

Christchurch District Plan Site of Ecological Significance

Site Significance Statement

Site name: Lake Ellesmere/Te Waihora and margins

Site number: SES/E/1

Summary of Significance:

Lake Ellesmere/Te Waihora is the largest coastal lake habitat in New Zealand and is recognised as being internationally significant for its birdlife abundance and diversity, nationally significant for its wetland vegetation and of regional significance for its indigenous fish fauna. It is an originally rare ecosystem and supports very extensive and representative, rare and distinctive freshwater and saltmarsh vegetation communities and representative and distinctive bird and fish assemblages. It provides habitat for an outstanding number of nationally Threatened and At Risk plant, bird and fish species and is a very important habitat for very large numbers of bird species including international and internal migrants, waterfowl and wetland species.

Site Map



Additional Site Information

Ecological District: Ellesmere

Area of SES (ha): 7390.50

Central point (NZTM): E1566050, N5149838

Site Description¹

Lake Ellesmere/Te Waihora is a large brackish, shallow coastal lake approximately 20 km south of Christchurch City on the southern side of Banks Peninsula. The lake is separated from the Pacific Ocean by a shingle barrier, the Kaitorete Spit and is at or near sea level with an average depth of 1.4 metres. The lake bed covers around 20,000 hectares and it is the largest coastal lake habitat in New Zealand, and New Zealand's fifth largest lake by area. A total of thirty seven rivers, streams and artificial drains flow into the lake. Five of these are major waterways: the Selwyn, Irwell, LII and Halswell Rivers and Harts Creek. Groundwater supply is also an important contributor to the lake (Cromarty and Scott 1995).

The average depth of the lake ranges from 2.5 to 4.5 m, and water levels continually change throughout the year because of seasonal changes in rainfall, catchment inputs and evaporation rates, and because of mechanical opening of the lake to the sea. Daily fluctuations occur in response to changes in wind direction. Strong prevailing winds result in the lake waters being permanently turbid (Cromarty and Scott 1995).

Lake Ellesmere/Te Waihora is one of New Zealand's most important wetland systems. The outstanding values of the lake are recognised in a National Water Conservation Order as: habitat for wildlife, indigenous wetland vegetation and fish; and as being of significance in accordance with tikanga Māori in respect of Ngāi Tahu history, mahinga kai and customary fisheries. Internationally Lake Ellesmere/Te Waihora is significant for its birdlife abundance and diversity and nationally for its wetland vegetation (Hughey and Taylor 2009).

The extensive freshwater swamplands which once surrounded Lake Ellesmere/Te Waihora have been almost entirely drained and developed into farmland since European colonisation, and little now remains except for some tiny areas scattered around the lake shoreline at Yarr's Flat, Hart's Creek and Lakeside.

At present, approximately 86% of the lakeshore wetland is estuarine (brackish coastal lagoon). The remaining 14% is freshwater wetland, mostly palustrine swamp, marsh and fen, with small areas of freshwater lacustrine marsh habitats in the vicinity of inflows (ECan 2007). The most abundant wetland vegetation types around Lake Ellesmere/Te Waihora (in order of abundance) and their extent in hectares (in brackets) (Grove et al. 2012) are:

¹ This section relates to the whole of Lake Ellesmere/Te Waihora, not just the part of the lake that is within the Council's administrative boundary.

- Saltmarsh herbfield (2,253)
- Three square reedland (401)
- Marsh ribbonwood shrubland (387)
- Saltmarsh grassland (331)
- Wet pasture (159)
- Sea rush rushland (155)
- *Juncus edgariae* rushland (136)
- Crack willow-dominant forest and treeland (70)
- Grey willow-dominant forest and treeland (70)
- Mixed rushes and sedges (59)
- Raupō reedland (39)
- Oioi restiad rushland (11)
- Harakeke flaxland (9)
- *Bolboschoenus caldwellii* reedland (8)

The dominant submerged plant species are *Ruppia megacarpa* and *Stuckenia pectinata* (Cromarty and Scott 1995).

Extent of Site of Ecological Significance

The site includes all of the lake and its margins that support wetland vegetation communities that are within the Christchurch City boundary. The remainder of Lake Ellesmere/Te Waihora is within Selwyn District. However, it is recommended that that entire lake and its wetland margins are managed as a single site.

Assessment Summary

The Lake Ellesmere/Te Waihora Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous fauna listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below). Under these criteria the site is ecologically significant because it meets the representativeness (criteria 1 and 2), rarity/distinctiveness (criteria 3, 4, 5 and 6), diversity and pattern (criterion 7) and ecological context criteria (criteria 8, 9 and 10).

Assessment against Significance Criteria

Representativeness

1. ***Indigenous vegetation or habitat of indigenous fauna that is representative, typical or characteristic of the natural diversity of the relevant ecological district. This can include degraded examples where they are some of the best remaining examples of their type, or represent all that remains of indigenous biodiversity in some areas.***

The site is significant under this criterion.

It is internationally significant for its birdlife abundance and diversity, nationally significant for its wetland vegetation and of regional significance for its indigenous fish fauna (Hughey and Taylor 2009).

Lake Ellesmere/Te Waihora's margins have been modified, but still contain extensive, diverse and good quality examples of a range of indigenous freshwater and saltmarsh vegetation communities and habitats for indigenous fauna (ECan 2007).

