

Christchurch District Plan Site of Ecological Significance

Site Significance Statement

Site name: Kaitorete Spit

Site number: SES/E/2

Physical address of site: Kaitorete Spit, Birdlings Flat

Summary of Significance:

This site is significant because it contains highly representative and distinctive dune communities and representative and rare dryland grassland and shrubland communities that are large examples of their type and occur almost entirely on an Acutely Threatened land environment. There are also four originally rare ecosystems within the site. The vegetation communities and habitats support an outstanding number of indigenous plants, birds, lizards and terrestrial invertebrates that are either nationally Threatened, At Risk, uncommon within the ecological district or endemic to the Spit, as well as several plants and invertebrates that are at their distributional limits. It provides important habitat for indigenous birds, lizards and terrestrial invertebrates. The site contains an ecological sequence from the intact coastal dunes to semi-natural grasslands and the internationally significant Lake Ellesmere/Te Waihora. Being a barrier spit it is topographically well buffered by the sea and Lake Ellesmere/Te Waihora.

Site Map:



Additional Site Information

Ecological District: Ellesmere

Area of SES (ha): 4259.89

Central point NZTM: E1562274, N5146467

Site Description

Kaitorete Spit is a mixed sand and gravel barrier that lies immediately to the west of Banks Peninsula and separates Te Waihora (Lake Ellesmere) from the Pacific Ocean. The spit is a depositional barrier bar formed by the longshore drift of river gravels originating from the Rakaia River. It is approximately 27 kms long, and tapers from a width of 5 kms at its eastern end to 250 m at its western end (Davis 2002). It covers an area of approximately 4,855 ha. The spit is within the Ellesmere Ecological District.

The coastal margin is characterised by a shingle beach, an extensive fore- and back dune ecosystem and sand flats. The dunes themselves are generally 3-5 m above sea level and decrease in size to the east. The tallest dunes are up to 15m in height. The active dune system is comprised of active foredunes and more stable inner dunes and there is an older system of deflating dunes about 100m inland of the active dunes (Davis 2002).

Beyond the dunes are substantial areas of extensively grazed semi-natural dryland grassland dominated by danthonia (*Rytidosperma*) with bracken fernland, tussockland, mossfield, cushionfield, stonefield and shrubland as well as some developed pasture and cultivated fields that extend to Te Waihora. These communities contain a high diversity of native plant species including a high number of nationally Threatened, At Risk species and endemic species.

Overall, Kaitorete Spit is recognised as having nationally significant ecological values and is considered to be a national priority for conservation (e.g. Johnson 1992, Davis 2002). There is nowhere else in New Zealand where there is a sequence of coastal dunes dominated by pingao, through semi-natural indigenous grassland to a wetland of international importance.

Extent of Site of Ecological Significance

The site includes the shingle beach above mean high water springs along the entire length of the spit and the dune ecosystem behind it which is comprised of active fore-dunes, deflation hollows, and the more stable inner dunes and sand flats. It also includes the un-cultivated semi-natural dryland grassland communities and other associated indigenous vegetation communities such as shrublands (including the extensive area of *Muehlenbeckia astonii* shrubland), bracken fernland, mossfields, cushionfields and stonefields.

The inland boundary of the site adjoins the Lake Ellesmere/Te Waihora and Margins site (SES/E/1). The boundary between the two sites is the well defined boundary between the lake margin wetlands and the dryland vegetation communities.

Developed and cultivated paddocks towards the eastern end of the spit, north of Jones and Bayleys Roads and on the Bayley's property near the western end of the spit (west of the residential dwelling) do not contain significant ecological features or values and are not part of the site.

Dwellings and associated garden areas, farm sheds and other buildings, the utility areas surrounding these buildings and existing exotic tree plantations are also excluded from the site.

Assessment Summary

The Kaitorete Spit Site has been evaluated against the criteria for determining significant indigenous vegetation and significant habitat of indigenous biodiversity listed in Appendix 3 of the Canterbury Regional Policy Statement (Environment Canterbury, 2013) (see below) referring also to the Wildland Consultants (2013) Guidelines and advice from the relevant Specialist Ecologist Groups. 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.

