/06/2021         | ✓           | ✓        | ✓        |
| 5/07/2021          | ✓           | ✓        | ✓        |
| 13/07/2021         | ✓           | ✓        | ✓        |
| 20/07/2021         | ✓           | ✓        | ✓        |
| 26/07/2021         | ✓           | ✓        | ✓        |
| <b>No. surveys</b> | <b>6</b>    | <b>6</b> | <b>6</b> |

| WINTER 2022        |             |          |          |
|--------------------|-------------|----------|----------|
| Survey Date        | Tidal Phase |          |          |
|                    | High        | Mid      | Low      |
| 15-16/6/2022       | ✓           | ✓        | ✓        |
| 30/06 – 1/7/2022   | ✓           | ✓        | ✓        |
| 11/07/2022         |             | ✓        | ✓        |
| 18/07/2022         | ✓           | ✓        | ✓        |
| 1/8/2022           | ✓           | ✓        | ✓        |
| 3/8/2022           | ✓           | ✓        | ✓        |
| 15/8/2022          | ✓           |          |          |
| <b>No. surveys</b> | <b>6</b>    | <b>6</b> | <b>6</b> |



## Appendix 3: Historic aerial images of Marsden Bay



|                                                                                                       |                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1942</b></p> <p>Marsden Bay</p> <p>(Source: retrolens.nz)</p>                                   |  <p>©Sourced from <a href="http://retrolens.nz">http://retrolens.nz</a> and licensed by LINZ CC-BY 3.0</p> |
| <p><b>1971</b></p> <p>Marsden Point and Bay, noting the Refinery NZ</p> <p>(Source: retrolens.nz)</p> |  <p>©Sourced from <a href="http://retrolens.nz">http://retrolens.nz</a> and licensed by LINZ</p>          |

**1985**

Marsden  
Bay

(Source:  
Google  
Earth)



**2004**

Marsden  
Bay

(Source:  
Google  
Earth)



**2021**

Marsden  
Bay

(Source:  
Google  
Earth)





## Appendix 4: Avifauna species & habitat list

Avifauna species list compiled from eBird data from the extent shown in Map 1, NZ Birds Online (Whangārei Harbour search location) and wading bird surveys conducted by 4Sight for Northport.

Information regarding primary (dark green) and secondary (light green) habitats presented in the following table was obtained for each species from Heather & Robertson (2005). For the purpose of this report, primary habitat refers to the habitat in which the species spends most of its time. Secondary habitats are other habitat types which the species may also utilise.



| SPECIES                 |                                            | CONSERVATION STATUS (Robertson et al. 2021) |                                            | HABITAT       |               |                   |                         |                       |                   |         |                   | DATA SOURCE |                               |           |                   |
|-------------------------|--------------------------------------------|---------------------------------------------|--------------------------------------------|---------------|---------------|-------------------|-------------------------|-----------------------|-------------------|---------|-------------------|-------------|-------------------------------|-----------|-------------------|
|                         |                                            |                                             |                                            | Native forest | Exotic Forest | Scrub / shrubland | Farmland / open country | Freshwater / wetlands | Coastal / Estuary | Oceanic | Urban/Residential | eBird       | NZBIRDS ONLINE Whangārei Hrbr | 2017-2022 | Northport surveys |
| Bellbird                | <i>Anthornis m. melanura</i>               | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Bush falcon             | <i>Falco novaeseelandiae</i> "bush"        | Threatened                                  | Nationally Increasing <sup>CR Inc</sup>    |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Kereru                  | <i>Hemiphaga novaeseelandiae</i>           | Not Threatened                              | Not Threatened <sup>CD Inc</sup>           |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Long-tailed cuckoo      | <i>Eudynamys taitensis</i>                 | Threatened                                  | Nationally Vulnerable <sup>CI CR DPT</sup> |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Kingfisher              | <i>Todiramphus sanctus vagans</i>          | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Morepork                | <i>Ninox n. novaeseelandiae</i>            | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| North Island brown kiwi | <i>Apteryx mantelli</i>                    | Not Threatened                              | Not Threatened <sup>CD PD RF</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| North Island fantail    | <i>Rhipidura fuliginosa placabilis</i>     | Not Threatened                              | Not Threatened <sup>EF</sup>               |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| North Island kaka       | <i>Nestor meridionalis septentrionalis</i> | At Risk                                     | Recovering <sup>CD Inc PD PF</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| North Island robin      | <i>Petroica longipes</i>                   | At Risk                                     | Declining <sup>CD CI PD</sup>              |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Red-crowned parakeet    | <i>Cyanoramphus n. novaeseelandiae</i>     | At Risk                                     | Relict <sup>CD PF</sup>                    |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Shining cuckoo          | <i>Chrysococcyx l. lucidus</i>             | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Tomtit                  | <i>Petroica macrocephala toitoi</i>        | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Tui                     | <i>Prothemadera n. novaeseelandiae</i>     | Not Threatened                              | Not Threatened <sup>Inc</sup>              |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Whitehead               | <i>Mohoua albicilla</i>                    | Not Threatened                              | Not Threatened <sup>CD CI PD</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Blackbird               | <i>Turdus merula</i>                       | Introduced                                  | Introduced & Naturalised <sup>SO</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Brown quail             | <i>Coturnix ypsilophora australis</i>      | Introduced                                  | Introduced & Naturalised <sup>SO</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| California quail        | <i>Callipepla californica</i>              | Introduced                                  | Introduced & Naturalised <sup>SO</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Eastern rosella         | <i>Platycercus eximius</i>                 | Introduced                                  | Introduced & Naturalised <sup>SO</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Grey warbler            | <i>Gerygone igata</i>                      | Not Threatened                              | Not Threatened                             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Pheasant                | <i>Phasianus colchicus</i>                 | Introduced                                  | Introduced & Naturalised <sup>SO</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Silvereye               | <i>Zosterops lateralis lateralis</i>       | Not Threatened                              | Not Threatened <sup>SO</sup>               |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |

| SPECIES              |                                            | CONSERVATION STATUS (Robertson et al. 2021) |                                                | HABITAT       |               |                   |                         |                       |                   |         |                   | DATA SOURCE |                              |           |                   |
|----------------------|--------------------------------------------|---------------------------------------------|------------------------------------------------|---------------|---------------|-------------------|-------------------------|-----------------------|-------------------|---------|-------------------|-------------|------------------------------|-----------|-------------------|
|                      |                                            |                                             |                                                | Native forest | Exotic Forest | Scrub / shrubland | Farmland / open country | Freshwater / wetlands | Coastal / Estuary | Oceanic | Urban/Residential | eBird       | NZBIRDS ONLINE Whangārei Hrb | 2017-2022 | Northport surveys |
| Chaffinch            | <i>Fringilla coelebs</i>                   | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Dunnock              | <i>Prunella modularis</i>                  | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Goldfinch            | <i>Carduelis carduelis</i>                 | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Greenfinch           | <i>Carduelis chloris</i>                   | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| House sparrow        | <i>Passer domesticus</i>                   | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Magpie               | <i>Gymnorhina tibicen</i>                  | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| NZ pipit             | <i>Anthus n. novaeseelandiae</i>           | At Risk                                     | Declining <sup>CI CR</sup>                     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Peafowl              | <i>Pavo cristatus</i>                      | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                              |           |                   |
| Redpoll              | <i>Carduelis flammea</i>                   | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   |             | ✓                            |           |                   |
| Skylark              | <i>Alauda arvensis</i>                     | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Song thrush          | <i>Turdus philomelos</i>                   | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Spur-winged plover   | <i>Vanellus miles novaehollandiae</i>      | Not Threatened                              | Not Threatened <sup>SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            | ✓         |                   |
| Starling             | <i>Sturnus vulgaris</i>                    | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Swamp harrier        | <i>Circus approximans</i>                  | Not Threatened                              | Not Threatened <sup>SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Welcome swallow      | <i>Hirundo n. neoxena</i>                  | Not Threatened                              | Not Threatened <sup>SO ST</sup>                |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Wild turkey          | <i>Meleagris gallopavo</i>                 | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                              |           |                   |
| Yellowhammer         | <i>Emberiza citrinella</i>                 | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |
| Australasian bittern | <i>Botaurus poiciloptilus</i>              | Threatened                                  | Nationally Critical <sup>CR DPT RF Sp TP</sup> |               |               |                   |                         |                       |                   |         |                   | ✓           |                              |           |                   |
| Australian shoveler  | <i>Anas rhynchos</i>                       | Not Threatened                              | Not Threatened <sup>SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           |                              |           |                   |
| Black-billed gull    | <i>Larus bulleri</i>                       | At Risk                                     | Declining <sup>CI CR RF</sup>                  |               |               |                   |                         |                       |                   |         |                   | ✓           |                              | ✓         |                   |
| Black shag           | <i>Phalacrocorax carbo novaehollandiae</i> | At Risk                                     | Relict <sup>CR DPS DPT SO Sp</sup>             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            | ✓         |                   |
| Black swan           | <i>Cygnus atratus</i>                      | Not Threatened                              | Not Threatened <sup>SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                            |           |                   |

| SPECIES                     |                                                | CONSERVATION STATUS (Robertson et al. 2021) |                                                    | HABITAT       |               |                   |                         |                       |                   |         |                   | DATA SOURCE |                               |           |                   |
|-----------------------------|------------------------------------------------|---------------------------------------------|----------------------------------------------------|---------------|---------------|-------------------|-------------------------|-----------------------|-------------------|---------|-------------------|-------------|-------------------------------|-----------|-------------------|
|                             |                                                |                                             |                                                    | Native forest | Exotic Forest | Scrub / shrubland | Farmland / open country | Freshwater / wetlands | Coastal / Estuary | Oceanic | Urban/Residential | eBird       | NZBIRDS ONLINE Whangārei Hrbr | 2017-2022 | Northport surveys |
| Black-fronted dotterel      | <i>Charadrius melanops</i>                     | At Risk                                     | Naturally Uncommon <sup>SO Sp</sup>                |               |               |                   |                         |                       |                   |         |                   |             | ✓                             |           |                   |
| Black-fronted tern          | <i>Chlidonias albastriatus</i>                 | Threatened                                  | Nationally Endangered <sup>CI CD, PD, RF, Sp</sup> |               |               |                   |                         |                       |                   |         |                   |             |                               |           | ✓                 |
| Brown teal                  | <i>Anas chlorotis</i>                          | Threatened                                  | Nationally Increasing <sup>CD Inc RR</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Feral goose                 | <i>Anser anser</i>                             | Introduced                                  | Introduced & Naturalised <sup>SO</sup>             |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Grey duck x mallard hybrid  | <i>Anas superciliosa x platyrhynchos</i>       | Not Threatened                              | Not Threatened                                     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Grey teal                   | <i>Anas gracilis</i>                           | Not Threatened                              | Not Threatened <sup>Inc SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Little black shag           | <i>Phalacrocorax sulcirostris</i>              | At Risk                                     | Naturally Uncommon <sup>RR SO</sup>                |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Little shag                 | <i>Phalacrocorax melanoleucos brevirostris</i> | At Risk                                     | Relict <sup>CR DPT</sup>                           |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Mallard                     | <i>Anas platyrhynchos</i>                      | Introduced                                  | Introduced & Naturalised <sup>SO</sup>             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| North Island fernbird       | <i>Bowdleria punctata vealeae</i>              | At Risk                                     | Declining <sup>CI CR DPS DPT</sup>                 |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| NZ dabchick                 | <i>Poliocephalus rufopectus</i>                | Threatened                                  | Nationally Increasing <sup>Inc</sup>               |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| NZ pied oystercatcher       | <i>Haematopus finschi</i>                      | At Risk                                     | Declining <sup>CI</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| NZ scaup                    | <i>Aythya novaeseelandiae</i>                  | Not Threatened                              | Not Threatened <sup>Inc</sup>                      |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Paradise shelduck           | <i>Tadorna variegata</i>                       | Not Threatened                              | Not Threatened                                     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Pied shag                   | <i>Phalacrocorax varius varius</i>             | At Risk                                     | Recovering <sup>CD</sup>                           |               |               |                   |                         |                       |                   |         |                   | ✓           |                               | ✓         |                   |
| Pied stilt                  | <i>Himantopus h. leucocephalus</i>             | Not Threatened                              | Not Threatened <sup>SO</sup>                       |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Pukeko                      | <i>Porphyrio m. melanotus</i>                  | Not Threatened                              | Not Threatened <sup>Inc SO</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Spotless crane              | <i>Porzana t. tabuensis</i>                    | At Risk                                     | Declining <sup>DPS DPT PF SO</sup>                 |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| White heron                 | <i>Ardea modesta</i>                           | Threatened                                  | Nationally Critical <sup>CR OL SO St</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Wrybill                     | <i>Anarhynchus frontalis</i>                   | Threatened                                  | Nationally Increasing <sup>RR CD CR</sup>          |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Asiatic black-tailed godwit | <i>Limosa limosa melanuroides</i>              | Vagrant                                     | Vagrant <sup>SO</sup>                              |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Asiatic whimbrel            | <i>Numenius phaeopus variegatus</i>            | Migrant                                     | Migrant <sup>SO</sup>                              |               |               |                   |                         |                       |                   |         |                   |             |                               |           | ✓                 |

| SPECIES                |                                           | CONSERVATION STATUS (Robertson et al. 2021) |                                                  | HABITAT       |               |                   |                         |                       |                   |         |                   | DATA SOURCE |                               |           |                   |
|------------------------|-------------------------------------------|---------------------------------------------|--------------------------------------------------|---------------|---------------|-------------------|-------------------------|-----------------------|-------------------|---------|-------------------|-------------|-------------------------------|-----------|-------------------|
|                        |                                           |                                             |                                                  | Native forest | Exotic Forest | Scrub / shrubland | Farmland / open country | Freshwater / wetlands | Coastal / Estuary | Oceanic | Urban/Residential | eBird       | NZBIRDS ONLINE Whangārei Hrbr | 2017-2022 | Northport surveys |
| Banded dotterel        | <i>Charadrius bicinctus bicinctus</i>     | At Risk                                     | Declining <sup>CD CI CR DPS PD</sup>             |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Banded rail            | <i>Gallirallus philippensis assimilis</i> | At Risk                                     | Declining <sup>CI CR DPS DPT RR</sup>            |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Black-backed gull      | <i>Larus d. dominicanus</i>               | Not Threatened                              | Not Threatened <sup>SO</sup>                     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Caspian tern           | <i>Hydroprogne caspia</i>                 | Threatened                                  | Nationally Vulnerable <sup>SO Sp</sup>           |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Bar-tailed godwit      | <i>Limosa lapponica baueri</i>            | At Risk                                     | Declining <sup>CI TO</sup>                       |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Eastern curlew         | <i>Numenius madagascariensis</i>          | Vagrant                                     | Vagrant <sup>TO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           |                               | ✓         |                   |
| Lesser knot            | <i>Calidris canutus rogersi</i>           | At Risk                                     | Declining <sup>CI TO</sup>                       |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Northern NZ dotterel   | <i>Charadrius obscurus aquilonius</i>     | Threatened                                  | Nationally Increasing <sup>CD CI Inc RR</sup>    |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| NZ fairy tern          | <i>Sternula nereis davisae</i>            | Threatened                                  | Nationally Critical <sup>CD CI CR RF RR</sup>    |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Pacific golden plover  | <i>Pluvialis fulva</i>                    | Migrant                                     | Migrant <sup>SO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Pectoral sandpiper     | <i>Calidris melanotos</i>                 | Vagrant                                     | Vagrant <sup>SO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Red-billed gull        | <i>Larus novaehollandiae scopulinus</i>   | At Risk                                     | Declining <sup>CI</sup>                          |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Red-necked stint       | <i>Calidris ruficollis</i>                | Migrant                                     | Migrant <sup>SO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Reef heron             | <i>Egretta sacra sacra</i>                | Threatened                                  | Nationally Endangered <sup>CI CR DPT SO Sp</sup> |               |               |                   |                         |                       |                   |         |                   | ✓           |                               | ✓         |                   |
| Royal spoonbill        | <i>Platalea regia</i>                     | At Risk                                     | Naturally Uncommon <sup>Inc RR SO Sp</sup>       |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Turnstone              | <i>Arenaria interpres</i>                 | Migrant                                     | Migrant <sup>SO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Variable oystercatcher | <i>Haematopus unicolor</i>                | At Risk                                     | Recovering <sup>CI Inc</sup>                     |               |               |                   |                         |                       |                   |         |                   | ✓           |                               | ✓         |                   |
| White-faced heron      | <i>Egretta novaehollandiae</i>            | Not Threatened                              | Not Threatened <sup>SO</sup>                     |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| White-fronted tern     | <i>Sterna s. striata</i>                  | At Risk                                     | Declining <sup>CI CR DPT</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             | ✓         |                   |
| Arctic skua            | <i>Stercorarius parasiticus</i>           | Migrant                                     | Migrant <sup>SO</sup>                            |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |
| Australasian gannet    | <i>Morus serrator</i>                     | Not Threatened                              | Not Threatened <sup>CI De* Inc SO</sup>          |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                             |           |                   |
| Black petrel           | <i>Procellaria parkinsoni</i>             | Threatened                                  | Nationally Vulnerable <sup>CD CI CR RR</sup>     |               |               |                   |                         |                       |                   |         |                   | ✓           |                               |           |                   |