With regard to birds, Lake Ellesmere/Te Waihora is of international significance because of its large size, representative bird communities, populations of threatened species and special wildlife characteristics (Cromarty and Scott 1995, O'Donnell 1985, 2000). It provides habitat for a diverse and highly representative assemblage of wetland and coastal birds. Waterfowl, grebes, pelagic seabirds, cormorants and shags, herons and allies, raptors, rails, arctic waders, native waders, gulls and terns were all recorded during recent surveys between 2006 and 2008 (Crossland et al. *in prep.*) (Appendix 1). A list of the bird species recorded between the Halswell River Mouth and the tip of Kaitorete Spit during formal Council monitoring (Crossland unpubl. data) is provided in Appendix 2.

It also provides habitat for a diverse and representative indigenous fish assemblage comprised of both freshwater and marine species (Appendix 3). Forty seven species of indigenous fish (including 19 indigenous freshwater and estuarine species and 20 marine species) have been recorded from the lake and its tributary system (Jellyman and Smith 2009).

2. *Indigenous vegetation or habitat of indigenous fauna that is a relatively large example of its type within the relevant ecological district.*

The site is significant under this criterion.

At approximately 20,000 ha² it is the largest coastal lake habitat in New Zealand and the only very large area of its type in New Zealand. This habitat type is uncommon in New Zealand, and most brackish coastal lagoons are very small. Lake Ellesmere/Te Waihora is also the fifth largest lake in New Zealand by area (Cromarty and Scott 1995).

Rarity/Distinctiveness

3. *Indigenous vegetation or habitat of indigenous fauna that has been reduced to less than 20% of its former extent in the Region, or relevant land environment, ecological district, or freshwater environment.*

The site is significant under this criterion.

Wetland ecosystems have been reduced to less than 20% of their former extent at the ecological district, regional and freshwater biogeographic unit scales. Ausseil et al. (2008) estimate that wetlands have been reduced to 10.6% of their original extent in the Canterbury Region and 7.0% in the Canterbury freshwater biogeographic unit. ECan (2007) estimate that more than 80% of Lake Ellesmere/Te Waihora's previous wetland extent has been lost since European settlement.

The site is also significant at the Level 4 land environment scale. Indigenous freshwater wetland vegetation on the margins of Lake Ellesmere/Te Waihora are

² There is significant variation in surface area, depending upon water level (Cromarty and Scott 1995)

situated on a Chronically Threatened land environment (I3.3a) where 10-20% indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

4. Indigenous vegetation or habitat of indigenous fauna that supports an indigenous species that is threatened, at risk, or uncommon, nationally or within the relevant ecological district.

The site is significant under this criterion.

It supports an outstanding number of nationally Threatened and At Risk plant, bird and fish species.

Nationally Threatened and At Risk plant species (de Lange et al. 2013) recorded from Lake Ellesmere/Te Waihora (McEwen 1987, ECan 2007) include:

- *Lepilaena bilocularis* (Threatened – Nationally Vulnerable) (McEwen 1987)
- Ladies tress orchid (*Spiranthes novae-zelandiae*) (Threatened – Nationally Vulnerable) (McEwen 1987, ECan 2007)
- Swamp nettle (*Urtica linearifolia*) (At Risk – Declining) (ECan 2007)
- Native musk (*Mimulus repens*) (At Risk – Naturally Uncommon) (McEwen 1987, ECan 2007)
- *Ruppia megacarpa* (At Risk – Naturally Uncommon) (McEwen 1987, Cromarty and Scott 1995)
- *Stuckenia pectinata* (At Risk – Naturally Uncommon) (Cromarty and Scott 1995)

Species that are uncommon within the ecological district include:

- Bladderwort (*Utricularia dichotoma*) (ECan 2007)
- Forked sundew (*Drosera binata*) (ECan 2007)
- *Machaerina rubiginosa* (McEwen 1987, ECan 2007)
- *Schoenoplectus tabernaemontani* (McEwen 1987)
- Square sedge (*Lepidosperma australe*) (McEwen 1987)

Birds

Unless stated otherwise, the following information on bird species that are either Threatened or At Risk nationally, or threatened, at risk or uncommon in the ecological district are sourced from formal Council monitoring (Crossland unpubl. data 2013, 2015 a,b) between the Halswell River Mouth and the tip of Kaitorete Spit.

Nationally Threatened bird species (Robertson et al. 2012) are:

- Black stilt (Threatened - Nationally Critical, threatened and uncommon in the ED)
- Black-billed gull (Threatened - Nationally Critical, and at risk in the ED)
- White heron (Threatened - Nationally Critical, and uncommon at risk in the ED)
- Grey duck (Threatened - Nationally Critical, and threatened and uncommon in the ED)
- Black-fronted tern (Threatened - Nationally Endangered and threatened and uncommon in the ED)

- Australasian bittern (Threatened - Nationally Endangered and threatened and uncommon in the ED) (Hughey and O'Donnell 2009)
- Australasian crested grebe (Threatened - Nationally Vulnerable and at risk and uncommon in the ED)
- Banded dotterel (Threatened - Nationally Vulnerable)
- Caspian tern (Threatened - Nationally Vulnerable, and at risk in the ED)
- Red knot (Threatened - Nationally Vulnerable and uncommon in the ED)
- Pied cormorant (Threatened - Nationally Vulnerable)
- Red-billed gull (Threatened - Nationally Vulnerable)
- Wrybill (Threatened - Nationally Vulnerable, and at risk and uncommon in the ED)

Nationally At Risk (Robertson et al. 2012) bird species³ that use the lake its margins are:

