



Braided River Field Guide



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Compiled by Barry Hibbert and Kerry Brown

Plant illustrations from
Wild Plants of Mount Cook National Park
by Hugh Wilson

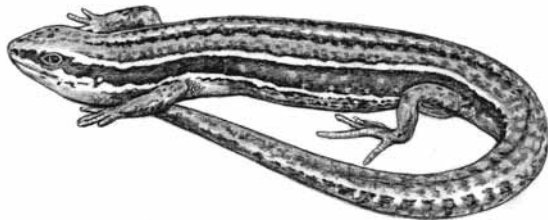
Some illustrations were based on original drawings in:
Freshwater Life
by Michael Winterbourn & Karen Mason -
common freshwater snail, all insects on pages 18-21,
water spider

Butterflies of New Zealand
by W.B.R. Laidlaw - boulder copper butterfly

The Grasshoppers of New Zealand
by R.S. Bigelow - minute grasshopper

Common Insects 2
by Annette Walker & Geoffrey Cox -
tiger beetles, chafer beetle

The Field Guide to the Birds of New Zealand,
Barrie Heather, Hugh Robertson & Derek Onley -
all birds



Cover photo: Ahuriri River, Mackenzie Basin

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Introduction

Braided rivers are very special habitats with plant and animal communities that are found nowhere else in the world. Physically similar extensive braided rivers are rare world-wide and occur only in Alaska, Canada and the Himalayas. Canterbury contains 60% of the braided-river habitat in New Zealand, and the Mackenzie Basin contains some of the most pristine of these rivers. This field guide briefly describes the ecology of some eighty introduced and native species found in the braided rivers and wetlands of the Mackenzie Basin, but many of these species are also found in other braided rivers.

Project River Recovery (PRR) is a DOC programme that aims to maintain and enhance braided-river and wetland habitats and ecological communities in the upper Waitaki Basin. PRR is funded by Meridian Energy Limited under a compensatory agreement that recognises the adverse effects of hydro-electric power development on rivers and wetlands. DOC and Meridian Energy are working together on jointly agreed projects to protect braided river habitats and their special communities of native plants and animals.

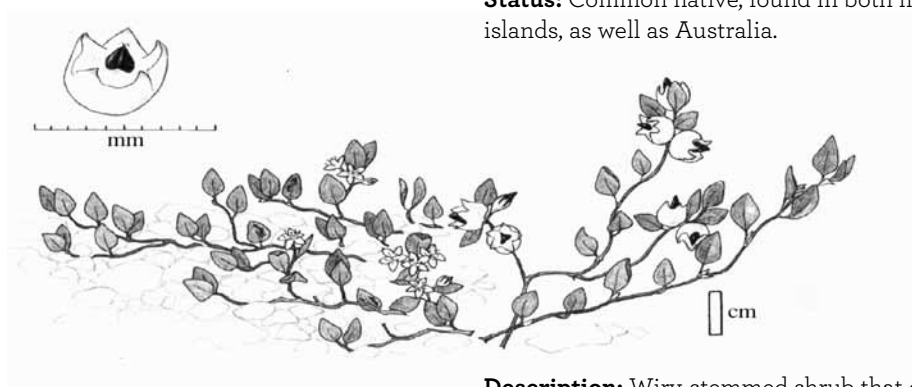
We hope that this guide adds to your enjoyment of braided rivers and wetlands by enabling you to understand more about the variety of animals and plants that live in these special ecological systems.

Ahuriri River

Creeping pōhuehue

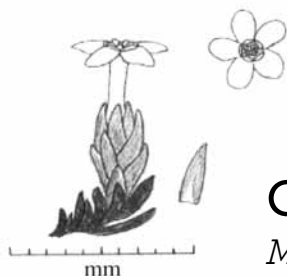
Muehlenbeckia axillaris

Status: Common native, found in both main islands, as well as Australia.



Description: Wiry-stemmed shrub that grows flat on the ground. Dark green leaves; small yellowish-white flowers (December–March); black nut (January–April).

Habitat: Scrubland riverflats, from coast to mountain slopes.



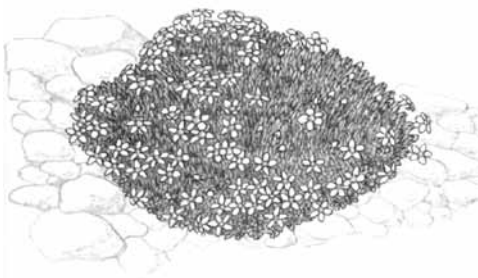
Cushion forget-me-not

Myosotis uniflora

Status: Uncommon endemic, found only in the upper reaches of some large Canterbury rivers.

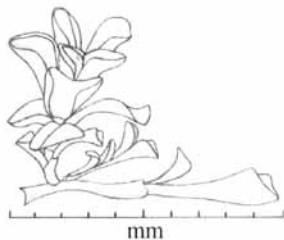
Description: Forms small rounded cushions. Closely packed hairy leaves; small sulphur-yellow flowers (November); tiny fruit (December–January).

Habitat: Grows exclusively on high-country shingle riverbeds.



Mat daisy

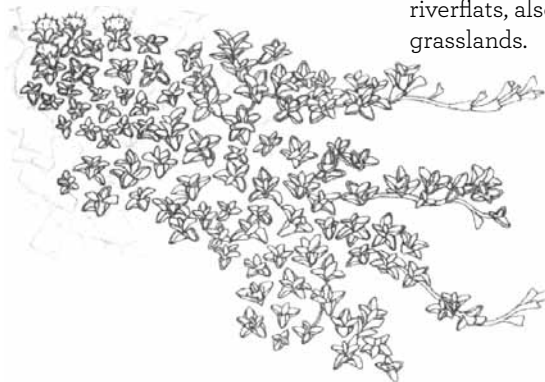
Raoulia hookeri



Status: Locally common endemic, found in three main islands.