| SPECIES                        |                                         | CONSERVATION STATUS (Robertson et al. 2021) |                                                | HABITAT       |               |                   |                         |                       |                   |         |                   | DATA SOURCE |                                         |                   |  |
|--------------------------------|-----------------------------------------|---------------------------------------------|------------------------------------------------|---------------|---------------|-------------------|-------------------------|-----------------------|-------------------|---------|-------------------|-------------|-----------------------------------------|-------------------|--|
|                                |                                         |                                             |                                                | Native forest | Exotic Forest | Scrub / shrubland | Farmland / open country | Freshwater / wetlands | Coastal / Estuary | Oceanic | Urban/Residential | eBird       | NZBIRDS ONLINE Whangārei Hrbr 2017-2022 | Northport surveys |  |
| Buller's shearwater            | <i>Puffinus bulleri</i>                 | At Risk                                     | Declining <sup>CD CR DPT OL St</sup>           |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Cook's petrel                  | <i>Pterodroma cookii</i>                | At Risk                                     | Relict <sup>CDB RR Inc</sup>                   |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Fairy prion                    | <i>Pachyptila turtur</i>                | At Risk                                     | Relict <sup>CDB RR SO</sup>                    |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Flesh-footed shearwater        | <i>Puffinus carneipes</i>               | At Risk                                     | Relict <sup>CD Inc RR SO</sup>                 |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Fluttering shearwater          | <i>Puffinus gavia</i>                   | At Risk                                     | Relict <sup>CDB RR</sup>                       |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Grey-faced petrel              | <i>Pterodroma macroptera gouldi</i>     | Not Threatened                              | Not Threatened <sup>De* Inc RR</sup>           |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Northern blue penguin          | <i>Eudyptula minor iredalei</i>         | At Risk                                     | Declining <sup>CI CR DPS DPT</sup>             |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Northern diving petrel         | <i>Pelecanoides urinatrix urinatrix</i> | At Risk                                     | Relict <sup>CBD Inc RR SO</sup>                |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Northern giant petrel          | <i>Macronectes halli</i>                | At Risk                                     | Recovering <sup>RR Inc SO</sup>                |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| North Island little shearwater | <i>Puffinus assimilis haurakiensis</i>  | At Risk                                     | Recovering <sup>CDB Inc RR</sup>               |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| NZ storm petrel                | <i>Fregetta maoriana</i>                | Threatened                                  | Nationally Vulnerable <sup>CDB CR Inc OL</sup> |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| NZ white-capped mollymawk      | <i>Thalassarche cauta steadi</i>        | At Risk                                     | Declining <sup>CD CI CR EF RR</sup>            |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| NZ white-faced storm petrel    | <i>Pelagodroma marina maoriana</i>      | At Risk                                     | Relict <sup>CDB RR</sup>                       |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Pycroft's petrel               | <i>Pterdroma pycrofti</i>               | At Risk                                     | Recovering <sup>CDB Inc RR</sup>               |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Short-tailed shearwater        | <i>Puffinus tenuirostris</i>            | Migrant                                     | Migrant <sup>SO</sup>                          |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Sooty shearwater               | <i>Puffinus griseus</i>                 | At Risk                                     | Declining <sup>CD CI SO</sup>                  |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Rock pigeon                    | <i>Columba livia</i>                    | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Barbary dove                   | <i>Streptopelia risoria</i>             | Introduced                                  | Introduced & Naturalised <sup>SO Sp</sup>      |               |               |                   |                         |                       |                   |         |                   | ✓           |                                         |                   |  |
| Myna                           | <i>Acridotheres tristis</i>             | Introduced                                  | Introduced & Naturalised <sup>SO</sup>         |               |               |                   |                         |                       |                   |         |                   | ✓           | ✓                                       |                   |  |







# BlueGreen

## About BlueGreen

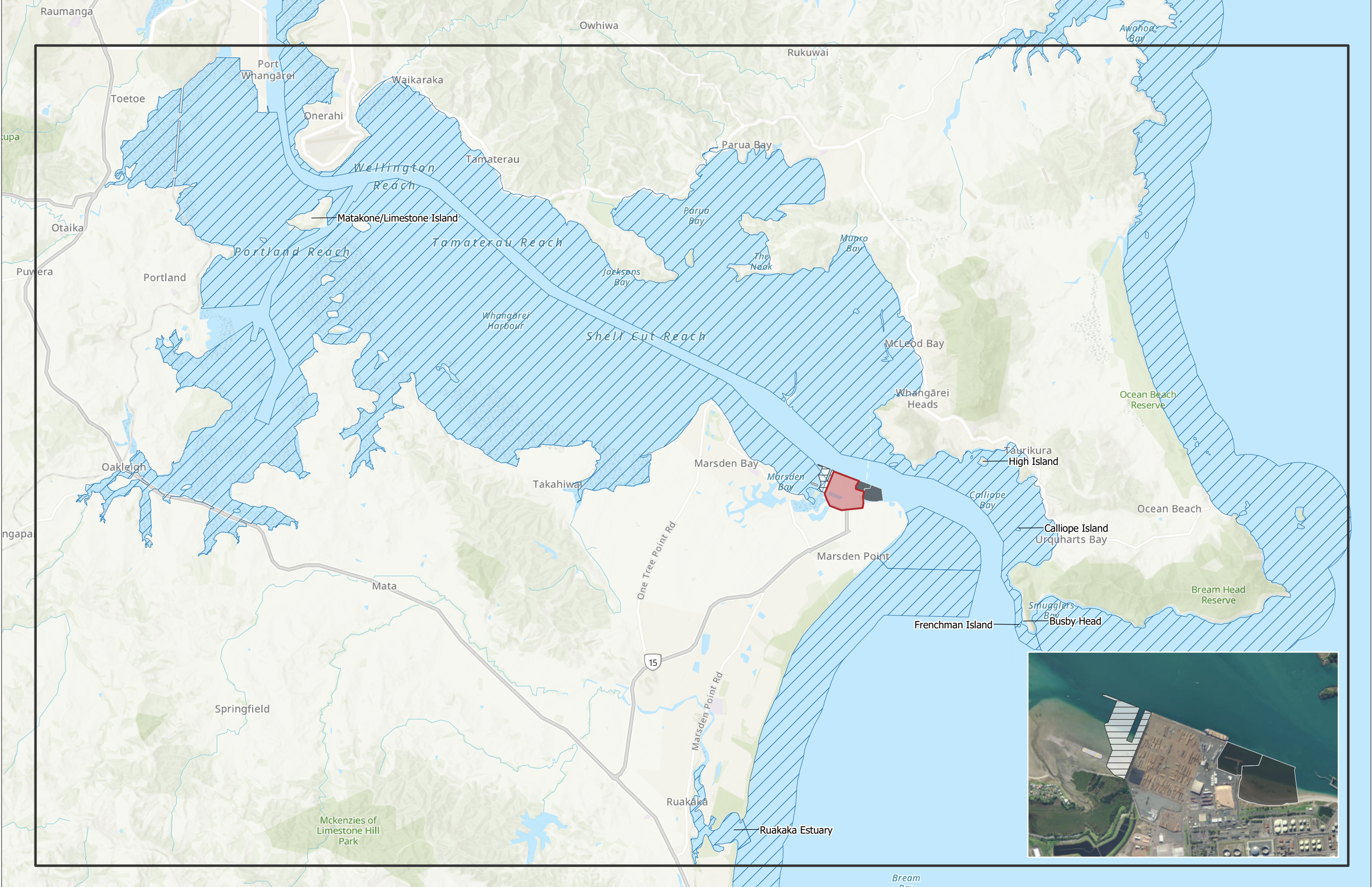
Over the last 20 years we have gathered a high level of knowledge and expertise working on a number of large scale projects of national significance, right from pre-consenting investigations through to Environment Court and Board of Inquiry Hearings. As such we are able to offer our clients proven expertise to assist with a range of ecological challenges, both simple and complex, across various ecosystems.

E: [Info@BlueGreenEcology.nz](mailto:Info@BlueGreenEcology.nz)

[BlueGreenEcology.nz](http://BlueGreenEcology.nz)

BlueGreen Ecology Ltd





## Shipyard project - Site Context

**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026



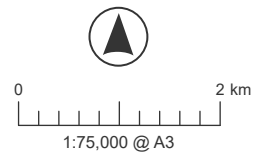
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- Northport
- eBird extent
- Significant Bird Area -
- Proposed Regional Plan (Decisions Version)

- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost

Data Sources: BlueGreen Ecology, 4Sight Consulting, NRC, Vince Kerr, Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors., Esri, NASA, NGA, USGS, Eagle Technology, LINZ

Projection: NZGD 2000 New Zealand Transverse Mercator







## Shipyard Project - Bird Survey Locations

### NORTHLAND SHIPYARD & DRYDOCK

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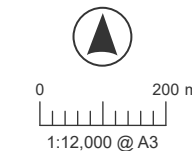
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- Northport
- Low Water Compartment
- High Water Compartment
- Expanded Compartment
- Penguin Survey

- Nesting Survey Observer Points
- Wading Bird Observer Points
- Nesting Survey Observer Points
- Nesting Survey

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator



**Map 2**





Albatross, petrel & penguins: eBird Records

**NORTHLAND SHIPYARD & DRYDOCK**  
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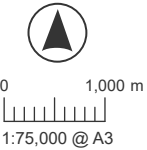
- Northport
- Extent of ebird assessment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost

- Carkpark footprint
- Coastal disturbance zone
- Albatross
  - Northern royal albatross
  - NZ white-capped mollymawk
  - Southern Buller's mollymawk

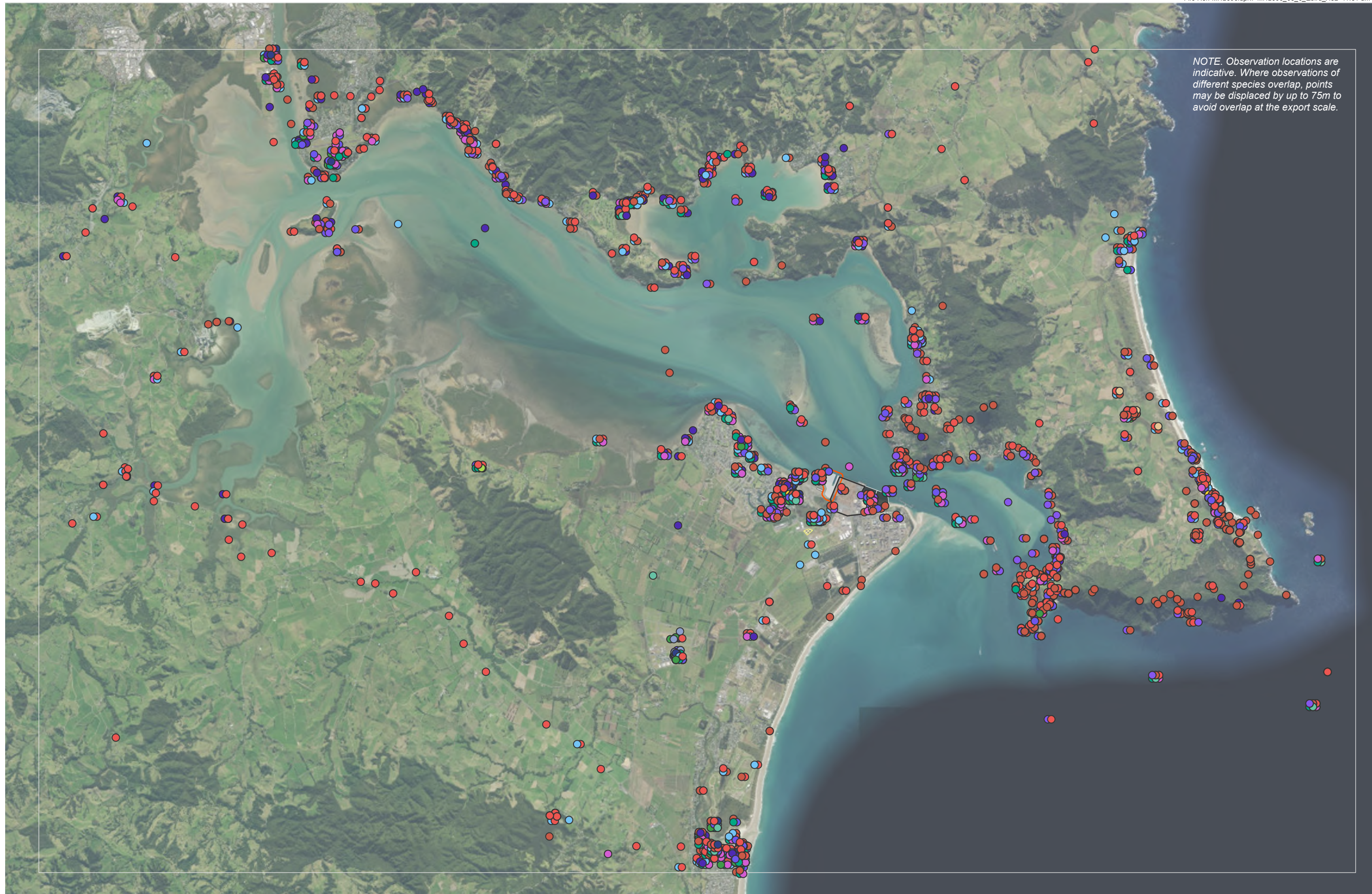
- Penguins
  - Little penguin
- Procellariidae petrel
  - Black petrel
  - Black-winged petrel
  - Cook's petrel
  - Grey-faced petrel

- Northern giant petrel
- Pycroft's petrel
- Petrel sp.
- Fairy prion
- Buller's shearwater
- Flesh-footed shearwater
- Fluttering shearwater
- Little Shearwater

- Short-tailed shearwater
- Sooty shearwater
- Storm & diving petrels
  - Common diving petrel
  - NZ storm-petrel
  - NZ white-faced storm petrel







## Wading birds: eBird Records

### NORTHLAND SHIPYARD & DRYDOCK

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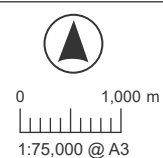
- Northport
- Extent of ebird assessment
- Western shipyard footprint
- Eastern reclamations

- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone
- Heron**
  - Kotuku / white heron
  - Reef heron

- White-faced heron
- Non-resident migrants**
  - Lesser knot
  - Pacific golden plover
  - Red-necked stint
  - Turnstone
  - Eastern bar-tailed godwit