- Eastern bar-tailed godwit (At Risk - Declining)
- New Zealand pied oystercatcher (At Risk - Declining)
- Pied stilt (At Risk - Declining)
- White-fronted tern (At Risk – Declining, and at risk in the ED)
- Black cormorant (At Risk - Naturally Uncommon)
- Royal spoonbill (At Risk - Naturally Uncommon)
- Marsh crake (At Risk – Relict, and at risk and uncommon in the ED) (Hughey and O'Donnell 2009)
- Spotless crake (At Risk – Relict, and at risk and uncommon in the ED) (Hughey and O'Donnell 2009)
- Variable oystercatcher (At Risk - Recovering)

Bird species that occur within the site (Crossland unpubl. data) that are uncommon within the Ellesmere Ecological District (but not nationally Threatened or At Risk) are:

- Asiatic whimbrel
- Curlew sandpiper
- Gull-billed tern
- Pacific golden plover
- Pectoral sandpiper
- Red-necked stint
- Sharp-tailed sandpiper
- Turnstone
- White-winged black tern

Fish

Nationally Threatened and At Risk freshwater fish species (Goodman et al. 2014) recorded from Lake Ellesmere/Te Waihora and diadromous⁴ species that occur in the catchment (Jellyman and Smith 2008) include:

- Lamprey (Threatened - Nationally Vulnerable)

³ Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).

⁴ Includes anadromous, catadromous, 'marginally' catadromous (i.e. inanga) and amphidromous species

- Longfin eel (At Risk - Declining)
- Torrentfish (At Risk - Declining)
- Koaro (At Risk - Declining)
- Inanga (At Risk - Declining)
- Bluegill bully (At Risk - Declining)
- Stokell's smelt (At Risk - Naturally Uncommon)

5. *The site contains indigenous vegetation or an indigenous species at its distribution limit within Canterbury Region or nationally.*

The site is significant under this criterion.

One plant species is at its southern regional distributional limit (and southern limit in eastern South Island):

- Giant umbrella sedge (*Cyperus ustulatus*) (McEwen 1987, ECan 2007)

Three bird species are at their distributional limits at the site (Crossland unpubl. data):

- Curlew sandpiper (southern annual national limit)
- White-winged black tern (southern annual national limit)
- Spotless crane (Lake Ellesmere's shoreline is the southern regional breeding limit)

6. *Indigenous vegetation or an association of indigenous species that is distinctive, of restricted occurrence, occurs within an originally rare ecosystem, or has developed as a result of an unusual environmental factor or combinations of factors.*

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is sufficiently distinctive to have its own ecological district (Ellesmere Ecological District) within the Canterbury Plains Ecological Region (McEwen 1987).

Lake Ellesmere is an example of a coastal lake, or 'Waituna type lagoon' (Kirk and Lauder 2000). These brackish lagoons are uncommon nationally (Cromarty and Scott 1995) and lagoons are identified by Williams et al. (2007) as an originally rare ecosystem.

The wetland communities on the lake margin are also highly distinctive and contain a very high diversity of micro-habitats that have developed as a result of inundation by brackish water and salinity gradients. The lake's margin is also an originally rare ecosystem (Williams et al. 2007).

Lake Ellesmere/Te Waihora's bird assemblages are distinctive internationally (O'Donnell 1985, 2000).

Diversity and Pattern

7. *Indigenous vegetation or habitat of indigenous fauna that contains a high diversity of indigenous ecosystem or habitat types, indigenous taxa, or has changes in species composition reflecting the existence of diverse natural features or ecological gradients.*

The site is significant under this criterion.

It supports a high diversity of indigenous wetland vegetation types and habitats. Sixty-three different vegetation types were described during a survey in 2007 (Grove and Pompei, 2009).

The principal environmental factors controlling the diversity of vegetation communities, habitats and fauna in and around Lake Ellesmere/Te Waihora are lake water levels, water surface area, elevation in relation to inundation, salinity, nutrients, turbidity, dissolved oxygen, lakebed sediment movement and substrate composition (DOC and TRONT 2005).

Lake Ellesmere/Te Waihora supports an outstanding diversity of birds. Including nationally or locally extinct species, at least 202 species (including 186 native species) have been recorded at the lake or in peripheral habitats, or as stragglers along Kaitorete Spit (Crossland unpubl. data 2010) (see the attached checklist in Appendix 4). Species richness is greater than that recorded for any other locality in New Zealand.

The diversity of indigenous fish (including both freshwater and marine species) is also very high. Nineteen species of indigenous freshwater and estuarine fish and 20 marine species have been recorded from the lake and its tributary system (Jellyman and Smith 2008).

Together, Lake Ellesmere/Te Waihora and Kaitorete Spit are part of a distinctive, ecological sequence from coastal dunes systems dominated by pingao, to the indigenous grassland, shrubland and mossfield-cushionfield-stonefield dryland habitats on Kaitorete Spit to the saltmarsh wetland communities on the margin of Te Waihora.

Ecological Context

8. *Vegetation or habitat of indigenous fauna that provides or contributes to an important ecological linkage or network, or provides an important buffering function.*

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is ecologically linked to other areas of high ecological value including its lakeshore wetlands, native dryland and dune vegetation on Kaitorete Spit, its tributaries and plains spring-fed tributary streams.

The lake and its wetlands are a critical part of an ecological network of river mouths, estuaries and coastal lagoons along the South Island's east coast that

provide a network of habitats for large numbers of indigenous bird species including international and internal migrants, waterfowl and wetland species.

Wetland communities on the margins of the lake also provide an important role in buffering the lake from external influences, the most important of which is excessive nutrient inputs from surrounding land.