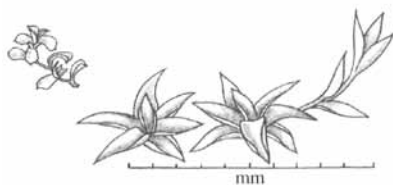
Description: Mat-like plant that forms large patches on ground. Small boat-shaped, greyish white leaves; button-shaped yellow flower heads (January–February); fluffy seeds.

Habitat: Glacial moraines and mountain riverflats, also extends into neighbouring grasslands.



Mat daisy/tutahuna

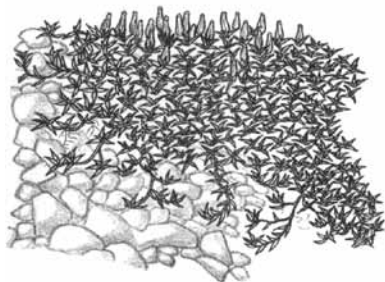
Raoulia tenuicaulis



Status: Locally common endemic, found in three main islands. Many members of its botanical group are popularly called ‘vegetable sheep’.

Description: Moss-like mat-forming plant that can spread up to 1 metre in diameter. Small, overlapping, pale green leaves; funnel-shaped yellow-tipped flower heads (November); fluffy seeds.

Habitat: Glacial moraines and mountain riverflats.



Scleranthus uniflorus

Status: Locally common endemic, found in three main islands (most widespread in South Island).

Description: Dense cushion-forming plant that resembles moss. Very small, closely packed orange-green leaves; tiny flowers and fruit (November–January).

Habitat: Inland riverbeds and high-country tussock land.



Dwarf heath

Pentachondra pumila

Status: Locally common native, found in all three main islands, as well as Australia.

Description: Small dense shrub that can form extensive, ground-hugging patches. Dark purplish-green leaves; small star-shaped white flowers (November–February); red fruit.

Habitat: Mountain slopes and subalpine shrublands.



Native daphne/pinātoro

Pimelea prostrata



Status: Widespread and locally common endemic found in both main islands.

Description: Low growing hebe-like shrub, with interlacing branches. Small green leaves edged with red; strongly scented white flowers (November); white fruit (December–February).

Habitat: Dry places, from rocky beaches to mountain riverflats.

Porcupine shrub

Melicytus alpinus



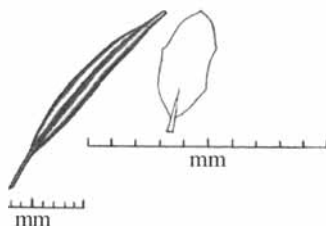
Status: Common endemic, found in South and Stewart Islands.

Description: Extremely tough low shrub with stout branches and spine-like branchlets. Small dark green leaves; bell-shaped pale yellow flowers (November–December); white fruit (December–April). In more exposed places, leaves are sparsely placed on plant.

Habitat: Open high country in dry rocky places.

Willowherb

Epilobium microphyllum



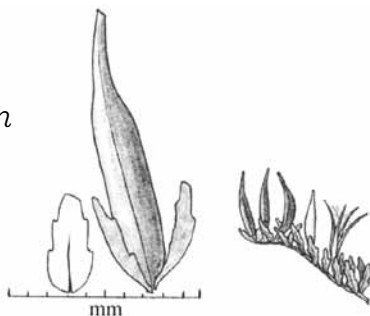
Status: Locally common endemic, found in both main islands.

Description: Small clump-forming herb with wiry stems. Green or red-brown leaves; white flowers (December–February); striped black and white seed capsules.

Habitat: High-country shingle riverflats. Epilobiums are usually the first plants to colonise dry, stable riverbeds.

Willowherb

Epilobium rostratum



Status: Locally common endemic, found only in the South Island.

Description: Small, partly sprawling herb. Dull green leaves; white or pink flowers (January); seed capsules have beaked tip.

Habitat: Inland shingle riverbeds.

Helichrysum depressum



Status: Common endemic. Apart from one small population in Hawke's Bay, this plant is known only from the South Island.

Description: Low, dead-looking shrub. Scaly, grey leaves; small yellowish flowers (January–February); fluffy windborne seeds.

Habitat: Gravelly riverbeds and glacial moraines.



Matagouri/tūmatakuru

Discaria toumatou



Status: Common and widespread endemic, found in both main islands. Known as 'Wild Irishman' by early European settlers.

Description: Spiny shrub or small tree that can grow up to 6 metres. Small dark green leaves; scented white flowers (November–December); fruit is a small dry capsule (January–March).

Habitat: Most common in dry inland valleys and riverbeds east of the Southern Alps. (Because it fixes nitrogen from the air, matagouri is an important pioneer plant on bare sites with newly developing soils.)

Grey woollyhead

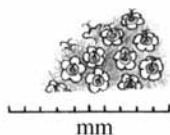
Craspedia lanata



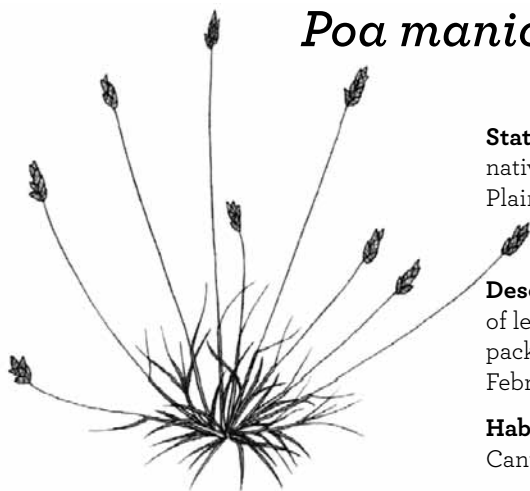
Status: Locally common endemic, found only in the South Island.

Description: Small herb. Woolly stems and greyish white leaves; yellow flowers (December–February); tiny fluffy seeds are dispersed in wind.