The coastal dunes are highly representative of the composition and structure of these communities at the 1840 baseline and have one of the best examples of pingao dominated dune systems in New Zealand (Johnson 1992). Pingao is the dominant vegetation on the dunes as exotic marram grass has now been contained to just a few sites along the spit (Jensen 2007). The relatively intact dune communities support a number of Threatened and At Risk and endemic plant, lizard and invertebrate species.

The strand line is occupied by only a few species. These include pingao seedlings (*Desmoschoenus spiralis*), sand sedge (*Carex pumila*), shore bindweed (*Calystegia soldanella*) and exotics such as saltwort (*Salsola kali*) and sea rocket (*Cakile edentula*) (Davis 2002).

The foredunes are dominated by extensive pingao, with haretail, shore bindweed, catsear and some sand sedge. Threatened species such as sand tussock (*Poa billardierei*) and a woolly head (*Craspedia* "Kaitorete") are less

common. In deflation hollows vegetation is sparse and comprises scabweed (*Raoulia australis*), catsear, sheep's sorrel, haretail, scattered pingao, silver tussock (*Poa cita*) and the small grass *Zoysia minima*.

The rear-dunes are more stable and dominated by pohuehue (*Muehlenbeckia complexa*) and *Carmichaelia appressa*. Scattered pingao is present along with species such as shore bindweed, catseye and sorrel. (Davis 2002).

Beyond the dunes are substantial areas of semi-natural grassland. Although the dominant grasses are introduced species such as *Rytidosperma caespitosa* and *Austrostipa nodosa* the grasslands are a mosaic of cushionfield, mossfield and stonefield vegetation. The cover of indigenous mossfields is particularly high in places. The dryland communities contain a relatively high diversity of indigenous plants including several indigenous moss species, *Crassula siberiana*, *Raoulia australis*, *R. monroi* *Melicytus alpinus*, *Carmichaelia appressa*, *Muehlenbeckia complexa*, *M. axillaris* (on stony ridges) *M. astonii*, matagouri and bracken. The pre-european vegetation of the grasslands would have been structurally similar to the existing vegetation but there would have been more silver tussock, native *Rytidosperma* species and matagouri (Burrows, 1969). Although modified by grazing and the presence of introduced plant species, the dryland communities are the best and largest remaining example of grassland, cushionfield, mossfield and stonefield communities on dryland stony/recent soils in Canterbury.

The stony beach ridges at the eastern end of Kaitorete Spit are the only known example of this ecosystem type in Canterbury (the only other known example in the South Island is at Rarangi in Marlborough) (Landcare Research website). Although the beach ridges within the site have been degraded by grazing and the presence of introduced plant species, in conjunction with similar connected areas in the Birdlings Flat Shrublands Site, they are one the best examples of stony beach ridge vegetation in New Zealand and are highly representative.

The lizard fauna of the spit is representative. Four of the five lizard species known to occur on Banks Peninsula occur within the site (Lettink 2004, Lettink et al. 2008)).

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.

The sand dunes support the largest continuous population of pingao in New Zealand (Courtney 1983).

Kaitorete Spit supports by far the largest area of dry grassland communities that support indigenous vegetation on this land environment in the Ellesmere Ecological District and the largest area in the Canterbury Region. Other examples are either very limited in extent or are highly fragmented.

The site supports the largest population of *Muehlenbeckia astonii* (Threatened - Nationally Endangered) in New Zealand (Wardle 1999, Dutton 2007).

Including Birdlings Flat, the site has the largest coastal shrubland in Canterbury (Lettink 2013) (and is the only known example of stony beach ridges in the ecological district and the Canterbury Region).

The site supports the largest population of the small grass *Zoysia minima* in New Zealand (Davis 2002).

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 entire site meets this criterion at the Level IV land environment scale.

The vast majority of Kaitorete Spit is on an Acutely Threatened land environment (J2.1b) where only 2.5% indigenous vegetation is left on this land environment nationally. Minor areas along the inland margin of the spit and in the vicinity of Birdlings Flat are on a Chronically Threatened land environment (J2.1d) where 10.4 % indigenous vegetation is left on this land environment nationally (Walker et al. 2007).

