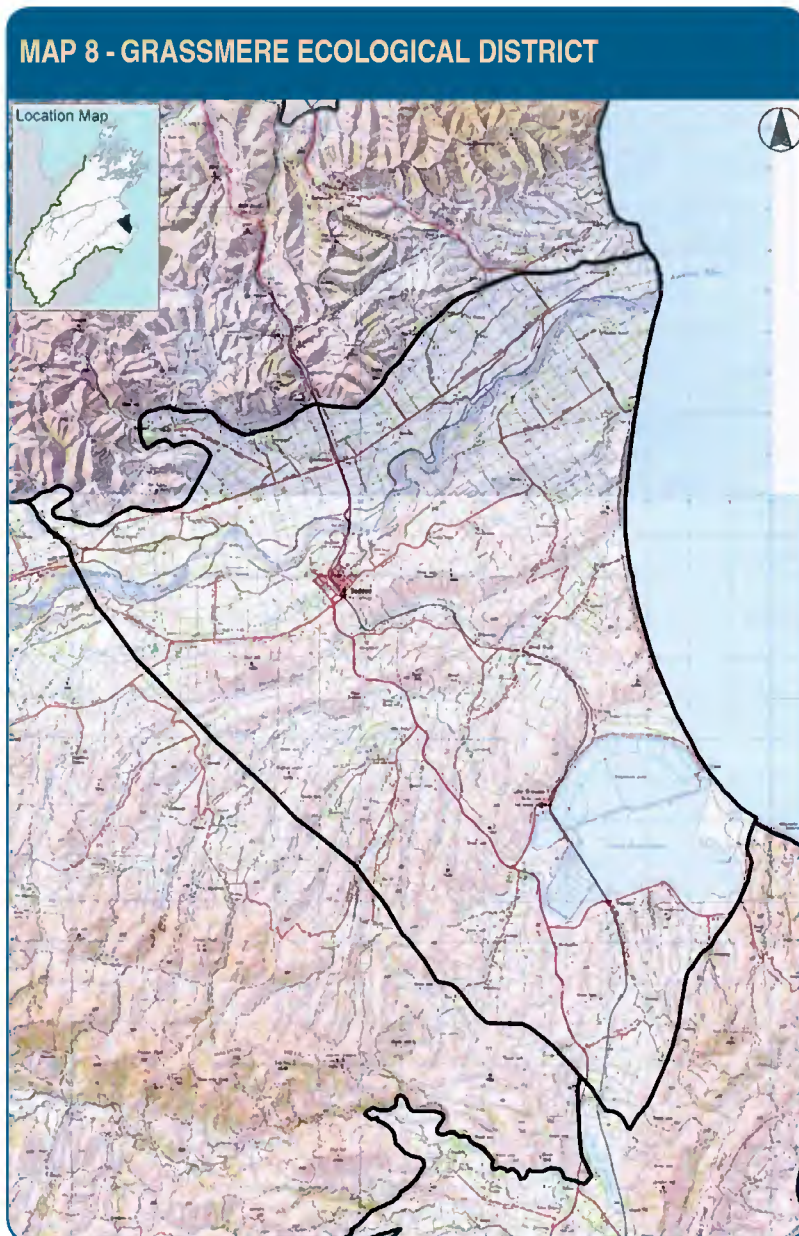


GRASSMERE ECOLOGICAL DISTRICT

**OVERVIEW**

The Grassmere Ecological District includes the Clifford Bay coastline, with its north-western boundary defined by the edge of the Awatere river plain where it meets the edge of the Wither Hills. A contour of approximately 150m defines the boundary to the south-west (there are no defining landforms to follow) and the foot of the coastal hills east of Ward defines its south-eastern margin. The land is low lying, running from sea level in the east to 293 m in the north-west. All the stream and river courses run in a generally parallel south-west to north-east orientation. The lowest reaches of the Awatere River pass through the District to the sea, although it drains very little of the area. Drainage is largely confined to a number of winter-borne streams, notably the Blind/Otuwhero River system, and Starborough Creek. Lake Grassmere was an estuarine area up until 1800 years ago and then became a freshwater lake until it was modified by the development of the salt works in the 1940s.

Large areas of the central and southern portions of the ecological district are of Tertiary origin, being composed of sandy mudstones with sandstone bands, concretions and shell beds. There are also localised areas of mudstone and sandstone grading into basal conglomerate and grit. Scientifically important fossil deposits occur in these sedimentary rocks.

