Coastal and freshwater sites of significance for indigenous birds in the Wellington region

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Nikki McArthur and Janet Lawson
Environmental Science Department

For more information, contact the Greater Wellington Regional Council:

Wellington
PO Box 11646

T 04 384 5708
F 04 385 6960
www.gw.govt.nz

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www.gw.govt.nz
info@gw.govt.nz

Report prepared by:	N McArthur	Environmental Scientist	
Report reviewed by:	P Crisp	Team Leader, Ecosystems and Quality Team	
Report approved for release by:	G Sevicke-Jones	Manager, Environmental Science	Date: July 2014

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Contents

1. Executive summary

Policy 23 of the Wellington Regional Policy Statement directs regional and district plans to "identify ecosystems…with significant indigenous biodiversity values" in coastal and freshwater habitats in the Wellington region.

In order to deliver on Policy 23 with respect to indigenous birds, Greater Wellington Regional Council has carried out this desktop review of existing data describing the distribution of rare and threatened indigenous birds in the Wellington region.

This data was summarised on a site-by-site basis, then the criteria listed under Policy 23 were applied to each candidate site to identify which sites met the threshold of possessing "significant indigenous biodiversity values" with respect to indigenous birds.

One hundred and sixty-six sites possessing "significant indigenous biodiversity values" were identified by this review, comprising 85 sites in the coastal marine area, 36 sites in the beds of rivers, 25 sites in lakes and 20 sites in wetlands. Information describing the location, bird values and threats to each site is summarised in the appendices to this report.

Limitations to the scope of this review meant that not all Policy 23 criteria could be applied to the candidate sites using bird distribution data alone. For some criteria, data describing species diversity, ecological connectivity and tangata whenua values are also required, and we provide recommendations on further work that can be done to allow the use of the remaining criteria to identify additional sites of significance for indigenous birds.

We also recognise that because a high proportion of the bird species that are dependent on coastal and freshwater habitats in New Zealand are currently ranked as either "Nationally Threatened" or "At Risk", the majority of sites for which bird data were available were identified as significant using Policy 23 criteria. This means that any coastal or freshwater sites not listed in the appendices of this report should be considered as "data deficient" at the present time, rather than not possessing any "significant indigenous biodiversity values."

We suggest that Greater Wellington Regional Council establishes a process to regularly review and update this list of significant sites and the summary tables provided in the appendices of this report. New bird survey data are frequently being collected in the Wellington region, and the National Threat Classification System rankings for all New Zealand birds are reviewed and updated every 3-4 years. As these sources of information are updated, sites will likely need to be added or dropped from the list provided in this report as bird values or threat rankings change.

2. Introduction

The Resource Management Act 1991 requires each regional council in New Zealand to prepare a regional policy statement which is designed to promote the sustainable management of each region's natural and physical resources. Section 6(c) of the Resource Management Act names "the protection of areas of significant vegetation and significant habitats of indigenous fauna" a matter of national importance.

Section 6(c) of the Resource Management Act has been expressed in the Wellington Regional Policy Statement (2013) by Policy 23, which directs regional and district plans to "identify ecosystems and habitats with significant indigenous biodiversity values that meet one or more of the following criteria:

(a) Representativeness: the ecosystems or habitats that are typical and characteristic examples of the full range of the original or current natural diversity of ecosystem and habitat types in a district or region, and:

  (i) Are no longer commonplace (less than about 30% remaining); or

  (ii) Are poorly represented in existing protected areas (less than about 20% legally protected)

(b) Rarity: the ecosystem or habitat has biological or physical features that are scarce or threatened in a local, regional or national context. This can include individual species, rare and distinctive biological communities and physical features that are unusual or rare.

(c) Diversity: the ecosystem or habitat has a natural diversity of ecological units, ecosystems, species and physical features within an area.

(d) Ecological context of an area: the ecosystem or habitat:

  (i) Enhances connectivity or otherwise buffers representative, rare or diverse indigenous ecosystems and habitats; or

  (ii) Provides seasonal or core habitat for protected or threatened indigenous species

(e) Tangata whenua values: the ecosystem or habitat contains characteristics of special spiritual, historical or cultural significance to tangata whenua, identified in accordance with tikanga Maori."

In order to deliver on Policy 23 of the Wellington Regional Policy Statement, the Environmental Science department has been asked to carry out a desktop review of existing data on the distribution of rare or threatened indigenous birds in the Wellington Region, and to identify sites that meet the Policy 23 criteria. The review was restricted to habitats that fall within the coastal marine area, wetlands and the beds of rivers and lakes in the Wellington region.

This report lists the data sources used, describes the process that was followed to identify sites that meet Policy 23 criteria and provides summary information describing the location, values and threats to each site identified.

3. Methodology

3.1 Data collection

At the outset of this review, a meeting between GWRC Environmental Policy, Environmental Science, Biodiversity and Flood Protection staff was held to discuss potential sources of bird data to be included in this review. At this meeting it was agreed that due to time and resource constraints it would only be practical to include relatively large and/or easily accessible datasets in the review. As a result, the principal sources of data used in this review included:

- A search of the published literature
- Unpublished bird survey data and reports held by Greater Wellington Regional Council
- Environmental effects assessments submitted in support of resource consent applications and held by Greater Wellington Regional Council
- Forest and Bird National Seabird Colony Database
- New Zealand eBird database (http://ebird.org/content/newzealand)
- New Zealand Biodiversity Recording Network database (http://nzbrn.org.nz)
- NatureWatch NZ database (http://naturewatch.org.nz)
- Unpublished data supplied by the Department of Conservation
- Unpublished data supplied by the Wellington and Wairarapa branches of the Ornithological Society of New Zealand

Data describing the presence of rare or threatened bird species were extracted from these sources and summarised on a site-by-site basis in Microsoft Excel spreadsheets. For the purpose of this review a threatened species was defined as any species given a ranking of “At Risk” or higher under the New Zealand Threat Classification System (Robertson et al. 2013).

Three additional species ranked as “Migrant” under the New Zealand Threat Classification System have also been included in this review on the basis of their regional rarity (see criterion (b) of Policy 23). These are Pacific golden plover (*Pluvialis fulva*), sharp-tailed sandpiper (*Calidris acuminata*) and ruddy turnstone (*Arenaria interpres*). Another species, pectoral sandpiper (*C. melanotos*), is ranked as “Vagrant” in the NZ threat classification system on the basis that fewer than 15 individuals visit NZ each year. We have included this species in our analysis because Lake Wairarapa is the national stronghold for this species, supporting an average of 20% of the NZ population in any given year (Robertson & Heather, 1999). One further species, the black-fronted dotterel (*Elseyornis melanops*), which is currently ranked as “Coloniser” has been included in the review on the basis that the Wairarapa is a key stronghold for this species in New Zealand (Dennison & Robertson, 1999).

Data for any species considered to be vagrant to the region or to a particular site were disregarded during this review irrespective of the rarity or New Zealand Threat Classification System ranking of these species. For the purpose of this review our definition of vagrant was based partially on that described by Townsend et al. (2008). Namely, we considered a vagrant to be any species found unexpectedly at a site and whose presence was naturally transitory. This was determined both through the use of the authors’ local knowledge as well as

by soliciting expert opinion. The rare and threatened bird values described for each site are therefore restricted to those birds species considered to be either resident or regular seasonal visitors to each site.

A full list of the bird species included in this review, along with their current New Zealand Threat Classification System rankings can be found in Appendix one.

3.2 Assessment of sites against Policy 23 criteria

Sites for which bird data were available were assessed individually against the Policy 23 criteria (b): Rarity and (dii): Ecological context. This process was relatively straightforward as the criteria could be applied to sites simply by evaluating bird distribution data alone. Evaluation of sites against three further criteria ((a): Representativeness, (dii): Ecological connectivity and (e): Tangata whenua values) all require access to additional data describing the ecosystem types, landscape connectivity and cultural values present at each site. Because the collation and analysis of such information falls outside the scope of this review, we did not attempt to evaluate sites against these three criteria. We recommend that this work is best addressed by carrying out further independent reviews of the relevant datasets. One further criterion, (c): Diversity was also not applied because a lack of readily-available data meant that we were unable to assess sites against this criterion within the time and resource constraints placed on this review (see further discussion below).

Sites were deemed to have met criterion (b): Rarity if they supported species that were considered to be rare at a regional or national scale. Species were considered regionally rare if they occurred at six of fewer sites in the Wellington region and species were considered nationally rare if they had been recorded in less than 10% of grid squares in the *Atlas of Bird Distribution in New Zealand 1999-2004* (Robertson et al. 2007). Sites were also considered to have met this criterion if they supported breeding populations or nesting colonies that were rare on a regional scale (eg, if a site supported one of the half a dozen known nesting colonies of black shags (*Phalacrocorax carbo*) in the region).

We noted that the presence of a nationally threatened species (defined by us as any species with a New Zealand Threat Classification System ranking of “At Risk” or higher) at a site would result in that site meeting two separate criteria, (b): Rarity and (d ii): Ecological context, but based on the same feature or value. To eliminate this duplication we chose to only consider nationally threatened species when assessing sites against criterion (d ii) and to reserve criteria (b) for assessing sites based on the presence of regionally or nationally rare (but not necessarily nationally threatened) species.

Sites were deemed to have met criterion (d ii): Ecological context if they supported either permanent or seasonal populations of one or more nationally threatened bird species. We noted that consideration of protected (but not necessarily nationally threatened) bird species was also required under this criterion. However, given that most indigenous bird species in New Zealand are protected under the Wildlife Act (1953), we chose to ignore the presence of any common or widespread, non-threatened bird species at a site when

assessing it against criterion (d ii). The reason for this is that the inclusion of protected, non-threatened species in this review (unless they met criterion (b): Rarity) would have meant that virtually every site for which we have bird data would have met this criterion and be deemed a site of "significant indigenous biodiversity value". Such a result would render this review of little use when it comes to informing decision-making regarding the management and use of the region's natural resources.

3.3 Preparation of summary tables and supporting maps

Summary information for each site identified as having met Policy 23 criteria has been collated and displayed in summary tables to be found in Appendices 2-5 in this report. This summary information includes:

- The name of each site (wetland names are consistent with those used by Boffa Miskell, 2011)
- The location of each site (the coordinates given describe the geographic centre of each site)
- A summary of the rare and threatened bird values of each site
- A description of all known existing or potential future threats mentioned in the literature for each site (regardless of whether or not they are controlled by the Regional Plan)
- A description of the times of year that species present at a site are particularly susceptible to specific threats
- A description of the ownership and legal protection status of each site
- The year of the most recent bird survey known to have been carried out at each site
- A list of the sources of bird data used to assess each site against the Policy 23 criteria

Each site was mapped using ArcMap version 9.3.1 and a separate shapefile was prepared for each site. Each shapefile contains a polygon describing the geographic boundary of that site. Geographic boundaries were defined using either the boundaries of the bird surveys from which relevant bird data was sourced or by using natural boundaries between different habitat types (eg, the natural margin of a wetland or estuary).

4. Results

This review identified a total of 166 sites of "significant indigenous biodiversity value" that meet one or more of the criteria listed in Policy 23 of the Wellington Regional Policy Statement for rare or threatened bird species. Of these, 85 sites were situated in the coastal marine area, 36 sites in the beds of rivers, 25 sites in lakes and 20 sites in wetlands (Appendices 2-5). Across these four habitat types a total of eight sites were found to have met criterion (b): Rarity; 109 sites met criterion (d ii): Ecological Context and 49 sites met both of these criteria (Table 3.1).

Table 3.1: Number of sites that met Policy 23 criteria on the basis of their value to rare or threatened bird species

Habitat	Number of sites meeting criterion (b): Rarity	Number of sites meeting criterion (d ii): Ecological context	Number of sites meeting criteria (b) and (d ii)	Total
Coastal marine area sites	0	64	21	85
River sites	8	11	17	36
Lake sites	0	17	8	25
Wetland sites	0	17	3	20
All sites	8	109	49	166

All of the 85 sites identified in the coastal marine area were situated either along the coastline, along the foreshores of adjacent inshore islands or on internal waters (ie, Wellington and Porirua Harbours). Marine habitats in New Zealand territorial seas (from the low tide mark to 12 NM from the coast) presented a unique problem with respect to identifying sites that meet Policy 23 criteria. Data describing the distribution and abundance of rare and threatened bird species in these habitats is extremely sparse and is heavily biased towards bird observations and surveys made either from the adjacent coastline or along the Cook Strait ferry corridor. This lack of representative data, combined with the large area of marine habitats in the region's territorial seas and difficulties in defining relevant natural habitat boundaries made it impossible to clearly define the boundaries of any sites of "significant indigenous biodiversity value" within this area.

We have chosen nonetheless to summarise existing data describing the rare and threatened bird species recorded in the region's territorial seas in a separate table (Appendix six). The reason for this is that we believe there is potential for marine sites in the coastal marine area to meet the requirements of Policy 23 criterion (a): Representativeness on the basis that less than 20% of marine habitats in the Wellington Region are represented in existing protected areas. Any further assessment of the significance of marine habitats in the territorial seas of the Wellington region for rare or threatened birds falls outside the scope of this review.

5. Discussion

5.1 Assessing sites against Policy 23 criterion (c): Diversity

As mentioned earlier, we disregarded Policy 23 criterion (c): Diversity during this review because we felt that it would be impossible to assess sites against this criterion in an objective manner using the data available to us. Sites would be deemed to meet this criterion with respect to rare and threatened birds if it could be demonstrated that: "the ecosystem or habitat has a natural diversity of…species…within an area". Unfortunately, because sites varied so much both in terms of the degree to which they have been modified by human activities and the quantity and quality of the available data describing the diversity of bird species present, we felt that it was not possible to compare sites in a consistent manner in order to assess whether this criterion had been met.

One potential means of assessing sites against this criterion would be to compare the number of bird species recorded at individual sites in the Wellington region with the mean number of bird species recorded within each corresponding habitat type within the region. The latter data may be able to be obtained from the Ornithological Society of New Zealand's Atlas Scheme database.