There are coastal shrublands on shingle beach ridges at the eastern end of the site. Coastal shrublands are likely to have been reduced to less than 20% of their former extent in the Region and the ecological district. There are very few intact coastal shrublands remaining on Banks Peninsula (Lettink 2013).

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 a large number of indigenous species, including plants, birds, lizards and terrestrial invertebrates that are either nationally Threatened, At Risk, uncommon nationally and/or within the Ellesmere Ecological District or endemic to Kaitorete Spit. These species are listed below.

Plants

Nationally Threatened, At Risk (de Lange et al. 2013) and uncommon plant species recorded from the site are:

- *Muehlenbeckia astonii* (Threatened - Nationally Endangered) - shrublands, largely on private farmland are the national stronghold for this species (Wardle 1999, Dutton 2007). 3,411 plants were recorded on the spit in 2007 (Dutton 2007).
- *Craspedia* (c) CHR 529115; Kaitorete) (Nationally Endangered) (and endemic to Kaitorete Spit) – confined to stable deflation hollows (Jensen and Donoghue 2003)
- *Geranium retrorsum* (Threatened-Nationally Vulnerable) – occurs in dryland grasslands (Jensen unpubl. data 2015, Canterbury Botanical Society 2014)
- *Daucus glochidiatus* (Nationally Vulnerable) – occurs in shrubland and grassland habitats on the Spit (Canterbury Botanical Society 2014).
- Pingao (*Ficinia spiralis*) (At Risk - Declining) – the population on the dunes is the largest continuous population in New Zealand (Courtney 1983)

- *Carmichaelia corrugata* (Declining) (and uncommon on Kaitorete Spit)
- *Muehlenbeckia ephedroides* (At Risk - Declining) – occurs on the shingle beach and in dryland grasslands and shrublands.
- *Poa billardierei*, (At Risk - Declining) – occurs in the foredunes and the strand zone (Davis 2002)
- *Raoulia monroi* (At Risk - Declining) – occurs in open sand and stonefield habitats within dryland grassland communities (Jensen 2007, Grove 2012, Canterbury Botanical Society 2014, Jensen unpubl. data 2015).
- *Acaena buchananii* (At Risk-Declining, uncommon in Ellesmere ED and the only known location on the Canterbury Plains) – occurs in dryland grasslands (Canterbury Botanical Society 2014, Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Carmichaelia appressa* (At Risk - Naturally Uncommon) (and rare in Canterbury) (Wilson 1992) – occurs in back dunes and dryland grasslands (Jensen 2007, Canterbury Botanical Society 2014, Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Colobanthus brevisepalis* (At Risk - Naturally Uncommon) - occurs in dryland grasslands (Jensen unpubl. data 2015, Canterbury Botanical Society 2014)
- *Leptinella serrulata* (At Risk - Naturally Uncommon) - occurs in dryland grasslands (Canterbury Botanical Society 2014)

There are three plant species that are endemic to Kaitorete Spit:

- *Craspedia* “kaitorete” (also Nationally Endangered)
- *Pimelea* aff. *prostrata* “Kaitorete” – occurs in semi stable deflation hollows and on sandy flats behind the dunes (Jensen and Donoghue 2003, Jensen 2007)
- *Galium* “kaitorete” – patchy distribution in semi stable deflation hollows and on sandy flats behind the dunes (Jensen and Donoghue 2003)

The broom *Carmichaelia appressa* is almost endemic to Kaitorete Spit (Davis 2002).