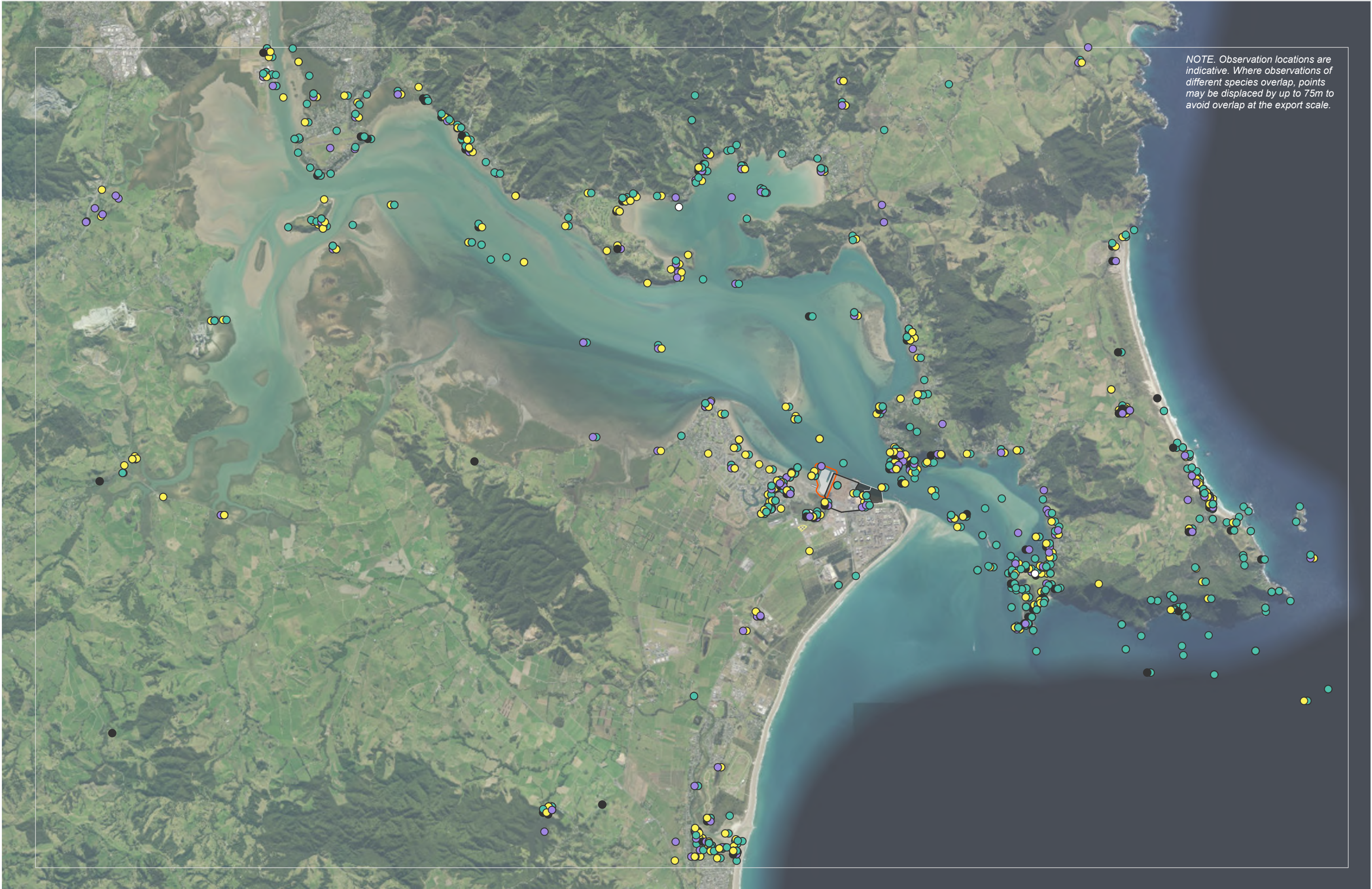
- Sharp-tailed sandpiper
- White-winged black tern
- NZ waders**
  - Banded dotterel
  - NZ pied oystercatcher
  - Pied stilt
  - Variable oystercatcher

- Wrybill
- Northern NZ dotterel
- Pied x black stilt (hybrid)
- Spoonbill & ibises**
  - Royal spoonbill



Map 4





## Shags: eBird Records

### NORTHLAND SHIPYARD & DRYDOCK

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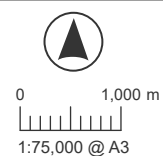
MapHouse | ©

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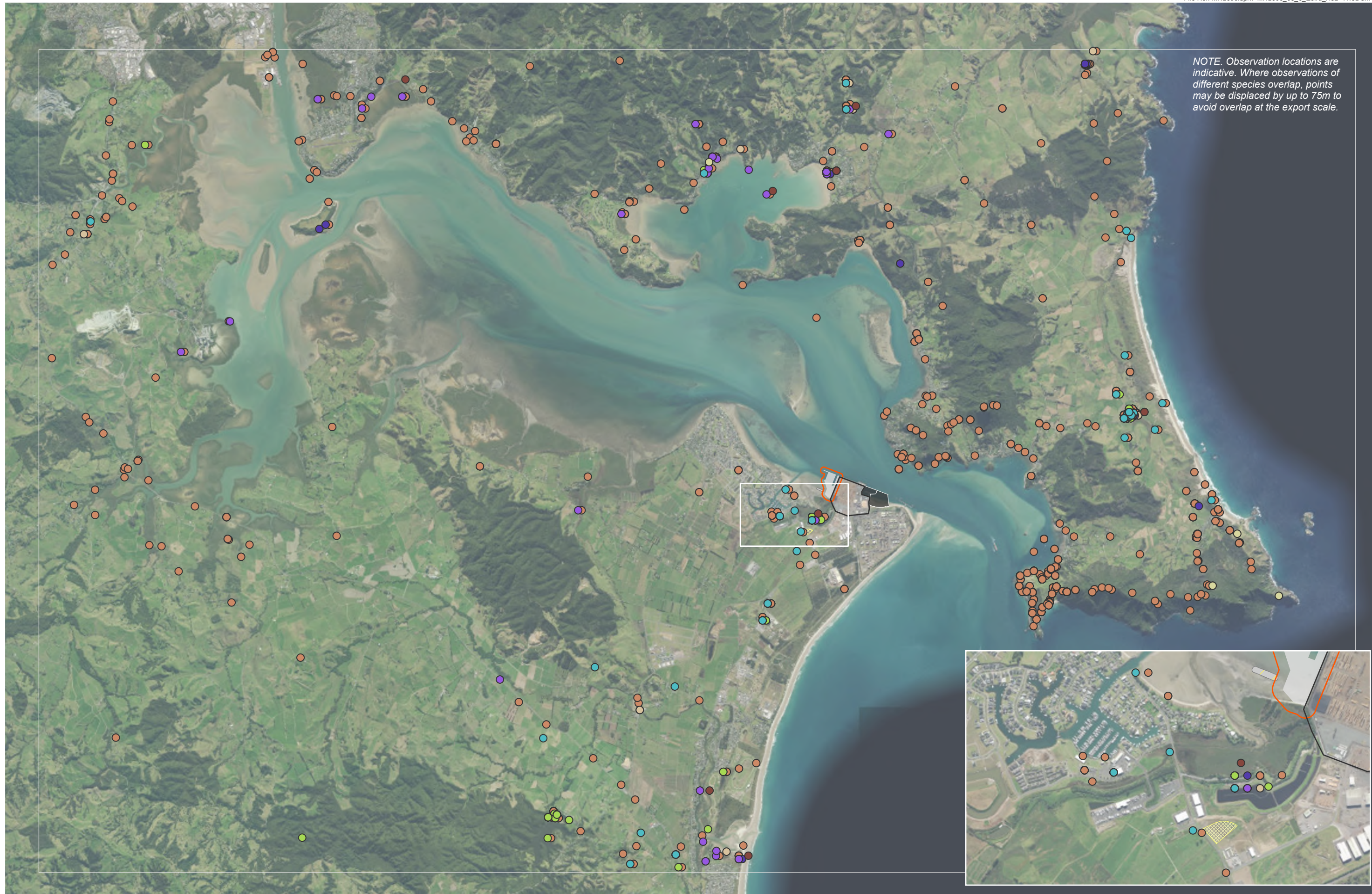
- Northport
- Extent of ebird assessment
- Western shipyard footprint
- Eastern reclamations

- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone
- Shags
  - Black shag

- Little black shag
- Little shag
- Pied shag
- Shag







## Wetland birds: eBird Records

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- Northport
- Extent of ebird assessment
- Western shipyard footprint
- Eastern reclamations

- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone
- Bitterns
  - Australasian bittern

- Rail & Crane
  - Weka
  - Spotless crane
  - Pukeko
  - Banded rail

- Fernbird & grebe
  - NZ dabchick
  - New Zealand fernbird
- Waterfowl
  - Brown teal



0 1,000 m  
1:75,000 @ A3

Map 6





## Shipyard project - Ecological Sites

### NORTHLAND SHIPYARD & DRYDOCK

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- Northport
- Coastal disturbance zone
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost

- Carpark footprint
- Marsden Spit Government Purpose Wildlife Management Reserve
- Significant Marine Mammal and Seabird Area - Proposed Regional Plan (Decisions Version)

- Significant Bird Area - Proposed Regional Plan (Decisions Version)
- Significant Bird Area - Critical Bird Habitat

Data Sources: BlueGreen Ecology, 4Sight Consulting, Department of Conservation, NRC, Vince Kerr, Northland Regional Council, Eagle Technology, LINZ

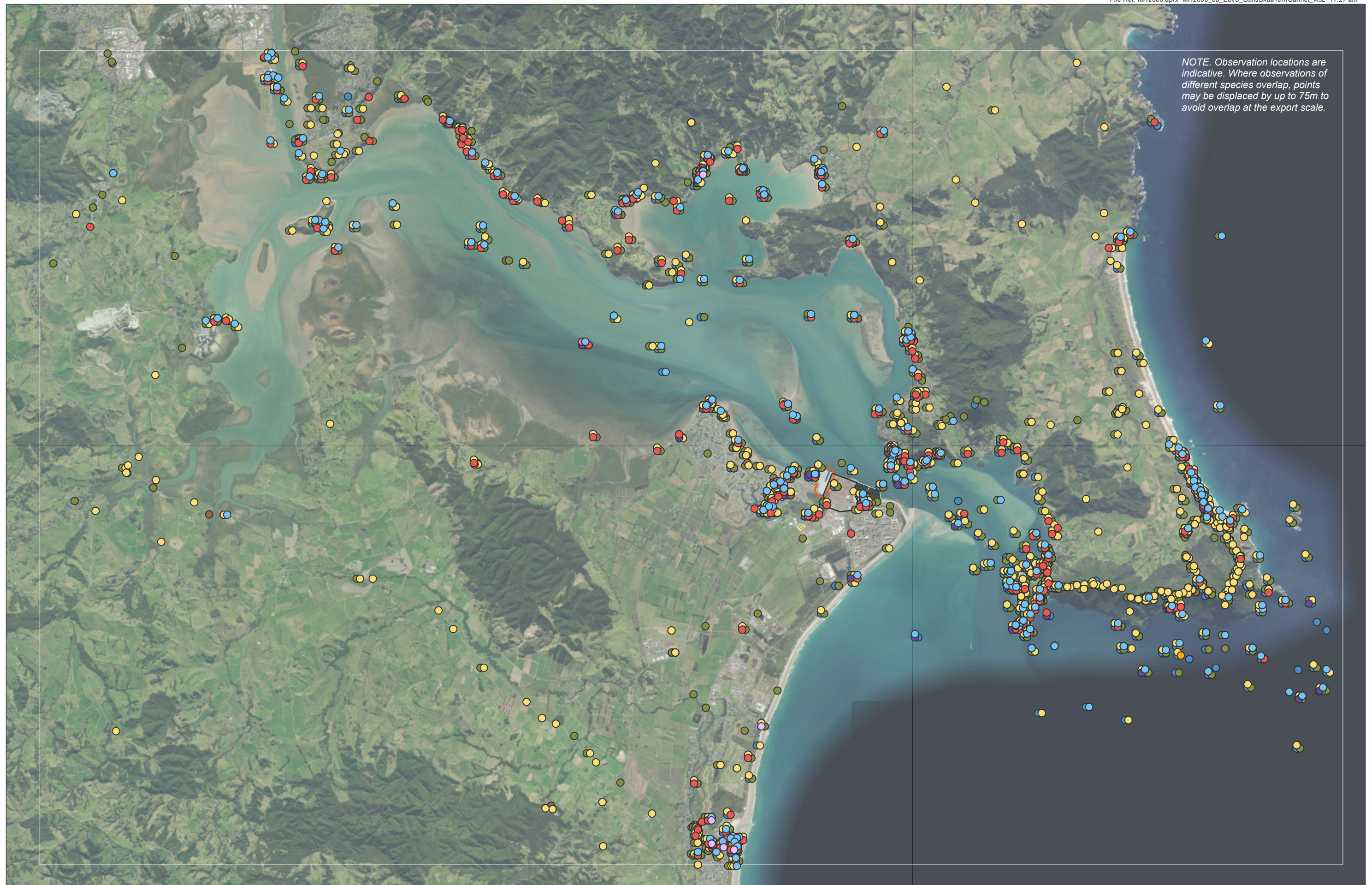
Projection: NZGD 2000 New Zealand Transverse Mercator



0 400 m  
1:25,000 @ A3

**Map 7**





## Gulls, skua, terns & gannet: Ebird Records

### NORTHLAND SHIPYARD & DRYDOCK

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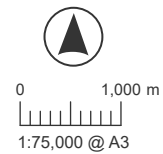
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- Northport
- Extent of ebird assessment
- Western shipyard footprint
- Eastern reclamations

- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone
- Gannet & boobies
- Australasian gannet

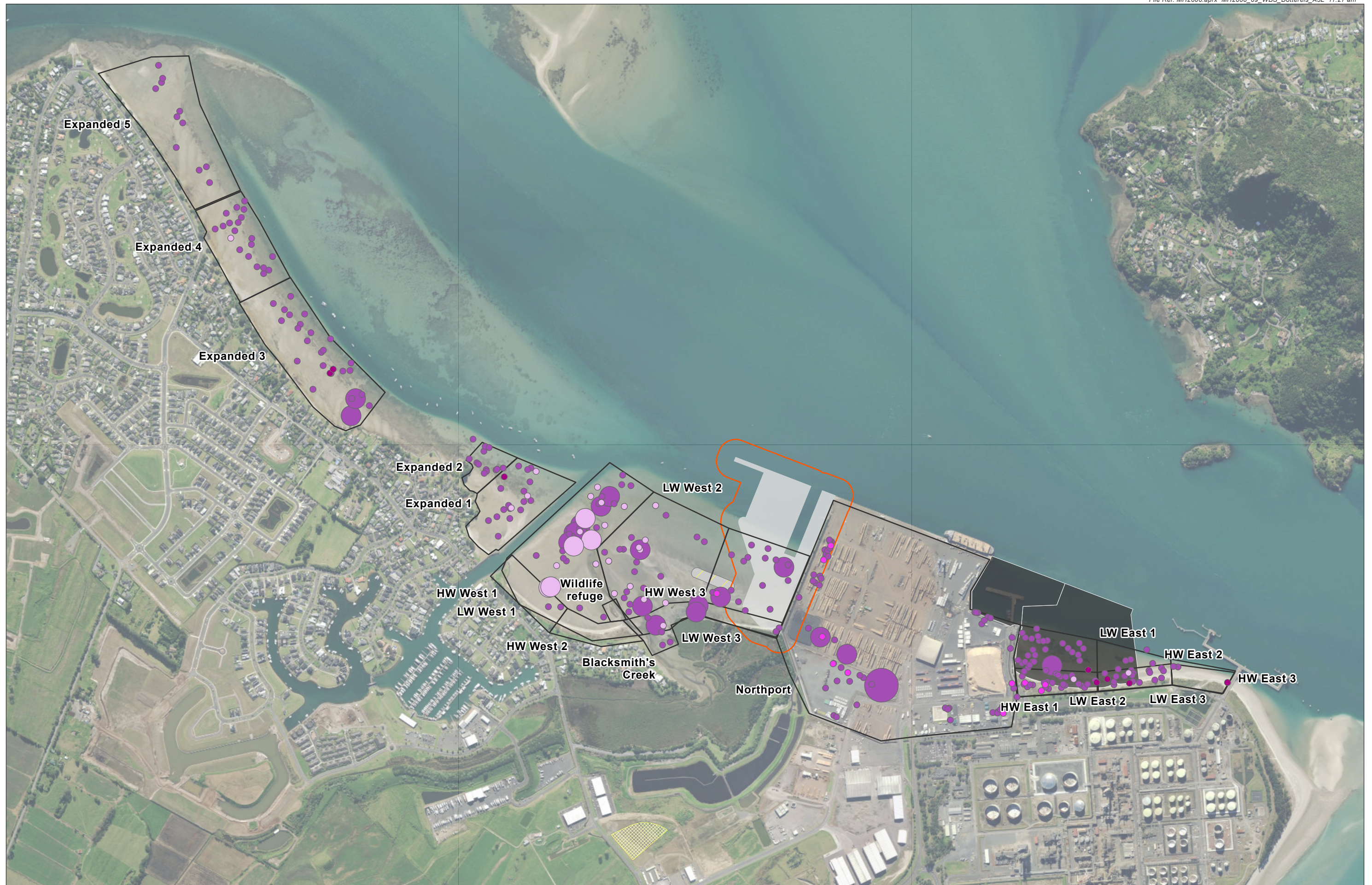
- Gulls, skua & terns
- Black-billed gull
- Red-billed gull
- Southern black-backed gull
- Arctic skua