However, significant areas are overlain by Quaternary terminal moraine and glacial outwash deposits from a range of glacial periods. The northern part of the area is composed entirely of these Quaternary deposits. Tertiary sediments also surface as a long thin band along the coast, north of the Blind River. The area of land between Lake Grassmere and the sea is derived from post-glacial swamp and lagoon deposits, and also includes sand dunes. Many of the soils are derived from loess (wind-deposited rock dust).

The climate is warm and very dry with high solar radiation and frequent extreme drought. Frosts are not common and winds are generally moderate to strong.

Prior to human arrival, the land was largely forested. Subsequent deforestation, in common with most eastern South Island districts, has been attributed to Polynesian fires. The original tree cover has been described as being largely of mahoe-titoki-ngaio coastal hardwood forest with small areas of matai-hinau-mahoe forest, manuka-kanuka scrub and fescue-silver tussock grassland. However, there seems no reason why lowland totara would not also have been a dominant component of the



former tree cover, with matai perhaps dominant on less fertile land. Totara, matai, titoki and hinau are no longer present in natural areas, such as has been the loss of forest cover. Moist riparian areas and swamps along low-lying land would have provided habitat for kahikatea. Silver tussock may naturally have been confined to coastal slopes and slips, its later widespread presence inland being fire-induced. The fires of 6-800 years ago resulted in a complete loss of forest by the time of European settlement, when Frederick Weld described the vegetation cover as extensive grassland with only a few miserable manuka shrubs.

Only tiny remnant indigenous ecosystems remain, little of which are in public ownership. Currently there are three very small protected areas, in total covering just 0.3% of the ecological district. The largest is the Muritai Scientific Reserve and Stewardship Land, containing the rare coastal tree broom and coastal forest and shrubland. The others are parts of dune systems. The most significant ecological weed is marram grass, dominating the native vegetation on the dunes.

SURVEY RESULTS

Of the 13 landowners approached regarding the survey nine were surveyed. A total of 10 significant sites were identified on private land. A further four sites were identified on public land (this includes several large public areas including the Awatere River and Lake Grassmere). The sites on private land have a combined area of 152 ha, which is less than 1% of the total area of the ecological district.

The sites are classified into seven basic ecosystem categories or types, (see Table 7). There has been a virtual elimination of the original forest cover, but there are significant amounts of dunes, forest remnants and shrublands. Among them are small pockets of broadleaved and beech forest. All of the sites are distinctive and special.

TABLE 7 - SITES IDENTIFIED IN THE GRASSMERE ECOLOGICAL DISTRICT

Ecosystem type	Total number of sites	Sites on Public land	Sites on Private land	Total area of sites on private land (ha) *	% area of Ecological District
Coastal dunes	2	1	1	33 (22)	
Coastal wetland	2	1	1	12 (875)	
Inland wetland	2		2	21	
River bed/Riparian communities	1	1		(600)	
Dry shrubland	2		2	35	
Coastal broadleaf forest	2	1	1	20(17)	
Inland broadleaf forest	3		3	31.5	
Total	14	4	10	152	<1%

* Publicly owned sites shown in brackets for information only

ECOSYSTEMS FOUND

The original vegetation cover of the ecological district has been almost completely eliminated since human arrival. Beach margins and coastal gullies contain much of what remains. The main ecosystem patterns are briefly described below.

COASTAL SAND DUNE COMMUNITIES

There are some areas of dune containing spinifex and a little pingao and sand tussock.



COASTAL WETLANDS

Saltmarsh turfs exist along the eastern margins of Lake Grassmere, as sea water now flows into it as a result of the salt works development. Estuarine conditions exist at the mouth of the Blind River and Awatere River.

INLAND WETLANDS

Several wetlands remain, mostly consisting of small pools and wet ground persisting along some stream courses all year round, containing a few sedges, rushes, raupo and harakeke.

RIVER BED/ RIPARIAN COMMUNITIES

The Awatere River margins are very weedy but there are localised areas of sandy gravels with native herbfield components and occasional shrub remnants such as *Muehlenbeckia astonii*.

DRY SHRUBLAND (“GREY SCRUB”)

Several areas of dry shrublands persist on hill slopes and on the margins of coastal gullies.