Some of the plant species that occur at the site that are uncommon within the Ellesmere Ecological District are:

- Kowhai (only one tree known to occur naturally on Kaitorete Spit) (Taylor 1996)
- Ngaio (Taylor 1996)
- *Hypoxis* ‘new species’? (uncommon in Ellesmere ED, possibly a threatened species?) – occurs in dryland grasslands (Canterbury Botanical Society 2014)
- *Geranium brevicaule* – occurs in dryland grasslands Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Carex comans* – occurs in dryland grasslands Wildland Consultants and Boffa Miskell unpubl. data 2015)

Birds

Nationally Threatened bird species (Robertson et al. 2012) that nest in dune and grassland habitats (Davis 2002) are:

- Banded dotterel (Nationally Vulnerable)

- Caspian tern (Nationally Vulnerable)
- White-fronted tern (At Risk - Declining)
- Red-billed gull (Threatened - Nationally Vulnerable)

One nationally At Risk (Robertson et al. 2012) bird species nests in dune and grassland habitats (Davis 2012)¹:

- New Zealand pipit (At Risk - Declining)

Lizards

The grasslands, shrublands and dunes on Kaitorete Spit site provides very important habitat for lizards. Of the four species recorded on Kaitorete Spit (Freeman 1994, Lettink 2004, Lettink et al. 2008) three are nationally Threatened or At Risk (Hitchmough et al. 2013) and one is also endemic to the Canterbury Region. These species are:

- Central Canterbury spotted skink (*Oligosoma aff. lineocellatum* "central Canterbury") (Nationally Vulnerable) – this species has been recorded from coastal shrubland behind the sand dunes on the southern side of the DOC Scientific Reserve approximately 1.5 km west of Birdlings Flat (Lettink et al. 2008)
- Common skink clade 5 (*Oligosoma aff. polychroma* Clade 5) (At Risk - Declining);
- Canterbury gecko (*Woodworthia cf brunnea*) (At Risk - Declining).

Invertebrates

Nationally Threatened and At Risk invertebrate species (Hitchmough et al. 2014) recorded from the site (Wildland Consultants 2012, unless cited otherwise) are:

- *Kiwaia* "plains jumper" (moth) (Threatened - Nationally Endangered, uncommon in the ecological district)
- *Stathmopoda albimaculata* (moth) (Threatened - Nationally Endangered, uncommon in the ecological district)
- *Kupea electilis* (moth) (Threatened - Nationally Vulnerable, species and genus endemic to Kaitorete Spit - known from 10 sites spread along the dunes (Wildland Consultants 2012).
- *Gadira leucophthalma* (Threatened - Nationally Vulnerable, uncommon in the ecological district)
- *Ericodesma aerodona* (moth) (At Risk - Declining, uncommon in the ecological district)
- Red katipo spider (*Latrodectus katipo*) (At Risk - Declining) - Kaitorete Spit is the national stronghold for this species. It is widespread in the foredunes (Patrick 2002, Heatherington 2014).
- *Samana acutata* (moth) (At Risk – Relict, uncommon in the ecological district) – present in shrublands within the site.
- *Kiwaia jeanae* (moth) (At Risk – Naturally Uncommon, endemic to Kaitorete Spit)
- *Bityla sericea* (moth) (At Risk – Naturally Uncommon, uncommon in the ecological district).

¹ Although for mobile fauna such as birds, species classified as nationally At Risk do not meet the threshold for significance (Wildland Consultants 2013).

- *Eurythecta robusta* (At Risk – Naturally Uncommon) (Wildland Consultants and Boffa Miskell unpubl. data 2015)

Endemic invertebrate species, some of which are also nationally Threatened and At Risk (and listed above) that have been recorded from the site (Patrick 1994) are:

- *Kiwaia jeanae*
- *Siythris niphazela*
- *Kupea electilis* - species and genus endemic to Kaitorete Spit - known from 10 sites spread along the dunes (Wildland Consultants 2012)
- *Notoreas* new species?
- *Tingena* sp.

Invertebrates recorded from the site that are uncommon in the Ellesmere Ecological District include:

- *Notoreas simplex* (moth) - very local distribution with larvae on *Pimelea* aff. *prostrata* (kaitorete)
- *Weeleus acutus* (antlion) - occurs in back dune (Wildland Consultants and Boffa Miskell unpubl. data 2015)
- *Arctesthes catapyrrha* - only record for Kaitorete Spit and Banks Peninsula (Wildland Consultants and Boffa Miskell unpubl. data 2015)

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.

There are three plant species that are at their distributional limits on Kaitorete Spit and at least five invertebrates.