Sixteen of the fish species recorded from the lake are diadromous (require access to the sea at some stage of their life history) (Jellyman and Smith 2008). The connection between the lake and sea is very important for these species.

9. A wetland which plays an important hydrological, biological or ecological role in the natural functioning of a river or coastal system.

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is of special value in maintaining the genetic and ecological diversity of the region because of its large size, diversity of microhabitats and very high species richness (Cromarty and Scott 1995). As for criterion 8, the wetland communities on the margins of the lake provide an important role in buffering the lake's shallow water ecosystem from external influences such as excessive nutrient inputs and sedimentation.

10. Indigenous vegetation or habitat of indigenous fauna that provides important habitat (including refuges from predation, or key habitat for feeding, breeding, or resting) for indigenous species, either seasonally or permanently.

The site is significant under this criterion.

Lake Ellesmere/Te Waihora is an internationally significant wildlife habitat (Hughey and Taylor 2009) and it is recognised as an outstanding wildlife habitat in the National Water Conservation Order (1990).

The lake and associated wetlands is of international significance for birds (Hughey and Taylor 2009). It is often recognised as New Zealand's single most important habitat for wetland birds based on species richness and the numbers of birds it supports. It has the greatest species richness known for any locality in New Zealand (O'Donnell 1985, Cromarty and Scott 1996). A maximum of 93,000 wetland birds have been recorded at the site (O'Donnell 2000). This would appear to be the highest verified total of birds recorded from any New Zealand wetland (*In: Crossland et al. in prep*).

The site provides key feeding, breeding, moulting, post-breeding flocking and migration staging habitat for a large number of indigenous bird species, both seasonally and permanently, including during critical stages in their biological cycles. For example Lake Ellesmere is recognised as the most important staging site for Wrybill in the South Island (O'Donnell 1985, Dowding and Moore 2006, Crossland et al. 2012). The lake supports the largest breeding colony of royal spoonbills in New Zealand (134 nests were counted during the 2013/2014 breeding season) (Thompson and Schweigman 2014). It also provides wintering habitat for migratory shorebirds from the Arctic (during the New Zealand summer) and nationally important wintering habitat for waders (Cromarty and Scott 1995).

The lake supports a sizeable proportion of the New Zealand populations of at least 17 species of waterfowl, including two species of herons, six species of swans, geese and ducks, five species of international migratory shorebirds, four species of indigenous shorebirds and one endemic species of gull (O'Donnell 1985, Cromarty and Scott 1995).

Lake Ellesmere/Te Waihora is of regional significance for indigenous fish (Hughey and Taylor 2009). Forty seven species of indigenous fish have been recorded from the lake and its tributary system (including both freshwater and marine species) (Jellyman and Smith 2008).

Site Management

Existing Protection Status

Within the Christchurch City boundary the lake bed and its margins are owned or administered by:

- Environment Canterbury
- Christchurch City Council
- Department of Conservation
- Private land owners

Within this area parts of the lake and its margins are protected as reserves or covenants. Important protected areas are:

- Kaitorete Spit Reserve (Christchurch City Council)
- Lakelands Wildlife Reserve (conservation unit M36185) (DOC)
- Motukarara Rail Trail Conservation Area (conservation unit M36151) (DOC)
- Kaitorete Spit Conservation Area (conservation unit M36486) (DOC)
- Waihora Scientific Reserve (conservation unit M37010) (DOC)
- QEII covenant (covenant number 5-11-053)
- Kaitorete Spit Reserves (Environment Canterbury)

Site Management

The importance of Lake Ellesmere/Te Waihora is recognised in a National Water Conservation Order, which lists the lakes outstanding features as wildlife habitat, habitat for indigenous wetland vegetation and fish, and significance in relation to tikanga Māori in respect of Ngāi Tahu history, mahinga kai and customary fisheries. All regional policy statements, regional plans and district plans must be consistent with the provisions of the Water Conservation Order. A significant amount of lake margin land, approximately 35%, is administered by the Department of Conservation and, under the Ngāi Tahu Claims Settlement Act 1998, ownership of the non-DOC administered crown-owned lake bed was returned to Te Rūnanga o Ngāi Tahu. All of these lands are managed under the Te Waihora Joint Management Plan prepared by Te Rūnanga o Ngāi Tahu and the Department of Conservation⁵. The catchment for the lake is large and activities throughout the catchment may impact on the lake and

⁵ In addition to the Te Waihora Joint Management Plan (DOC and TRONT 2005) there are a large number of other management plans that guide the management of specific areas, reserves, resources and species within the site.

its tributaries. Many organisations play an important role in the governance and management of Te Waihora and its catchment. These include organisations with a statutory role (namely, Environment Canterbury, Selwyn District Council, Christchurch City Council, Department of Conservation, Ministry for Primary Industries, Fish & Game NZ, and Te Rūnanga o Ngāi Tahu), non-statutory organisations, and a range of interest groups whose views are taken into consideration (Hughey and Taylor 2009).

Because of the importance and size of Lake Ellesmere/Te Waihora and the number of agencies, organisations and stakeholders involved in its management, a co-ordinated approach to management of the site is crucial. It is therefore important that the area of Lake Ellesmere/Te Waihora that is within Christchurch City administrative boundary is not managed in isolation from the remainder of the site. It is recommended that the Council ensure that the other relevant agencies, organisations and stakeholders are informed of the identification of the area within the Christchurch City boundary as a Site of Ecological Significance.