Between 1999 and 2004, members of the Ornithological Society of New Zealand carried out a project to map the distribution of New Zealand's birds in $10km^2$ NZMG squares throughout the country (Robertson et al. 2007). The resulting dataset, comprising over 1.5 million individual bird records enables us (among other things) to make a detailed comparison of avian species richness between the various habitat types surveyed. It may be possible therefore, to extract data from the atlas database that could be used to calculate the mean number of bird species recorded during the OSNZ atlas survey in each of the habitat types included in this review. The number of species recorded at individual sites identified in this review can then be compared to these mean values, to assess whether or not individual sites support greater than the average (or expected) number of species for that habitat type.

This analysis was not pursued during the current review for a number of reasons. Firstly, there are several problems that would need to be resolved in order to carry out such an analysis accurately. For instance, the habitat type data recorded during the OSNZ atlas survey does not always match the habitat types included in this review. Secondly, the raw OSNZ atlas data includes species we have considered "vagrants" for the purpose of this review, so these species would need to be removed from the dataset before the mean species richness of individual habitats could be calculated. Additionally, the accuracy of any comparisons between individual site data and mean species richness values will likely be compromised by differences in search effort between individual site-based surveys and the OSNZ atlas surveys. Lastly, the extra work required to resolve these issues and carry out this analysis could not be carried out within the time and resource constraints of this current review. Nevertheless, it may be useful to pursue this analysis at some point in the future because we believe that a number of sites in the Wellington region are likely to meet criterion (c) of Policy 23 should such an analysis prove possible.

5.2 Information gaps

It is useful to note that the vast majority of sites for which threatened bird presence/absence data were available subsequently met one or more of the Policy 23 criteria and were identified as sites of "significant biodiversity value". The reason for this is likely because relatively high proportions of the indigenous bird species that are restricted to the habitats included in this review now have New Zealand Threat Classification System rankings of "At Risk" or higher. This includes 91% of indigenous New Zealand-breeding bird species found predominantly in coastal habitats and 46% of indigenous species found predominantly in freshwater habitats (Miskelly et al. 2008; Robertson et al. 2013).

A very small number of wetland sites for which bird data were available did not meet any of the Policy 23 criteria. However the bird data from each of these sites consisted of incidental bird observations recorded during short site visits during which bird surveys were not the main focus of work. For this reason, the absence of any records of threatened bird species from these wetlands was not considered to be adequate evidence that these species were absent from these wetland sites.

For these reasons, any coastal, river, lake or wetland sites not mentioned in Appendices 2-5 have been omitted due to a lack of available bird data rather than because they haven't met Policy 23 criteria as sites of "significant indigenous biodiversity value". Any sites in the Wellington region's coastal marine area, rivers, lakes or wetlands not mentioned in this report should therefore be considered to be data deficient, rather than to be sites with no significant indigenous biodiversity values for rare and threatened birds.

Collecting data to describe both seasonal and spatial patterns of habitat use by seabirds in the territorial seas of the Wellington Region's coastal marine area should be considered a particularly high priority. Despite the presence of a number of rare and threatened seabird species in the coastal marine area, data describing their distribution and movements are extremely sparse and are currently insufficient to allow the identification of sites of significance within this large portion of the coastal marine area. Indeed, the distribution and behaviour of seabirds away from land is the least well understood aspect of many of these species' biology. Filling these gaps in our knowledge has been recognised as a high priority in the Department of Conservation's *Action Plan for Seabird Conservation in New Zealand* and is considered essential to inform the sustainable management of many seabird species and their marine habitats (Taylor, 2000).

5.3 Updating sites of significance summary tables

We recommend that a process is developed to periodically review the available data on the distribution of rare and threatened bird species in the Wellington Region and to regularly re-assess and update the sites of significance listed in Appendices 2-5. The reason for this is that new bird survey data is constantly being collected in the Wellington region, enabling further sites of significance to be identified and facilitating the re-assessment of existing sites. Furthermore, the dynamic nature of the habitat types included in this review

means that the range of species present at individual sites is likely to change relatively quickly over time in comparison to typically more stable habitat types such as indigenous forest. A third reason for implementing periodic reviews of the available bird data is that the New Zealand Threat Classification System rankings for New Zealand's birds are currently reviewed every 3-4 years and species' threat rankings do change from one review to the next. The inclusion of any new species among the ranks of nationally threatened taxa could well lead to the identification of new sites of significance based on Policy 23 criteria. The converse is also possible - any downgrading of species currently listed as threatened could lead to the future exclusion of some sites from the current lists.

6. Acknowledgements

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References

Abernethy B. Undated. *Water level management in the J. K. Donald Block, Lake Wairarapa. Assessment of environmental effects.* Unpublished draft report, Fish and Game Council, Wellington.

Airey S, Puentener R and Rebergen A. 2000. *Lake Wairarapa wetlands action plan 2000-2010.* Department of Conservation, Wellington.

Allen RB and Beadel SM. 2002. *Ecology and restoration of Te Harakeke Wetland, Waikanae.* Contract report No. 490, Wildlands Consultants Ltd, Rotorua.

Allred N. 1987. *Wellington Harbour resource management study. Hutt River estuary bird survey.* Victoria University, Wellington.

Aorangi Restoration Trust 2012. *Coastal buffer zone update July 2012*. Aorangi Restoration Trust.

Armitage I. 2008. Foot trembling and beak probing by the shore plover (*Thinornis novaeseelandiae*) on sandy beaches. *Notornis* 55: 38-39.

Armitage I. 2009. *Banded dotterel on the coastline near Pencarrow lakes.* Unpublished report, Ornithological Society of New Zealand, Wellington.

Beadel S, Bibby C, Perfect A, Rebergen A and Sawyer J. 2004. *Eastern Wairarapa Ecological District. Survey report for the Protected Natural Areas Programme.* Department of Conservation, Wellington.

Beadel S, Perfect A, Rebergen A and Sawyer J. 2000. *Wairarapa Plains Ecological District. Survey report for the Protected Natural Areas Programme.* Department of Conservation, Wellington.

Blaschke P, Woods J and Forsyth F. 2010. *The Porirua Harbour and its catchment: a literature summary and review.* A report prepared for Porirua City Council and Wellington City Council by Blaschke and Rutherford Environmental Consultants.

Boffa Miskell 2011. *Desktop delineation and assessment of significance of wetlands of the Wellington Region – methods and results*. Report prepared for Greater Wellington Regional Council, Report Number W10140-007, Boffa Miskell Ltd, Wellington.

Brown M. 1992. *Coastal management study: Pencarrow. Environmental information [and] resource management issues.* Environmental and Planning Associates, Wellington.

Challies CN and Scadden CE. 2010. Trends in the size of the Caspian tern (*Hydropogne caspia*) colony at Onoke Spit, Cape Palliser, New Zealand. *Notornis* 57: 196-198.

Cheyne J. 2013. *Wairarapa Moana eastern wetlands bird survey.* Unpublished report prepared for Greater Wellington Regional Council, Wellington.

Dennison TC and Robertson HA 1999. Status of the black-fronted dotterel (*Charadrius melanops*) in the Wairarapa. *Notornis* 46: 187-193.

Falconer ML, Fleming CA and Wodzicki KA 1973. *Birdlife at Waikanae Estuary*. Unpublished booklet held in the Greater Wellington Regional Council library, Wellington.

Forest and Bird 2014. *New Zealand Seabirds: Important Bird Areas and Conservation.* The Royal Forest and Bird Protection Society of New Zealand, Wellington, New Zealand.

Gibb JA. 2000. Activity of birds in the Western Hutt hills, New Zealand. *Notornis* 47: 13-35.

Gibbs G. 2002. *Pencarrow Lakes. Conservation values and management.* Department of Conservation, Wellington.

Gill BJ (Convener), Bell BD, Chambers GK, Medway DG, Palma RL, Scofield RP, Tennyson AJD and Worthy TH 2010. *Checklist of the birds of New Zealand, Norfolk and Macquarie Islands, and the Ross Dependency, Antarctica.* Te Papa Press, Wellington.

Govella S and McArthur N. 2009. *A baseline survey of the aquatic flora, lake bed profile and shoreline weeds of the lower dam lake, Wainuiomata Water Catchment Area.* Unpublished report for Greater Wellington Regional Council, Upper Hutt.

Graeme C. 2003. *Waitohu Wetland. Ecological report and reserve management plan.* Report prepared for the Waitohu Stream Care Group, Wellington.

Healy WB (ed.). 1980. *Pauatahanui Inlet – an environmental study*. DSIR Information Series No. 141. Department of Scientific and Industrial Research, Wellington.

Heather BD. 1973. The black-fronted dotterel (*Charadrius melanops*) in the Wairarapa. *Notornis* 20: 251-261.

Heather BD and Robertson HA. 1996. *The field guide to the birds of New Zealand*. Viking, Auckland.

KRTA Ltd. 1986. *The Gollans Valley wetlands. An environmental appraisal in relation to a proposal for effluent treatment*. Report prepared for the Hutt Valley Drainage Board.

Miskelly CM. 2010. *Mana Island ecological restoration plan review*. Department of Conservation, Wellington.

Miskelly CM, Dowding JE, Elliott GP, Hitchmough RA, Powlesland RG, Robertson HA, Sagar PM, Scofield RP and Taylor GA. 2008. Conservation status of New Zealand birds, 2008. *Notornis* 55: 117-135.

Moore PJ. 1983. Marsh crake at Lake Wairarapa. *Notornis* 30: 246-249.

Moore PJ, Ogle CC and Moynihan KT. 1984. *Habitat requirements of wetland birds in the Lake Wairarapa wetlands.* Occasional Publication No. 5. New Zealand Wildlife Service, Department of Internal Affairs, Wellington.

O'Malley J. 2009. *Titahi Bay reserves management plan – Titahi Bay bird survey report.* Report prepared for Porirua City Council, Porirua.

Parrish G. 1984. *Wildlife and wildlife sites of the Wellington region.* Fauna Survey Unit report no. 38. New Zealand Wildlife Service, Wellington.

Powlesland RG, Munro AR and Westbrooke IM. 2007. Black shag (*Phalacrocorax carbo*) roost counts at Melling, Hutt Valley and breeding in the Wellington Region, New Zealand. *Notornis* 54: 93-98.

Powlesland RG and Reese PJ. 1999. Aspects of the breeding biology of black shags (*Phalacrocorax carbo*) near Lake Kohangatera, Wellington. *Notornis* 46: 484-497.

Powlesland RG, Sharp SE and Smith ANH. 2008. Aspects of the breeding biology of the pied shag (*Phalacrocorax varius*) at Makara Beach, Wellington. *Notornis* 55: 69-76.

QEII National Trust 1996. *Tairoa wetlands open space covenant management statement.* File report 5/7/267, QEII National Trust, Wellington.

QEII National Trust 1997. *Pateke lagoons open space covenant management statement.* File report 5/7/291.1 & .2, QEII National Trust, Wellington.

Rebergen A. 2011. *River bird numbers on Ruamahanga, Waingawa, Waiohine and Tauherenikau rivers, Wairarapa in spring 2010*. Forest and Bird, Wellington.

Rebergen A. 2012. *Birds on Wairarapa rivers and coast in 2011-12 breeding season*. Forest and Bird, Wellington.

Robertson CJR, Hyvönen P, Fraser MJ and Pickard CR. 2007. *Atlas of bird distribution in New Zealand 1999-2004*. Ornithological Society of New Zealand, Inc. Wellington.

Robertson HA. 1992. Trends in the number and distribution of coastal birds in Wellington Harbour. *Notornis* 39: 263-298.

Robertson HA, Dowding JE, Elliott GP, Hitchmough RA, Miskelly CM, O'Donnell CJF, Powlesland RG, Sagar PM, Scofield RP and Taylor GA. 2013. *Conservation status of New Zealand birds, 2012*. New Zealand Threat Classification Series 4, Department of Conservation, Wellington.

Robertson HA and Heather BD. 1999. Effects of water levels on the seasonal use of Lake Wairarapa by waders. *Notornis* 46: 79-88.

Sim D. 1997. *Effect of gravel extraction on the banded dotterel (*Charadrius bicinctus*).* Unpublished report, Wellington Regional Council, Masterton.

Sim D and Powlesland RG. 1995. Recoveries of black shags (*Phalacrocorax carbo*) banded in Wairarapa, New Zealand. *Notornis* 42: 23-26.

Stephenson G. 1977. *Wildlife and wildlife areas in the Wellington region*. Wellington Regional Planning Authority, Wellington.

Taylor GA. 2000. *Action plan for seabird conservation in New Zealand*. Threatened species occasional publication No. 16. Department of Conservation, Wellington.

Todd M, Graeme C, Kettles H and Sawyer J. In prep. *Estuaries in Wellington Hawke's Bay Conservancy (excluding Hawke's Bay and Chatham Island Areas): Current status and future management.* Unpublished report, Department of Conservation, Wellington.

Townsend AJ, de Lange PJ, Duffy CAJ, Miskelly CM, Molloy J and Norton D. 2008. *New Zealand Threat Classification System manual.* Department of Conservation, Wellington.

Waugh S. (Undated). *Matiu/Somes Island bird species.* Unpublished report, Ornithological Society of New Zealand, Wellington.

Waugh S. 2009. *Pelagic marine Important Bird Areas for New Zealand.* Draft report for the Royal Forest and Bird Protection Society, Wellington.

White P. 2005. *Pauatahanui Wildlife Management Reserve restoration plan*. Forest and Bird, Wellington.

Appendix 1: New Zealand Threat Classification System rankings for bird species mentioned in this report

Threat rankings are as per Robertson et al. (2013). Species names and taxonomic order are as per Gill et al. (2010). Key to threat rankings: NC – Nationally Critical; NE – Nationally Endangered; NV – Nationally Vulnerable; D – At Risk, Declining; RC – At Risk, Recovering; RE – At risk, Relict; NU – At Risk, Naturally Uncommon; C – Coloniser; M – Migrant; V – Vagrant A.

