Threatened Naturally Uncommon Ecosystems

Naturally uncommon ecosystems are those that would naturally occur over a small area in the absence of human activity. They often have highly specialised and diverse collections of flora and fauna. Of those 72 ecosystems, **45 are classed as threatened** (critically endangered, endangered or vulnerable) exhibiting a high probability of being lost. These are **listed in the table below**.

- Locations are examples only, unless specified.
- Ecosystem names link to factsheets on Manaaki Whenua - Landcare Research's website which contains images and longer descriptions.

CRITICALLY ENDANGERED ECOSYSTEMS				
Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Coastal	Coastal turfs	Coastal low-stature herb-dominated vegetation maintained by salt spray and wind; induced by marine mammals in some locations	Turf vegetation usually under 5 cm tall	Tunnel Beach (Otago), Long Point (Southland), Te Kaukau Point (Wairarapa)
	Shell barrier beaches (chenier plains)	Accumulations of shell and coarse sand deposited in foreshore zones, forming low ridges or plains; saltmarsh and/or mangrove communities may occur landward	Bars and ridges of shell and coarse sand in foreshore areas extending landward	Confined to Auckland / Waikato regions (Pollen Island, Pūkorokoro / Miranda)
Geothermal	Fumaroles	Geothermal vents emitting steam and gases with highly acidic hot soil conditions; supports specialised microbial and plant communities	Active or recently active volcanism; presence of hydrogen sulphide	Taupō Volcanic Zone (Waikato)
	Geothermal stream sides	Margins of geothermal streams with high temperatures and unusual water chemistry.	Presence of steam and plant species adapted to warmer temperatures	Taupō Volcanic Zone (Waikato), along the Alpine Fault (South Island)
	Heated ground (dry)	Areas where heat flow from geothermal activity belowground creates warm soil conditions	Warm soil supporting unique plant assemblages	Taupō Volcanic Zone (Waikato)
	Hydrothermally altered ground (now cool)	Soils changed by geothermal steam that are strongly acidic and infertile; low in organic matter and phosphorous	Presence of prostrate kānuka (*Kunzea ericoides* var. *microflora*)	Taupō Volcanic Zone, (Waikato)

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Induced by Native Vertebrates	Marine mammal haulouts	Coastal areas modified by marine mammals (seals); sites shaped by frequent disturbance and enriched by animal excrement; soils may be compacted; unique plant assemblages; coastal turfs may be induced in high use areas	Mammal presence and pungent odour; generally confined to rocky shorelines at present	Cape Foulwind (Westland), Chalky and Breaksea Islands, (Southwestland)
	Seabird-burrowed soils	Areas where soils have been disturbed and enriched by burrowing nesting seabirds; track formation and bird excrement are other drivers	Unstable pot-holed ground; open grassy areas to under low-statured forest	Mercury Islands (Waikato), Punakaiki (Westland), Seaward Kaikōura Range, (Canterbury)
	Seabird guano deposits	Deposits of seabird excrement of varying depths high in nitrogen and acidic; vegetation depends on age of excrement and bird activity; colony size ranging from 100s to 1000s of birds	Significant accumulations of greyish white excrement on rocks and adjacent soil; pungent odour	Cape Kidnappers (Hawke's Bay), Kaikōura Headland (Canterbury)
Inland & Alpine	Inland outwash gravels	Plains of inland basins with coarse, well drained and infertile gravelly substrates; frost and wind are important erosional forces	Gravelly, sparsely vegetated plains of dry inland basins	Mackenzie Basin (Canterbury), Upper Clutha and Waitaki River basins (Otago)
	Inland saline (salt pans)	Small, flat pan-like features with high soil salt content and alkalinity owing to naturally poor drainage and high evaporation rates	Grey-white pan-like features often occurring as a mosaic of small patches	Confined to Central Otago
	Inland sand dunes	Inland non-volcanic sand dune formed from river sands that have not been influenced by coastal processes	Stabilised sand deposits with vegetation like riverbed sand deposits	Upper Clutha and Waitaki basins (Otago), Ashburton, Rakaia River valleys, (Canterbury)
	Old tephra (>500 years) plains - frost flats	Plains or flats of the volcanic plateau with pumice-derived soils, severe year-round frosts and shrubby cold adapted vegetation different from frost hollows	Dominance by the shrub monoao (*Dracophyllum subulatum*); mat-forming mosses and lichens	Confined to North Island volcanic plateau (Rangitāiki Conservation Area, Kāingaroa Plateau)