Habitat: Subalpine valleys and stony riverflats.



Poa maniototo



Status: Common, but easily overlooked, native grass named after the Maniototo Plains. Found only in Otago and Canterbury.

Description: Very small bluish-green tufts of leaves, bearing an oblong cluster of closely packed flowers (spikelets) usually seen in February.

Habitat: Stony river flats of Otago and Canterbury.

Stonecrop/wall pepper

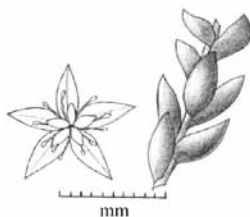
Sedum acre



Status: Locally common exotic introduced from Europe as garden plant. Its peppery-tasting leaves are poisonous. Spreading in the braided rivers of Canterbury.

Description: Low-growing succulent that forms clumps or mats. Small fleshy light green leaves; yellow flowers, often abundant (January).

Habitat: Grows on dry banks, stone walls and gravelly riverbeds.



King devil hawkweed

Hieracium praealtum

Status: Abundant exotic herb, introduced from Europe. Can be a significant problem plant in open areas and grasslands.

Description: Small herb with pale green leaves and long sparse hairs. Often forms extensive colonies of tufted upright leaves. Bright yellow flower heads, forming fluffy wind-dispersed seeds (November – March).

Habitat: Stony ground and grassland, from lowland to alpine areas.

Russell lupin

Lupinus polyphyllus



Status: Exotic garden plant that has been spread by people into the wild in many parts of the South Island. Problem plant in the braided rivers of the Mackenzie Basin.

Description: Perennial plant (dies down in winter). Downy green leaves; white, blue, pink, mauve, orange or yellow flowers carried on tall spikes (November–February); seeds are held in furry pods which explode when ripe.

Habitat: Stony ground; riverflats and terraces.

Yellow tree lupin

Lupinus arboreus



Status: Common exotic. Problem plant in Canterbury riverbeds. DOC is attempting to eradicate yellow tree lupin in the Mackenzie Basin.

Description: Large shrub. Downy green leaves; sweetly scented yellow flowers (October–May); ripe seed pods explode in sun.

Habitat: Most common in sandy coastal areas; also vigorously colonises inland riverbeds and terraces.



Crack willow

Salix fragilis

Status: Widespread exotic, introduced from Europe to control rivers. Now naturalised in many places. Spreads quickly in active riverbeds. Problem plant in riverbeds and wetlands.

Description: Large deciduous tree with rough bark and shiny orange-brown twigs. Bright green leaves; yellowish flowers (catkins) (November).

Habitat: Riverbanks and terraces; boggy ground.



Viper's bugloss

Echium vulgare

Status: Locally common exotic, introduced from Europe as garden plant. It was once prescribed as a remedy for snakebite.

Description: Bristly biennial herb that forms a rosette of leaves the first year and flower stems the next. Dull green leaves; pink, turning to vivid blue, flowers. Produces high-quality honey.

Habitat: Favours dry stony ground.

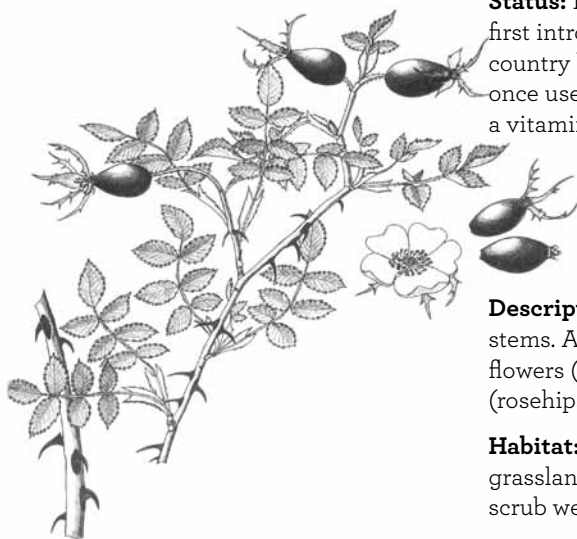
Sweet brier

Rosa rubiginosa

Status: European rose, thought to have been first introduced into the South Island high country by Otago gold-diggers. Its fruit was once used for the production of rosehip syrup, a vitamin C tonic.

Description: Thorny shrub with arching stems. Apple-scented green leaves; pink flowers (January–February); orange-red fruit (rosehips) (March–April).

Habitat: Dry riverflats and terraces; stony grassland. (Sweet brier is the most widespread scrub weed in Central Otago.)



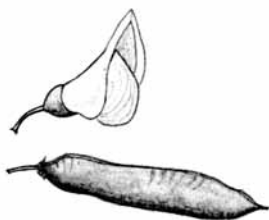
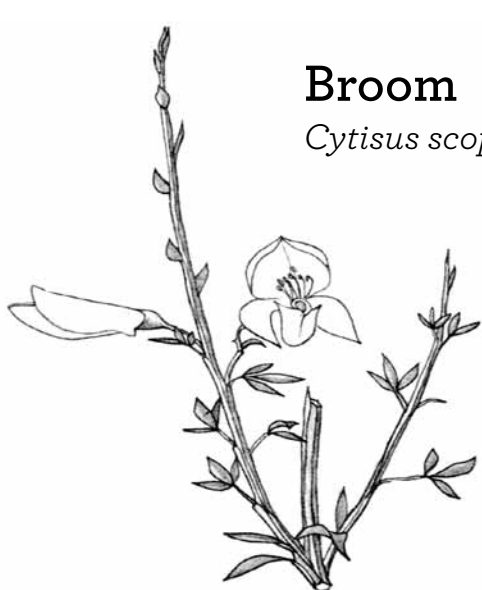
Broom

Cytisus scoparius

Status: Common and widely spread scrub weed, introduced from Europe. Problem plant in riverbeds.

