

## **APPENDIX X – ECOLOGICAL COMPONENTS OF THE NATURAL LANDSCAPE CHARACTER OF THE MACKENZIE BASIN SUBZONE**

The purpose of this appendix is to provide a list of ecological features which contribute to the biological diversity of the basin floor and its natural landscape character across the whole subzone.

### **‘Ecosystems’ including historically rare ecosystems based on geomorphological features**

*NOTE: Parentheses indicate the land types of Lynn (1993) and Environment Canterbury (2010) within which these ecosystems are mainly (bold type) or more occasionally found.*

Lake margins and deltas (**H3**)

Connected sequences of moraines of different ages (**H3**)

Striated moraines framing lakes (**H3**)

Terminal moraines (**H3**)

Rugged and hummocky young moraines (**H3**, H4)

Subdued older rolling moraine surfaces (usually further from lakes) (**H3**, H4)

Erratic boulders and boulderfields (**H3**, **H4**)

Kettlehole tarns and ephemeral wetlands (**H3**, H4)

Seepages and flushes (**H3**, **H4**)

Ephemeral streams (**H3**, **H4**)

Other wetland types and systems on and within depositional surfaces (**H3**, **H4**)

Outwash gravel terraces and fans (H3, **H4**)

Braided dry meltwater outwash channels (H3, **H4**)

Inland sand dunes (**H1**)

Terraces separating different depositional surfaces (**H3**, **H4**)

Series of terraces (H3, **H4**)

Braided rivers and associated alluvial surfaces (**H3**, **H4**)

Rivers, streams and associated alluvium issuing from surrounding ranges (**H3**, **H4**, **H17**)

Ice-sculpted hills within basin (**H7**)

Footslopes of ranges and hills (**H3**, **H4**, **H7**)

Alluvial and colluvial fans (**H3**, **H4**, **H7**)

### **Gradients, sequences, patterns, ecotones and transitions**

Wet north-west to drier south-east aridity gradient

Sequences of different soils across the aridity gradient

Sequences of moraines of different ages

Moist western moraines with tall and short tussock grassland

Drier moraines with short tussock grassland and herbfields

Moraines cut by outwash and meltwater channels of different ages

Extensive, continuous, undeveloped moraine-outwash-alluvium sequences

Complexes of outwash and alluvial gravel surfaces of different ages

Transitions or ecotones between different depositional (glacial and alluvial) landforms

Series and flights of terraces (high and/or low, and different ages)

Terrace brows, scarps, and toes

Micro-habitat and soil variation (including aspect-related) within moraines

Ridge and hollow micro-topography on outwash gravels

### **Vegetation and flora**

Extensive and little-fragmented sequences of vegetation  
Tall and short tussock grasslands and their native inter-tussock flora  
Matagouri shubland and wild spaniard  
Ephemeral wetlands and their turfs  
Lakeshore and delta plant communities  
Wetlands, wetland complexes, and their vegetation  
Alternation of sparse and better-vegetated surfaces on outwash gravels and alluvium  
Braided vegetation patterns on outwash and alluvium  
Grey and mixed shrublands and their native flora  
Mat and cushion vegetation, including hawkweed-dominated  
Mossfields, lichenfields, and non-vascular crusts  
Exposed stonefields  
Prostrate or low-growing native flora  
Spring annual and seasonal geophytes (orchids, ferns) and their habitats  
Non-vascular species (including lichens, mosses, and fungi) in all habitats  
Xerophytic (drought-adapted) endemic flora  
At risk and threatened flora

### **Fauna (including habitats)**

Native and endemic wading birds, terns and gulls of braided rivers, outwash surfaces and moraine wetlands  
Extensive seasonal breeding habitats of banded dotterel and pied oystercatcher, especially sparsely-vegetated outwash and alluvial surfaces  
Native wetland bird fauna  
Grey shrubland native bird fauna  
New Zealand pipit and their mixed grassland habitats (especially moraine)  
Endemic lizards and their habitats including mixed grasslands, erratics and bouldery surfaces  
Endemic insect species characteristic of different habitats  
Endemic freshwater fish fauna of clear unpolluted streams  
Xerophytic (drought-adapted) endemic fauna  
At risk and threatened fauna

### **REFERENCES**

Environment Canterbury 2010. Canterbury Regional Landscape Study Review – Final Report – July 2010. <http://www.crc.govt.nz/publications/Plans/canterbury-regional-landscape-study-review-2010.pdf>  
Lynn IH 1993. Land types of the Canterbury Region. Landcare Research New Zealand and Lucas Associates.