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Inland & Alpine	Strongly leached terraces and plains	Very infertile terraces, plains or dry shingle fans formed as part of ancient glacial processes; fans are cone-shaped deposits formed where streams or rivers exits a narrow, steep valley	Prevalence of bog pine (*Halocarpus bidwillii*) and mat-forming mosses and lichens	Mavora Basin (Southland), Mackenzie Basin (Canterbury), Molesworth Recreation Reserve (Marlborough)
Subterranean or Semi-subterranean	Cave entrances	Distinct transitional zone between subterranean and surface environments; influenced by light and air flow; can be shaded, wet or dry; occur in various rock types but prevalent in limestone; entrance sufficiently large to support a distinct assemblage of species	The zone at the opening of a cave, extending to the limit of light penetration but not further	Waikato-King Country, Northwest Nelson Westland (Nelson-Tasman), Banks Peninsula (Canterbury) and Otago Peninsulas (Otago)
Wetlands	Ephemeral wetlands	Wetlands with a pronounced and noticeably long seasonal dry phase; may not be wet in all years; on plains or flats with scant summer rainfall; supports species adapted to drying out	Wetland with a pronounced dry phase; occur in a range of settings, landforms and substrate types	Country-wide but pronounced on the eastern side of the Main Divide (South Island) and Mackenzie Basin (Canterbury)
	Gumlands	Flat to rolling heathland with strongly leached infertile, acidic, and seasonally waterlogged soils; topsoil layers are thin and sometimes peaty; deposits of kauri gum are common	Heathland dominated by mānuka (*Leptospermum scoparium*) and other shrubs and sedges	Confined to Northland and Auckland (Ahipara Plateau, Lake Ohia, Kaimaumau, Maitahi, Wiroa; Albany Scenic Reserve)
	Damp sand plains	Flat areas amongst active coastal dunes where wind has removed sand down to a level where the water table is permanently just below the surface or occasionally above it	Low-lying damp to wet sandy areas amongst active coastal dunes	Between the Manawatū and Rangitīkei Rivers (Manawatū–Whanganui)

ENDANGERED ECOSYSTEMS				
Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Coastal	Active sand dunes	Predominantly coastal dunes whose physical landscape and ecological character results from continuously moving wind-blown sand; bare to sparsely vegetated in their natural form	Dominance by two sand-binding species: Spinifex (*Spinifex sericeus*) and Pīngao (*Ficinia spiralis*)	Aupōuri Peninsula (Northland), Manukau Heads (Auckland), Farewell Spit (Nelson) Mason Bay (Stewart Island)
	Coastal cliffs of calcareous rocks	Limestone or marble cliffs next to the ocean; from highly exposed to sheltered and shaded sites; from dry to wet; vegetation influenced by wind and salt spray	Habitats from bare rock with only mosses and lichens to deeper soils supporting woody vegetation	Napenape (Canterbury) Castlepoint (Wairarapa) Punakaiki (West Coast)
	Coastal cliffs of ultramafic (ultrabasic) rocks	Ultramafic or serpentine cliffs next to the ocean; high in metal oxides and toxic metals, low in essential plant nutrients; from highly exposed to sheltered and shaded sites; from dry to wet; vegetation influenced by wind and salt spray	Rocks dark greenish grey to red or orange where highly weathered and oxidised; prevalence of many rare endemic species	Confined to Hikurua Surville Cliffs (Northland) and D'Urville Island (Marlborough)
	Dune deflation hollows	Depressions within coastal dune systems where wind erosion has lowered the ground surface, exposing material too coarsely grained to be moved by wind; transitions into a damp sand plain when water table is just below the surface	Stable, armoured surface within or adjacent to active dune fields	Between the Manawatū and Rangitīkei Rivers (Manawatū–Whanganui), Kaitorete Spit (Canterbury)
	Shingle beaches	Beaches comprised of sand, water-smoothed gravel and cobbles; common where shingle-laden rivers enter the ocean or where shingle is eroded from coastal cliffs; shoreface often gives rise to a ridge beyond the high tide mark	Dominance of gravels and cobbles; vegetation cover ranging from sparse to near continuous cover	Canterbury and Hawke's Bay, Onoke Spit (Wairarapa)