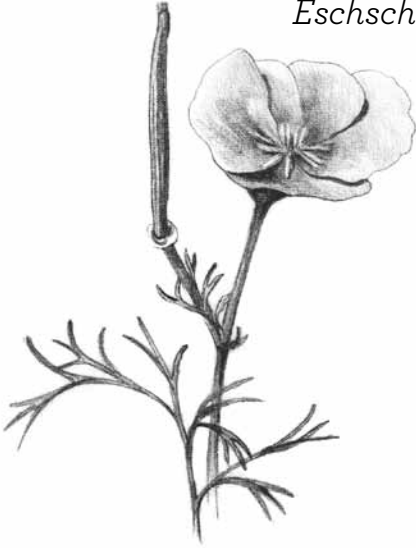
Description: Erect shrub with straight green stems. Small sparsely spaced green leaves; bright yellow flowers (November–January); ripe seed pods explode in sun.

Habitat: Gravelly riverbeds, shrub and grassland.



California poppy

Eschscholzia californica



Status: Locally common exotic, introduced from North America as garden plant.

Description: Annual wildflower. Feathery green leaves; orange, yellow and sometimes cream flowers (October–March); narrow, cone-shaped seed heads. Spreading into Mackenzie Basin riverbeds.

Habitat: Favours hot dry places, with sandy or stony soils.

Woolly mullein/ poor man's tobacco

Verbascum thapsus



Status: Common exotic, introduced from Europe as garden plant.

Description: Biennial herb that grows a large rosette of leaves in its first year, and a tall (up to 2 metres) flower-bearing spike the next. Greenish white woolly leaves; yellow flowers (January–March); seed borne in capsules.

Habitat: Dry stony ground including riverbeds.

Gorse

Ulex europaeus



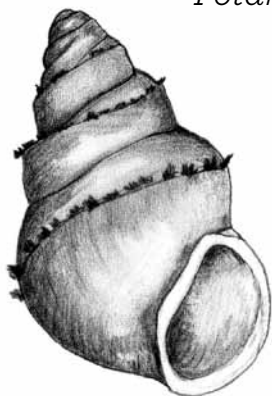
Status: This European shrub was introduced to New Zealand as a hedge plant in the 19th century. Widespread and abundant in many areas, it is now treated as a pest by many farmers and conservationists.

Description: Spiny green shrub with furrowed bark. Strongly scented white flowers (October–December); bears seed in pods that explode when ripe.

Habitat: If given the chance, will vigorously colonise open ground from the coast to the lower slopes of mountains.

Common freshwater snail

Potamopyrgus antipodarum



Status: Endemic, the most widespread and abundant of our freshwater snails. An important source of food for fish and some riverbed birds.

Size: Shell height 3–12 mm.

Habitat: Rivers, streams, lakes, ponds, estuaries and swamps.

Habits: Feeds on algae and organic debris. Mostly females in any population, as eggs can develop without male fertilisation.

Caddisfly larva

Pycnocentroides species



Status: New Zealand's caddisflies, of which there are nearly 230 species, are commonly placed into 16 families. Members of the pycnocentroides group distinguish themselves from other caddisflies by the dark banding on the leg joints and larval casing that they construct out of sand.

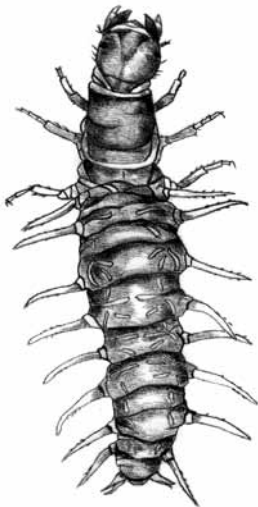
Size: Up to 10 mm.

Habitat: Stony streams, rivers and lakes. Caddisfly larvae are a vital link in many riverbed food chains that end with the larger fish and birds such as wrybills and dotterels.

Habits: Feeds on algae and organic debris. The moth-like adults, called 'sedges' by anglers, are strongly attracted to light.

Dobsonfly larva/toebiter

Archichauliodes diversus



Status: Common endemic. The larvae of the dobsonfly are New Zealand's largest running-water insects. *Archichauliodes diversus* is the only dobsonfly species in New Zealand.

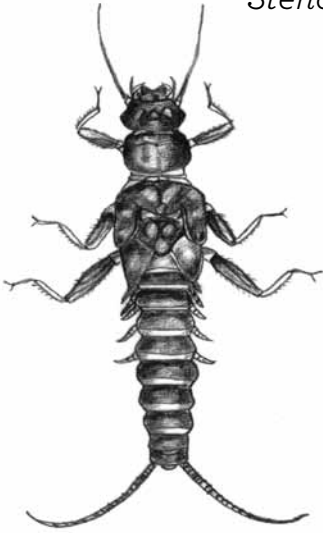
Size: Larvae up to 50 mm long.

Habitat: The water of stony streams and rivers. Older larvae, which are often used by anglers as trout bait, are found beneath dry stones close to the water's edge.

Habits: Dobsonfly larvae take several years to reach full size, during which time they feed on mayfly larvae. The large, winged adults emerge in summer and live for only 6-10 days.

Large green stonefly nymph

Stenoperla prasina



Status: Widespread endemic; the most common of the 80+ species of stonefly found in New Zealand.

Size: Up to 25 mm long.

Habitat: Clear stony streams and the edges of lakes.

Habits: Feeds on mayfly larvae and midges. Nymph stage lasts 1-3 years; large, winged adults live only several weeks.

Mayfly nymph

Deleatidium species



Status: These abundant aquatic insects are an important food source for trout and riverbed birds. The three tail filaments are a characteristic feature that distinguishes mayfly nymphs from the larvae of other aquatic insects found in the Mackenzie Basin.

Size: Up to 10 mm, excluding tails.

Habitat: Abundant in streams and rivers all over New Zealand; their absence from these habitats often indicates serious water pollution.