Scientific name	Common name	Threat ranking
Anas chlorotis	brown teal	RC[1]
A. superciliosa	grey duck	NC
Poliocephalus rufopectus	New Zealand dabchick	NV
Eudyptula minor	little penguin	D[2]
Diomedea antipodensis	Antipodean albatross	NC
D. epomorphora	southern royal albatross	NU
D. sandfordi	northern royal albatross	NU
Thalassarche bulleri	Buller's albatross	NU
T. cauta steadi	New Zealand white-capped albatross	D
T. salvini	Salvin's albatross	NC
Macronectes halli	northern giant petrel	NU
Daption capense australe	Snares cape petrel	NU
Pachyptila turtur	fairy prion	RE
Procellaria westlandica	Westland petrel	NU
Puffinus bulleri	Buller's shearwater	NU
P. carneipes	flesh-footed shearwater	D
P. griseus	sooty shearwater	D
P. gavia	fluttering shearwater	RE
P. huttoni	Hutton's shearwater	D
Pelagodroma marina maoriana	white-faced storm petrel	RE
Pelecanoides urinatrix urinatrix	northern diving petrel	RE
Phalacrocorax carbo	black shag	NU
P. varius	pied shag	NV
P. sulcirostris	little black shag	NU
Ardea modesta	white heron	NC
Egretta sacra	reef heron	NE
Botaurus poiciloptilus	Australasian bittern	NE

[1] Threat classification ranking refers to that of the taxon *Anas chlorotis* "North Island", recognised by Gill et al. (2010) as the North Island population of the monotypic species *Anas chlorotis*.

[2] Threat classification ranking refers to that of the subspecies with the junior synonym *Eudyptula minor iredalei,* now recognised by Gill et al. (2010) as belonging to the single monotypic species *Eudyptula minor.*

Scientific name	Common name	Threat ranking
Platalea regia	royal spoonbill	NU
Porzana tabuensis	spotless crake	RE
P. pusilla	marsh crake	RE
Calidris canutus rogersi	lesser knot	NV
C. acuminata	sharp-tailed sandpiper	M[3]
C. melanotos	pectoral sandpiper	V[4]
Limosa lapponica baueri	eastern bar-tailed godwit	D
Arenaria interpres	ruddy turnstone	M[5]
Haematopus unicolor	variable oystercatcher	RC
H. finschi	New Zealand pied oystercatcher	D
Himantopus himantopus	pied stilt	D
Pluvialis fulva	Pacific golden plover	M[6]
Charadrius obscurus aquilonius	northern New Zealand dotterel	NV
C. bicinctus	banded dotterel	NV
Anarhynchus frontalis	wrybill	NV
Elseyornis melanops	black-fronted dotterel	C[7]
Thinornis novaeseelandiae	shore plover	NC
Larus novaehollandiae	red-billed gull	NV
L. bulleri	black-billed gull	NC
Hydropogne caspia	Caspian tern	NV
Chlidonias albostriatus	black-fronted tern	NE
Sterna striata	white-fronted tern	D
Bowdleria punctata vealeae	North Island fernbird	D
Anthus novaeseelandiae	New Zealand pipit	D

[3] Sharp-tailed sandpiper has been included in this list based on its rarity in the Wellington region.
[4] Pectoral sandpiper is ranked as "Vagrant (A)" in the New Zealand threat classification system on the basis that fewer than 15 individuals visit New Zealand each year. We have included this species in our analysis because Lake Wairarapa is the national stronghold for this species, supporting an average of 20% of the New Zealand population in any given year (Robertson & Heather, 1999).
[5] Ruddy turnstone had been included in this list based on its rarity in the Wellington region.
[6] Pacific golden plover has been included in this list based on its rarity in the Wellington region.
[7] Black-fronted dotterel has been included in this list based on the criteria that it is nationally sparse, but locally common in the Wellington region.

Appendix 2: Coastal marine area sites of significance for indigenous birds in the Wellington region