Plants at their distributional limits on Kaitorete Spit (Davis 2002) are:

- *Akeake* (*Dodonea viscosa*) (southern national limit)
- *Muehlenbeckia astonii* (southern national limit)
- *Carmichaelia appressa* (northern national limit)

Terrestrial invertebrates at their distributional limits on Kaitorete Spit (Wildland Consultants 2012) (excluding species that are endemic to the spit - which are listed under criterion 4) are:

- *Kiwaia* "plains jumper" (moth) (northern national limit)
- *Gadira leucophthalma* (moth) (southern national limit)
- *Notoreas simplex* (moth) (south-eastern national limit)
- *Ericodesma aerodona* (moth) (southern national limit)
- *Stathmopoda albimaculata* (moth) (northern national 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.

The Spit is sufficiently distinctive for some to suggest that it warrants its own ecological district (Davis 2002).

Four ecosystems within the site are originally rare ecosystems (Williams et al. 2007): active sand dunes², dune deflation hollows, shingle beaches and stony beach ridges.

The beach along the entire length of the coastal margin is a shingle beach. The dune systems behind this are active sand dunes dominated by pingao there are also dune deflation hollows within the dune system. The eastern end of the spit supports indigenous vegetation on stony beach ridges³. Stony beach ridges are an originally rare ecosystem (Williams et al. 2007).

Kaitorete Spit also supports distinctive vegetation and fauna assemblages.

The vegetation of the spit is distinctive. It has adapted to a harsh environment characterised by low precipitation, high summer temperatures, low humidity and strong and persistent winds and salt spray. The vegetation has a number of species that are prostrate or low growing (e.g. *Pimelea* aff. *prostrata* "Kaitorete", *Carmichaelia appressa*, *Carmichaelia corrugata* and *Muehlenbeckia ephedroides*) or appear seasonally and then die-off. It has a high proportion of species that are nationally Threatened and At Risk and endemic to the site (refer to criterion 4 and 5). The site is also distinctive in that all five species of *Muehlenbeckia* are present (Partridge 2001).

Dunes and shrublands within the site provide habitat for distinctive invertebrate communities, particularly moths (Wildland Consultants 2012). The dune systems support a high diversity of indigenous moths, and a large number of species are nationally Threatened and At Risk, endemic to Kaitorete Spit, at their distributional limits (refer to criterion 4 and 5) or species usually found in montane and sub-alpine environments. Native dune and grass specialist moths predominate and many common and widespread lowland moth species are either scarce or absent, highlighting the general aridity of the area and the naturalness of the flora. Over 30 of the moth species are diurnal and fly fast and low around their host plant or sunbathing on the hot bare sand. *Kiwaia jeanae* and *Kiwaia* "plains jumper" are a special feature of the moth fauna of Kaitorete Spit. These small, brachypterous moths jump rather than fly (Patrick 1994).

The also site provides habitat for a distinctive assemblage of indigenous lizard species. It supports four of the five lizard species known to occur on Banks Peninsula and is the only site on Banks Peninsula and in the Canterbury Region with this particular assemblage of species (Lettink 2004, Lettink et al. 2008).

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.

² Although Williams et al. (2007) note that the rarity of active sand dunes at a national scale may be questionable.

³ The area east of the Scientific Reserve is within the Birdlings Flat site, however those areas within and west of the Scientific Reserve, are within the Kaitorete Spit site.

The site is significant under this criterion.

There is a distinct vegetation pattern across Kaitorete Spit from the coastal margin to the margin of Lake Ellesmere/Te Waihora. These vegetation patterns are driven by the processes that relate to the formation of the barrier, including substrate type and depth and elevation, current coastal and lagoon processes and historic human disturbance. From the coast to Lake Ellesmere the sequence includes active foredunes, stable back dunes, sand flats, semi-natural indigenous dryland grasslands, a raised undulating gravel Speight ridge supporting remnant shrublands, dryland grasslands, saltmarsh ribbonwood shrublands, tall saltmarsh and salt meadow vegetation and mudflats.