Habits: Feed on algae and organic debris found under submerged stones. After passing rapidly through two stages, mayflies live only several days. These separate adult forms, both of which have wings, are called 'duns' and 'spinners' by anglers.

Sandfly larva/namu

Austrosimulium australense



Status: The commonest of several species of sandfly found in the Mackenzie Basin. Of the 11 species of adult native sandflies, this is one of only two that bites humans.

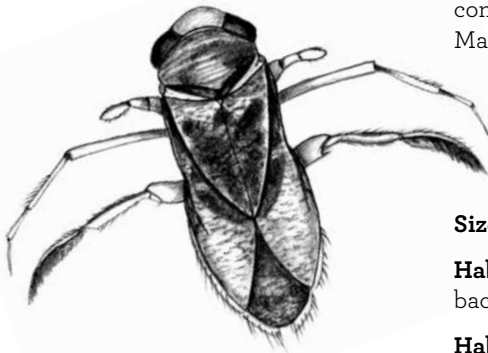
Size: 5–6 mm.

Habitat: South Island rivers and streams.

Habits: Feed by filtering plankton and bacteria from water. They use silk to attach themselves to underwater stones.

Water boatman

Sigara species



Status: The illustrated water boatman is typical of several closely related species commonly found in the waterways of the Mackenzie Basin.

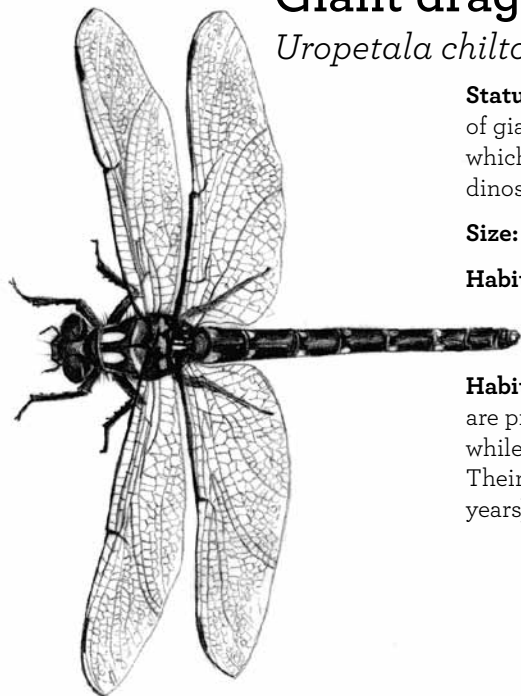
Size: Adult about 5 mm.

Habitat: Small ponds and the calmer backwaters of streams and rivers.

Habits: Feed mainly on algae and organic debris, which they extract from mud. They propel themselves with their hind legs, and come to the water surface for air. Males can make a chirping sound.

Giant dragonfly/kapowai

Uropetala chiltoni



Status: Endemic; one of two ancient species of giant dragonfly found in New Zealand, which have changed little since the age of the dinosaurs.

Size: Wingspan 110–120 mm.

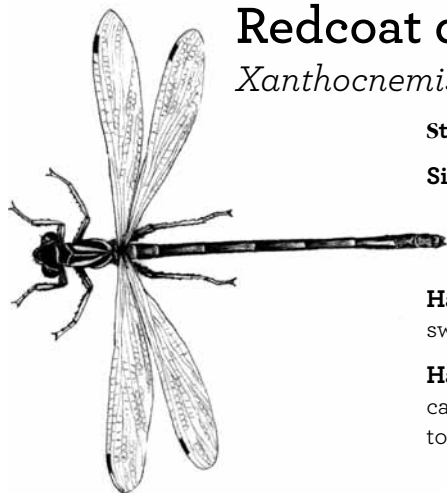
Habitat: Near rivers, streams, ponds and lakes.

Habits: These yellow and black dragonflies are predatory and catch their prey (insects) while on the wing.

Their larvae are slow to mature (up to six years), and live in long burrows near water.

Redcoat damselfly/kihitara

Xanthocnemis zealandica



Status: Common endemic

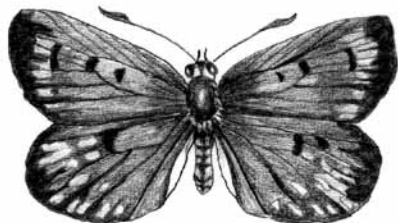
Size: Body length 32 mm.

Habitat: Near streams, rivers, lakes and swamps.

Habits: This red damselfly preys on insects caught on the wing. Their larvae take two years to mature, and live among aquatic vegetation.

Boulder copper

Lycaena boldenarum



Status: Common endemic, New Zealand's smallest butterfly.

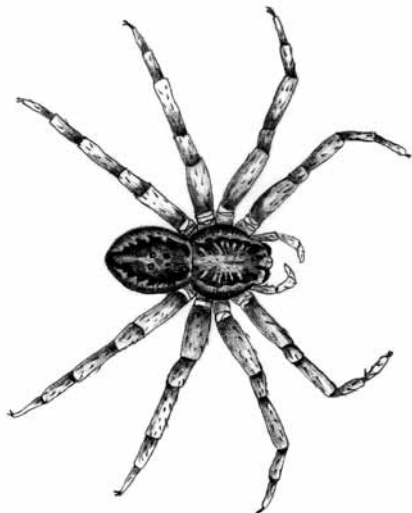
Size: Wingspan 20 mm.

Habitat: Most abundant in the South Island, where it favours tussock grassland and riverflats.

Habits: Never moves far from its larval food plants: sorrel and pohuehue species. Adult butterflies alight on stones rather than vegetation. Males have iridescent purple wings, females have orange-brown wings. The small caterpillars (10 mm) can be either red or green.

Water spider

Dolomedes aquaticus



Status: One of a group of closely related endemic spiders that are common among stony banks of rivers throughout New Zealand.