ENDANGERED ECOSYSTEMS				
Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Coastal	Stable sand dunes	Previously active dunes now stable; distant from the ocean and no longer impacted by coastal processes	Notable soil development; near continuous and often woody vegetation cover	Rangitāiki Plains (Bay of Plenty), Manawatū-Whanganui dunes
	Stony beach ridges	Former beach crests no longer influenced by wave action and comprised of wave-deposited water-smoothed gravel and cobbles no longer or rarely influenced by the ocean	Ridges becoming older in a landward direction; woody vegetation in hummocks to near continuous cover	Pūkorokoro / Miranda (Waikato), Pukerua Bay (Wellington), Rārangi (Marlborough), Kaitorete Spit (Canterbury)
Inland & Alpine	Boulderfields of volcanic rocks	Areas of frost-weathered volcanic rock on gentle gradients; little to no soil development other than between blocks or boulders	A continuous or patchy sea of blocks or boulders in areas of volcanism	Mt Ruapehu (Tongariro National Park)
	Braided riverbeds	Bed of a braided river with evidence of channel migration within the riverbed and the riverbed across its floodplain; high sediment loads with shifting shingle and gravel islands	Gently sloping and broad gravelly floodplain with multiple mobile channels	Ngaruroro River (Hawke's Bay), Rangitīkei River (Manawatū–Whanganui), Rakaia, Rangitata, and Tasman rivers (Canterbury)
	Frost hollows	Areas on terrace and valley floors where cold air accumulates; shrubby vegetation adapted to severe frosts and poor drainage; differ from old tephra (>500 years) plains – frost flats	Frosts prevent species in surrounding vegetation types from establishing, especially tall forest	Waiau River Valley (Southland), Buller River Valley (West Coast)
	Sandstone erosion pavements	Areas of flat to gentle slopes lacking topsoil and exposed to chemical weathering; cracks and fissures may be present; those associated with coal deposits of greatest concern	Bare rock patches on ridges, plateaus, and mountain tops	Denniston and Stockton plateaus (Westland), Herbert Range (Nelson-Tasman)
	Volcanic dunes	Mostly inland sandy to gravelly dunes derived from volcanic deposits reworked and deposited by wind and water; form in sheltered sites and around sand binding vegetation forming hummocks	Low mounds in a chaotic pattern of hummocks and hollows, intermixed with hard, gravelly surfaces	Mt Ruapehu (Tongariro National Park)

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Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Subterranean or semi-subterranean	Sinkholes	Natural bowl-shaped depressions in limestone or karst landscapes where surface water drainage has led to the dissolution and collapse of the underlying substrate	Depressions where the ground's surface collapses into an underground cavity	Western Waikato-King Country, Northwest Nelson, Central Westland, Northeastern Otago
Wetlands	Domed peat bogs	Bogs that over time, through peat accumulation, develop a signature convex dome raised above the local topography; high rainfall results in waterlogging; low nutrient and acidic conditions	Wetlands dominated by *Sporadanthus ferrugineus* and *Sporadanthus traversii* among other specialised flora	Confined to the Waikato (e.g. Kopuatai Peat Dome) and the Chatham Islands
	Dune slacks	Nutrient-enriched moist depressions between shore dunes or in a sandbank; periodically holds water; vegetation is typically wetland adapted; occur in association with active dunes	Permanently damp to seasonally wet habitats in coastal dunes; wetter than damp sand plains	Tangimoana and Hīmatangi (Manawatū-Whanganui), Mason Bay (Stewart Island)
	Lagoons	Shallow body of water separated from the ocean by a beach ridge or barrier bar; connects to the ocean during storms and flooding events; salinity fluctuates from fresh to nearly seawater	Dynamic aquatic system driven by riverine and ocean processes	Te Waihora Lake Ellesmere (Canterbury), Waituna Lagoon (Southland), Ōkārito Lagoon (West Coast), Lake Ōnoke (Wairarapa)
	Seepages and flushes	Wetland habitat where nutrient and oxygen rich groundwater emerges; seepages tend to be wetter for longer periods than flushes; areas of a few to several 10s of m^2	Herbaceous species dominate; saturated soils exclude woody plants	Widely occurring but most pronounced in the montane zones of wetter districts