The dune and grassland communities are naturally species poor, but relative to other examples the dune communities support a high diversity of species. This reflects their relative intactness and the absence of exotic marram from large areas of the dunes which has displaced many coastal dune species from similar dune habitats.

The dryland grassland communities also contain a relatively high diversity of plant species for dryland communities of their type, and have retained a good cover of native herbs (including rare species such as *Daucus glochidiatus* and *Geranium retrorsum*), which have been lost from the majority of similar dry grasslands in lowland Canterbury.

Some habitats support diverse invertebrate assemblages (Patrick 1994, Davis 2002). At least 126 species of *Lepidoptera* have been recorded from Kaitorete Spit. The coastal dunes support a particularly diverse *Lepidoptera* assemblage (Patrick 1994). More modified dryland habitats are less diverse (Wildland Consultants and Boffa Miskell unpubl. data 2015).

The site also supports a diverse lizard assemblage. Four lizard species occur within the site (Lettink 2004, Lettink et al. 2008).

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.

It contains an ecological sequence from the coastal strand zone to Lake Ellesmere/Te Waihora that includes active foredunes, stable back dunes, sand flats, semi-natural indigenous grasslands and shrublands to saltmarsh and salt meadow vegetation.

The indigenous vegetation on the dune system provides a continuous ecological corridor of approximately 27 km in length that is important for indigenous fauna, particularly invertebrates (including flightless species) and lizards. It provides an ecological link to the connected high value shrublands at Birdlings Flat.

The site is buffered by the sea and Ellesmere/Te Waihora. Together they act as a barrier to animal pest and biodiversity pest plant threats.

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.

Environment Canterbury Reserve land at the western end of the spit supports a complex mosaic of dryland and wetland environments. These wetlands are connected to the significant wetlands on the margin of Lake Ellesmere/Te Waihora that are within the Lake Ellesmere/Te Waihora and margins Site (SES/E/1).

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. It provides important habitat for indigenous birds, lizards and terrestrial invertebrates.

The dryland grassfield-mossfield-herbfield vegetation between the margin of Te Waihora and Bayleys Road is an important seasonal habitat for banded dotterel (Threatened – Nationally Vulnerable). Kaitorete Spit is the last non-braided river habitat in Canterbury where the species still occurs in significant numbers (A. Crossland *pers. comm* 2014). This species gathers here in large numbers over the winter months. Kaitorete Spit is also an important breeding site for this species. Over 100 pairs breed on the spit (Crossland 2014a) in undeveloped dryland grassland, mossfield and herbfield communities in the Council Reserve adjacent to Lake Ellesmere/Te Waihora (Crossland unpubl. data 2014b) and along the coastal margin (DOC unpubl. data 2014).

Kaitorete Spit is a very important habitat for indigenous invertebrates. It has a very diverse invertebrate fauna and highly unique and nationally important assemblage of dune system *Lepidoptera*. A total of 130 species of *Lepidoptera* have been recorded from Kaitorete Spit, 126 of which are resident natives (Patrick 1994). The coastal dunes are also a national stronghold for red katipo spider (*Latrodectus katipo*) (At Risk – Declining). The abundance of katipo at Kaitorete Spit is attributed to the extensive cover of the native sand-binding sedge *Ficinia spiralis* (Patrick 2002), the lack of development on the spit, and the scarcity of marram grass (Heatherington 2014).

The site provides important habitat for four lizard species; Canterbury gecko, Central Canterbury spotted skink, common skink clade 5 and McCann's skink. The spotted skink population on Kaitorete Spit is currently the largest population known from Banks Peninsula and the greater Christchurch Area (Lettink et al. 2008).