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Awhea River mouth	41°30'16.254"S 175°31'01.744"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, variable oystercatcher and pied stilt.	Present threats: Weed encroachment (e.g. tall fescue) and trampling and bank erosion caused by livestock. Seasonality: Unknown.	Much of the site consists of unprotected crown land. A portion of the shingle spit on the southern side of the Awhea River mouth is gazetted as Recreation Reserve and is managed by South Wairarapa District Council.	2009	Todd et al (in prep).
Awheaiti Stream mouth	41°30'45.644"S 175°30'22.072"E	Ecological context: This site provides seasonal or core habitat for red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	The southern bank of the stream mouth is gazetted as a Recreation Reserve and is managed by South Wairarapa District Council. The northern bank is gazetted as crown land reserved from sale and is managed by the Department of Conservation as part of the Awheaiti Marginal Strip.	2009	Todd et al (in prep).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Baring Head coastline, including the Wainuiomata River estuary	41°24'29.016"S 174°52'38.467"E	Rarity: This site is one of less than half a dozen sites along the south Wellington coastline that supports a coastal breeding population of banded dotterels. Ecological context: This site supports breeding populations of banded dotterels and variable oystercatchers. This site also provides seasonal or core habitat for little penguin, white-fronted tern, Caspian tern, red-billed gull, pied stilt, black shag, pied shag and New Zealand pipit.	Present and future threats: Predation of banded dotterel eggs and chicks by hedgehogs and cats is having a significant impact on dotterel nesting success at this site. Disturbance by off-road vehicles is another ongoing threat, but has recently been reduced following the construction of a car park. Gravel mining poses a potential future threat; Winstone Aggregates Ltd. holds gravel mining rights for this site but has not yet applied for a resource consent to carry out any mining. Seasonality: Banded dotterels and variable oystercatchers are particularly susceptible to predation and disturbance during the breeding season (August to January and September to April respectively).	Much of this site falls within the Baring Head block of East Harbour Regional Park which is gazetted as a Scenic Reserve. Small portions of the site also fall either within the Baring Head Recreational Reserve or on adjacent private land.	2012	Stephenson (1977); Parrish (1984); Brown (1992); Heather & Robertson (1996); Todd et al (in prep); GWRC unpublished data; NZ eBird database.
Cape Palliser	41°36'19.033"S 175°18'48.380"E	Ecological context: This site provides seasonal or core habitat for black shag and red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	Much of the site consists of unprotected crown land. A small portion of the site also falls on land gazetted as Native Reserve.	2011	NZ eBird database.
Cape Palliser stream mouths (the mouths of the Makotukutuku (Washpool), the Pararaki, and the Otakaha Streams)	41°31'58.386"S 175°12'27.533"E	Ecological context: This site provides seasonal or core habitat for little penguin, red-billed gull, Caspian tern, variable oystercatcher, banded dotterel, pied stilt, black shag and NZ Pipit. There is recent evidence of little penguins visiting nest boxes installed between Whatarangi and the Washpool Bridge.	Present threats: Unknown. Seasonality: Little penguins are particularly susceptible to predation during the breeding season (July to March).	Much of this site consists of either unprotected crown land or private land. A small proportion of the site falls within a Local Purpose Reserve managed by South Wairarapa District Council.	2011	Heather & Robertson (1996); Todd et al (in prep); Rebergen (2012); Aorangi Restoration Trust (2012); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Castlepoint	40°54'14.904"S 176°13'37.286"E	Rarity: This site supports the largest of only a handful of known nesting colonies of red-billed gulls in the Wellington Region. Ecological context: This site supports large breeding colonies of red-billed gulls and white-fronted terns. This site also provides seasonal or core habitat for black shag, variable oystercatcher and New Zealand pipit.	Present threats: Disturbance or vandalism of the gull and tern nesting colonies by people is the most significant ongoing threat at this site. Seasonality: Red-billed gulls and white-fronted terns are particularly susceptible to disturbance or vandalism during the breeding season (August to March and October to March respectively).	This entire site falls within Castlepoint Scenic Reserve and is managed by the Department of Conservation.	2011	Heather & Robertson (1996); Rebergen (2012); NZ eBird database.
Flat Point coastline and the Arawhata Stream mouth	41°15'14.915"S 175°55'46.326"E	Ecological context: This site supports a small breeding population of banded dotterels. This site also provides seasonal or core habitat for variable oystercatcher, pied stilt, white-fronted tern, black shag and New Zealand pipit.	Present threats: Predation of eggs and chicks by mammalian predators and disturbance caused by off-road vehicles. Seasonality: Banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to January).	Unprotected crown land.	2011	Heather & Robertson (1996); Rebergen (2012); NZ eBird database.
Green Point, Porirua	41°15'14.641"S 175°55'48.346"E	Rarity: This is one of only two mainland sites in the Wellington Region that is used as a regular roosting and feeding site by shore plover. Ecological context: This site provides seasonal or core habitat for shore plover, variable oystercatcher, Caspian tern, pied shag, red-billed gull and white- fronted tern.	Present threats: Predation of adult shore plover by mammalian predators as well as disturbance caused by people, dogs, livestock or vehicles are the most significant ongoing threats at this site. Predators are currently being controlled by Greater Wellington Regional Council. Seasonality: Adult shore plover are susceptible to predation or disturbance all year round; however the site is typically occupied by this species in the non-breeding season (April to September).	Unprotected crown land.	2009	Heather & Robertson (1996); Armitage (2008); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Hadfields (Peka Peka) Stream mouth	41°06'39.787"S 174°48'17.118"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, banded dotterel, black-fronted dotterel, pied stilt, red-billed gull, black-billed gull and Caspian tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2009	Todd et al (in prep); New Zealand eBird database.
Honeycomb Rock to Glenburn	41°20'51.720"S 175°49'36.419"E	Ecological context: This site supports breeding colonies of red-billed gulls and white-fronted terns.	Present threats: Disturbance or vandalism of the gull and tern nesting colonies by people is the most significant ongoing threat at this site. Seasonality: Red-billed gulls and white-fronted terns are particularly susceptible to disturbance or vandalism during the breeding season (August to March and October to March respectively).	This site falls partly on unprotected crown land and partly on private land.	1996 (Red-billed gulls); 2011 (White-fronted terns)	Heather & Robertson (1996); Beadel et al (2004); Rebergen (2012); GWRC unpubl. data.
Hongoeka Bay	41°04'03.245"S 174°51'02.099"E	Ecological context: This site supports seasonal or core habitat for pied shag, black shag, red-billed gull, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on unprotected crown land, partly on private land and partly on land gazetted at Maori Reserve.	2012	NZ eBird database.
Humpy Stream mouth	40°55'57.169"S 176°10'38.636"E	Ecological context: This site provides seasonal or core habitat for pied stilt.	Present threats: Unknown. Seasonality: Unknown.	Part of this site consists of land gazetted as Local Purpose Reserve and managed by Masterton District Council; the remainder of the site falls on land owned by Masterton District Council.	2009	Todd et al (in prep).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Kaiwhata River mouth	41°11'49.765"S 175°59'26.254"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site provides seasonal or core habitat for pied stilt.	Present threats: Disturbance caused by off-road vehicles; trampling by livestock and weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land.	2009	Todd et al (in prep).
Kapiti Island foreshore	40°51'23.011"S 174°54'09.472"E	Rarity: This site provides little penguins with access to one of only two relatively large little penguin breeding colonies remaining in the Wellington Region. Ecological context: The Kapiti Island foreshore supports a black shag roost site and a breeding colony of red-billed gulls. The foreshore also provides access for little penguins from the sea to nesting sites further inland on the island. This site also provides seasonal or core habitat for variable oystercatcher, pied shag, white-fronted tern and Caspian tern.	Present threats: Re-invasion of Kapiti Island by mammalian predators is the most significant ongoing threat to this site. Seasonality: Unknown	Much of the foreshore falls within, or is bordered by the Kapiti Island Nature Reserve and Kapiti Island Marine Reserve. A portion of the foreshore at the northern end of the island is bordered by private land.	pre-1977 (red-billed gulls); 1998 (black shags); 2012 (all other species)	Heather & Robertson (1996); Stephenson (1977); Powlesland et al (2007) NZ eBird database; GWRC unpubl. data.
Makara estuary	41°13'17.562"S 174°42'53.262"E	Ecological context: This site supports breeding colonies of pied shags. This site also provides seasonal or core habitat for little black shag, Caspian tern, little penguin, red-billed gull, white-fronted tern, black shag, pied stilt, royal spoonbill and variable oystercatcher.	Present threats: Disturbance by people, boats, jet skis, dogs and livestock; weed encroachment and bank erosion caused by livestock. Seasonality: Pied shags are particularly prone to disturbance at nesting colonies; however this species is known to nest virtually year-round.	This site falls mainly on unprotected crown land. A small area of the Makara beach foreshore is gazetted as a recreation reserve and is managed by Wellington City Council. Much of the northern bank of Makara Stream is in private ownership.	2011	Heather & Robertson (1996); Powlesland et al (2008); Todd et al (in prep); Rebergen (2012); NZ eBird database; WCC unpublished data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Makaro/Ward Island foreshore	41°17'38.800"S 174°52'17.569"E	Ecological context: This site supports breeding populations of white-fronted terns, variable oystercatchers and little penguins.	Present threats: Re-invasion by exotic mammalian predators; disturbance, vandalism or trampling of nests by people. Seasonality: White-fronted terns, variable oystercatchers and little penguins are particularly susceptible to predation or disturbance during the breeding season (October to March, September to April and July to March respectively).	This site is owned by the Port Nicholson Block Settlement Trust and falls entirely within Makaro/Ward Scientific Reserve. The site is co-managed by the Department of Conservation and the Port Nicholson Block Settlement Trust.	2012	Stephenson (1977); Heather & Robertson (1996); NZ seabird colony database; NZ eBird database; GWRC unpubl. data.
Mana Island foreshore	41°05'12.725"S 174°46'53.908"E	Rarity: The Mana Island foreshore supports the only breeding population of shore plover in the Wellington Region. Ecological context: This site supports at least 20% of the global population of shore plover. The foreshore also provides access for little penguins from the sea to nesting sites further inland on the island. This site also supports seasonal or core habitat for red-billed gull, white-fronted tern and pied shag.	Present threats: Re-invasion of Mana Island by mammalian predators is the most significant ongoing threat to this site. Seasonality: Adult shore plover are susceptible to predation all year round; eggs and chicks will be vulnerable during the breeding season (October to March). Little penguins are particularly susceptible to predation during the breeding season (July to March).	This site falls entirely within Mana Island Scientific Reserve and is managed by the Department of Conservation.	2010	Heather & Robertson (1996); Miskelly (2010); www.birdingnz.net.nz.
Manurewa Point	41°30'21.784"S 175°31'53.339"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, red-billed gull and Caspian tern.	Present and future threats: Disturbance by people and dogs. Levels of disturbance appear likely to increase in the future due to development of coastal subdivisions nearby. Seasonality: Unknown.	This site falls partly on unprotected crown land, partly on crown land reserved from sale and partly on land gazetted as recreation reserve.	2012	Rebergen (2012); NZ eBird database; N. McArthur pers. obs.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Mataikona River mouth	40°46'54.757"S 176°16'03.133"E	Rarity: This site supports seasonal or core habitat for black-fronted dotterel. Ecological context: This site provides seasonal or core habitat for black shag, pied stilt, royal spoonbill, Caspian tern, banded dotterel, variable oystercatcher and red-billed gull.	Present and future threats: Disturbance by people, dogs and off-road vehicles; weed encroachment. Seasonality: Unknown.	This site consists of both unprotected crown land and privately-owned land.	2011	Todd et al (in prep); Rebergen (2012).
Matiu/Somes Island foreshore	41°15'29.207"S 174°51'51.912"E	Rarity: This site provides little penguins with access to one of only two relatively large little penguin breeding colonies remaining in the Wellington Region. This site is also one of only two sites in the region at which reef herons have been confirmed breeding in recent years. Ecological context: The foreshore provides access for little penguins from the sea to nesting sites further inland on the island. Reef heron and variable oystercatcher have been recorded breeding at this site. This site also provides seasonal or core habitat for black shag, little black shag, red-billed gull and white-fronted tern.	Present threats: Re-invasion of Matiu/Somes Island by mammalian predators is the most significant ongoing threat to this site. Seasonality: Little penguins and variable oystercatchers are particularly susceptible to predation during the breeding season (July to March and September to April respectively).	This site is owned by the Port Nicholson Block Settlement Trust and falls entirely within Matiu Scientific Reserve. The site is co-managed by the Department of Conservation and the Port Nicholson Block Settlement Trust.	2012	Stephenson (1977); Robertson (1992); Heather & Robertson (1996); Waugh (undated); NZ seabird colony database; NZ eBird database; GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Mokopuna Island foreshore	41°15'04.608"S 174°51'53.561"E	Ecological context: This site supports breeding populations of little penguins and variable oystercatchers. This site also provides seasonal or core habitat for red-billed gull and white-fronted tern.	Present threats: Re-invasion of Mokopuna Island by mammalian predators is the most significant ongoing threat to this site. Seasonality: Little penguins and variable oystercatchers are particularly susceptible to predation during the breeding season (July to March and September to April respectively).	This site is owned by the Port Nicholson Block Settlement Trust and falls entirely within Matiu Scientific Reserve. The site is co-managed by the Department of Conservation and the Port Nicholson Block Settlement Trust.	2012	Stephenson (1977); Heather & Robertson (1996); NZ eBird database.
Motungarara (Fishermans) Island foreshore	40°53'12.530"S 174°54'02.196"E	Ecological context: This site supports breeding variable oystercatchers.	Present threats: Predation of eggs and chicks by mammalian predators and disturbance by people. Seasonality: Variable oystercatchers are particularly susceptible to predation during the breeding season (September to April).	This site falls entirely on privately-owned land.	pre-1977	Stephenson (1977); Heather & Robertson (1996).
Ngakaukau Stream mouth	40°55'36.440"S 176°11'05.158"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, pied stilt and black shag.	Present threats: Disturbance and trampling by stock accessing the stream bank; weed encroachment. Seasonality: Unknown.	This site falls entirely on privately-owned land.	2009	Todd et al (in prep).
Okau Stream mouth	40°50'51.410"S 176°14'37.442"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher and red-billed gull.	Present threats: Disturbance and trampling by stock accessing the stream bank; disturbance caused by off-road vehicles; weed encroachment. Seasonality: Unknown.	This site falls entirely on privately-owned land.	2011	Rebergen (2012).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Onepoto Arm, Porirua Harbour	41°06'58.410"S 174°51'03.787"E	Rarity: The Onepoto Arm is one of only a handful of relatively large estuaries in the Wellington Region and is therefore a regionally important stop-over site for several migrant shorebird species such as NZ pied oystercatcher and bar-tailed godwit. Ecological context: This site provides seasonal or core habitat for red-billed gull, black-billed gull, pied stilt, variable oystercatcher, bar-tailed godwit, royal spoonbill, banded dotterel, NZ pied oystercatcher and Caspian tern.	Present threats: Disturbance by people and dogs. Seasonality: Internal New Zealand migrant species such as NZ pied oystercatcher will be most susceptible to disturbance when present in peak numbers during autumn, winter and spring months. Northern hemisphere migrants such as bar-tailed godwits will be most susceptible when present in peak numbers during spring and summer months.	Unprotected New Zealand internal waters.	2012	Heather & Robertson (1996); Todd et al (in prep); NZ eBird database.
Onoke Spit	41°23'19.028"S 175°07'01.916"E	Rarity: The site supports ca. 40% of the total breeding population of banded dotterels on the Wairarapa coast and supports the only Caspian tern breeding colony in the lower North Island. This site also provides seasonal or core habitat for black-fronted dotterel. Ecological context: The site supports breeding populations of banded dotterel, Caspian tern and red-billed gulls. This site also provides seasonal or core habitat for variable oystercatcher, bar-tailed godwit, black-billed gull, white-fronted tern, black-fronted tern, black shag, little black shag, royal spoonbill and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; vandalism of gull and tern nesting colonies by people; disturbance caused by people, dogs and off-road vehicles and weed encroachment. Seasonality: Banded dotterels, Caspian terns and red-billed gulls are most susceptible to predation or disturbance during the breeding season (August to January, September to February and August to March respectively).	This site falls entirely within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation. This site also falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and identified as an Important Bird Area by Birdlife International.	2012	Heather & Robertson (1996); Challies & Scadden (2010); Rebergen (2012); Forest & Bird (2014); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Otahome	40°56'50.716"S 176°09'24.019"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, NZ pipit, pied stilt, red-billed gull, banded dotterel and Caspian tern.	Present threats: Trampling and disturbance by stock, people and dogs; disturbance caused by off-road vehicles. Seasonality: Unknown.	This site falls partly on private land and partly on unprotected crown land.	2011	Todd et al (in prep); Rebergen (2012).
Otaki River mouth	40°45'31.000"S 175°06'14.555"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site provides seasonal or core habitat for royal spoonbill, Australasian bittern, black shag, pied shag, banded dotterel, pied stilt, red-billed gull, Caspian tern and white-fronted tern have been recorded at this site.	Present threats: Disturbance and modification to estuary morphology caused by flood protection activities; disturbance by people, dogs and off-road vehicles and weed incursion. Seasonality: Unknown.	The majority of the site consists of unprotected crown land; part of the site falls on land gazetted as Otaki Ferry Reserve.	2012	Todd et al (in prep); NZ eBird database.
Oteranga Bay	41°17'39.606"S 174°37'42.276"E	Rarity: This site is one of less than half a dozen sites along the south Wellington coastline that supports a coastal breeding population of banded dotterels. Ecological context: This site supports a small breeding population of banded dotterels. This site also provides seasonal or core habitat for variable oystercatcher.	Present threats: Predation of eggs and chicks by mammalian predators and disturbance by people, dogs and off-road vehicles. Seasonality: Banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to January).	This site consists of unprotected crown land; crown land reserved from sale and land gazetted as cable termination station land.	2008	Stephenson (1977); Heather & Robertson (1996); N. McArthur pers. obs.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Oterei River mouth	41°29'03.757"S 175°34'41.495"E	Ecological context: This site supports seasonal or core habitat for black shag, NZ pipit, variable oystercatcher, banded dotterel and pied stilt.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	Much of this site falls on privately-owned land; a small proportion of the site falls on land gazetted as Recreation Reserve.	2011	Todd et al (in prep); Rebergen (2012).
Pahaoa estuary and Pahaoa Scientific Reserve	41°23'45.312"S 175°43'17.882"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site supports breeding populations of banded dotterels, variable oystercatchers and red-billed gulls This site also provides seasonal or core habitat for black shag, pied stilt, black-billed gull, Caspian tern, white-fronted tern and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people, dogs, livestock and off-road vehicles; vandalism of gull nests by people. Seasonality: Banded dotterels, variable oystercatchers and red-billed gulls are particularly susceptible to predation and disturbance during the breeding season (August to January, September to April and August to March respectively).	This site falls partly on private land, partly on unprotected crown land and partly on land gazetted as Native Reserve.	2012	Heather & Robertson (1996); Todd et al (in prep); Rebergen (2012); NZ eBird database; GWRC unpubl. data.
Paraparaumu Beach	40°53'12.822"S 174°58'58.825"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull, Caspian tern and white-fronted tern.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	This site consists mostly of unprotected crown land; a small portion of the site falls on land gazetted as a Recreation Reserve.	2012	NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pauatahanui Inlet, Porirua Harbour	41°05'52.811"S 174°53'34.375"E	Rarity: Pauatahanui inlet is one of only a handful of relatively large estuaries in the Wellington Region and is therefore a regionally important stop-over site for several migrant shorebird species such as NZ pied oystercatcher and bar-tailed godwit. Ecological context: This site provides seasonal or core habitat for red-billed gull, black shag, Australasian bittern, spotless crake, pied stilt, NZ pied oystercatcher, variable oystercatcher, bar-tailed godwit, NZ pipit, banded dotterel, Caspian tern, little black shag and royal spoonbill.	Present threats: Disturbance by people, dogs and recreational watercraft. The construction of the Transmission Gully bypass has the potential to increase sedimentation rates in the inlet. The construction of a wind farm at Puketiro could create a risk of migrating shorebirds colliding with wind turbines. Seasonality: Internal New Zealand migrant species such as NZ pied oystercatcher will be most susceptible to disturbance when present in peak numbers during autumn, winter and spring months. Northern hemisphere migrants such as bar-tailed godwits will be most susceptible when present in peak numbers during spring and summer months.	The inlet itself consists of unprotected New Zealand internal waters; much of the shoreline is gazetted as either Wildlife Reserve (administered by the Department of Conservation), Recreation Reserve or Local Purpose Reserve (administered by Porirua City Council).	2012	Healy (1980); Parrish (1984); Heather & Robertson (1996); White (2005); Blaschke et al (2010); Todd et al (in prep); OSNZ unpublished data; NZ eBird database.
Pekapeka Beach	40°50'30.516"S 175°02'41.312"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, variable oystercatcher and NZ pied oystercatcher.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	Unprotected crown land.	2011	NZ eBird database; GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pencarrow foreshore	41°22'10.423"S 174°51'33.620"E	Rarity: This site is the largest of less than half a dozen sites along the south Wellington coastline that supports a coastal breeding population of banded dotterels. Ecological context: This site supports breeding populations of banded dotterels and variable oystercatchers. This site also provides seasonal or core habitat for red-billed gull, Caspian tern, white-fronted tern, black shag, pied shag, little black shag and NZ pipit.	Present threats: Predation of banded dotterel eggs and chicks by hedgehogs and cats is having a significant impact on dotterel nesting success at this site. Disturbance by off-road vehicles is another ongoing threat, but is currently being limited by restricted access past Burdan's Gate. Disturbance by people, dogs and livestock is another potential threat but did not appear to be a major cause of nest failure in the 2012/2013 breeding season. Weed encroachment (e.g. marram and horned poppy) is a further potential threat. Seasonality: Banded dotterels and variable oystercatchers are particularly susceptible to predation and disturbance during the breeding season (August to January and September to April respectively).	This site consists of unprotected crown land; privately-owned land and land gazetted as Wildlife Reserve. The majority of the site is managed by Greater Wellington Regional Council as part of East Harbour Regional Park.	2012	Heather & Robertson (1996); Armitage (2009); GWRC unpublished data; NZ eBird database; N. McArthur and A. Harvey pers. obs.