Size: Body length up to 23 mm.

Habitat: Near stony streams and rivers.

Habits: These spiders either hunt on land or submerge themselves under water for up to half an hour to catch insects and small fish. They are nocturnal and during the day shelter under stones close to the water edge. They only use silk to build nests.

Minute grasshopper

Sigaus minutus

Status: This rare endemic species, first identified in 1962, is known only from the Mackenzie Basin and a similar species in Central Otago. However, it appears to be more widespread and less threatened than the robust grasshopper.



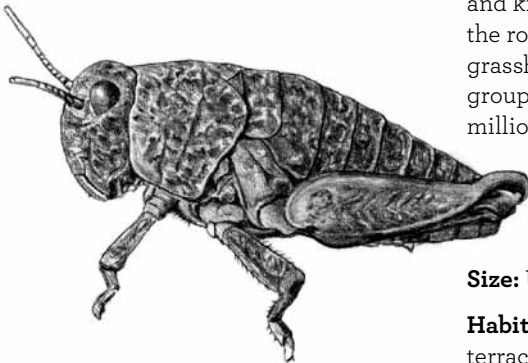
Size: Up to 16 mm.

Habitat: River terraces adjoining braided rivers in the Mackenzie Basin; habitat often dominated by mat daisies (*Raoulia*).

Robust grasshopper

Brachaspis robustus

Status: Vulnerable endemic with an apparently shrinking population. First identified in 1963 and known only from the Mackenzie Basin, the robust is closely related to the alpine grasshoppers of New Zealand, an ancient group that seems to have changed little in 100 million years.

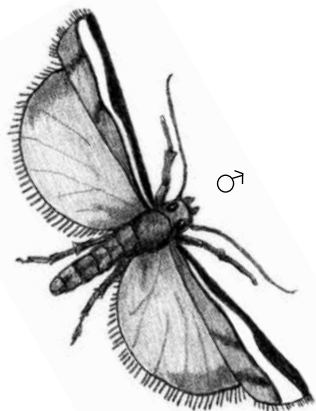


Size: Up to 30 mm.

Habitat: Stony floodplains and riverflats and terraces of the Tekapo, Pukaki and Ohau rivers; also Sawdon and Stony river outwashes.

Grass moth

Orocrambus fugitevellus



Status: This moth has been found only in one locality in the south eastern side of the Mackenzie Basin, along the Haldon road.

Size: Body length up to 18 mm.

Habitat: Seasonally wet grass (resulting from foothill drainage) in shallow hollows.

Habits: The female moth is wingless, so recolonising of new areas is slow.

Cicada/kihikihi

Maoricicada campbelli



Status: Widespread throughout the Mackenzie Basin and can be found at high altitudes.

Size: Up to 16 mm.

Habitat: Favours dry stony ground and is common on braided riverbeds.

Habits: Males sing on fine sunny days and, in places, can be deafening. Generally sing from a stone or small rock.

Tiger beetles

Neocicindela species



Status: These endemic beetles are widespread and common in the Mackenzie Basin. The illustrated beetle is typical of the group.

Size: Up to 13 mm.

Habitat: Hot open areas, like banks, riverflats and terraces, where vegetation is sparse or absent.

Habits: Predatory; nimble adults pursue their insect prey along the ground in high-speed chases; larvae ambush from burrows. Depending on climate and food supplies, the larval stage can last several years.

Chafer beetle

Prodontria matagouriae



Status: This recently discovered beetle is known only from one small population near Twizel. It is still to acquire a common name to distinguish it from other New Zealand chafer beetles.

Size: Up to 14 mm.

Habitat: Live on bedded stony soils such as that found on floodplains.

Little is known about the habits, distribution or conservation status of this species. Observations so far, however, suggest that the adult beetles may feed only on the leaves of matagouri. This beetle, like other chafers, is closely related to the common grass grub beetle.

Tekapo ground wētā

Hemiandrus species

Status: This species was discovered during the 1990s in the lower Tekapo River. With further survey, it is likely to be more widespread than at present.

Size: 15–18 mm.



Habitat: Braided-river terraces and outwashes that are stable and not flooded on a regular basis.

Habits: Lives in tunnels in the ground, so is regularly found in sandy loose substrates.

Common skink

Oligosoma nigriplantare polychroma

Status: Widespread in the Mackenzie Basin, this endemic species is often difficult to distinguish from McCann's skink. Found from Central North Island to Southland.

Size: 130–145 mm.

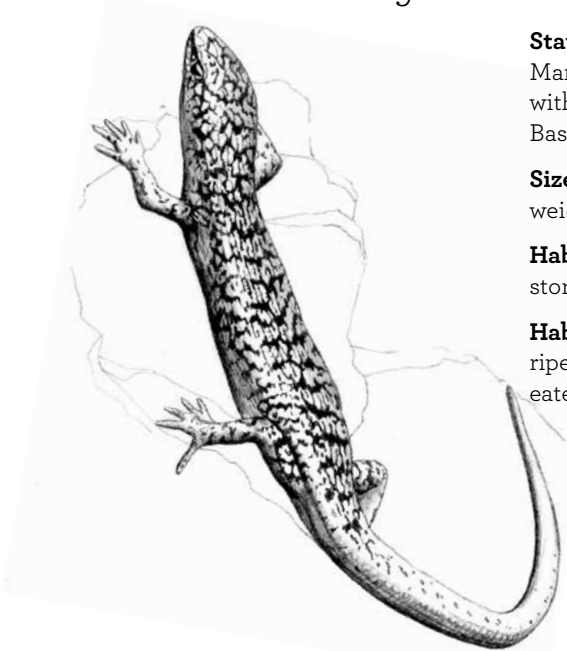


Habitat: Favours densely vegetated grass, and shrublands.

Habits: Commonly basks in sun and feeds mainly on invertebrates.