Site Management

Existing Protection Status

Kaitorete Spit is owned or administered by:

- Private landowners
- Ngai Tahu (Taumutu runanga)
- Department of Conservation
- Environment Canterbury
- Christchurch City Council
- Land Information New Zealand - on the coastal side of Birdlings Flat

There are a number of areas protected by reserves:

Reserves on the Lake Ellesmere/Te Waihora side of Kaitorete Spit are:

- Kaitorete Spit Reserve (Christchurch City Council)
- Waihora Scientific Reserve (conservation unit M37010) (DOC)
- Kaitorete Spit Conservation Area (Timber Depot and Landing Area Reserve) (conservation unit M36486) (DOC) – west of the Christchurch City Council Reserve
- Kaitorete Spit Conservation Area (conservation unit M37031) (DOC) – adjacent to Bayleys Road, west of Waihora Scientific Reserve
- Kaitorete Spit Reserves (Environment Canterbury) – along the margin of Lake Ellesmere/Te Waihora

Reserves on the coastal side of Kaitorete Spit are:

- Kaitorete Spit Conservation Area (conservation unit M37023) (DOC) – seaward margin, western end
- Pacific Ocean Foreshore Kaitorete Spit Conservation Area (conservation unit M37009) (DOC) – middle of the seaward margin
- Kaitorete Spit Conservation Area Marginal Strip (conservation unit M37029) (DOC) – seaward margin, eastern end
- Kaitorete Spit Scientific Reserve (conservation unit M37011) (DOC) – inland of the seaward margin, western end of the marginal strip
- Kaitorete Spit Scientific Reserve (conservation unit M37014) (DOC) – west of Birdlings Flat settlement and inland of the seaward margin

Threats and risks	Management recommendations	Support package options
<ul style="list-style-type: none"> · Biodiversity pest plants including marram, boxthorn, tree lupin, boxthorn, gorse, broom and wilding pines. · Garden escapes from Birdlings Flat settlement are likely to be an ongoing threat. 	<ul style="list-style-type: none"> · Department of Conservation to continue control of biodiversity pest plants (such as marram and tree lupin) along the coastal dunes. · Consider controlling the biodiversity pest plants already present at the site. Woody species are a priority for control in the low stature grassland and shrubland environments at the site. · Birdlings Flat community to consider continuing the control work they are doing in the vicinity of the settlement. · Consider regular surveillance for new weed incursions, particularly garden escapes from Birdlings Flat and Taumutu. 	<ul style="list-style-type: none"> · Advice and guidance to landowners about monitoring and control of pest plants. · Raise awareness with neighbours about impacts on biodiversity of garden escapes. · Assistance available where possible.
<ul style="list-style-type: none"> · Pest animals. Those known to occur on the Spit are rabbits, hares, feral cats, ferrets, stoats, weasels, European hedgehog, rats, mice and possums (Davis 2002). · Rabbits and hares are widespread in the dunes and grasslands and rabbits have been numerous in the past (Davis 2002). 	<ul style="list-style-type: none"> · Consider monitoring hare and rabbit densities across the spit. If rabbit control is required consider a joint agency/landowner control operation. · Council, DOC and ECan to consider continuing seasonal control (trapping) of predatory animal pests surrounding important nesting sites at the tip of the Spit and Crescent Island. · Consider implementing a multi-species animal pest control programme to control feral cats, ferrets, stoats, weasels, European hedgehogs and rats to protect birds (particularly on the margins of Lake Ellesmere/Te Waihora) and lizards. The site is well buffered by the sea 	<ul style="list-style-type: none"> · Advice and guidance to landowners about monitoring and control of pest animals. · Assistance available where possible.

	<p>and Lake Ellesmere/Te Waihora so re-invasion is likely to be less of an issue than at other sites. Priority areas are likely to be the margins of the lake, coastal dunelands, and shrublands.</p>	
<ul style="list-style-type: none"> Domestic stock. 	<ul style="list-style-type: none"> Consider fencing the coastal dunes to keep stock out. Consider reducing stocking rates in areas where stocking rates are high. To maintain or enhance indigenous vegetation communities consider grazing sheep in preference to cattle. For dryland grassland and shrubland areas consider either controlled, light sheep grazing during the growing season to reduce rank exotic grass, or removing grazing from some areas. Consider establishing robust, but simple monitoring to evaluate the effects of grazing and different grazing regimes on the indigenous vegetation communities within the site. 	<ul style="list-style-type: none"> Discussions with landowners about the benefits to biodiversity of different options for stock management.
<ul style="list-style-type: none"> Fire 	<ul style="list-style-type: none"> Council should consider developing a fire response plan for the Spit in consultation with DOC and landowners to ensure a rapid response to fire on the Spit. Consider erecting suitable signs in key locations to highlight the danger of fires, and seek people's co-operation. The fire risk should be part of wider discussions with Birdlings flat and Taumutu residents, and 4WD/ off-road motorbikes clubs. 	<ul style="list-style-type: none"> N/A