Pipinui Point	41°10'21.709"S 174°44'29.159"E	Ecological context: This site is a regular roosting site for black shags.	Present threats: Unknown. Seasonality: Unknown.	This site falls on unprotected crown land, but is completely surrounded by privately-owned land.	1998	Powlesland et al (2007).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Plimmerton foreshore	41°04'46.956"S 174°51'44.647"E	Rarity: This is one of only two mainland sites in the Wellington Region that is used as a regular roosting and feeding site by shore plover. Up to 34 shore plover have been seen at this site, representing over 20% of the global population of this species. Shore plover have also attempted to breed at this site on at least two occasions. Ecological context: This site provides seasonal or core habitat for shore plover, variable oystercatcher, Caspian tern, white-fronted tern, red-billed gull, black shag and little black shag.	Present threats: Predation of adult shore plover and eggs/chicks by mammalian predators as well as disturbance caused by people and dogs are the two most significant threats at this site. Seasonality: Adult shore plover are susceptible to predation or disturbance all year round.	Unprotected crown land.	2012	Heather & Robertson (1996); OSNZ unpublished data; NZ eBird database www.birdingnz.net.nz.
Pukerua Bay	41°01'43.946"S 174°53'09.996"E	Ecological context: This site supports breeding variable oystercatchers. This site also provides seasonal or core habitat for reef heron, red-billed gull, white-fronted tern, black shag and pied shag.	Present threats: Predation by exotic mammalian predators; disturbance by people and dogs. Seasonality: Variable oystercatchers are particularly susceptible to predation and disturbance during the breeding season (September to April).	Unprotected crown land.	2012	Heather & Robertson (1996); NZ eBird database.
Pukerua Bay (coastline north to Paekakariki)	41°01'09.361"S 174°54'42.149"E	Ecological context: This site provides seasonal or core habitat for black shag, pied shag, red-billed gull and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2012	NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pukerua Bay (coastline south to Hongoeka Bay	41°02'55.162"S 174°51'12.139"E	Ecological context: This site provides seasonal or core habitat for pied shag, variable oystercatcher, red-billed gull and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2012	NZ eBird database.
Queen Elizabeth Park foreshore (McKay's to Raumati South)	40°56'55.867"S 174°58'16.630"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls within Queen Elizabeth (Regional) Park and is managed by Greater Wellington Regional Council.	2012	NZ eBird database.
Queen Elizabeth Park foreshore (Paekakariki to McKay's Crossing)	40°57'53.798"S 174°57'50.537"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher.	Present threats: Unknown. Seasonality: Unknown.	This site falls within Queen Elizabeth (Regional) Park and is managed by Greater Wellington Regional Council.	2012	NZ eBird database.
Rerewhakaaitu River mouth	41°24'50.728"S 175°40'31.411"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, banded dotterel, pied stilt, black shag and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on unprotected crown land, partly on private land and partly on land gazetted as Local Purpose Reserve.	2009	Todd et al (in prep).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Riversdale Beach & Motuwaireka Stream mouth	41°05'07.541"S 176°04'43.759"E	Rarity: This is the only site in the region that supports breeding northern NZ dotterels. Ecological context: This site supports breeding populations of banded dotterels, northern NZ dotterels, variable oystercatchers, little penguins and pied stilts. This site also provides seasonal or core habitat for black shag, little black shag, royal spoonbill, variable oystercatcher, bar-tailed godwit, white-fronted tern, black-fronted tern, Caspian tern, red-billed gull and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people, dogs and off-road vehicles. Seasonality: NZ dotterels, banded dotterels, variable oystercatchers, little penguins and pied stilts are particularly susceptible to predation and disturbance during the breeding season (August to February, August to January, September to April, July to March and July to January respectively).	Unprotected crown land.	2012	Heather & Robertson (1996); Todd et al (in prep); Rebergen (2012); NZ eBird database; GWRC unpubl. data.
Stony Bay	41°29'45.805"S 175°32'37.928"E	Ecological context: This site supports a breeding colony of red-billed gulls.	Present threats: Disturbance or vandalism of gull and tern nesting colonies by people. Seasonality: Red-billed gulls are particularly susceptible to disturbance or vandalism during the breeding season (August to March).	This site falls partly on unprotected crown land and partly on crown land reserved from sale.	2011	Heather & Robertson (1996); Rebergen (2012).
Tahoramaurea (Browns) Island foreshore	40°53'23.474"S 174°54'08.230"E	Ecological context: This site supports breeding variable oystercatchers.	Present and future threats: Predation of eggs and chicks by mammalian predators; disturbance by people or dogs. Seasonality: Variable oystercatchers are particularly susceptible to predation during the breeding season (September to April).	This site falls entirely on privately-owned land.	pre-1977	Stephenson (1977); Heather & Robertson (1996).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Taputeranga Island foreshore	41°20'59.957"S 174°46'22.562"E	Rarity: This site is one of only two sites in the region at which reef herons have been confirmed breeding in recent years. Ecological context: This site supports breeding populations of little penguins, variable oystercatchers and reef herons. This site also provides seasonal or core habitat for red-billed gull.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance or vandalism of nests by people. Seasonality: Variable oystercatchers, little penguins and reef herons are particularly susceptible to predation and disturbance during the breeding season (September to April, July to March and September to February respectively).	This site is fully protected and falls entirely within the Taputeranga Marine Reserve, managed by the Department of Conservation.	2012	Stephenson (1977); Robertson (1992); Heather & Robertson (1996); NZ eBird database; GWRC unpubl. data.
Te Humenga	41°31'32.405"S 175°11'49.409"E	Ecological context: This site provides seasonal or core habitat for black shag, banded dotterel and pied stilt.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on private land and partly on land gazetted as Local Purpose Reserve.	2011	Rebergen (2012); NZ eBird database.
Te Kawakawa Point	41°36'12.388"S 175°14'22.618"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, variable oystercatcher, pied stilt, black shag and little penguin.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on private land and partly on unprotected crown land.	2011	Rebergen (2012); NZ eBird database.
Titahi Bay	41°06'20.538"S 174°50'05.449"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2011	O'Malley (2009); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Tokomapuna (Aeroplane) Island foreshore	40°52'51.532"S 174°55'37.589"E	Ecological context: This site supports breeding populations of little penguin and red-billed gull.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance or vandalism of nests by people. Seasonality: Little penguins and red-billed gulls are particularly susceptible to predation or disturbance during the breeding season (July to March and August to March respectively).	This site falls entirely on privately-owned land.	pre-1977	Stephenson (1977); Heather & Robertson (1996).
Tora foreshore	41°32'50.370"S 175°28'13.501"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, pied shag, red-billed gull, black-billed gull, black shag and NZ pipit.	Present threats: Disturbance and trampling by livestock; disturbance by people and dogs; levels of disturbance appears likely to increase in the future due to development of coastal subdivisions nearby. Seasonality: Unknown.	This site falls partly on unprotected crown land and crown land reserved from sale.	2012	Beadel et al (2004); NZ eBird database; GWRC unpubl. data.
Turakirae Head	41°25'47.946"S 174°55'17.029"E	Ecological context: This site provides seasonal or core habitat for black shag, variable oystercatcher, red-billed gull, black-fronted tern, white-fronted tern, Caspian tern and NZ pipit.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on land gazetted as Scientific Reserve. The Scientific Reserve is managed by the Department of Conservation.	2012	GWRC unpubl. data; NZ eBird database.
Uruti Dunes and Patanui Stream mouth	41°08'11.245"S 176°02'59.773"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, variable oystercatcher, black shag and royal spoonbill.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	This site falls partly on private land and partly on unprotected crown land.	2012	Todd et al (in prep); Rebergen (2012); GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Waikanae Estuary	40°52'30.324"S 175°00'16.283"E	Rarity: The Waikanae Estuary is one of only a handful of relatively large estuaries in the Wellington Region and is therefore a regionally important stop-over site for several migrant shorebird species such as NZ pied oystercatcher and bar-tailed godwit. This site is one of only two sites in the Wellington Region to support a breeding population of NI fernbird and is one of only two mainland sites in the Wellington region where brown teal are regularly recorded. Ecological context: The estuary supports breeding populations of banded dotterel, NI fernbird, dabchick, variable oystercatcher, pied stilt and pied shag. It also provides important non-breeding habitat for a range of migratory shorebirds such as NZ pied oystercatcher and bar-tailed godwit. This site also provides seasonal or core habitat for Australasian bittern, spotless crake, royal spoonbill, black shag, little black shag, black-billed gull, red-billed gull, white-fronted tern, black-fronted tern and Caspian tern.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people, dogs and off-road vehicles. Seasonality: Banded dotterels, fernbird, dabchick, variable oystercatchers, pied stilts and pied shags are particularly susceptible to disturbance during the breeding season (August to January, August to March, June to March, September to April, July to January and year-round respectively). Internal New Zealand migrant species such as NZ pied oystercatcher will be most susceptible to disturbance when present in peak numbers during autumn, winter and spring months. Northern hemisphere migrants such as bar-tailed godwits will be most susceptible when present in peak numbers during spring and summer months.	The majority of the site is fully protected and falls within the Waikanae Estuary Scientific Reserve which is managed by the Department of Conservation. Other parts of the site are gazetted as either Local Purpose Reserve or Recreation Reserve and fall under the management of Kapiti Coast District Council.	2012	Falconer et al (1973); Stephenson (1977); Heather & Robertson (1996); Powlesland et al (2008); Todd et al (in prep); NZ eBird database; www.birdingnz.net.nz.
Waikaraka Stream mouth	41°09'32.285"S 176°01'04.872"E	Ecological context: This site provides seasonal or core habitat for pied stilt, variable oystercatcher and red-billed gull.	Present threats: Weed encroachment (e.g. marram, tall fescue). Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land.	2009	Todd et al (in prep).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Waimeha Stream mouth	40°51'28.300"S 175°01'41.675"E	Ecological context: This site provides seasonal or core habitat for pied stilt, Caspian tern and variable oystercatcher.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2009	Todd et al (in prep).
Wainui Stream mouth	40°58'23.171"S 174°57'35.550"E	Ecological context: This site provides seasonal or core habitat for pied stilt, banded dotterel and variable oystercatcher.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely within Queen Elizabeth (Regional) park and is managed by Greater Wellington Regional Council.	2009	Todd et al (in prep).
Wairaka Point	41°01'52.414"S 174°52'13.994"E	Ecological context: Reef heron have been recorded breeding at this site in the past. This site also provides seasonal or core habitat for red-billed gull and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people or dogs. Seasonality: Reef herons are particularly susceptible to predation or disturbance during the breeding season (September to February).	Unprotected crown land.	2012	Stephenson (1977); Heather & Robertson (1996); NZ eBird database; GWRC unpubl. data.
Waitohu Stream mouth	40°43'39.529"S 175°07'19.682"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, variable oystercatcher, banded dotterel, pied stilt and Caspian tern.	Present threats: Disturbance by people, dogs and off-road vehicles. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land.	2009	Todd et al (in prep); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour foreshore; Pencarrow sewer outfall to Burdan's Gate	41°20'20.623"S 174°51'38.552"E	Rarity: This site is one of less than half a dozen sites along the south Wellington coastline that supports a coastal breeding population of banded dotterels. Ecological context: Banded dotterels and variable oystercatchers breed along this section of shoreline. This site provides seasonal or core habitat for red-billed gull, Caspian tern, little black shag, pied shag, black shag, white-fronted tern and NZ pipit.	Present threats: Predation of banded dotterel eggs and chicks by hedgehogs and cats is having a significant impact on dotterel nesting success at this site. Disturbance by off-road vehicles is another ongoing threat, but is currently being limited by restricted access past Burdan's Gate. Disturbance by people, dogs and livestock is another potential threat but did not appear to be a major cause of nest failure in the 2012/2013 breeding season. Weed encroachment (e.g. marram and horned poppy) is a further potential threat. Seasonality: Banded dotterels and variable oystercatchers are particularly susceptible to predation and disturbance during the breeding season (August to January and September to April respectively).	Unprotected crown land.	2012	Robertson (1992); Heather & Robertson (1996); Armitage (2009); OSNZ unpubl. data; NZ eBird database, N. McArthur & A. Harvey pers. obs; GWRC unpubl. data.
Wellington Harbour foreshore; Burdan's Gate to northern end of Day's Bay	41°17'52.638"S 174°53'29.843"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, red-billed gull, variable oystercatcher, black shag, little black shag, pied shag and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2010	Robertson (1992); OSNZ unpubl. data.
Wellington Harbour foreshore; northern end of Day's Bay to Point Howard	41°15'47.365"S 174°54'26.600"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull, black shag, little black shag and pied shag.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2010	Robertson (1992); OSNZ unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour foreshore; Point Howard to eastern shore of Hutt River mouth	41°14'57.869"S 174°54'09.320"E	Ecological context: This site provides seasonal or core habitat for bar-tailed godwit, royal spoonbill, red-billed gull, variable oystercatcher, NZ pied oystercatcher, pied stilt, black shag, little black shag, pied shag and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land.	2010	Allred (1987); Robertson (1992); Todd et al (in prep); OSNZ unpubl. data; NZ eBird database.
Wellington Harbour foreshore; western shore of Hutt River mouth to Petone Beach rowing club	41°13'44.656"S 174°52'35.638"E	Ecological context: This site provides seasonal or core habitat for royal spoonbill, white heron, banded dotterel, bar-tailed godwit, red-billed gull, variable oystercatcher, NZ pied oystercatcher, NZ pipit, black shag, little black shag, pied shag, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2010	Robertson (1992); Todd et al (in prep); OSNZ unpubl. data; NZ eBird database.
Wellington Harbour foreshore; Petone Beach rowing club to Ngauranga railway station	41°14'07.966"S 174°50'05.150"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, NZ pipit, red-billed gull, black shag, little black shag, pied shag, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected crown land.	2012	OSNZ unpubl. data; NZ eBird database.
Wellington Harbour foreshore; Ngauranga railway station to Interislander ferry terminal	41°15'25.027"S 174°47'56.951"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, NZ pipit, red-billed gull, black shag, little black shag, pied shag, Caspian tern, white-fronted tern and little penguin.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land.	2010	Robertson (1992); OSNZ unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour foreshore; Interislander ferry terminal to CentrePort	41°16'44.720"S 174°47'04.247"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, black shag, pied shag and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected private land.	2010	Robertson (1992); OSNZ unpubl. data.
Wellington Harbour foreshore; Queen's Wharf to Clyde Quay terminal	41°17'22.423"S 174°47'05.982"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, variable oystercatcher, black shag, little black shag, pied shag, little penguin and Caspian tern.	Present threats: Unknown. Seasonality: Unknown.	Unprotected private land.	2012	OSNZ unpubl. data; WCC unpubl. data; NZ eBird database.
Wellington Harbour foreshore; Clyde Quay terminal to Point Jenningham	41°17'21.631"S 174°47'46.097"E	Ecological context: This site provides seasonal or core habitat for red-billed gull, variable oystercatcher, black shag, little black shag, pied shag, little penguin and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Wellington Harbour Board land.	2010	OSNZ unpubl, data; NZ eBird database.
Wellington Harbour foreshore; Point Jenningham to Point Halswell	41°18'07.906"S 174°48'39.870"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull, black shag, little black shag, pied shag and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on private land, partly on land gazetted as Local Purpose Reserve and partly on unprotected crown land.	2010	Robertson (1992); OSNZ unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour foreshore; Point Halswell to Worser Bay boat club	41°17'56.537"S 174°49'56.996"E	Ecological context: This site supports a breeding colony of white-fronted terns and a breeding population of little penguins. This site also provides seasonal or core habitat for variable oystercatcher, red-billed gull, black shag, little black shag and pied shag.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance or vandalism of nests, eggs or chicks by people. Seasonality: White-fronted terns and little penguins are most susceptible to predation during the breeding season (October to March and July to March respectively).	This site falls mainly on unprotected crown land. A small portion of the site falls on land gazetted as Recreation Reserve.	2010	Robertson (1992); Heather & Robertson (1996); Powlesland et al (2008); OSNZ unpubl. data; WCC unpubl. data; NZ eBird database.
Wellington Harbour foreshore; Worser Bay boat club to Point Dorset	41°19'21.932"S 174°50'02.965"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, red-billed gull, black shag, little black shag, pied shag, little penguin, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls mainly on unprotected crown land. A small portion of the site falls on land gazetted as Recreation Reserve.	2010	OSNZ unpubl. data; WCC unpubl. data.
Wellington Harbour foreshore; Point Dorset to Palmer Head	41°20'08.668"S 174°49'40.559"E	Ecological context: This site provides seasonal or core habitat for NZ pied oystercatcher, variable oystercatcher, red-billed gull, black shag, little black shag, pied shag, little penguin, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls mainly on unprotected crown land. A small portion of the site falls on land gazetted as Recreation Reserve.	2010	OSNZ unpubl. data; WCC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour foreshore; Palmer Head to Lyall Bay	41°20'22.438"S 174°48'08.485"E	Ecological context: This site supports a breeding population of little penguins. This site also provides seasonal or core habitat for NZ pied oystercatcher, variable oystercatcher, banded dotterel, red-billed gull, black shag, little black shag, pied shag, Caspian tern, black-fronted tern and white-fronted tern.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance or vandalism of nests, eggs or chicks by people. Seasonality: Little penguins are most susceptible to predation during the breeding season (July to March).	This site falls mainly on unprotected crown land. A small portion of the site falls on land gazetted as Recreation Reserve and land gazetted as Scenic Reserve.	2010	Heather & Robertson (1996); OSNZ unpubl. data; WCC unpubl. data.
Wellington Harbour foreshore; Te Raekaihau Point to Ohiro Bay road end	41°20'49.513"S 174°46'13.012"E	Ecological context: This site provides seasonal or core habitat for black-billed gull, red-billed gull, reef heron, variable oystercatcher, NZ pipit, black shag, little black shag, pied shag, little penguin, Caspian tern, black-fronted tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	Part off this site is fully protected and falls within the Taputeranga Marine Reserve, managed by the Department of Conservation. The remainder of the site falls on either unprotected crown land or land gazetted as Recreation Reserve.	2010	OSNZ unpubl. data; WCC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wellington Harbour inland waters	41°16'53.738"S 174°50'59.813"E	Rarity: Wellington Harbour provides seasonal habitat for large numbers of fluttering shearwaters and provides access for little penguins to some of the largest little penguin breeding colonies remaining in the Wellington Region. Ecological context: Large numbers of fluttering shearwaters enter the harbour during winter months to roost and feed. The harbour also provides access for little penguins to the large breeding colonies on Matiu/Somes, Makaro/Ward and Mokopuna Islands as well as smaller colonies on Miramar Peninsula. This site also provides seasonal or core habitat for red-billed gull, Caspian tern and white-fronted tern.	Present threats: Perhaps the greatest potential threat to this site is of a large chemical or oil spill occurring in the harbour. Seasonality: Fluttering shearwaters would be most susceptible to the effects of an oil spill during the winter months when they are present in the harbour in peak numbers. Little penguins would be most susceptible during or immediately after the breeding season (July to March).	Unprotected New Zealand internal waters.	2010	Heather & Robertson (1996); OSNZ unpublished data; NZ eBird database.
Wellington south coast (Sinclair Head to Owhiro Bay)	41°21'18.421"S 174°43'41.419"E	Ecological context: This site provides seasonal or core habitat for black shag, variable oystercatcher, red-billed gull, white-fronted tern and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	The majority of this site falls on unprotected crown land; part of the site falls within Sinclair Head Scientific Reserve which is managed by the Department of Conservation.	2012	NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Whakataki River mouth	40°52'15.416"S 176°13'38.057"E	Ecological context: This site provides seasonal or core habitat for white-fronted tern, Caspian tern, royal spoonbill, banded dotterel, variable oystercatcher and red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	The majority of this site falls on unprotected crown land; part of the site falls on land gazetted as Local Purpose Reserve and another portion falls on private land.	2011	Beadel et al (2004); Todd et al (in prep); Rebergen (2012).
Whangaimoana Beach	41°24'34.996"S 175°10'06.125"E	Ecological context: This site provides seasonal or core habitat for banded dotterel and pied stilt.	Present threats: Unknown. Seasonality: Unknown.	The majority of the site falls on unprotected crown land; a small portion of the site falls within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation.	2011	Rebergen (2012).
Whareama River mouth	41°00'49.194"S 176°06'08.251"E	Ecological context: This site provides seasonal or core habitat for variable oystercatcher, reef heron, banded dotterel, pied stilt, bar-tailed godwit and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	The majority of this site falls on unprotected crown land; small portions of the site fall on both private land and on land gazetted as Local Purpose Reserve.	2009	Beadel et al (2004); Rebergen (2012); GWRC unpubl. data.
Wharemauku Stream mouth	40°55'01.153"S 174°58'41.754"E	Ecological context: This site provides seasonal or core habitat for red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	This site falls on both unprotected crown land and land gazetted as Domain (Paraparaumu Domain).	2009	Todd et al (in prep).
Whareroa Stream mouth	40°57'22.414"S 174°58'07.518"E	Ecological context: This site provides seasonal or core habitat for red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely within Queen Elizabeth (Regional) park and is managed by Greater Wellington Regional Council.	2009	Todd et al (in prep).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
White Rock to Te Kaukau Point (incl. White Rock beach and Opouawe River mouth)	41°34'06.434"S 175°24'42.606"E	Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt, variable oystercatcher, Caspian tern and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance caused by people, dogs and off-road vehicles. Seasonality: Banded dotterels are most susceptible to predation and disturbance during the breeding season (August to January).	This site falls mainly in unprotected crown land, with smaller portions of the site falling both on private land and land gazetted as Local Purpose Reserve.	2011	Heather & Robertson (1996); Beadel et al (2004); Rebergen (2012).
Whitireia Park foreshore	41°05'48.239"S 174°51'02.390"E	Ecological context: This site provides seasonal or core habitat for pied shag, variable oystercatcher, NZ pied oystercatcher, red-billed gull and Caspian tern have been recorded at this site.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on land gazetted as Recreation Reserve (Whitireia Park) and managed by the Whitireia Park Board and Greater Wellington Regional Council.	2012	NZ eBird database.