- Pomarine skua
- Skua sp.
- Caspian tern
- White-fronted tern
- Fairy tern



**Map 8**





# Shipyard Project - Wading Bird Surveys: Dotterels

## NORTHLAND SHIPYARD & DRYDOCK

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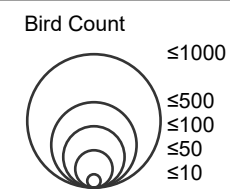
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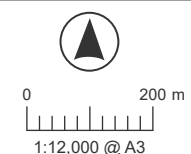
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint
- Coastal disturbance zone

- Species
- Northern NZ dotterel
- Banded dotterel
- Dotterel (unidentified)
- Wrybill

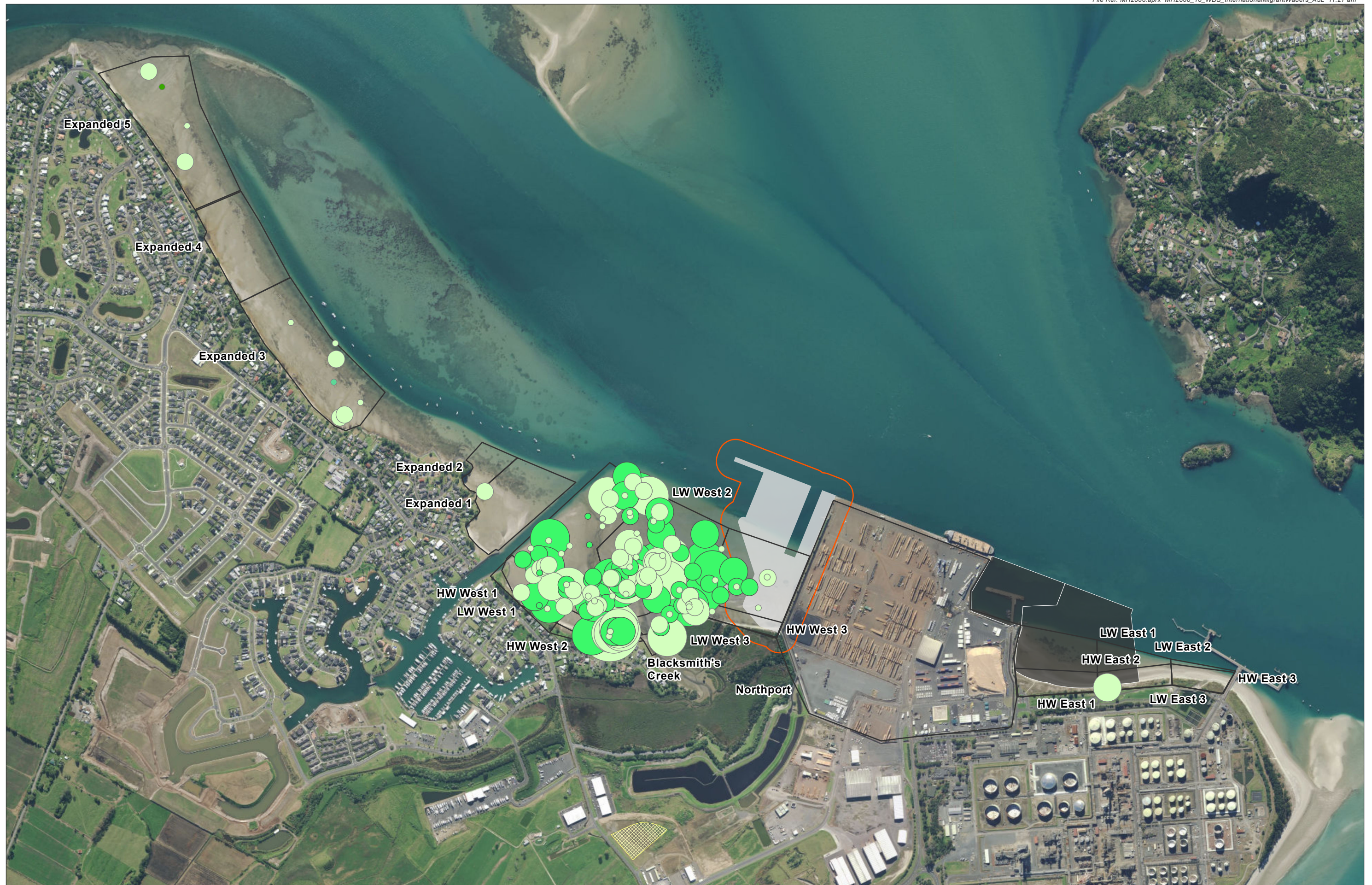


Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator







# Shipyard Project - Wading Bird Surveys: International Migrant waders NORTHLAND SHIPYARD & DRYDOCK

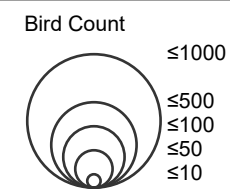
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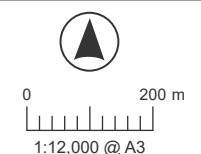
- Compartment
- Carpark footprint
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Coastal disturbance zone

- Species
- Bar-tailed godwit
  - Lesser knot
  - Eastern curlew
  - Whimbrel



Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator



**Map 10**





# Shipyard Project - Wading Bird Surveys: Oystercatchers & stilts NORTHLAND SHIPYARD & DRYDOCK

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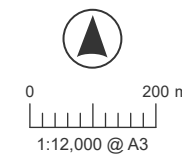
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint

- Coastal disturbance zone
- Species
  - Pied stilt
  - Oystercatcher
  - South Island pied oystercatcher

- Variable oystercatcher
- Bird Count
  - ≤500
  - ≤100
  - ≤50
  - ≤10

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator



**Map 11**





Shipyard Project - Wading Bird Surveys:  
Gulls & Terns

NORTHLAND SHIPYARD & DRYDOCK

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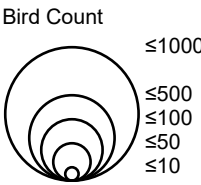
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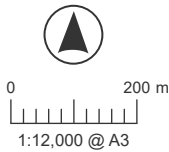
- Compartments
  - Western shipyard footprint
  - Eastern reclamations
  - Consented high tide roost
  - Carpark footprint
  - Coastal disturbance zone

- Species
- Caspian tern
  - White-fronted tern
  - Red-bill gull
  - Black-billed gull
  - Southern black-backed gull
  - Black fronted tern



Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator







# Shipyard Project - Wading Bird Surveys:

## Herons & Royal Spoonbill

### NORTHLAND SHIPYARD & DRYDOCK

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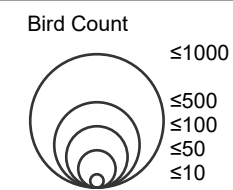
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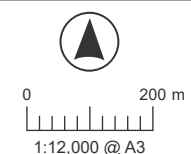
- Compartiment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species
- Heron
- Reef heron
- White-faced heron
- Royal spoonbill



Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator







Shipyard Project - Wading Bird Surveys:  
Shags

NORTHLAND SHIPYARD & DRYDOCK

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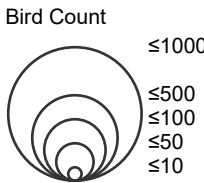
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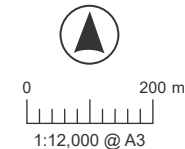
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species
- Little shag
  - Little black shag
  - Pied shag
  - Black shag
  - Shag (Unidentified)

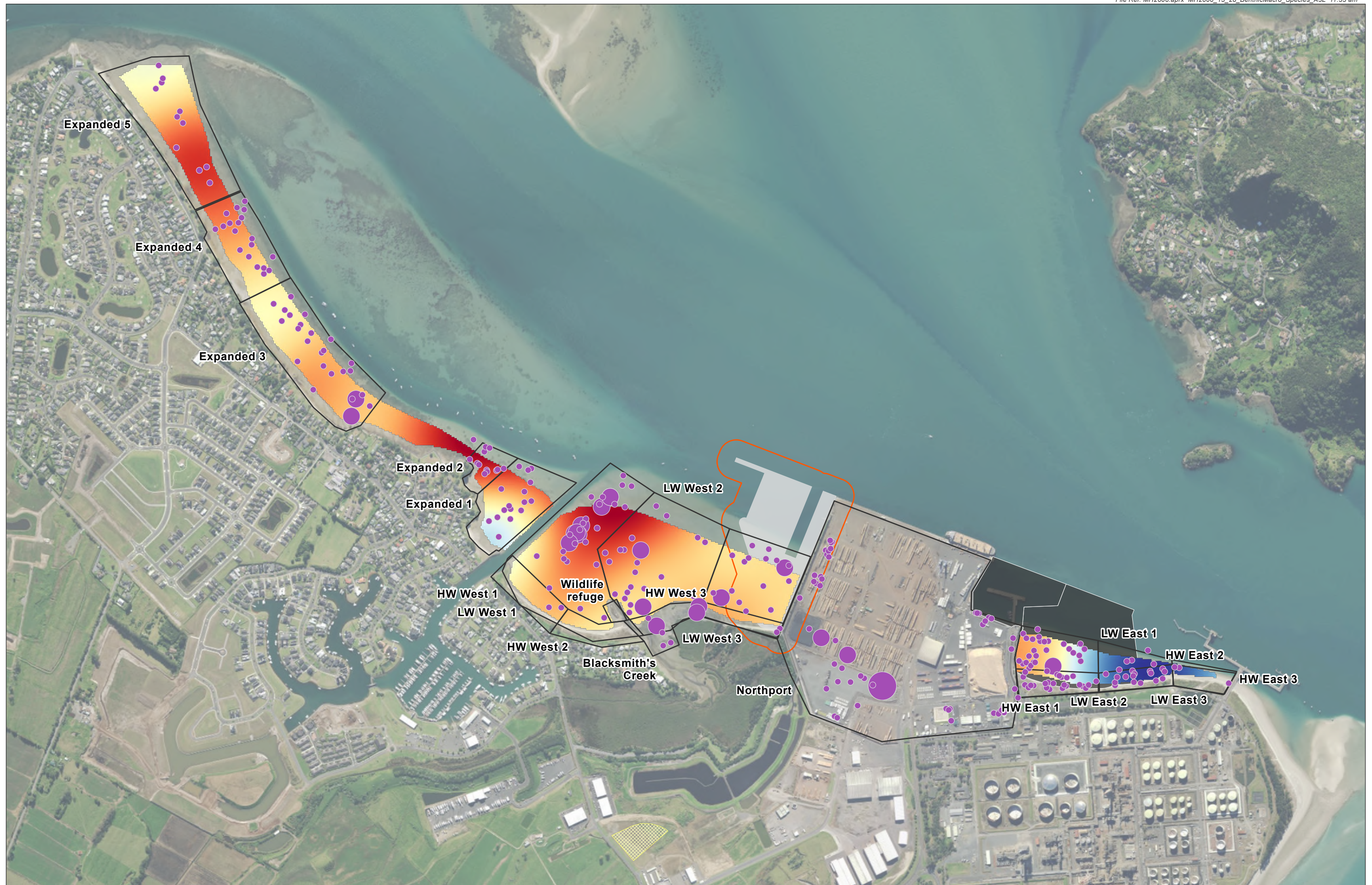


Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator







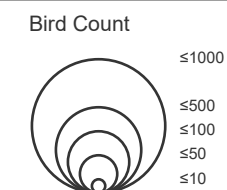
**Benthic macroinvertebrate and  
Northern NZ dotterel**  
**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026

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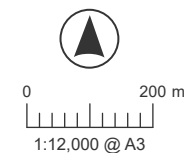
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Northern NZ dotterel
- Individual macroinvertebrates**
- High: 190
  - Low: 35



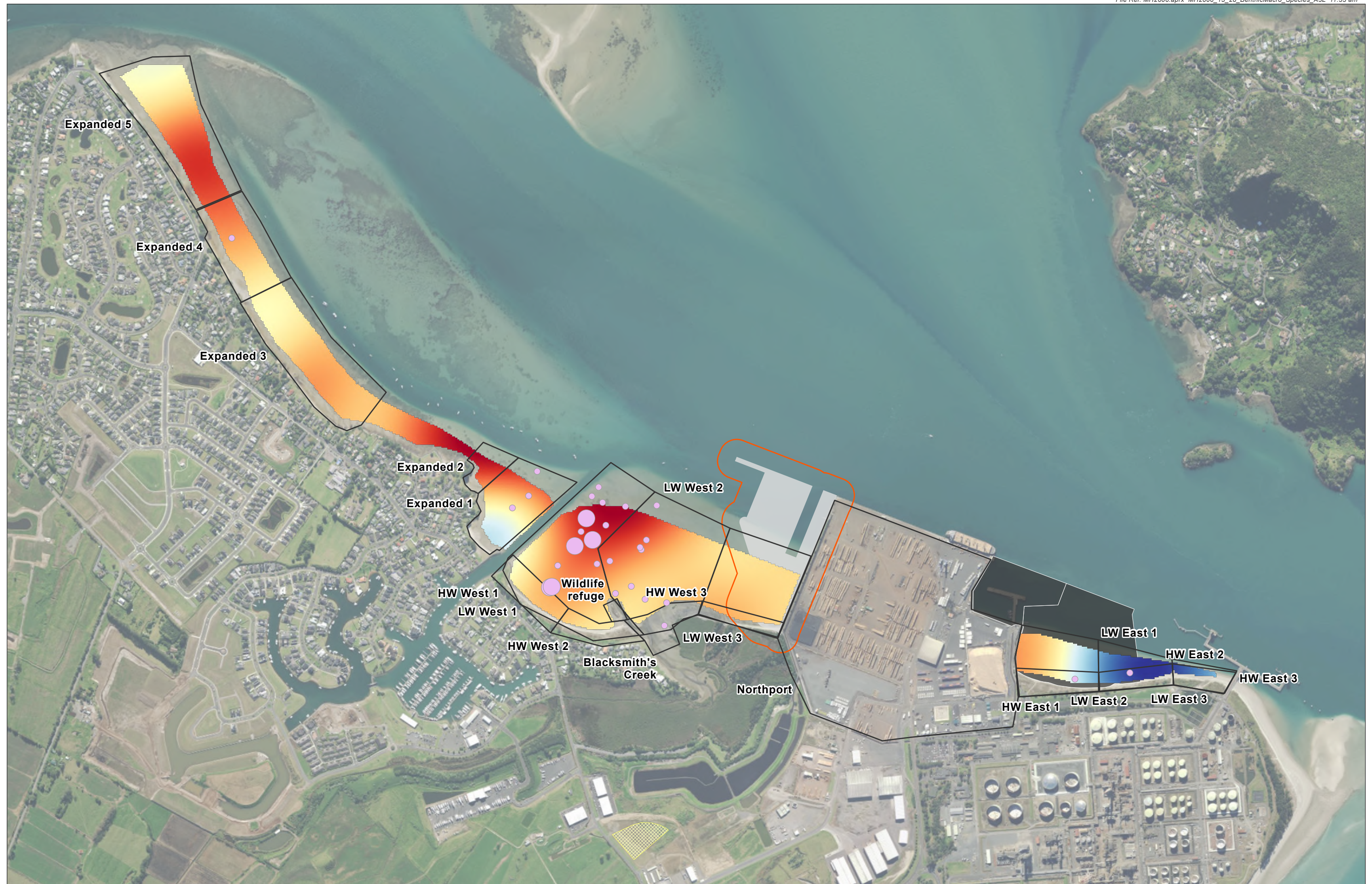
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 15**