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PLEASE NOTE THIS STATEMENT IS BASED ON INFORMATION AVAILABLE AT THE TIME OF WRITING. DUE TO THE DYNAMIC NATURE OF ECOSYSTEMS, FUTURE REASSESSMENT OF THE SITE MAY BE NECESSARY TO REFLECT ANY CHANGES IN KNOWLEDGE OF ITS ECOLOGICAL SIGNIFICANCE.

Appendix 1: Bird Species Groups Recorded at Lake Ellesmere/Te Waihora, February 2006, 2007 and 2008.

Source: Crossland et al. (in prep.)

Species Group	2006	2007	2008
Waterfowl	29,831	32,278	29,121
Grebes	5	11	6
Pelagic seabirds	1	0	0
Cormorants and shags	265	300	109
Hérons and allies	243	316	248
Raptors	58	31	18
Rails	28	11	23
Arctic waders	539	293	208
Native waders	5,181	4,948	7,459
Gulls	2,285	1,536	1,826
Terns	290	193	156
Total	38,726	39,917	39,175

Appendix 2: Bird Species List

Bird species recorded between the Halswell River Mouth and the tip of Kaitorete Spit during formal Council monitoring (Source: Crossland unpubl. data n.d. a,b,c).

* denotes introduced species

Species
Asiatic whimbrel
Australasian crested grebe
Australasian harrier
Banded dotterel
Bar-tailed godwit
Black cormorant
Black stilt
Black swan
Black-backed gull
Black-billed gull
Black-fronted tern
*Canada goose
Caspian tern
Chestnut-breasted shelduck
Common greenshank
Common tern
Curlew sandpiper
*Feral goose
Grey duck
Grey teal
Gull-billed tern
Little cormorant
Little egret
Little tern
*Mallard/grey duck
*Mute swan
New Zealand dotterel
New Zealand kingfisher
New Zealand pied oystercatcher
New Zealand scaup
New Zealand shoveler
Pacific golden plover
Paradise shelduck
Pectoral sandpiper
Pied cormorant
Pied stilt
Pukeko
Red knot
Red-billed gull
Red-necked stint

Royal spoonbill
Sanderling
Sharp-tailed sandpiper
Spotted shag
Spur-winged plover
Turnstone
Variable oystercatcher
Welcome swallow
White heron
White-faced heron
White-fronted tern
White-winged black tern
Wrybill

Appendix 3: Fish Species Recorded from Lake Ellesmere/Te Waihora, and the Selwyn District Council

Source: Jellyman and Smith (2009)

* denotes introduced species

Species	Lake Ellesmere (T), Selwyn Catchment (S)
Freshwater/estuarine species	T,S
Yelloweye mullet	T,S
Shortfin eel	T,S
Longfin eel	T,S
*Goldfish	T,S
Torrentfish	T,S
Giant kokopu?	?
Koaro	T
Banded kokopu	T
Inanga	T,S
Canterbury galaxias	S
Lamprey	T,S
Upland bully	S
Common bully	T,S
Giant bully	T,S
Estuarine triplefin	T
Canterbury mudfish	S
Common smelt	T,S
Stokells smelt	T
Black flounder	T
Koura	S
*Perch	T,S
*Brook char	S
*Brown Trout	T,S
*Rudd	T
*Catfish	T
*Tench	T
*Chinook salmon	T
Marine species	
Kahawai	T
Yellowbelly flounder	T
Sand flounder	T
Greenback flounder	T
Common sole	T
Sprat	T
Hake	T
Sand stargazer	T
Estuarine stargazer	T
Sand eel	T
Red cod	T

Basking shark	T
Rig	T
Elephant fish	T
Spiny dogfish	T
Skate	T
Globefish	T
Spotty	T
Warehou	T
Red gurnard	T
Sand eel	T
Red cod	T

Appendix 4: Checklist of Lake Ellesmere Bird Species

This list includes all bird species that have been recorded at the lake or in peripheral habitats, or as stragglers along Kaitorete Spit and species that are now nationally or locally extinct.

Sourced from Crossland unpubl. data (2010).

Species	Origin	Status	Breeding
Australasian Crested Grebe (NZ) <i>Podiceps cristatus australis</i>	NZ	RS	B
New Zealand Dabchick (NZ) <i>Poliiocephalus rufpectus</i>	NZ	Ex	
Snowy Albatross (O) <i>Diomedea exulans.</i>			
Gibson's Albatross (NZ) <i>Diomedea gibsoni.</i>			
Antipodean Albatross (NZ) <i>Diomedea antipodensis.</i>			
Northern Royal Albatross (NZ) <i>Diomedea sanfordi.</i>			
Southern Royal Albatross (NZ) <i>Diomedea epomophora</i>			
Campbell Albatross (Mollymawk) (NZ) <i>Diomedea melanophrys impavida</i>			
Black-browed Albatross (Mollymawk) (NZ) <i>Diomedea melanophrys melanophrys</i>			
Salvin's Albatross (Mollymawk) (NZ) <i>Thalassarche salvini</i>			
White-capped Albatross (Mollymawk) (NZ) <i>Thalassarche steadi</i>			
Buller's Albatross (Mollymawk) (NZ) <i>Thalassarche bulleri</i>			
Light-mantled Sooty Albatross (NZ) <i>Phoebetria palpebrata</i>			
Northern Giant Petrel (NZ) <i>Macronectes halli</i>			
Southern Giant Petrel (O) <i>Macronectes giganteus</i>			
Buller's Shearwater (NZ) <i>Puffinus bulleri</i>			
Sooty Shearwater (NZ) <i>Puffinus grieseus</i>	NZ	RV*	
Short-tailed Shearwater (Au) <i>Puffinus tenuirostris</i>			
Flesh-footed Shearwater (NZ) <i>Puffinus carneipes</i>			
Fluttering Shearwater (NZ) <i>Puffinus gavia</i>			
Hutton's Shearwater (NZ) <i>Puffinus huttoni</i>			
Common Diving Petrel (NZ) <i>Pelecanoides urinatrix urinatrix</i>			
White-chinned Petrel (NZ) <i>Procellaria aequinoctialis</i>			