Appendix 3: River sites of significance for indigenous birds in the Wellington region

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Arawhata Stream	41°14'52.793"S 175°54'48.964"E	Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people, livestock, dogs and off-road vehicles. Seasonality: Banded dotterels are particularly susceptible to disturbance during the breeding season (August to January).	This site falls entirely on privately-owned land.	2011	Rebergen (2012).
Awhea River	41°27'24.588"S 175°30'41.137"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on privately-owned land, partly on crown land reserved from sale and partly on unprotected crown land.	1996	Dennison & Robertson (1999).
Huangarua River (White Rock Rd bridge to Te Muna/Craggy Range)	41°17'16.051"S 175°28'57.266"E	Rarity: This site supports a breeding population of black-fronted dotterels.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock. Seasonality: Black-fronted dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February).	This site falls partly on privately-owned land and partly on unprotected crown land.	1996	Heather (1973); Dennison & Robertson (1999).
Huangarua River (Te Muna/Craggy Range to Hinakura Rd bridge)	41°15'35.539"S 175°29'56.933"E	Rarity: This site supports a breeding population of black-fronted dotterels. Ecological context: This site provides seasonal or core habitat for grey duck, pied shag and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock. Seasonality: Black-fronted dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February).	This site falls partly on privately-owned land and partly on unprotected crown land.	2011	Heather (1973); Dennison & Robertson (1999); Rebergen (2012).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Huangarua River (Hinakura Rd bridge to Ponatahi Rd bridge)	41°13'08.033"S 175°29'23.428"E	Rarity: This site supports a breeding population of black-fronted dotterels. Ecological context: This site provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock. Seasonality: Black-fronted dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February).	This site falls partly on privately-owned land and partly on unprotected crown land.	2011	Heather (1973); Dennison & Robertson (1999); Rebergen (2012).
Hutt River (Te Marua Water Treatment Plant to Akatarawa Rd Bridge)	41°05'20.555"S 175°07'30.155"E	Rarity: This site supports one of less than a dozen nesting colonies of black shags known in the Wellington Region. Ecological context: This site supports a nesting colony of black shags. This site also provides seasonal or core habitat for pied stilts.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Black shags are particularly prone to disturbance at nesting colonies; however this species is known to nest virtually year-round.	This site falls partly on unprotected crown land, partly on crown land gazetted as Water Supply and Recreational Purposes Reserve and partly on privately-owned land. This site is managed by GWRC for the purpose of flood protection.	2012	Powlesland et al (2007); GWRC unpubl. data.
Hutt River (Totara Park bridge to Moonshine Rd bridge)	41°06'56.315"S 175°03'35.579"E	Ecological context: This site provides seasonal or core habitat for black shag.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on crown land gazetted as River Protection Reserve. This site is managed by GWRC for the purpose of flood protection.	2012	GWRC unpubl. data.
Hutt River (Moonshine Rd bridge to Silverstream bridge)	41°07'59.448"S 175°01'06.323"E	Ecological context: This site provides seasonal or core habitat for pied stilt and Caspian tern.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Unknown.	This site falls on unprotected crown land and is managed by GWRC for the purpose of flood protection.	2012	GWRC unpubl. data; NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Hutt River (Silverstream bridge to Kennedy-Good bridge)	41°10'12.065"S 174°57'44.219"E	Ecological context: This site provides seasonal or core habitat for pied stilt.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Unknown.	This site falls partly on unprotected crown land and land crown land gazetted as River Protection Reserve. This site is managed by GWRC for the purpose of flood protection.	2012	GWRC unpubl. data.
Hutt River (Kennedy-Good bridge to 1.3 km upstream of Hutt River mouth)	41°12'33.491"S 174°54'27.868"E	Ecological context: This site provides seasonal or core habitat for black shag, pied shag, pied stilt, banded dotterel, black-billed gull, red-billed gull and Caspian tern.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Unknown.	This site falls on unprotected crown land and is managed by GWRC for the purpose of flood protection.	2012	Gibb (2000); Powlesland et al (2007); GWRC unpubl. data.
Hutt River (1.3 km upstream of Hutt River mouth to the Hutt River mouth)	41°14'01.468"S 174°53'59.860"E	Ecological context: This site provides seasonal or core habitat for black shag, little black shag, royal spoonbill, variable oystercatcher and red-billed gull.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on crown land gazetted as Local Purpose Reserve. The site is managed by GWRC for the purpose of flood protection.	2012	GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Opouawe River (Cape River)	41°29'30.289"S 175°26'09.571"E	Rarity: This site supports a breeding population of black-fronted dotterels. This site also supports a regionally-significant breeding population of banded dotterels. Together with the other sites identified on the Opouawe River and its tributaries this site supports around 25% of the Wairarapa banded dotterel population. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).
Opouawe River (Castle River)	41°29'43.789"S 175°25'35.821"E	Rarity: This site supports a breeding population of black-fronted dotterels. This site also supports a regionally-significant breeding population of banded dotterels. Together with the other sites identified on the Opouawe River and its tributaries this site supports around 25% of the Wairarapa banded dotterel population. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Opouawe River (road bridge to Poley Stream confluence)	41°31'11.680"S 175°25'33.816"E	Rarity: This site supports a breeding population of black-fronted dotterels. This site also supports a regionally-significant breeding population of banded dotterels. Together with the other sites identified on the Opouawe River and its tributaries this site supports around 25% of the Wairarapa banded dotterel population. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).
Opouawe River (Poley Stream confluence to White Rock Station fence)	41°32'10.392"S 175°25'06.197"E	Rarity: This site supports a breeding population of black-fronted dotterels. This site also supports a regionally-significant breeding population of banded dotterels. Together with the other sites identified on the Opouawe River and its tributaries this site supports around 25% of the Wairarapa banded dotterel population. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Opouawe River (S-bend)	41°32'29.785"S 175°25'22.123"E	Ecological context: This site provides seasonal or core habitat for NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).
Opouawe River (White Rock Station fence to Opouawe River mouth)	41°33'07.510"S 175°25'31.408"E	Rarity: This site supports a breeding population of black-fronted dotterels. This site also supports a regionally-significant breeding population of banded dotterels. Together with the other sites identified on the Opouawe River and its tributaries this site supports around 25% of the Wairarapa banded dotterel population. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls entirely on privately-owned land.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012).
Otakaha Stream	41°32'47.364"S 175°14'25.170"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, black shag and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely on privately-owned land.	2011	Rebergen (2012); New Zealand eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Otaki River (bottom of Otaki Gorge to SH1 bridge)	40°47'34.523"S 175°10'38.147"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. This site supports a small nesting colony of black shags, less than a dozen such colonies known in the Wellington Region. This river also supports the largest breeding population of banded dotterels on the west coast of the Wellington Region. Ecological context: This site supports a nesting colony of black shags and breeding populations of banded dotterels and pied stilts. This site also provides seasonal or core habitat for NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people and dogs; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Black shags are particularly prone to disturbance at their nesting colonies; however this species is known to nest virtually year-round. Banded dotterels and pied stilts are particularly susceptible to predation and disturbance during the breeding season (August to January and July to January respectively).	This site falls partly on unprotected crown land, partly on crown land gazetted as Local Purpose Reserve and partly on privately-owned land. The site is managed by GWRC for the purpose of flood protection.	2012	GWRC unpubl. data.
Otaki River (SH1 bridge to Otaki River mouth)	40°45'52.042"S 175°07'40.991"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. This river also supports the largest breeding population of banded dotterels on the west coast of the Wellington Region. Ecological context: This site supports breeding populations of pied stilts and banded dotterels. This site also provides seasonal or core habitat for black shag, pied shag, Caspian tern, white-fronted tern and red-billed gull.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people and dogs; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Pied stilts are particularly susceptible to predation and disturbance during the breeding season (July to January).	This site falls entirely on unprotected crown land.	2012	GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pahaoa River (Glendhu bridge to Pahaoa River mouth)	41°23'00.910"S 175°43'40.894"E	Ecological context: This site provides seasonal or core habitat for black shag, little black shag, variable oystercatcher, pied stilt and red billed gull.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely on unprotected crown land and partly on privately-owned land.	2011	Rebergen (2012).
Pahaoa River (upstream of Glendhu bridge)	41°21'20.639"S 175°41'50.233"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site provides seasonal or core habitat for banded dotterel, pied stilt, variable oystercatcher and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls partly on privately-owned land and partly on unprotected crown land.	1993-1994	Beadel et al (2004).
Pararaki Stream	41°31'22.289"S 175°13'27.196"E	Ecological context: This site provides seasonal or core habitat for banded dotterel, pied stilt, variable oystercatcher and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls entirely on privately-owned land.	2011	Rebergen (2012).
Poley Stream (confluence with Opouawe River to 2.4 km upstream)	41°31'14.135"S 175°24'30.888"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for pied stilt and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by livestock; woody weed encroachment. Seasonality: Banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to January).	This site falls entirely on privately-owned land.	2011	Rebergen (2012).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Ruamahanga River (Rathkeale College to Te Ore Ore Rd bridge)	40°55'16.014"S 175°41'53.754"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels. This site also supports a nesting colony of black-billed gulls, the only such colony known in the Wellington Region. Ecological context: This site supports a nesting colony of black-billed gulls and a breeding population of banded dotterels. This site also provides seasonal or core habitat for black shag, pied stilt, black-billed gull and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people and dogs; disturbance and habitat modification caused by flood protection activities; woody weed encroachment; intentional vandalism of gull nests. Seasonality: Black-billed gulls and banded dotterels are particularly susceptible to predation, disturbance or vandalism during the breeding season (September to February and August to January respectively).	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	2011	Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012); Forest & Bird (2014).
Ruamahanga River (Te Ore Ore Rd bridge to Wardell's bridge)	40°58'42.481"S 175°40'56.867"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1972	Heather (1973); Dennison & Robertson (1999); Forest & Bird (2014).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Ruamahanga River (Wardell's bridge to Gladstone bridge)	41°02'22.538"S 175°38'58.787"E	Rarity: This site supports a breeding population of black-fronted dotterels. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for black shag, pied stilt, black-billed gull and NZ pipit.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Black-fronted dotterels and banded dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February and August to January respectively).	This site falls on unprotected crown land and is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	2011	Heather (1973); Sim (1997); Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012); Forest & Bird (2014).
Ruamahanga River (Gladstone bridge to Ponatahi bridge)	41°04'39.011"S 175°35'43.660"E	Rarity: This site supports a breeding population of black-fronted dotterels. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land, partly on crown land reserved from sale and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1972	Heather (1973); Dennison & Robertson (1999); Forest & Bird (2014).
Ruamahanga River (Ponatahi bridge to Waiohine River confluence)	41°06'00.176"S 175°32'23.197"E	Rarity: This site supports a breeding population of black-fronted dotterels. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1972	Heather (1973); Dennison & Robertson (1999); Forest & Bird (2014).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Ruamahanga River (Waiohine River confluence to Morrison's Bush)	41°07'35.443"S 175°29'14.201"E	Rarity: This site supports a breeding population of black-fronted dotterels. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1972	Heather (1973); Dennison & Robertson (1999); Forest & Bird (2014).
Ruamahanga River (Morrison's Bush to Martinborou-gh Rd bridge)	41°10'29.485"S 175°28'14.189"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1972	Heather (1973); Dennison & Robertson (1999); Forest & Bird (2014).
Ruamahanga River (Martinborou-gh Rd bridge to Pukio)	41°13'05.048"S 175°24'30.319"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. It is estimated that in 1996 all of the Ruamahanga River sites combined supported approximately 10% of the national population of black-fronted dotterels.	Present threats: Disturbance caused by recreational users, dogs and vehicles; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Unknown.	This site falls partly on unprotected crown land and partly on private land. This site is managed by GWRC for the purpose of flood protection and has been identified as an Important Bird Area by Birdlife International.	1989	Dennison & Robertson (1999); Forest & Bird (2014).