<ul style="list-style-type: none"> Declining populations of lizards, particularly spotted skink. 	<ul style="list-style-type: none"> Consider undertaking predator control at key locations to reduce the number of cats, hedgehogs, mustelids and rodents (Lettink et al 2008). Consider undertaking regular monitoring at key locations to assess population distribution, size and trends (Lettink et al 2008). Consider undertaking additional surveys for new populations of spotted skink in the scattered shrublands present along the hind dunes on Kaitorete Spit (Lettink et al 2008). 	<ul style="list-style-type: none"> Advice and guidance for landowners about protection of lizard habitats. Discussion with landowners about continued research and monitoring of lizards by agencies/universities. Assistance available where possible
<ul style="list-style-type: none"> Loss or decline of threatened and endemic plant species. Several threatened species that are endemic to the spit, or where the Kaitorete Spit population is nationally significant, may require specific recovery programmes to ensure their long-term survival. 	<ul style="list-style-type: none"> Appropriate management may need to be considered including habitat manipulation, erection of enclosures, restoration planting, seed collection, removal of plants for artificial propagation, captive breeding, pest control and studies on population dynamics and recruitment. 	<ul style="list-style-type: none"> Discussion with landowners about benefits to biodiversity of different management options. Assistance where possible
<ul style="list-style-type: none"> Loss of <i>Muehlenbeckia astonii</i> plants and lack of recruitment. 	<ul style="list-style-type: none"> Consider legally protecting at least part of the <i>Muehlenbeckia astonii</i> population. Consider grazing sheep in preference to cattle to prevent damage to shrubs Consider rabbit and hare control in the area, or erecting rabbit proof fencing. Consider methods to initiate seed germination and seedling development Consider supplementary planting of progeny raised from seed collected from the site into appropriate rabbit-fenced habitats. 	<ul style="list-style-type: none"> Discussions with landowners about protection and enhancement of <i>Muehlenbeckia astonii</i> populations. Assistance available where possible.

	<p>Follow up releasing from rank grass is also likely to be required until seedlings are tall enough.</p> <ul style="list-style-type: none"> · The Department of Conservation should continue to monitor plants inside and outside the existing enclosures. 	
<ul style="list-style-type: none"> · Damage to dunes and dune vegetation by off-road motorbikes and 4WD vehicles (Davis 2002, Hooson 2003) 	<ul style="list-style-type: none"> · Consider prohibiting the use of road motorbikes and 4WD vehicles on coastal dunes. · Consider options for restricting the use of off-road vehicles on dryland areas and reserves to existing tracks (with the exception of land owners and managers). 	<ul style="list-style-type: none"> · Discussions with landowners about the benefits to biodiversity about the restriction of motor vehicles away from sensitive areas. · Ensure that landowners are aware that they are able to continue to use and maintain existing tracks and access ways.
<ul style="list-style-type: none"> · Existing shelterbelts and existing pine plantations. 	<ul style="list-style-type: none"> · Landowners will be able to trim or fell existing shelterbelts and existing pine plantations. 	<ul style="list-style-type: none"> · Ensure that landowners are aware of this.

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Assessment completed by: Scott Hooson
Date: 12 March 2015

Statement completed by: Scott Hooson
Date: 12 March 2015

Statement updated by: Debbie Hogan
Date: 6 June 2017
Update purpose: Site map updated to show boundary as amended through Decision 50 (Natural and Cultural Heritage (Part) – 9.1 Indigenous Biodiversity) of the Independent Hearings Panel on the Christchurch Replacement District Plan

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.

⁴ www.ecan.govt.nz/publications/Plans/ecological-significance-indigenous-vege-canterbury.pdf