Benthic macroinvertebrate and  
Banded dotterel  
**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026

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**Legend:**

- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint
- Coastal disturbance zone

**Species**

- Banded dotterel

**Individual macroinvertebrates**

- High: 190
- Low: 35

**Bird Count**

- ≤1000
- ≤500
- ≤100
- ≤50
- ≤10

**Data Sources:** BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

**Projection:** NZGD 2000 New Zealand Transverse Mercator

**Scale:** 1:12,000 @ A3

**Map 16**





**Benthic macroinvertebrate and Wrybill**  
**NORTHLAND SHIPYARD & DRYDOCK**  
 Plan prepared by MapHouse | 27 July 2026

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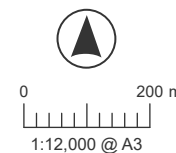
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint
- Coastal disturbance zone

**Species**  
 Wrybill  
 Individual macroinvertebrates  
 High: 190  
 Low: 35

**Bird Count**  
 ≤1000  
 ≤500  
 ≤100  
 ≤50  
 ≤10

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

Projection: NZGD 2000 New Zealand Transverse Mercator







**Benthic macroinvertebrate and  
Bar-tailed godwit**  
**NORTHLAND SHIPYARD & DRYDOCK**

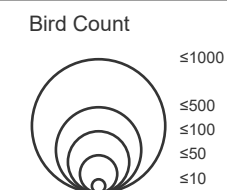
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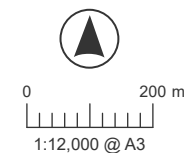
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Bar-tailed godwit
- Individual macroinvertebrates**
- High: 190
  - Low: 35



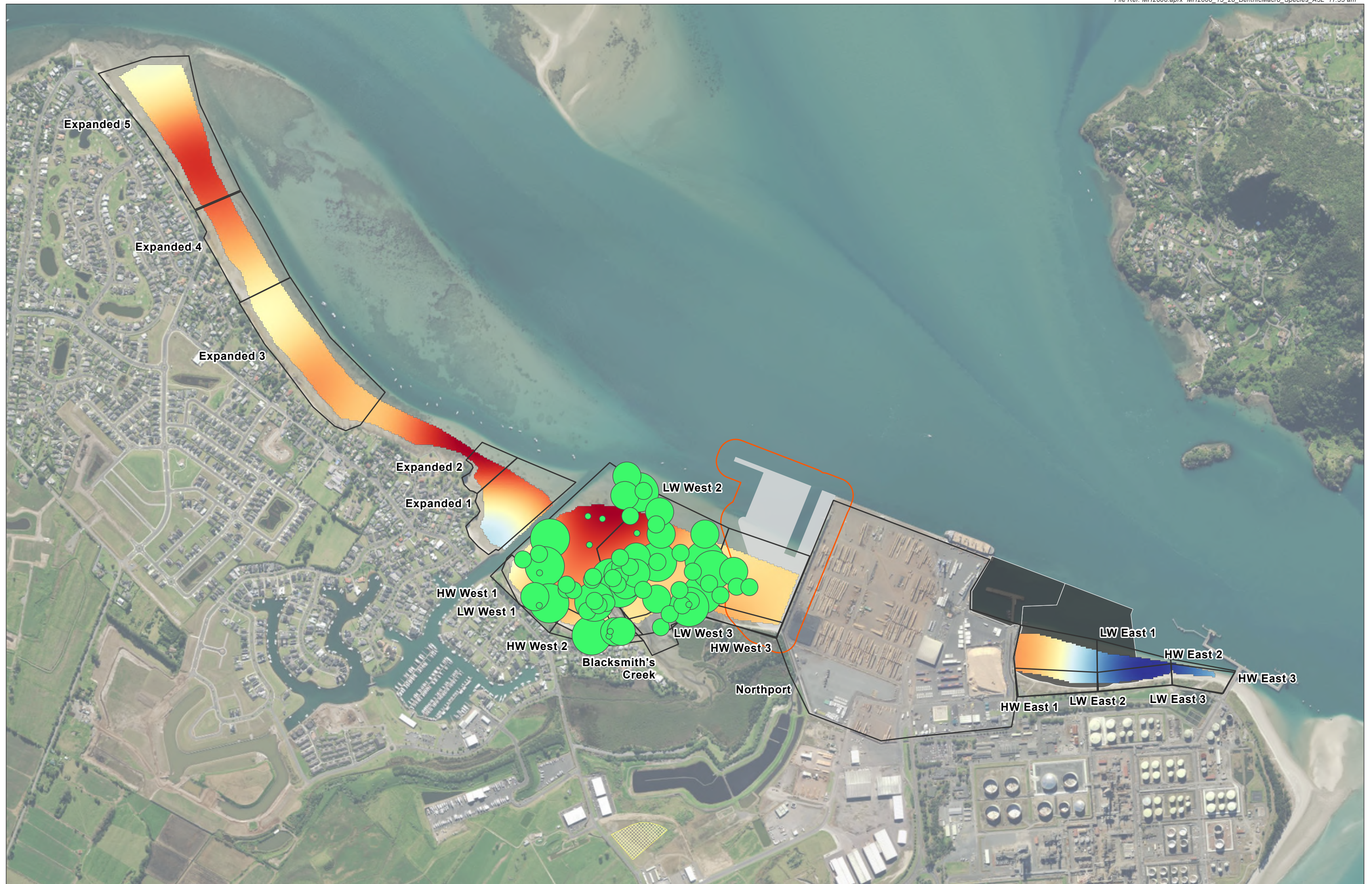
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 18**





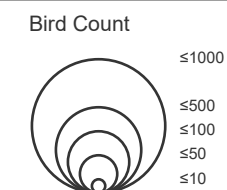
**Benthic macroinvertebrate and Lesser knot**  
**NORTHLAND SHIPYARD & DRYDOCK**  
 Plan prepared by MapHouse | 27 July 2026

**BlueGreen** MapHouse | ©

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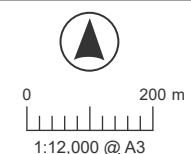
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint
- Coastal disturbance zone

- Species**
- Lesser knot
- Individual macroinvertebrates**
- High: 190
  - Low: 35

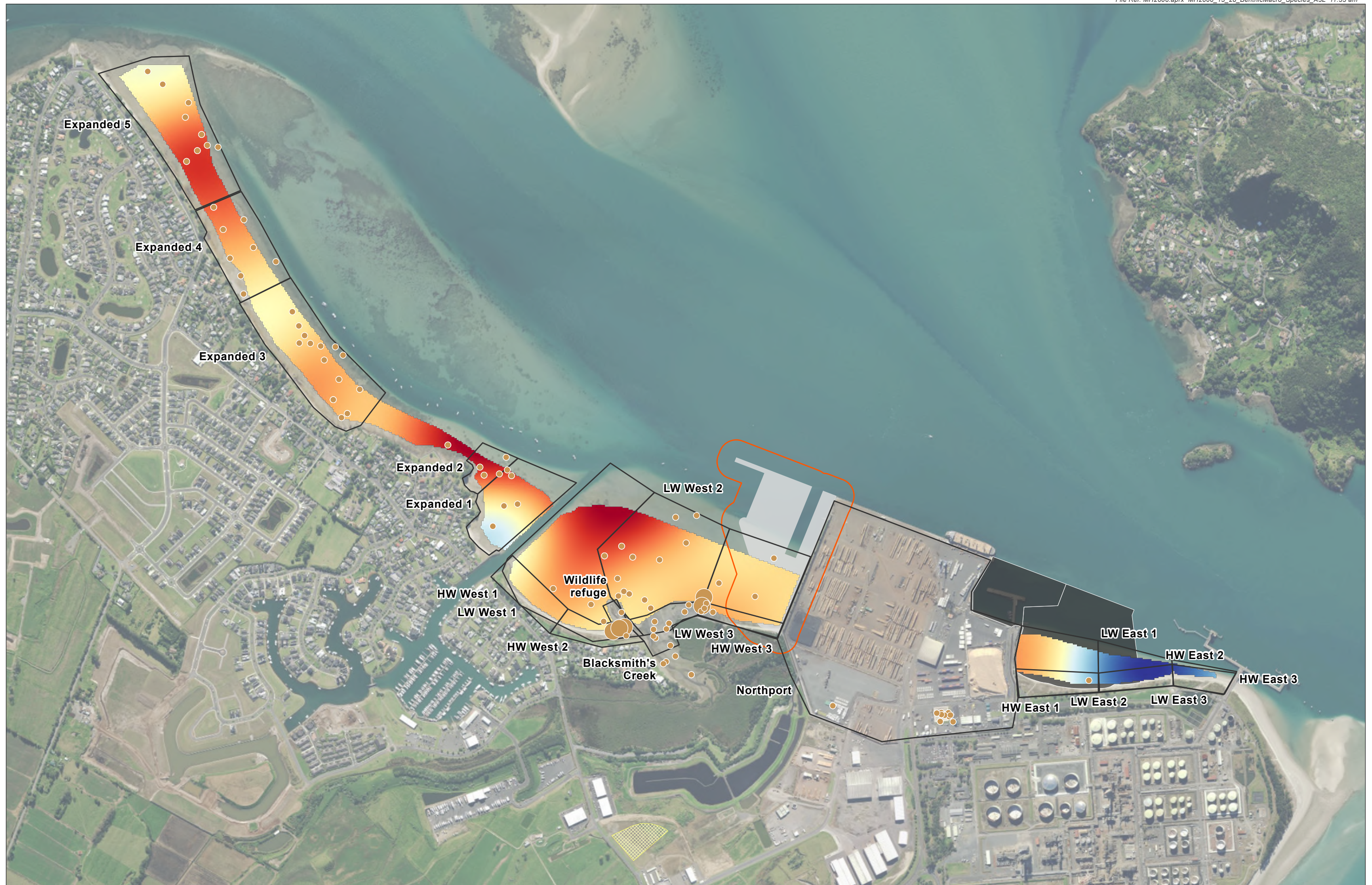


*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator







# Benthic macroinvertebrate and Pied stilt

## NORTHLAND SHIPYARD & DRYDOCK

Plan prepared by MapHouse | 27 July 2026

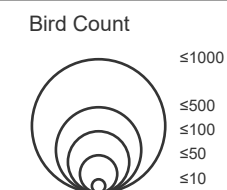
**BlueGreen**

**MapHouse** | ©

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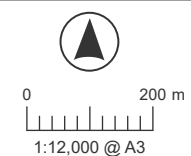
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Pied stilt
- Individual macroinvertebrates**
- High: 190
  - Low: 35



*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 20**





**Benthic macroinvertebrate and  
South Island pied oystercatcher  
NORTHLAND SHIPYARD & DRYDOCK**

Plan prepared by MapHouse | 27 July 2026

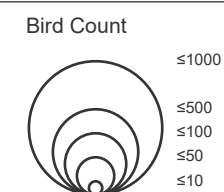
**BlueGreen**

**MapHouse** | ©

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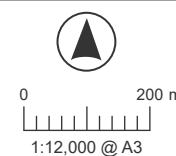
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- South Island pied oystercatcher
- Individual macroinvertebrates**
- High: 190
  - Low: 35



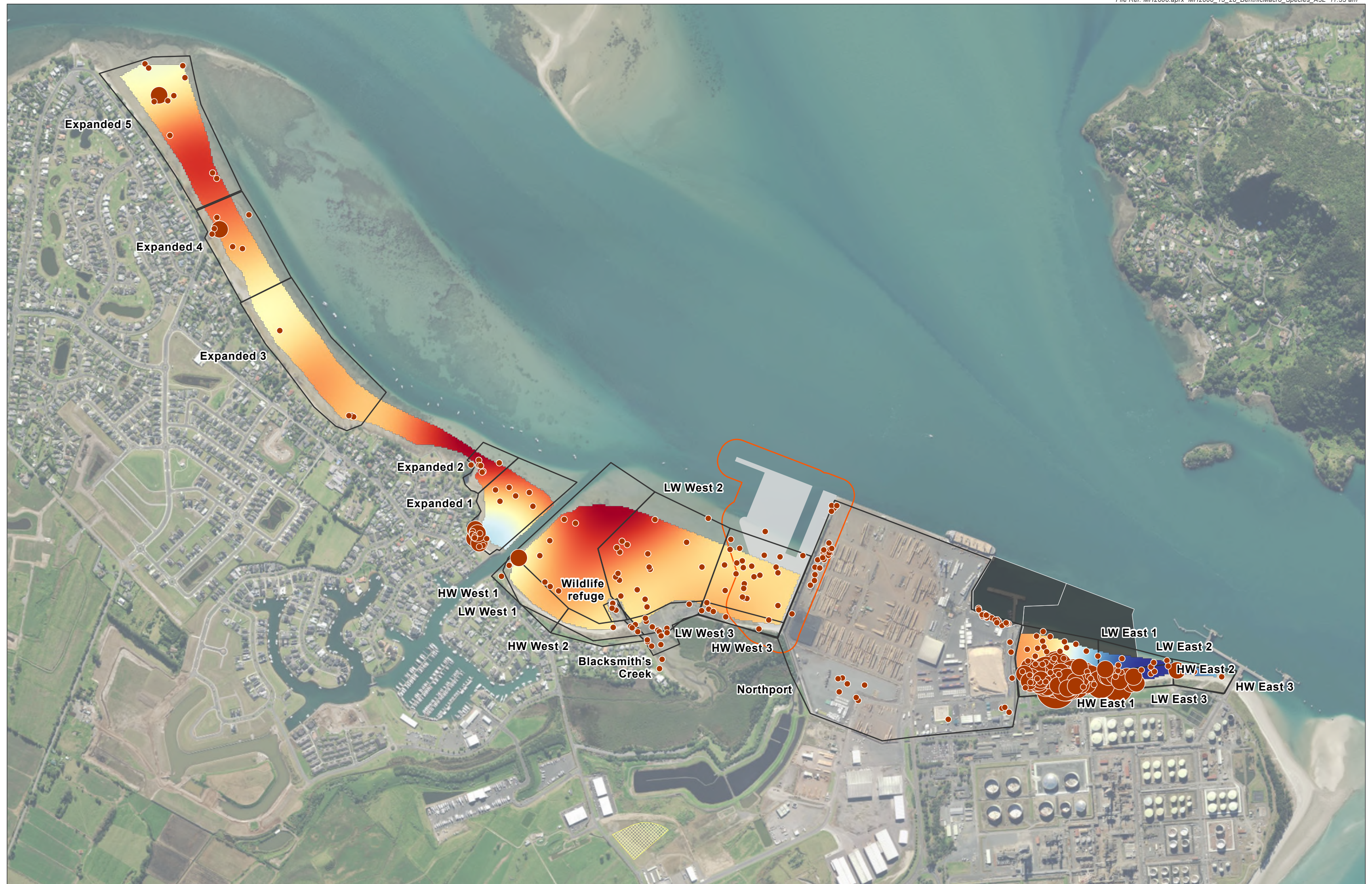
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 21**





**Benthic macroinvertebrate and  
Variable oystercatcher**  
**NORTHLAND SHIPYARD & DRYDOCK**

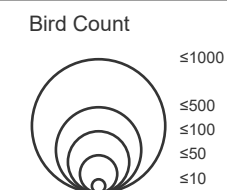
Plan prepared by MapHouse | 27 July 2026

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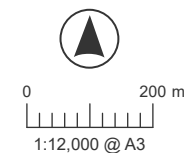
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Variable oystercatcher
- Individual macroinvertebrates**
- High: 190
  - Low: 35