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Tauherenikau River (railway bridge to Martinborou-gh Rd bridge)	41°06'40.774"S 175°22'16.144"E	Rarity: This site supports a breeding population of black-fronted dotterels. Ecological context: This site provides seasonal or core habitat for pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people, dogs and livestock; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Black-fronted dotterels are particularly susceptible to predation and disturbance during the breeding season (August to February).	This site falls partly on privately-owned land and partly on unprotected crown land.	2012	Heather (1973); Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012); GWRC unpubl. data.
Turanganui River	41°23'41.658"S 175°13'25.010"E	Ecological context: This site supports a breeding population of banded dotterels.	Present threats: Predation of eggs and chicks by mammalian predators; woody weed encroachment. Seasonality: Banded dotterels are particularly susceptible to predation during the breeding season (August to January).	This site falls partly on privately-owned land and partly on unprotected crown land.	1997	Sim (1997).
Waingawa River (Totara Park Drive to Ruamahanga River confluence)	40°58'07.766"S 175°36'59.069"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for black shag, pied stilt, black-billed gull and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people and dogs; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Banded dotterels are particularly susceptible to predation during the breeding season (August to January).	This site falls partly on privately-owned land and partly on unprotected crown land.	2012	Heather (1973); Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012); GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Waiohine River (railway bridge to SH2 bridge)	41°03'40.514"S 175°27'02.635"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site supports a breeding population of banded dotterels. This site also provides seasonal or core habitat for black shag, pied stilt, black-billed gull and NZ pipit.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people and dogs; disturbance and habitat modification caused by flood protection activities; woody weed encroachment. Seasonality: Banded dotterels are particularly susceptible to predation during the breeding season (August to January).	This site falls partly on privately-owned land and partly on unprotected crown land.	2012	Heather (1973); Dennison & Robertson (1999); Rebergen (2011); Rebergen (2012); GWRC unpubl. data.

Appendix 4: Lake sites of significance for indigenous birds in the Wellington region

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Barton's and Simmons Lagoons	41°10'09.523"S 175°18'57.049"E	Ecological context: This site supports breeding pied stilts. This site also provides seasonal or core habitat for NZ dabchick, Australasian bittern, marsh crake, spotless crake, black shag, Caspian tern and grey duck.	Present threats: Predation of eggs and chicks by mammalian predators; increased rates of sedimentation; invasion by willows and alders; disturbance to vegetation caused by planned willow and alder control. Seasonality: Pied stilts are particularly susceptible to predation during the breeding season (July to January).	This site falls on crown land gazetted as recreation reserve and is managed by South Wairarapa District Council, Greater Wellington Regional Council and Fish and Game. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Cheyne (2013); Forest & Bird (2014); NZ eBird database; GWRC unpubl. data.
Buckett Dune Lake	40°42'12.200"S 175°08'18.474"E	Ecological context: This site provides seasonal or core habitat for pied shag.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2003	GWRC unpubl. data.
Campbell/Connell Dam (incl. associated ponds and wetland)	40°47'45.600"S 175°35'09.985"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick, Australasian bittern and banded dotterel.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land, but has a QEII covenant.	2012	GWRC unpubl. data.
Egan Lakes (A & B)	40°55'41.682"S 175°32'58.747"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick and pied stilt.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land, but has a QEII covenant.	2003	GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Henley Lake (incl. associated ponds and wetlands)	40°57'10.872"S 175°40'49.922"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. This site provides a pre- and post-breeding season staging site for the Wellington Region's only breeding colony of black-billed gulls. Ecological context: This site provides seasonal or core habitat for NZ dabchick, grey duck, white heron, royal spoonbill, black shag, little black shag, pied stilt, banded dotterel and Caspian tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls on crown land, parts of which are gazetted as recreation reserve. The site is managed by Masterton District Council.	2012	Rebergen (2012); NZ eBird database; OSNZ unpubl. data.
Hidden Lakes	40°49'27.498"S 175°38'26.243"E	Ecological context: This site provides seasonal or core habitat for grey duck and royal spoonbill.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land. The majority of the site has a QEII covenant.	2003	GWRC unpubl. data.
Kaiwhata River oxbow	41°10'53.659"S 175°54'39.110"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick and black shag.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2012	GWRC unpubl. data.
Karori reservoirs	41°17'40.740"S 174°44'57.091"E	Rarity: This site supports one of only two breeding populations of brown teal in the Wellington Region, and the only population found on the mainland. Ecological context: This site supports a nesting colony of pied shags and black shags. This site provides seasonal or core habitat for little black shag.	Present threats: Re-invasion by mammalian predators is the most significant ongoing threat at this site. Seasonality: Brown teal are likely to be susceptible to predation year-round.	This site falls on crown land administered by Wellington City Council and falls within Zealandia, a wildlife sanctuary managed by the Karori Sanctuary Trust.	2012	NZ eBird database; Karori Sanctuary Trust unpubl. data; R. Empson pers. comm.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Kiriwai Lagoon	41°21'15.419"S 175°07'07.457"E	Ecological context: This site provides seasonal or core habitat for black shag, royal spoonbill, banded dotterel, Caspian tern and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2009	Beadel et al (2000); Todd et al (in prep).
Kourarau Dam	41°05'33.619"S 175°42'07.492"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick, black shag, little black shag, pied stilt and banded dotterel.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2012	NZ eBird database; GWRC unpubl. data.
Lake Nganoke	41°21'21.146"S 175°11'10.072"E	Ecological context: This site supports a nesting colony of black shags. This site provides seasonal or core habitat for NZ dabchick and grey duck.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2012	GWRC unpubl. data.
Lake Ngarara	40°52'38.219"S 175°00'20.272"E	Ecological context: This site supports a breeding population of NZ dabchick.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2008	NZ eBird database.
Lake Onoke	41°22'45.336"S 175°07'50.866"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site provides seasonal or core habitat for NZ dabchick, Australasian bittern, royal spoonbill, pied shag, black shag, little black shag, banded dotterel, wrybill, pied stilt, black-billed gull, red-billed gull, Caspian tern and white-fronted tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Beadel et al (2000); Forest & Bird (2014); Todd et al (in prep); NZ eBird database, GWRC unpubl data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Lake Wairarapa	41°13'06.679"S 175°14'14.197"E	Rarity: This site provides habitat for nationally-significant numbers of a range of shorebird species, including black-fronted dotterel, banded dotterel, pied stilt, Pacific golden plover, sharp-tailed sandpiper and pectoral sandpiper. This site also provides important winter (non-breeding) habitat for the Wellington Region's only breeding colony of black-billed gulls. Lake Wairarapa also provides habitat for the Wellington Region's largest population of bar-tailed godwits. Ecological context: This site provides seasonal or core habitat for NZ dabchick, grey duck, black shag, little black shag, spotless crake, white heron, Australasian bittern, royal spoonbill, banded dotterel, pied stilt, SI pied oystercatcher, variable oystercatcher, bar-tailed godwit, red-billed gull, black-billed gull, Caspian tern, royal spoonbill and variable oystercatcher.	Present threats: High rates of sedimentation and nutrient enrichment of waters; prolonged high or low water levels caused by the South Wairarapa flood management scheme; predation by mammalian predators and encroachment by weeds such as willow, alder and tall fescue. Seasonality: The high diversity of threatened and rare bird species present means that this site is sensitive to pressures year-round.	This site falls within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation and Greater Wellington Regional Council. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Dennison & Robertson (1999); Robertson & Heather (1999); Airey et al (2000); Beadel et al (2000); Forest & Bird (2014); NZ eBird database; GWRC unpubl. data.
Manawa-David Dalziel	40°45'53.251"S 176°00'06.847"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick.	Present threat: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2003	GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Okupe Lagoon, Kapiti Island	40°49'35.875"S 174°56'52.926"E	Rarity: This site supports one of only two populations of brown teal in the Wellington Region and is one of only two sites at which royal spoonbills have been observed breeding in the Wellington Region. Ecological context: This site provides seasonal or core habitat for brown teal, pied shag, royal spoonbill, variable oystercatcher, pied stilt, banded dotterel, red-billed gull and NZ pipit.	Present threats: Re-invasion by mammalian predators is the most significant ongoing threat at this site. Seasonality: Brown teal are likely to be susceptible to predation year-round.	This site is surrounded by privately-owned land.	2011	Stephenson (1977); NZ eBird database.
Onoke/ Okorewa Lagoon	41°23'50.356"S 175°08'51.047"E	Ecological context: This site provides seasonal or core habitat for black shags.	Present threats: Unknown. Seasonality: Unknown.	This site falls within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2003	Forest & Bird (2014); GWRC unpubl. data.
Otaki oxidation ponds	40°45'40.529"S 175°08'01.550"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick and pied stilt.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2012	NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Parangarahu Lakes	41°21'38.909"S 174°52'08.332"E	Rarity: This site supports a nesting colony of black shags, one of the largest of less than a dozen such colonies known in the Wellington Region. Ecological context: This site supports a breeding population of NZ dabchick. This site also provides seasonal or core habitat for grey duck, Australasian bittern, pied shag, black shag, little black shag, spotless crake, banded dotterel and NZ pipit have been recorded at this site.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance of nesting shags by people; aquatic and terrestrial weed encroachment. Seasonality: Black shags are particularly prone to disturbance at their nesting colonies; however this species is known to nest virtually year-round.	This site is owned by the Port Nicholson Block Settlement Trust and is jointly managed by the trust and Greater Wellington Regional Council.	2012	Stephenson (1977); Parrish (1984); KRTA Ltd (1986); Brown (1992); Powlesland & Reese (1999); Gibbs (2002); Powlesland et al (2007); Todd et al (in prep); www.birdingnz.net NZ forum; NZ eBird database; OSNZ unpubl. data; GWRC unpubl data.
Pharyzn Reserve	40°50'56.609"S 175°02'56.209"E	Rarity: Black-fronted dotterel have been recorded breeding at this site. This site is also a regionally-significant wintering site for NZ dabchick. Ecological context: This site supports nesting colony of pied shags as well as a breeding population of NZ dabchick. This site also provides seasonal or core habitat for black shag, little black shag, royal spoonbill and pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance by people. Seasonality: Black-fronted dotterels and pied shags are most susceptible to predation and disturbance during the breeding season (August to February and year-round respectively).	This site falls on crown land.	2012	NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pounui Lagoon	41°21'42.595"S 175°07'34.154"E	Rarity: This site supports breeding black-fronted dotterels. Ecological context: This site provides seasonal or core habitat for NZ dabchick, grey duck, Australasian bittern, royal spoonbill, black shag and Caspian tern.	Present threats: Predation of eggs and chicks by mammalian predators; encroachment by weeds such as willows and alders. Seasonality: Black-fronted dotterels are most susceptible to predation and disturbance during the breeding season (August to February).	This site falls within the Lake Wairarapa Wetland Conservation Area and is managed by the Department of Conservation and Greater Wellington Regional Council. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Forest & Bird (2014); Todd et al (in prep); NZ eBird database; GWRC unpubl. data.
Waimanu Lagoon	40°52'17.137"S 175°00'42.134"E	Ecological context: This site supports a large nesting colony of pied shags. This site also provides seasonal or core habitat for NZ dabchick, royal spoonbill, black shag, little black shag and red-billed gull.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance or vandalism of pied shag nesting colony. Seasonality: Pied shags are most vulnerable to predation or disturbance during the breeding season, but this can be virtually year-round.	This site falls on crown land gazetted as recreation reserve.	2012	NZ eBird database.
Waimeha Lagoon	40°52'02.186"S 175°01'08.749"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick, pied stilt, variable oystercatcher, NZ pied oystercatcher and Caspian tern.	Present threats: Unknown. Seasonality: Unknown.	This site falls on crown land.	2008	Stephenson (1977); NZ eBird database.
Wainuiomata lower dam lake	41°16'05.300"S 174°59'27.344"E	Ecological context: This site is used as a regular roosting site by black shags.	Present threats: Unknown. Seasonality: Unknown.	This site is owned and managed by Greater Wellington Regional Council for water supply and recreational purposes.	2012	Parrish (1984); Powlesland et al (2007); Govella & McArthur (2009); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Whitby Lakes	41°07'04.876"S 174°53'30.815"E	Ecological context: This site provides seasonal or core habitat for red-billed gull.	Present threats: Unknown. Seasonality: Unknown.	This site falls on crown land. The upper lake is gazetted as scenic reserve; the lower lake is gazetted as recreation reserve.	2012	NZ eBird database.