Westland Petrel (NZ) <i>Procellaria westlandica</i>			
Kerguelen Petrel (O) <i>Lugensa brevirostris</i>			
Antarctic Fulmar (O) <i>Fulmarus glacialisoides</i>	O	V*	
Snares Cape Petrel (NZ) <i>Daption capense australe</i>			
Southern Cape Petrel (O) <i>Daption capense capense</i>			
Blue Petrel (O) <i>Halobaena caerulea</i>			
Fairy Prion (NZ) <i>Pachyptila turtur</i>			
Fulmar Prion (NZ) <i>Pachyptila crassirostris</i>			
Fulmar Prion (NZ) <i>Pachyptila crassirostris</i>			
Broad-billed Prion (NZ) <i>Pachyptila vittata</i>	NZ	V*	
Thin-billed Prion (NZ) <i>Pachyptila belcheri</i>			
Thin-billed Prion (NZ) <i>Pachyptila belcheri</i>			
Salvin's Prion (NZ) <i>Pachyptila salvini</i>			
Salvin's Prion (NZ) <i>Pachyptila salvini</i>			
Mottled Petrel (NZ) <i>Pterodroma inexpectata</i>			
Mottled Petrel (NZ) <i>Pterodroma inexpectata</i>			
Black-winged Petrel (NZ) <i>Pterodroma nigripennis</i>			
Black-winged Petrel (NZ) <i>Pterodroma nigripennis</i>			
White-headed Petrel (NZ) <i>Pterodroma lessonii</i>			
White-headed Petrel (NZ) <i>Pterodroma lessonii</i>			
Grey-faced Petrel (NZ) <i>Pterodroma macroptera</i>			
Grey-faced Petrel (NZ) <i>Pterodroma macroptera</i>			
Grey-backed Storm Petrel (NZ) <i>Oceanites nereis</i>			
Grey-backed Storm Petrel (NZ) <i>Oceanites nereis</i>			
White-faced Storm Petrel (NZ) <i>Pelagodroma marina</i>			
White-faced Storm Petrel (NZ) <i>Pelagodroma marina</i>			
Wilson's Storm Petrel (NZ) <i>Oceanites oceanicus</i>			
Wilson's Storm Petrel (NZ) <i>Oceanites oceanicus</i>			
Yellow-eyed Penguin (NZ) <i>Megadyptes antipodes</i>	NZ	lr	
Little Blue Penguin (NZ)	NZ	lr	

<i>Eudyptula minor</i> sub.sp.			
White-flippered Penguin (NZ) <i>Eudyptula minor albosignata</i>	NZ	RV	
Eastern Rockhopper Penguin (NZ) <i>Eudyptes chrysocome filholi</i>	NZ	V	
Fiordland Crested Penguin (NZ) <i>Eudyptes pachyrhynchus</i>	NZ	V	
Erect-crested Penguin (NZ) <i>Eudyptes sclateri</i>	NZ	V	
Australian Pelican (Au) <i>Pelecanus conspicillatus conspicillatus</i>	Au	V	
Australasian Gannet (NZ) <i>Morus serrator</i>	NZ	S*	
Brown Booby (P) <i>Sula leucogaster</i>	O	V	
Black Cormorant (NZ) <i>Phalacrocorax carbo novaehollandiae</i>	NZ	RS	B
Pied Cormorant (NZ) <i>Phalacrocorax varius varius</i>	NZ	RV	
Little Black Cormorant (NZ) <i>Phalacrocorax sulcirostris</i>	NZ	V	
Little Cormorant (NZ) <i>Phalacrocorax melanoleucos brevirostris</i>	NZ	RS	B
Spotted Shag (NZ) <i>Stictocarbo punctatus punctatus</i>	NZ	RV	
Stewart Island Shag (NZ) <i>Leucocarbo carunculatus</i>	NZ	V	
White-faced Heron (NZ) <i>Ardea novaehollandiae novaehollandiae</i>	NZ	RS	B
White Heron (NZ) <i>Egretta alba modesta</i>	NZ	S	
Intermediate Egret (Au) <i>Egretta intermedia</i>	Au	V	
Little Egret (Au) <i>Egretta garzetta</i>	Au	Ir	
Reef Heron (NZ) <i>Egretta sacra sacra</i>	NZ	V	
Cattle Egret (Au) <i>Bubulcus ibis coromandus</i>	Au	S	
Nankeen Night Heron (NZ) <i>Nycticorax caledonicus</i>	NZ/Au	V	
Australasian Bittern (NZ) <i>Botaurus poiciloptilus</i>	NZ	RS	B
Glossy Ibis (Au) <i>Plegadis falcinellus</i>	Au	S	
Australian White Ibis (Au) <i>Threskiornis molucca</i>	Au	V	
Royal Spoonbill (NZ) <i>Platalea regia</i>	NZ	RS	
Mute Swan (I) <i>Cygnus olor</i>	I	R	B
Black Swan (NZ) <i>Cygnus atratus</i>	NZ	RS	B
Canada Goose (I) <i>Branta canadensis maxima</i>	I	RS	B
Greylag (Feral) Goose <i>Anser anser</i>	I	R	B
Cape Barren Goose (I) <i>Cereopsis novaehollandiae</i>	I	V	