Scree skink

Oligosoma waimatense



Status: This endemic species is found from Marlborough to Otago. Probably widespread with small local populations in Mackenzie Basin.

Size: Up to 300 mm long; large individuals weighing around 22 grams.

Habitat: Active rock and shingle screes, and stony gullies.

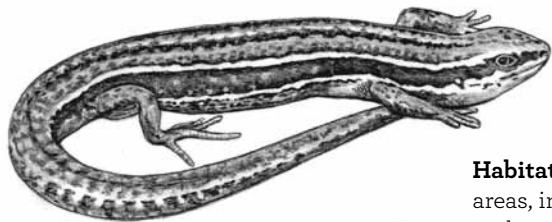
Habits: Feeds mainly on invertebrates, but ripe fruits of *Melicytus alpinus* are commonly eaten.

McCann's skink

Oligosoma maccanni

Status: Endemic lizard; the most common and widespread skink found in the Mackenzie Basin. Found from Mid-Canterbury (including Banks Peninsula) to Southland.

Size: 130–145 mm.



Habitat: Favours dry grasslands and stony areas, including riverbeds. Generally found on rock outcrops.

Habits: Commonly basks in sun and feeds mainly on invertebrates.

Longfin eel/tuna

Anguilla dieffenbachii

Status: Common native fish that is widely caught by commercial and recreational anglers. A very important traditional food source for Māori throughout New Zealand.



Size: Females can grow as long as 2 metres and weigh up to 25 kg; most longfinned eels – male and female – reach a maximum of 1 metre and weigh less than 10 kg.

Habitat: Found in rivers, streams, wetlands and lakes all over New Zealand.

Habits: Longfin eels are slow to mature and can live to 80 or more years. Normally, when they reach between 25 and 35 years of age they migrate to sea and lay their eggs in the warm waters of the Western Pacific. After an eighteen month journey, travelling on ocean currents, the baby (glass) eels find their way to New Zealand.

The adults, however, never return and die at sea. These eels are nocturnal and feed mainly on insects and small fish, but can take ducklings and other birds. They are also skilled climbers.

Alpine galaxias

Galaxias paucispondylus

Status: Uncommon native, found only in the South Island.



Size: Commonly 80–85 mm.

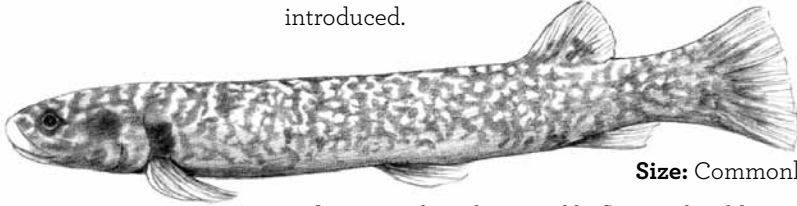
Habitat: Confined almost exclusively to the upper portion of braided rivers draining the Southern Alps. Favours the more stable courses of braided rivers and side-streams through tussock flats.

Habits: Feeds on a wide variety of insect larvae. Spawns during spring but little else is known of its breeding habits.

Kōaro

Galaxias brevipinnis

Status: Very widespread native, found on all three main islands of New Zealand. Young form small part of annual whitebait catch. They have declined greatly in lakes where trout have been introduced.



Size: Commonly 160–180 mm.

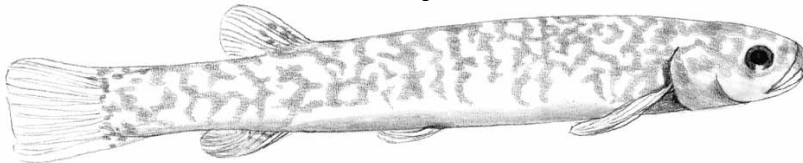
Habitat: Prefers clear, swiftly flowing bouldery streams that run through forest, and tussock streams that flow into high-country lakes. Kōaro are landlocked in the Mackenzie Basin, and schools of whitebait are commonly seen around the edges of Lakes Benmore, Ohau, Pukaki and Tekapo.

Habits: After hatching, young migrate to sea and spend four months developing before returning to freshwater habitats, where they remain the rest of their lives. Kōaro are nocturnal and eat a wide variety of small insects and other invertebrates. Like eels, they are strong climbers.

Canterbury galaxias

Galaxias vulgaris

Status: Endemic galaxid, found only in the South Island, where it is widespread and commonest on the eastern side of the Southern Alps as far south as the Waitaki River. Similar species occur in Otago and Southland.



Size: Commonly 100–120 mm.

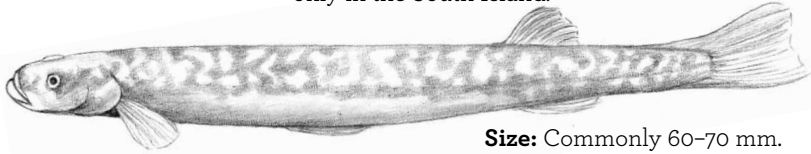
Habitat: Favours clear streams with a variety of flow velocities. Found throughout braided rivers at all altitudes in Canterbury.

Habits: Lays eggs under boulders; feeds mainly on the larvae of small aquatic insects.

Longjaw galaxias

Galaxias prognathus

Status: Uncommon and sparsely distributed endemic, found only in the South Island.



Size: Commonly 60–70 mm.

Habitat: Apart from one small population in coastal North Otago and another in Maruia, this fish is present only in the high-country braided streams and rivers of Canterbury. Prefers the shallow edges and riffles of stable braided-river side-channels.