*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 22**





**Benthic macroinvertebrate and  
Red-bill gull**  
**NORTHLAND SHIPYARD & DRYDOCK**

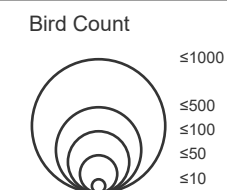
Plan prepared by MapHouse | 27 July 2026

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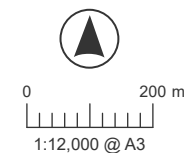
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Red-bill gull
- Individual macroinvertebrates**
- High: 190
  - Low: 35



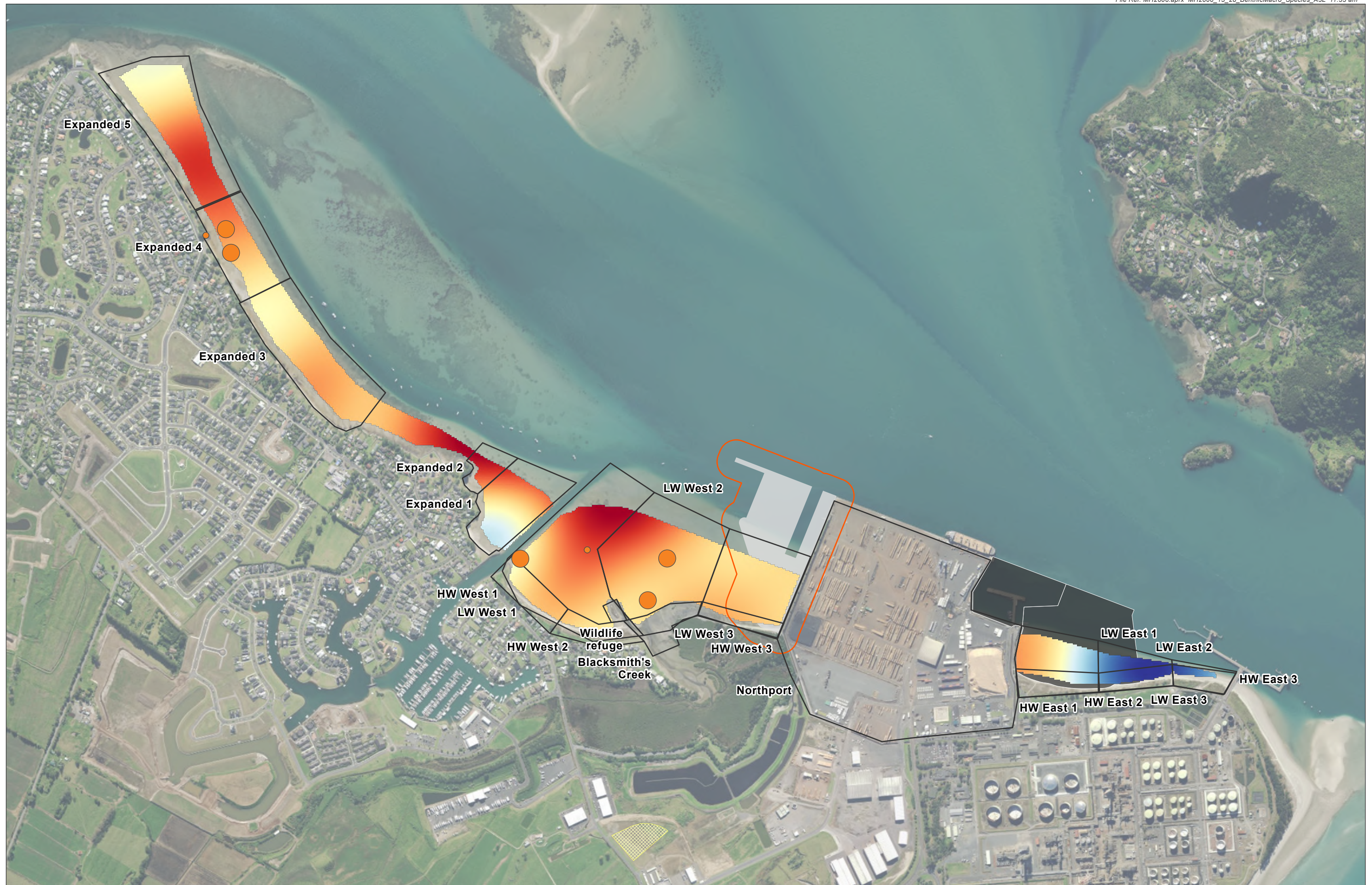
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 23**





**Benthic macroinvertebrate and  
Black-billed gull**  
**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026

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- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

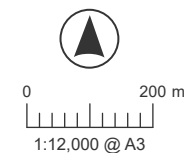
**Species**  
● Black-billed gull  
**Individual macroinvertebrates**  
High: 190  
Low: 35

**Bird Count**

- ≤1000
- ≤500
- ≤100
- ≤50
- ≤10

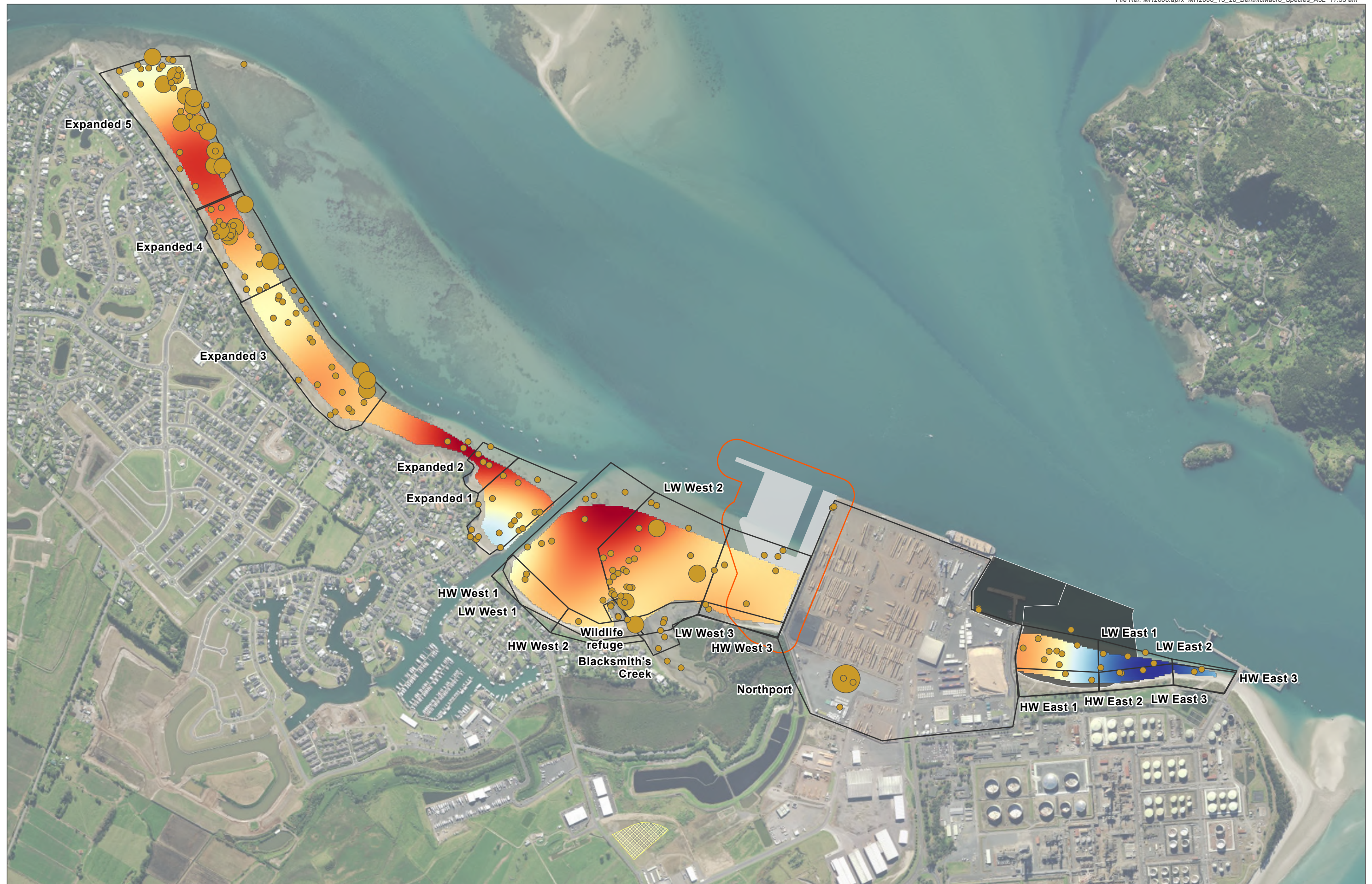
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 24**





**Benthic macroinvertebrate and  
Southern black-backed gull  
NORTHLAND SHIPYARD & DRYDOCK**

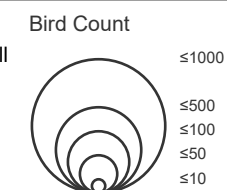
Plan prepared by MapHouse | 27 July 2026

**BlueGreen** MapHouse | ©

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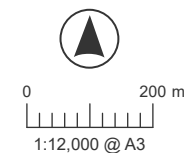
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Southern black-backed gull
- Individual macroinvertebrates**
- High: 190
  - Low: 35



*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 25**





**Benthic macroinvertebrate and  
Reef heron**  
**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026

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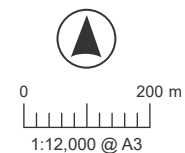
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

**Species**  
● Reef heron  
**Individual macroinvertebrates**  
■ High: 190  
■ Low: 35

**Bird Count**  
 ≤1000  
 ≤500  
 ≤100  
 ≤50  
 ≤10

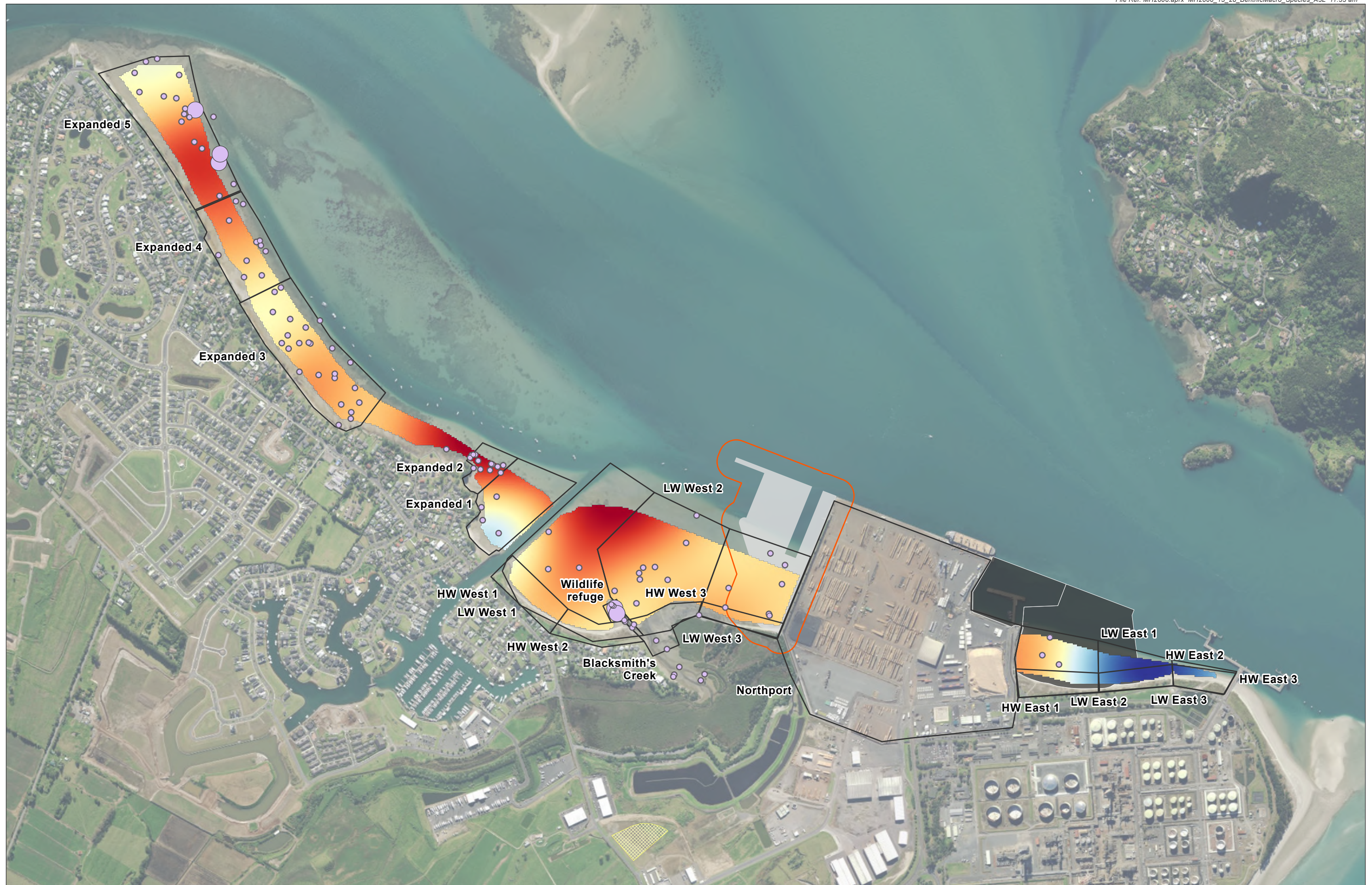
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 26**





**Benthic macroinvertebrate and  
White-faced heron**  
**NORTHLAND SHIPYARD & DRYDOCK**

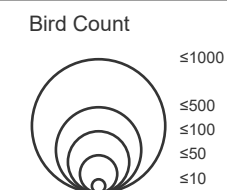
Plan prepared by MapHouse | 27 July 2026

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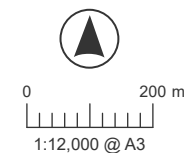
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- White-faced heron
- Individual macroinvertebrates**
- High: 190
  - Low: 35



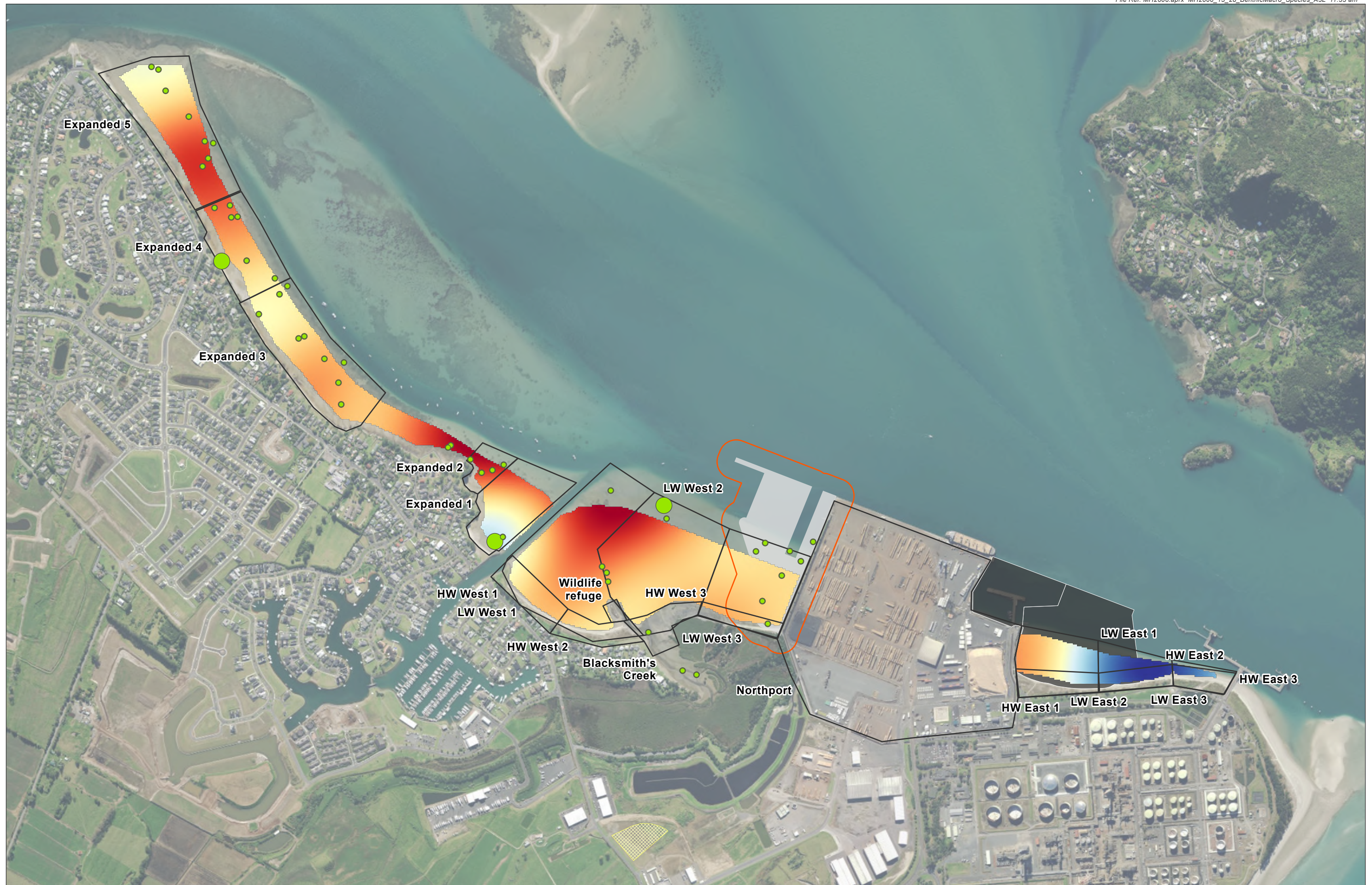
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 27**