Paradise Shelduck (NZ) <i>Tadorna variegata</i>	NZ	RS	B
Chestnut-breasted Shelduck (NZ) <i>Tadorna tadornoides</i>	NZ/Au	Ir	
Mallard (I) <i>Anas platyrhynchos platyrhynchos</i>	I	RS	B
Grey Duck (NZ) <i>Anas superciliosa superciliosa</i>	NZ	RS	B
Grey Teal (NZ) <i>Anas gracilis</i>	NZ	RS	B
Brown Teal (NZ) <i>Anas aucklandica chlorotis</i>	NZ	Ex	
New Zealand Shoveler (NZ) <i>Anas rhynchotis variegata</i>	NZ	RS	B
New Zealand Scaup (NZ) <i>Aythya novaeseelandiae</i>	NZ	RS	B
White-eyed Duck (Au) <i>Aythya australis</i>	NZ/Au	V	
Australasian Harrier (NZ) <i>Circus approximans</i>	NZ	RS	B
New Zealand Falcon (NZ) <i>Falco novaeseelandiae</i>	NZ	V	
Nankeen Kestrel (Au) <i>Falco cenchroides cenchroides</i>	Au	V	
California Quail (I) <i>Callipepla californica brunnescens</i>	I	R	B
Red-legged Partridge (I) <i>Alectoris rufa</i>	I	Ex	
Grey Partridge (I) <i>Perdix perdix</i>	I	Ex	
Ring-necked Pheasant (I) <i>Phasianus colchicus</i>	I	R	B
New Zealand Quail (NZ) <i>Cortunix novaezelandiae novaezelandiae</i>	NZ	Ex	
Feral Chicken (I) <i>Gallus gallus</i>	I	R	
Banded Rail (NZ) <i>Rallus philippensis assimilis</i>	NZ	Ex	
Buff Weka (NZ) <i>Gallirallus australis hectori</i>	NZ	Ex	
Spotless Crake (NZ) <i>Porzana tabuensis plumbea</i>	NZ	R	B
Ballion's Crake (NZ) <i>Porzana pusilla affinis</i>	NZ	RS	B
Purple Swamphen (NZ) <i>Porphyrio porphyrio melanotus</i>	NZ	RS	B
Australasian Coot <i>Fulica atra australis</i>	NZ	V	
Australian Painted Snipe (Au) <i>Rostratula australis</i>	Au	V	
South Island Pied Oystercatcher (NZ) <i>Haematopus ostralegus finschi</i>	NZ	RS	B
Variable Oystercatcher <i>Haematopus unicolor</i>	NZ	RV	
Pied Stilt (NZ) <i>Himantopus himantopus leucocephalus</i>	NZ	RS	B
Black Stilt (NZ) <i>Himantopus novaezelandiae</i>	NZ	S	
Red-necked Avocet (NZ- formerly)	NZ/Au	Ex	

<i>Recurvirostra novaehollandiae</i>			
Oriental Pratincole (M) <i>Glareola maldivarum</i>	NH	V	
New Zealand Plover (NZ) <i>Charadrius obscurus</i>	NZ	V	
Double-banded Plover (NZ) <i>Charadrius bicinctus bicinctus</i>	NZ	RS	B
Red-capped Dotterel (Au) <i>Charadrius ruficapillus</i>	NZ/Au	V	
Black-fronted Dotterel (NZ) <i>Charadrius melanops</i>	NZ	S	
Large Sand Plover (M) <i>Charadrius leschenaultii</i>	NH	V	
Mongolian Plover (M) <i>Charadrius mongolus</i>	NH	V	
Oriental Plover (M) <i>Charadrius veredus</i>	NH	V	
Wrybill (NZ) <i>Anarhynchus frontalis</i>	NZ	S	
Pacific Golden Plover (M) <i>Pluvialis fulva</i>	NH	S	
Masked Lapwing <i>Vanellus miles novaehollandiae</i>	NZ	RS	B
Turnstone (M) <i>Arenaria interpres</i>	NH	S	
Japanese Snipe (M) <i>Gallinago hardwickii</i>	NH	V	
Red Knot (M) <i>Calidris canutus canutus</i>	NH	S	
Great Knot (M) <i>Calidris tenuirostris</i>	NH	V	
Sanderling (M) <i>Calidris alba</i>	NH	V	
Stilt Sandpiper (M) <i>Calidris himantopus</i>	NH	V	
Curlew Sandpiper (M) <i>Calidris ferruginea</i>	NH	S	
Sharp-tailed Sandpiper (M) <i>Calidris acuminata</i>	NH	S	
Pectoral Sandpiper (M) <i>Calidris melanotos</i>	NH	S	
Red-necked Stint (M) <i>Calidris rufficollis</i>	NH	S	
Little Stint (M) <i>Calidris minuta</i>	NH	V	
Long-toed Stint (M) <i>Calidris subminuta</i>	NH	V	
Eastern Curlew (M) <i>Numenius madagascariensis</i>	NH	Ir	
Asiatic Whimbrel (M) <i>Numenius phaeopus variegatus</i>	NH	V	
American Whimbrel (M) <i>Numenius hudsonicus</i>		??	
American Whimbrel (M) <i>Numenius hudsonicus</i>		??	
Little Whimbrel (M) <i>Numenius minutus</i>	NH	V	
Eastern Bar-tailed Godwit (M) <i>Limosa lapponica baueri</i>	NH	S	