BROADLEAVED FORESTS (COASTAL GULLIES AND INLAND)

There are a few very small coastal gully forest remnants, made up of ngaio, mahoe and akiraho. A number of gorged tributaries of the Awatere River also shelter small forest and treeland remnants.

SPECIAL FEATURES

Despite the history of great modification by people, there are several features worthy of celebration.

NATIVE FLORA

- Nationally threatened plants found in the ecological district during the survey include coastal tree broom (*Carmichaelia murita*), dwarf broom (*Carmichaelia vexillata*), sand tussock (*Austrofestuca littoralis*), pingao (*Desmoschoenus spiralis*), sea holly (*Eryngium* aff. *vesiculosum*), shrubby tororaro (*Muehlenbeckia astonii*), *Muehlenbeckia ephedroides*, coastal mat daisy (*Raoulia* aff. *hookeri*), native musk (*Mimulus repens*) and the coastal groundsel *Senecio hauwai*.

NATIVE FAUNA

- Birds listed as nationally threatened are black-billed gull, black-fronted tern, grey duck, banded dotterel, white-fronted tern, black shag, pied shag and NZ falcon (karearea or sparrowhawk).
- Lake Grassmere deserves special mention as an exceptional site for bird life. It is a major feeding and roosting site for large numbers of waders such as bar-tailed godwit, pied stilt, South Island pied oystercatcher and knot, and many species of migrant and vagrant waders have been noted. Seasonally the area also supports large numbers of waterfowl especially grey teal, grey duck/mallard and the introduced black swan. White-fronted tern has bred there.
- The bird life of the Awatere River is well documented. There are large numbers of breeding banded dotterel (classified as “chronically threatened, gradual decline”), and small numbers of breeding black-fronted tern (classified as “chronically threatened, serious decline”), and pied stilt. Five percent of the South Island population of black-fronted dotterel breed along the mid to lower reaches of the Awatere River. South Island pied oystercatcher and black-billed gull (classified as “chronically threatened, serious decline”) frequent the river, but breed mainly outside the ecological district, upriver. Black shag (classified as “at risk, sparse”), little shag, and kingfisher are also present. Backwaters support grey teal and grey duck/mallard. Welcome swallows frequent the open riverbed and spur-winged plover and paradise shelduck the margins, braids and adjacent alluvial pastoral flats. Caspian tern and white-faced heron occur occasionally along the Awatere riverbed.
- Native forest and shrublands are very nearly absent from the District, and the few native bird species recorded from them include bellbird, grey warbler, silvereye and fantail.



- There are records of two lizard species, namely common gecko (*Hoplodactylus maculatus*) and common skink (*Oligosoma nigriplantare polychroma*). Coastal driftwood is a key habitat for the skinks.
- Fourteen species of native freshwater fish have been recorded in the ecological district. The only one listed as nationally threatened is longfin eel. Banded kokopu is regionally uncommon. Two of the other species - northern galaxias and upland bully - may have locally distinct populations because they are non-migratory. The Awatere River catchment, the lowest reaches of which flow through the ecological district, is considered to be of regional importance for freshwater fish and habitat diversity. The catchment is huge and the main river stem that lies in the ecological district is critical for allowing the passage of migratory species between the tributaries and the sea. It is very important for torrentfish, containing the best population in the region and one of the better ones nationally. The Otuwhero (Blind) River catchment drains much of the District. Its flow is ephemeral, although deep pools remain year round. Banded kokopu have been recorded in parts of the upper catchment. Both eel species (longfin and shortfin) are present, and support a part of the Marlborough commercial eel fishery.



GRASSMERE ECOLOGICAL DISTRICT - PHOTO ESSAY

**BLIND RIVER MOUTH –**

A brackish estuarine area which is mostly cut off from the sea except for periodic flooding or high seas. It contains an extensive area of saltmarsh ribbonwood and two threatened plant species.

**CLIFFORD BAY COASTAL GULLIES –**

The best remaining example of now very rare coastal forest (mainly akiraho), in this area. Mosaics of scattered shrubs, herbs and grasses occur on mudstone cliffs.



NINA BROOK -

An example of a distinctive gorge landform that has provided a refuge for native species. The shrub cover is predominantly akiraho forest with Marlborough rock daisy on the cliffs and populations of a rare broom species at its northern limit of distribution.



CLIFFORD BAY COAST -

A duneland system with significant native elements including extensive areas of spinifex and the rare pingao. The introduced marram grass is a threat and is likely to win out over native species in the long term unless controlled.