**Benthic macroinvertebrate and  
Royal spoonbill**  
**NORTHLAND SHIPYARD & DRYDOCK**

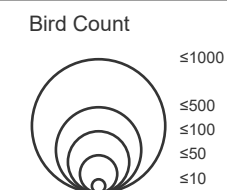
Plan prepared by MapHouse | 27 July 2026

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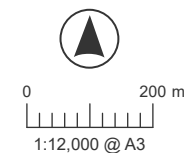
- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Species**
- Royal spoonbill
- Individual macroinvertebrates**
- High: 190
  - Low: 35



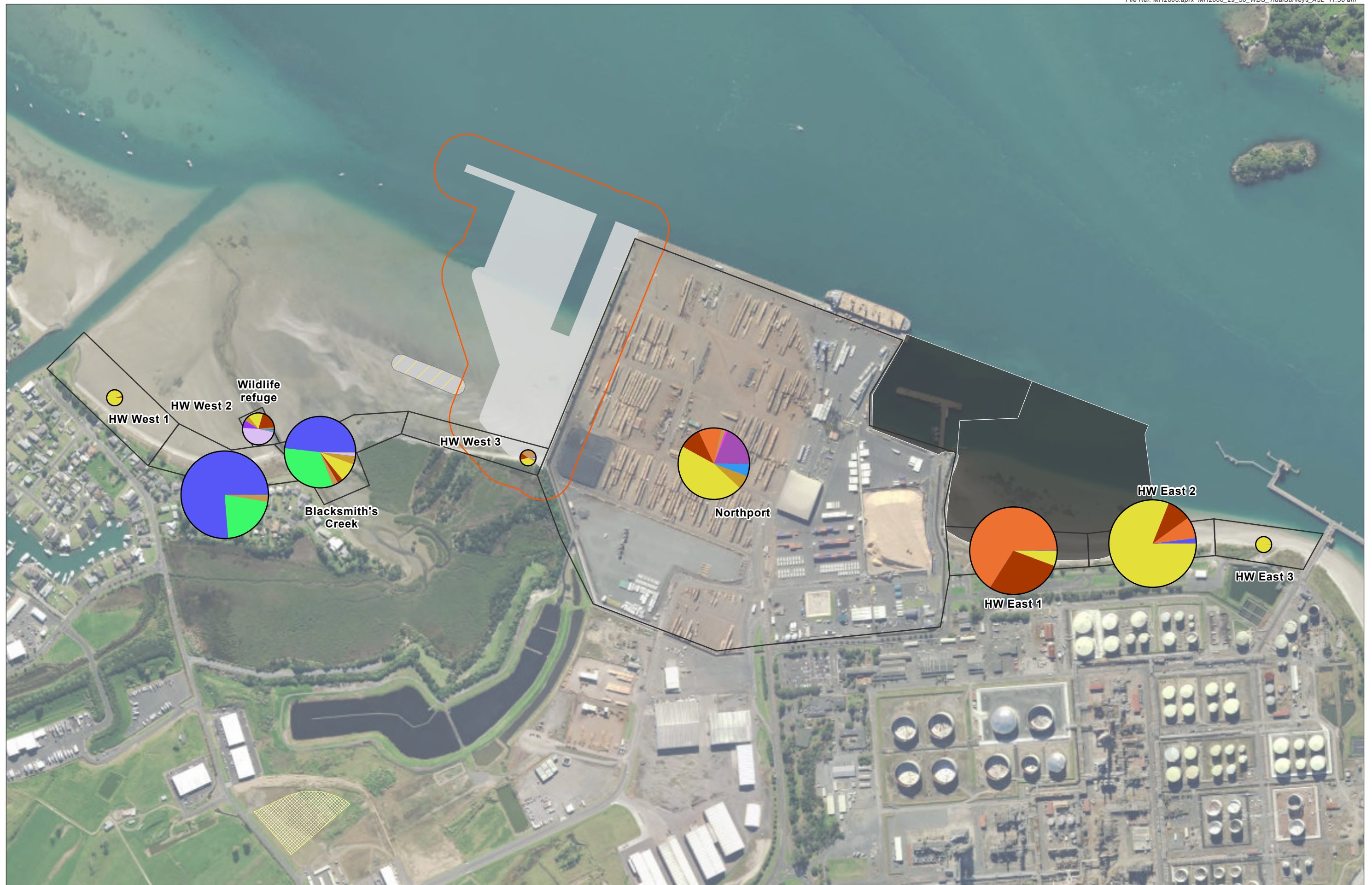
*Data Sources:* BlueGreen Ecology, 4Sight Consulting, Eagle Technology, Land Information New Zealand, GEBCO, Community maps contributors

*Projection:* NZGD 2000 New Zealand Transverse Mercator



**Map 28**





Shipyard Project - Wading Bird Survey:  
2017 - 2022 (High Tide)  
NORTHLAND SHIPYARD & DRYDOCK  
Plan prepared by MapHouse | 27 July 2026

**BlueGreen** MapHouse | ©

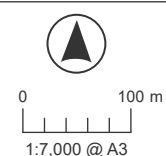
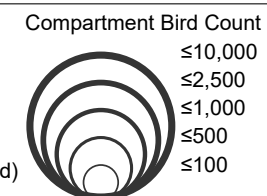
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- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

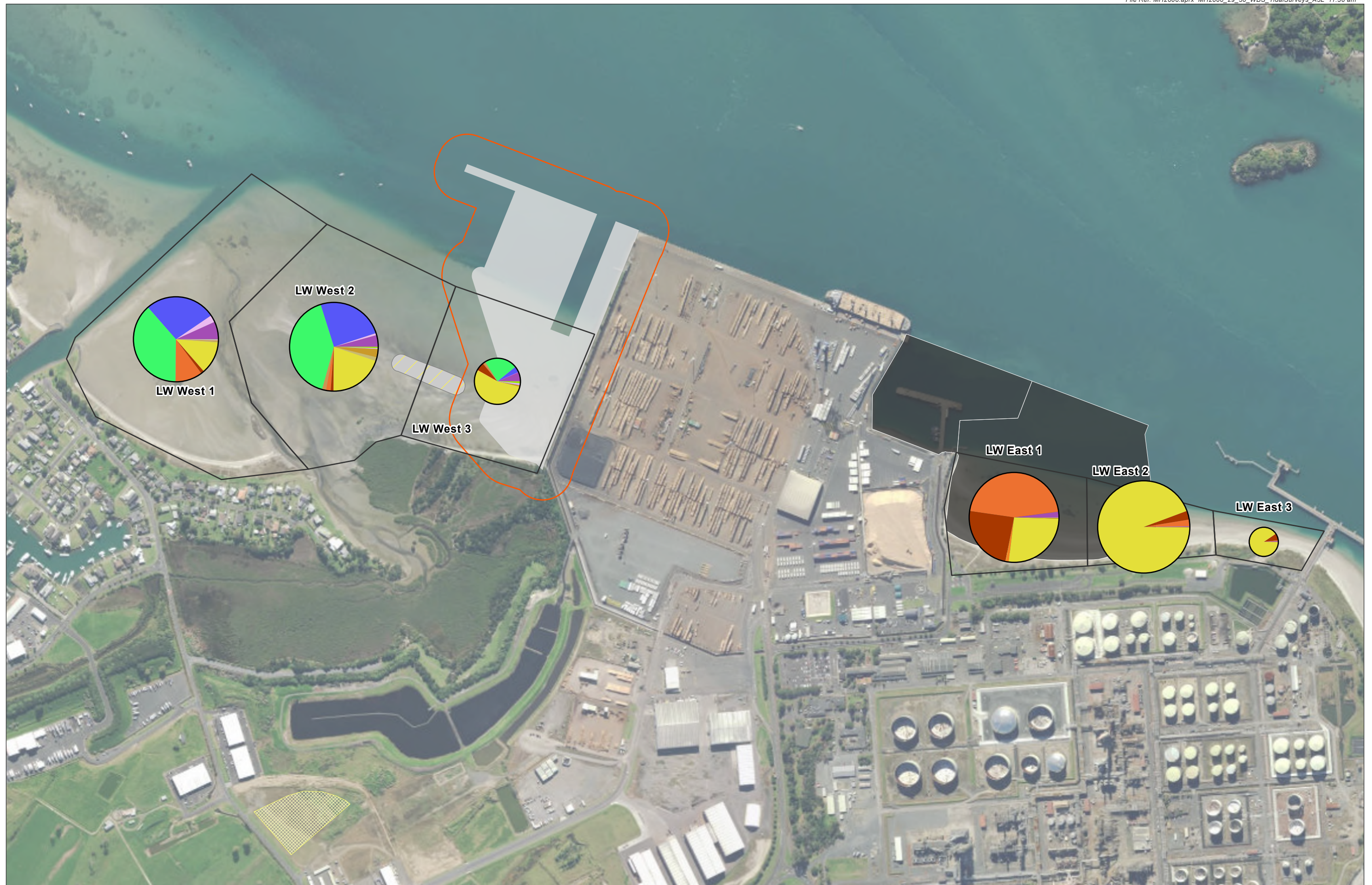
- Northern NZ dotterel
- Dotterel
- Wrybill
- Bar tailed godwit
- Lesser knot
- Pied stilt
- Osytercatcher

- South Island pied oystercatcher
- Variable oystercatcher
- Caspian tern
- Red bill gull
- Southern black backed gull
- Reef heron
- White faced heron

- Royal spoonbill
- Little shag
- Little black shag
- Pied shag
- Black shag
- Shag (Unidentified)







Shipyard Project - Wading Bird Survey:  
2017-2022 (Low Mid Tide)  
NORTHLAND SHIPYARD & DRYDOCK  
Plan prepared by MapHouse | 27 July 2026

**BlueGreen** MapHouse | ©

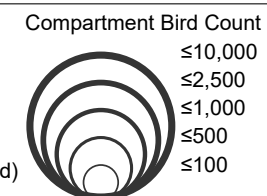
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- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Northern NZ dotterel
- Dotterel
- Wrybill
- Bar tailed godwit
- Lesser knot
- Pied stilt
- Osytercatcher

- South Island pied oystercatcher
- Variable oystercatcher
- Caspian tern
- Red bill gull
- Southern black backed gull
- Reef heron
- White faced heron

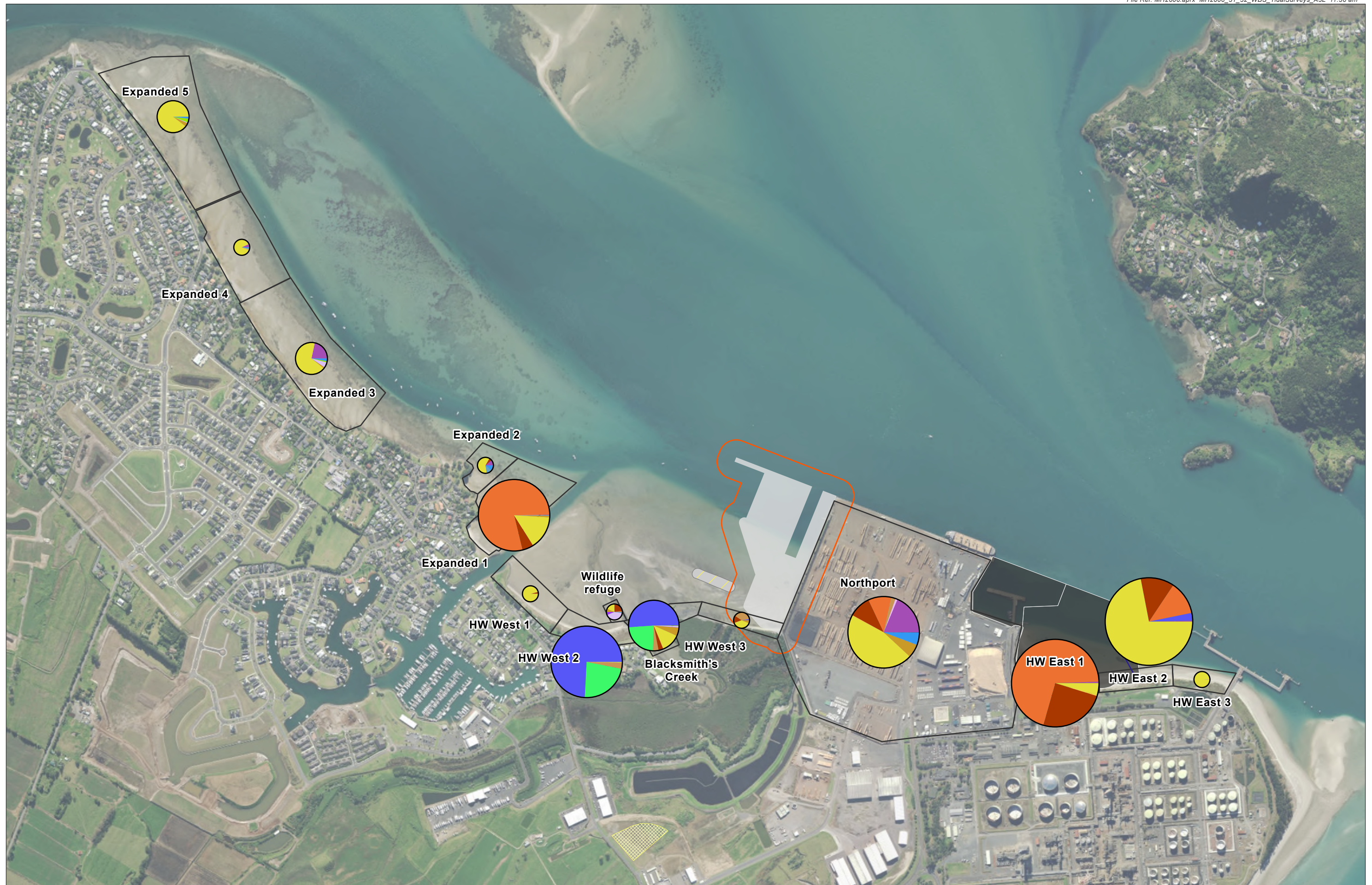
- Royal spoonbill
- Little shag
- Little black shag
- Pied shag
- Black shag
- Shag (Unidentified)



0 100 m  
1:7,000 @ A3

**Map 30**





Shipyard project - Wading Bird Survey:  
Dec 2019 - 2022 (High Tide)  
**NORTHLAND SHIPYARD & DRYDOCK**