Asiatic Black-tailed Godwit (M) <i>Limosa limosa melanuroides</i>	NH	Ir	
Hudsonian Godwit (M) <i>Limosa haemastica</i>	NH	Ir	
Alaskan Tattler (M) <i>Tringa incana</i>		??	
Alaskan Tattler (M) <i>Tringa incana</i>		??	
Siberian Tattler (M) <i>Tringa brevipes</i>	NH	V	
Common Greenshank (M) <i>Tringa nebularia</i>	NH	V	
Marsh Sandpiper (M) <i>tringa stagnatilis</i>	NH	V	
Lesser Yellowlegs (M) <i>Tringa flavipes</i>	NH	V	
Terek Sandpiper (M) <i>Tringa terek</i>	NH	V	
Eastern Broad-billed Sandpiper (M) <i>Limicola falcinellus sibiricus</i>	NH	V	
Ruff (M) <i>Philomachus pugnax</i>	NH	V	
Grey Phalarope (M) <i>Phalaropus fulicarius</i>	NH	V	
Red-necked Phalarope (M) <i>Phalaropus lobatus</i>	NH	V	
Wilson's Phalarope (M) <i>Phalaropus tricolor</i>	NH	V	
Brown (Sub-Antarctic) Skua (NZ) <i>Catharacta skua lonnbergi</i>	NZ	V	
South Polar Skua (O) <i>Catharacta maccormicki</i>	O	V	
Arctic Skua (M) <i>Stercorarius parasiticus</i>	NH	S	
Pomarine Skua (M) <i>Stercorarius pomarinus</i>	NH	S	
Long-tailed Skua (M) <i>Stercorarius longicaudus</i>	NH	V	????
Black-backed Gull (NZ) <i>Larus dominicanus dominicanus</i>	NZ	RS	B
Red-billed Gull (NZ) <i>Larus scopulinus</i>	NZ	RS	
Black-billed Gull (NZ) <i>Larus bulleri</i>	NZ	S	
White-winged Black Tern (M) <i>Chlidonias leucopterus</i>	NH	S	
Black-fronted Tern (NZ) <i>Sterna albobriata</i>	NZ	S	
Caspian Tern (NZ) <i>Sterna caspia</i>	NZ	RS	B
White-fronted Tern (NZ) <i>Sterna striata</i>	NZ	RS	B
Fairy Tern (NZ) <i>Sterna nereis davisae</i>	NZ	Ex	
Eastern Little Tern (NZ) <i>Sterna albifrons sinensis</i>	NH	Ir	
New Zealand Pigeon (NZ) <i>Hemiphaga novaeseelandiae novaeseelandiae</i>	NZ	V	
Feral Rock Pigeon (I)	I	R	B

<i>Columba livia</i>			
Sulphur-crested Cockatoo (I) <i>Cacatua galerita</i>	I	R	B
South Island Kaka (NZ) <i>Nestor meridionalis meridionalis</i>	Ex		
Red-crowned Parakeet (NZ) <i>Cyanoramphus novaezelandiae novaezelandiae</i>	Ex		
Yellow-crowned Parakeet (NZ) <i>Cyanoramphus auriceps auriceps</i>	Ex		
Shining Cuckoo (NZ) <i>Chrysococcyx lucidus lucidus</i>	NZ	S	B
Long-tailed Cuckoo (NZ) <i>Eudynamys taitensis</i>	NZ	V	
Morepork (NZ) <i>Ninox novaeseelandiae novaeseelandiae</i>	NZ	Ex	
Little Owl (NZ) <i>Athene noctua</i>	I	R	B
New Zealand Kingfisher (NZ) <i>Halcyon sancta vagans</i>	NZ	RS	B
Skylark (I) <i>Alauda arvensis</i>	I	RS	B
Welcome Swallow (NZ) <i>Hirundo tahitica neoxena</i>	NZ	RS	B
New Zealand Pipit (NZ) <i>Anthus novaeseelandiae novaeseelandiae</i>	NZ	RS	B
Black-faced Cuckoo-shrike (Au) <i>Coracina novaehollandiae</i>	Au	V	
Dunnock (I) <i>Prunella modularis</i>	I	R	B
Blackbird (I) <i>Turdus merula</i>	I	RS	B
Song Thrush (I) <i>Turdus philomelos</i>	I	RS	B
South Island Fernbird (NZ) <i>Bowdleria punctata punctata</i>	Ex		
Grey Warbler (NZ) <i>Gerygone igata</i>	NZ	RS	B
South Island Fantail (NZ) <i>Rhipidura fuliginosa fuliginosa</i>	NZ	RS	B
Silvereye (NZ) <i>Zosterops lateralis lateralis</i>	NZ	RS	B
Bellbird (NZ) <i>Anthornis melanura melanura</i>	NZ	S	
Yellowhammer (I) <i>Emberiza citrinella</i>	I	RS	B
Cirl Bunting (I) <i>Emberiza cirlus</i>	I	S	
Chaffinch (I) <i>Fringilla coelebs</i>	I	RS	B
Greenfinch (I) <i>Carduelis chloris</i>	I	RS	B
Goldfinch (I) <i>Carduelis carduelis</i>	I	RS	B
Redpoll (I) <i>Carduelis flammea</i>	I	RS	B
House Sparrow (I) <i>Passer domesticus</i>	I	RS	B
Starling (I) <i>Sturnus vulgaris</i>	I	RS	B

White-backed Australian Magpie (I) <i>Gymnorhina tibicen hypoleuca</i>	I	RS	B
Rook (I) <i>Corvus frugilegus</i>	I	V	