Appendix 5: Wetland sites of significance for indigenous birds in the Wellington region

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Bankview Wetland	41°08'10.478"S 175°45'47.927"E	Ecological context: This site provides seasonal or core habitat for spotless crake.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	1996	Beadel et al (2004).
Boggy Pond, Wairarapa Moana Wetlands	41°14'57.750"S 175°15'53.942"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. Ecological context: This site supports a breeding population of NZ dabchick and black shags. This site also provides seasonal or core habitat for Australasian bittern, white heron, spotless crake, marsh crake, banded dotterel and pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; encroachment by weeds such as willow, alder, tall fescue and beggar's ticks; effects of water level management regime and high nutrient inputs; disturbance to the vegetation caused by weed control activities. Seasonality: NZ dabchick and black shags are most susceptible to predation and disturbance during the breeding season (June to March and year-round respectively).	This site falls entirely within crown land gazetted as a Wildlife Management Reserve and is managed by the Department of Conservation. This site also falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore (1983); Moore et al (1984), Cheyne (2013); Forest & Bird (2014); GWRC unpubl. data; NZ eBird database.
Castle River Wetland	41°29'33.979"S 175°25'38.806"E	Ecological context: This site provides seasonal or core habitat for banded dotterel and NZ pipit.	Present threats: Disturbance caused by livestock. Seasonality: Unknown.	This site falls on privately-owned land.	2012	Beadel et al (2004); GWRC unpubl. data

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
JK Donald Block, Wairarapa Moana Wetlands	41°12'03.524"S 175°18'39.798"E	Rarity: This site is one of only two sites at which royal spoonbills have been observed breeding in the Wellington Region. Ecological context: This site supports breeding populations of black shags and little black shags. This site also provides seasonal or core habitat for grey duck, NZ dabchick, Australasian bittern spotless crake and pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; encroachment by weeds such as willow, alder and tall fescue; effects of water level management regime and high nutrient inputs; disturbance to the vegetation caused by weed control activities. Seasonality: Royal spoonbills, black shags and little black shags are most susceptible to predation and disturbance during the breeding season (September to March and year-round respectively).	This site falls partly on crown land managed by the Department of Conservation and partly on private land protected by a QEII open space covenant. The majority of the site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); QEII National Trust (1996); Rebergen (2011); Cheyne (2013); Forest & Bird (2014); Abernethy (undated); GWRC unpubl. data.
Makakiki backwater, Wairarapa Moana Wetlands	41°13'38.831"S 175°18'08.690"E	Ecological context: This site provides seasonal or core habitat for grey duck and black shag.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International	2003	Forest & Bird (2014); GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Matthews Lagoon, Wairarapa Moana Wetlands	41°15'40.558"S 175°15'48.593"E	Rarity: This site provides seasonal or core habitat for black-fronted dotterel. This site also supports the largest shag nesting colony in the Wellington Region. The majority of the birds nesting in this colony are little black shags, with smaller numbers black shags also present. Ecological context: This site supports a breeding population of NZ dabchick. This site also provides seasonal or core habitat for Australasian bittern, spotless crake, marsh crake and pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; encroachment by weeds such as willow, alder and tall fescue; effects of water level management regime and high nutrient inputs; disturbance to the vegetation caused by weed control activities. Seasonality: NZ dabchick, black shags and little black shags are most susceptible to predation and disturbance during the breeding season (June to March and year-round respectively).	This site falls entirely within crown land gazetted as a Wildlife Management Reserve and is managed by the Department of Conservation. This site also falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Sim & Powlesland (1995); Cheyne (2013); Forest & Bird (2014); GWRC unpubl. data; NZ eBird database.
MacKay's Crossing Swamp	40°58'25.698"S 174°58'43.781"E	Ecological context: This site provides seasonal or core habitat for grey duck, Australasian bittern and spotless crake.	Present threats: Unknown. Seasonality: Unknown.	This site falls on crown land. Part of the site is gazetted as General Purpose Reserve and the remainder as Road Reserve.	1991	Stephenson (1977); Brown (1992).
Oporua Raupo Swamp, Wairarapa Moana Wetlands	41°14'37.162"S 175°16'44.238"E	Ecological context: This site provides seasonal or core habitat for Australasian bittern and black shag.	Present threats: Unknown. Seasonality: Unknown.	This site falls on crown land gazetted for River Control and Soil Conservation Purposes. This site falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	1999	Sim (1999); Forest & Bird (2014); GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Pateke Lagoon, Te Hapua Wetland complex	40°48'58.230"S 175°05'06.889"E	Ecological context: This site provides seasonal or core habitat for grey duck, NZ dabchick, Australasian bittern, black shag, pied stilt and NZ pipit.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land. The majority of the site falls within a QEII open space covenant.	2008	QEII National Trust (1997); NZ eBird database.
Plimmerton Swamp	41°04'35.530"S 174°52'39.500"E	Ecological context: This site provides seasonal or core habitat for Australasian bittern and spotless crake.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	1991	Parrish (1984); Brown (1992).
Ratanui Swamp	40°53'32.640"S 175°00'51.556"E	Ecological context: This site provides breeding habitat for NZ dabchick and pied stilt.	Present threats: Predation of eggs and chicks by mammalian predators; disturbance caused by people and dogs. Seasonality: NZ dabchick and pied stilt are most susceptible to predation and disturbance during the breeding season (September to March and February to June respectively).	This site falls on privately-owned land.	Pre-1977	Stephenson (1977).
Ruakaka Pond	41°07'21.450"S 176°01'36.937"E	Ecological context: This site provides seasonal or core habitat for NZ dabchick, black shag and spotless crake.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land.	2012	GWRC unpubl. data.
Taumata Oxbow	41°05'35.171"S 175°31'16.604"E	Ecological context: This site provides seasonal or core habitat for grey duck, NZ dabchick, royal spoonbill, banded dotterel and pied stilt.	Present threats: Unknown. Seasonality: Unknown.	This site falls on privately-owned land and is protected by a QEII open space covenant.	2003	GWRC unpubl. data.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Taupo Swamp complex	41°04'13.145"S 174°52'22.886"E	Ecological context: This site provides seasonal or core habitat for spotless crake.	Present threats: Unknown. Seasonality: Unknown.	The majority of this site is owned and managed by the QEII National Trust and is protected by a QEII open space covenant. A small proportion of the site falls on crown land gazetted as Local Purpose Reserve and Recreation Reserve.	Pre-1977	Stephenson (1977); GWRC unpubl. data.
Te Harakeke Wetland	40°50'56.519"S 175°02'55.799"E	Rarity: This site supports one of two known populations of NI fernbird in the Wellington Region. Ecological context: This site provides seasonal or core habitat for Australasian bittern, spotless crake and NI fernbird.	Present threats: Predation by mammalian predators; weed encroachment and effects of water level management. Seasonality: Unknown.	This site falls on privately-owned land and the majority of the site is protected by a QEII open space covenant.	2012	Allen & Beadel (2002); NZ eBird database.
Tuturumuri Swamp	41°24'27.112"S 175°29'03.674"E	Ecological context: This site supports a small breeding population of grey duck. This site also provides seasonal or core habitat for spotless crake.	Present threats: Predation of eggs and chicks by mammalian predators; encroachment by weeds such as field horsetail. Seasonality: Grey duck is most susceptible to predation during the breeding season (August to March).	This site falls on privately-owned land and the majority of the site is protected by a QEII open space covenant.	2012	GWRC unpubl. data; NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Waingawa Swamp	40°58'06.812"S 175°35'08.225"E	Ecological context: This site supports breeding pied stilts. This site also provides seasonal or core habitat for NZ dabchick.	Present threats: Predation of eggs and chicks by mammalian predators; weed encroachment; disturbance caused by livestock; dumping of landfill material. Seasonality: Pied stilts are most susceptible to predation and disturbance during the breeding season (July to January).	This site falls on privately-owned land and the majority of the site is protected by a QEII open space covenant.	2003	Beadel et al (2000); GWRC unpubl. data.
Wairio Wetland, Wairarapa Moana Wetlands	41°14'37.802"S 175°15'26.215"E	Ecological context: This site provides seasonal or core habitat for Australasian bittern, white heron, royal spoonbill, spotless crake, marsh crake, pied stilt and banded dotterel.	Present threats: Predation by mammalian predators; encroachment by weeds such as willow, alder, tall fescue and beggar's ticks; effects of water level management regime and high nutrient inputs; disturbance to the vegetation caused by weed control activities. Seasonality: Unknown.	This site falls entirely on crown land managed by the Department of Conservation and Ducks Unlimited. This site also falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Cheyne (2013); Forest & Bird (2014); GWRC unpubl. data; NZ eBird database.
Waitohu River Mouth Saltmarsh	40°43'57.551"S 175°07'24.337"E	Ecological context: This site provides seasonal or core habitat for grey duck, Australasian bittern, black shag, marsh crake and pied stilt.	Present threats: Predation by mammalian predators; weed encroachment and disturbance caused by livestock. Seasonality: Unknown.	The majority of the site falls on privately-owned land.	2012	Graeme (2003); Todd et al (in prep); NZ eBird database.

Site name	Latitude and longitude	Features relevant to the criteria	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Willow Island, Wairarapa Moana Wetlands	41°14'58.927"S 175°13'12.306"E	Ecological context: This site provides seasonal or core habitat for Australasian bittern, white heron and pied stilt.	Present threats: Predation by mammalian predators; encroachment by weeds such as willow, alder, tall fescue and beggar's ticks; effects of water level management regime and high nutrient inputs; disturbance to the vegetation caused by weed control activities. Seasonality: Unknown.	This site falls entirely on crown land and is managed by the Department of Conservation and Greater Wellington Regional Council. This site also falls within Wairarapa Moana, a 10,500 ha wetland complex nominated as a wetland of international importance under the Ramsar Convention and has been identified as an Important Bird Area by Birdlife International.	2012	Moore et al (1984); Forest & Bird (2014); GWRC unpubl. data; NZ eBird database.

Appendix 6: Aquatic marine habitats for indigenous birds in the Wellington region

Site name	Latitude and longitude	Existing rare and threatened bird values.	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Cook Strait marine area	41°32'02.220"S 174°55'03.040"E	This site provides seasonal or core habitat for Antipodean albatross, northern royal albatross, southern royal albatross, NZ white-capped albatross, Buller's albatross, Salvin's albatross, little penguin, fairy prion, northern giant petrel, Snares cape petrel, Westland petrel, northern diving petrel, Buller's shearwater, flesh-footed shearwater, sooty shearwater, fluttering shearwater, Hutton's shearwater, red-billed gull, Caspian tern, white-fronted tern and black-fronted tern.	Present threats: Some species of seabird are at risk of being caught as by-catch by tuna long-line fishing vessels. Seasonality: Most recorded fisheries mortality occurs in the winter months.	The majority of this site consists of unprotected New Zealand territorial seas. A very small proportion of the site falls within the Taputeranga Marine Reserve and is managed by the Department of Conservation.	2010	Robertson et al (2007); Waugh (2009); OSNZ unpublished data; NZ eBird database; www.birdingnz.net.nz.
Kapiti Coast marine area	40°59'12.988"S 174°44'31.013"E	This site provides seasonal or core habitat for NZ white-capped albatross, Salvin's albatross, Westland petrel, northern diving petrel, northern giant petrel, NZ white-faced storm petrel, fairy prion, sooty shearwater, fluttering shearwater, Hutton's shearwater, little penguin, red-billed gull and white-fronted tern.	Present threats: Some species of seabird are at risk of being caught as by-catch by tuna long-line fishing vessels. Seasonality: Most recorded fisheries mortality occurs in the winter months.	The majority of this site consists of unprotected New Zealand territorial seas. A very small proportion of the site falls within the Kapiti Marine Reserve and is managed by the Department of Conservation.	2009	Robertson et al (2007); Waugh (2009); NZ eBird database; www.birdingnz.net.nz.

Site name	Latitude and longitude	Existing rare and threatened bird values.	Threats	Existing status and levels of protection	Most recent year of survey	Sources
Wairarapa Coast marine area	41°16'03.868"S 176°00'32.180"E	This site provides seasonal or core habitat for Buller's albatross, sooty shearwater, flesh-footed shearwater, Buller's shearwater, fluttering shearwater, little penguin, red-billed gull and white-fronted tern.	Present threats: Some species of seabird are at risk of being caught as by-catch by tuna long-line fishing vessels. Seasonality: Most recorded fisheries mortality occurs in the winter months.	Unprotected New Zealand territorial seas.	2012	Robertson et al (2007); Waugh (2009); NZ eBird database.

The Greater Wellington Regional Council promotes **Quality for Life** by ensuring our environment is protected while meeting the economic, social and cultural needs of the community

For more information contact the Greater Wellington Regional Council:

Wellington office
PO Box 11646
Manners Street
Wellington 6142

T 04 384 5708
F 04 385 6960

Follow the Wellington Regional Council

info@gw.govt.nz
www.gw.govt.nz

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