Plan prepared by MapHouse | 27 July 2026

**BlueGreen**

**MapHouse** | ©

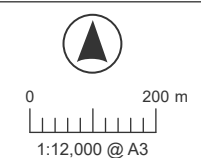
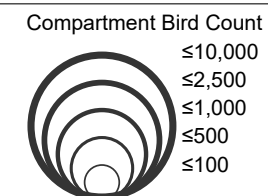
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- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Northern NZ dotterel
- Dotterel
- Wrybill
- Bar tailed godwit
- Lesser knot
- Pied stilt
- South Island pied oystercatcher

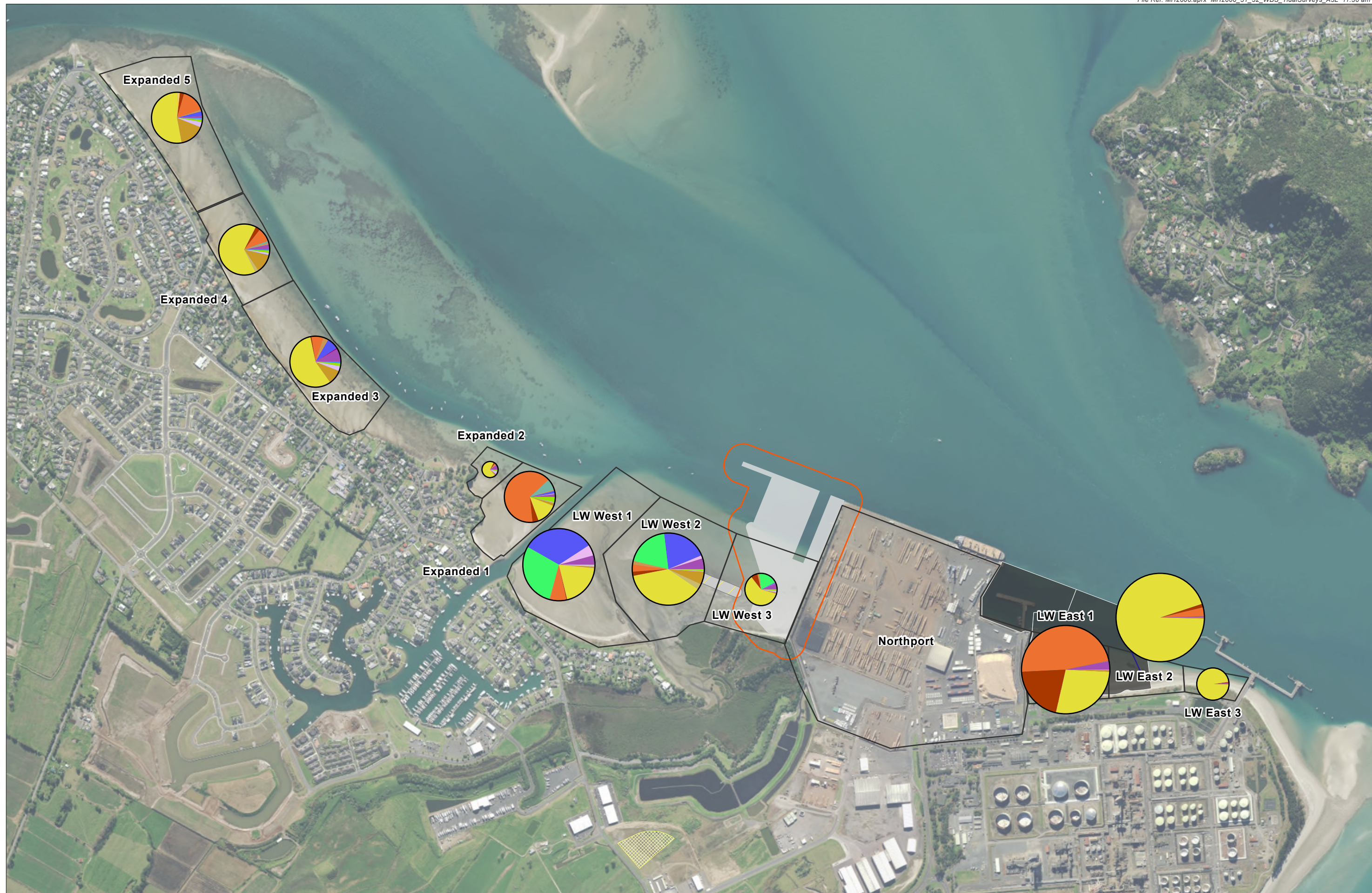
- Variable oystercatcher
- Caspian tern
- Red bill gull
- Black billed gull
- Southern black backed gull
- Reef heron
- White faced heron

- Royal spoonbill
- Little shag
- Pied shag
- Black shag
- Shag (Unidentified)



**Map 31**





Shipyard project - Wading Bird Survey:  
Dec 2019 - 2022 (Low Mid Tide)  
**NORTHLAND SHIPYARD & DRYDOCK**

Plan prepared by MapHouse | 27 July 2026

**BlueGreen**

**MapHouse** | ©

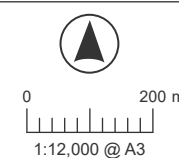
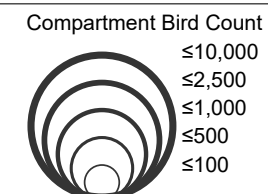
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- Compartment
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carpark footprint
- Coastal disturbance zone

- Northern NZ dotterel
- Dotterel
- Wrybill
- Bar tailed godwit
- Lesser knot
- Pied stilt
- South Island pied oystercatcher

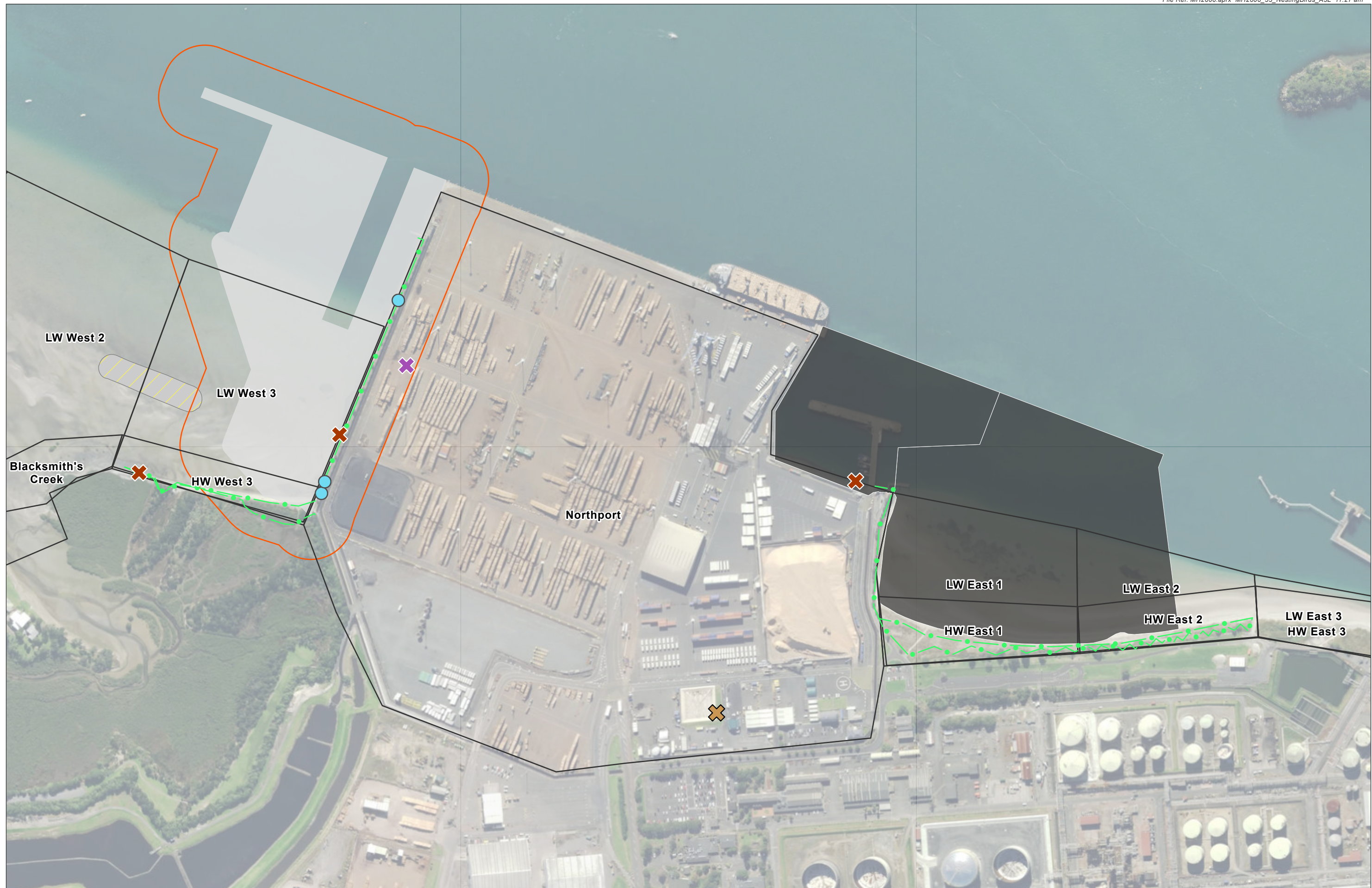
- Variable oystercatcher
- Caspian tern
- Red bill gull
- Black billed gull
- Southern black backed gull
- Reef heron
- White faced heron

- Royal spoonbill
- Little shag
- Pied shag
- Black shag
- Shag (Unidentified)



**Map 32**





## Shipyard Project - Nesting Birds

### NORTHLAND SHIPYARD & DRYDOCK

Plan prepared by MapHouse | 27 July 2026

**BlueGreen**

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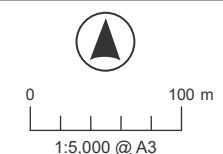
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Coastal disturbance zone
- Compartment

- - - Nesting Survey
- Dog indication (2021)

- Species**
- X Northern NZ dotterel
  - X Variable oystercatcher
  - X Pied stilt

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, LINZ

Projection: NZGD 2000 New Zealand Transverse Mercator



**Map 33**





Western shipyard footprint habitat

**NORTHLAND SHIPYARD & DRYDOCK**  
Plan prepared by MapHouse | 27 July 2026

**BlueGreen**

**MapHouse** | ©

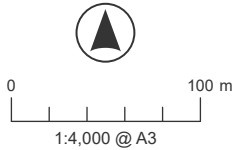
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- Western shipyard footprint
- Consented high tide roost
- Coastal disturbance zone

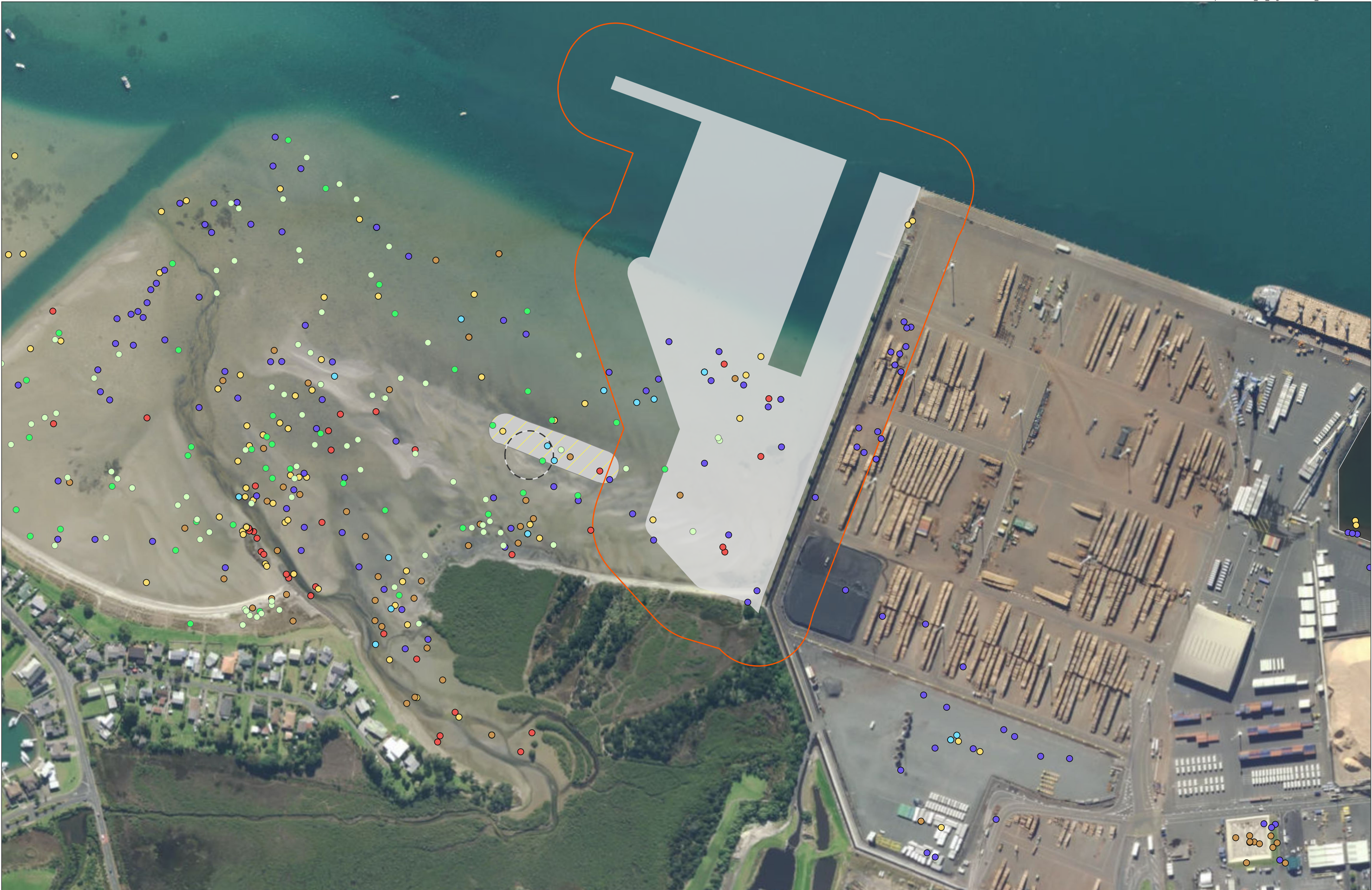
- Tide**
- Subtidal
  - Intertidal
  - Terrestrial

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, LINZ

Projection: NZGD 1949 Mount Eden Circuit







Consented and proposed high tide roost locations

NORTHLAND SHIPYARD & DRYDOCK

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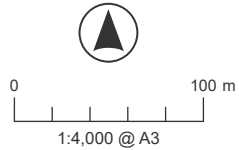
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Proposed high tide roost
- Coastal disturbance zone

Species

- Bar-tailed godwit
- Lesser knot
- Caspian tern
- Northern NZ dotterel
- Pied stilt
- Southern black-backed gull
- White-faced heron

Data Sources: BlueGreen Ecology, 4Sight Consulting, Eagle Technology, LINZ

Projection: NZGD 1949 Mount Eden Circuit







# NPS-IB Highly Mobile Fauna

## NORTHLAND SHIPYARD & DRYDOCK

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- Coastal disturbance zone
- Western shipyard footprint
- Eastern reclamations
- Consented high tide roost
- Carkpark footprint

- Mean High Water Springs (LINZ)
- Significant Bird Area - Proposed Regional Plan (Decisions Version)
- Significant Bird Area - Critical Bird Habitat

- Significant Marine Mammal and Seabird Area - Proposed Regional Plan (Decisions Version)
- Species surveyed above MHWS
- Banded dotterel

- Bar-tailed godwit
- Caspian tern
- Lesser knot
- Northern NZ dotterel
- Pied shag
- Pipit
- Red-bill gull

- South Island pied oystercatcher
- Southern black-backed gull
- Variable oystercatcher
- Wrybill

### Bird Count