VULNERABLE ECOSYSTEMS				
Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Coastal	Coastal cliffs of mafic (basic) rocks	Cliffs of mostly volcanic origin (e.g. basalt) next to the ocean; from highly exposed to sheltered and shaded; from dry to wet	Vegetation driven by wind and salt spray; woody plants stunted, wind shorn	Whangārei Harbour (Northland), Banks Peninsula (Canterbury), Caitlins (Southland)
Inland & Alpine	Boulderfields of calcareous rocks	Fields of large fragments of fallen limestone and marble rock; usually little soil development; lichens and mosses the only colonists initially, followed by mat-forming plants	Deposits of large (>0.25 m) fragments of fallen rock on gentle slopes	Wharepapa/Arthur Range and Matiri Range (Kahurangi National Park), Garibaldi Range (West Coast), Chalk Range (South Marlborough), Castle Hill Basin (Canterbury)
	Cliffs, scarps and tors of calcareous rocks	Outcrops of limestone or marble; sparsely vegetated by species tolerant of shallow soils, full sunlight, drought, or damp and shady crevices; high numbers of rare endemic plants	Cliffs are high steep faces; scarps are cliffs along plateau edges; tors are mounds of glacial eroded bedrock with steep sides	Widespread across the North Island (Wairarapa) and South Island (Nelson, Canterbury)
	Cliffs, scarps and tors of mafic (basic) rocks	Outcrops of mostly volcanic rock (e.g. basalt); vegetated by species tolerant of shallow soils, full sunlight, drought, or damp and shady crevices	Cliffs are high steep faces; scarps are cliffs along plateau edges; tors are mounds of glacial eroded bedrock with steep sides	Throughout Northland and the Coromandel Peninsula; Banks and Otago Peninsulas
	Moraines	Accumulation of rock deposited by glacial action or left behind after glacial retreat; dry, raw soils sparsely vegetated by mosses and lichens; scattered herbs and shrubs; those east of the Main Divide of greatest concern	Rocks marking the extent of a glacier; distinguished from boulder fields by the mode of formation	Throughout the Mackenzie Basin (Canterbury), Upper Rangitata and Waimakariri rivers (Canterbury), Hakatere Basin (Canterbury), Upper Clutha River Valley (Otago)
	Screes of calcareous rocks	Accumulated fine to course limestone rock, ranging from gravel and cobbles to patches of boulders covering slopes often with protruding bedrock; mostly above tree line	Shingle slides sparsely to mostly unvegetated owing to downslope movement	Wharepapa/Arthur Range and Matiri Range (Kahurangi National Park), Chalk Range (South Marlborough)

VULNERABLE ECOSYSTEMS				
Category	Ecosystem name	Short description	Diagnostic feature(s)	Location examples
Inland & Alpine	Young tephra (<500 years) plains and hillslopes	Deposits of fine to coarse grained material recently (<500 years) ejected during volcanic eruptions; soils poorly developed and lacking organic matter	Composed of volcanic ash, pumice and gravelly sand	Mt Taranaki, Mt Tarawera, Tongariro National Park, Whakaari White Island
Wetlands	Blanket mires	Peat wetlands covering undulating low relief terrain; precipitation and/or groundwater fed; vegetated by mosses, sedges and some shrubs; typical of cool, windy, and wet locations	Wetlands that accumulate peat but at a reduced rate relative to a domed bog	Southland, Westland, Rakiura / Stewart Island, Subantarctic Islands
	Estuarine margins	Transitional habitats of estuaries where open water grades into freshwater wetland or terrestrial habitats; behind sand spits and coastal embayments, at river mouths, and in drowned river valleys; vegetation influenced by salinity, tides, wave action, and topography	Estuary edges influenced by coastal and riverine processes; salt-tolerant vegetation; shoreline slope influences ecosystem extent and zonation	Throughout the country in coastal areas with a permanent direct connection to the ocean
	Lake margins	Transitional habitats between aquatic and terrestrial habitats bordering lakes and tarns (small higher altitude lake-like water bodies); species composition driven by episodic wetting and drying; functions similar to an ephemeral wetland but with a corresponding water body.	Relates to the ephemeral margin of the lake or tarn influenced by a fluctuating water level; width of margin may vary annually.	Throughout the country from sea level to above tree line; lakes as larger low to mid-altitude water bodies; tarns as smaller mid-altitude to alpine water bodies.

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