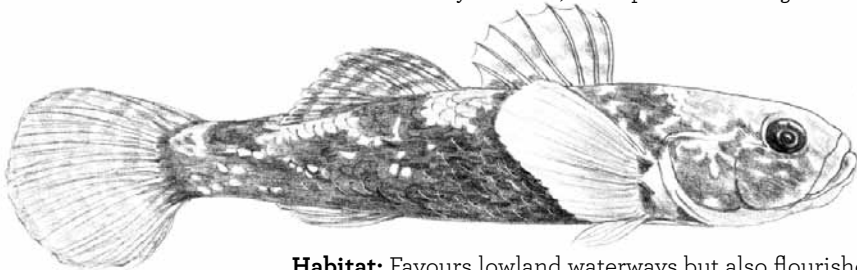
Habits: Feeds on a wide variety of insect larvae but little is known of its breeding habits. Spawns during spring.

Common bully

Gobiomorphus cotidianus

Status: Very common endemic, found on all three main islands as well as Chatham. In some areas, an important food source for trout.

Size: Commonly 100 mm; lake specimens are generally smaller.



Habitat: Favours lowland waterways but also flourishes in gravelly rivers and lakes at higher altitudes.

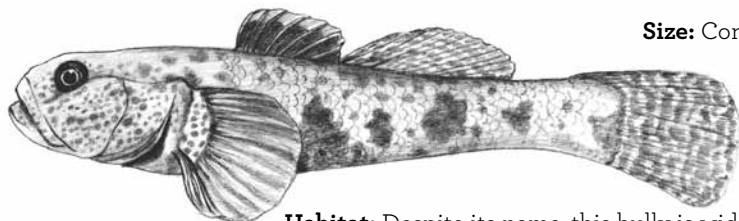
Habits: After hatching, the young move to the sea, where they feed and grow, returning to fresh water after 3–4 months. Landlocked populations, however, are able to complete a life cycle without undertaking this migration. Eats a wide variety of stream insects as well as fish and crustaceans. Mackenzie Basin populations are landlocked, and outmigration to the lakes, especially Benmore, occurs.

Upland bully

Gobiomorphus breviceps

Status: Common endemic, found on all three main islands.

Size: Commonly 80 mm.



Habitat: Despite its name, this bully is widespread and common in lowland as well upland habitats. Favours the gentler water of gravelly streams and rivers and also lake shallows.

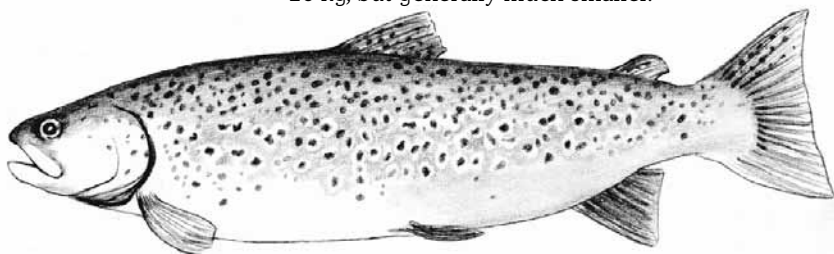
Habits: These fish are secretive and spend a great deal of their time under rocks. They feed on a wide variety of aquatic insects as well as small snails; unlike common bullies, they do not undertake a juvenile migration to the sea.

Brown trout

Salmo trutta

Status: Exotic salmonid, first introduced into New Zealand in 1867. Much prized by sporting anglers for its wariness and fighting spirit when hooked.

Size: Can grow up to 1400 mm in length and weigh more than 20 kg, but generally much smaller.



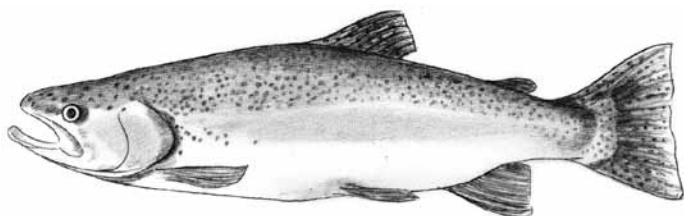
Habitat: Found in a wide variety of freshwater habitats from estuaries to subalpine lakes. Requires cool well-oxygenated water.

Habits: Unlike sea-run Chinook salmon, brown trout survive their first breeding season and go on to spawn annually for up to 10 years. This generally takes place in shallow gravels. They eat insects, crustaceans and small fish.

Rainbow trout

Oncorhynchus mykiss

Status: First introduced into New Zealand from North America in 1886, this trout is more closely related to the sockeye salmon than to the brown trout.



Size: Can grow up to a metre in length and weigh 18 kg, but generally much smaller.

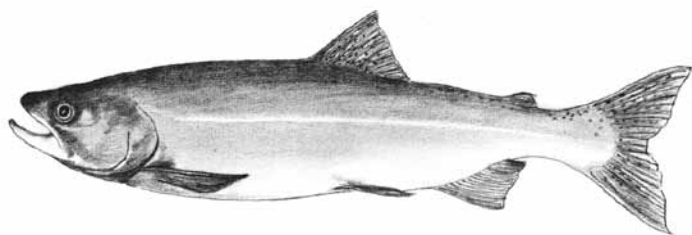
Habitat: Favours inland lakes and rivers associated with lakes. Requires cool, well-oxygenated water.

Habits: Spawns in gravelly headwater streams. More like other salmon than brown trout, many rainbows never spawn again after their first breeding season. They have the same diet as brown trout.

Sockeye salmon

Oncorhynchus nerka

Status: First introduced to the Waitaki River in the early 1900s in an effort to develop a local canning industry, this North Pacific species is now almost extinct in the wild in New Zealand.



Size: Small compared with fish caught in Canada. Waitaki sockeyes can grow to 500 mm in length and weigh 1.8 kg, but are usually much smaller.

Habitat: Found only in the large natural and hydro lakes of the upper Waitaki River, primarily in Lake Ohau.

Habits: In March they leave the lakes and spawn in tributary streams; adults all die after spawning. They feed on small crustaceans, snails and aquatic insects.

Whistling frog

Litoria ewingii



Status: Introduced from Tasmania in 1875, this exotic brown frog is well established in Westland, Southland, parts of Canterbury, and the Manawatu.

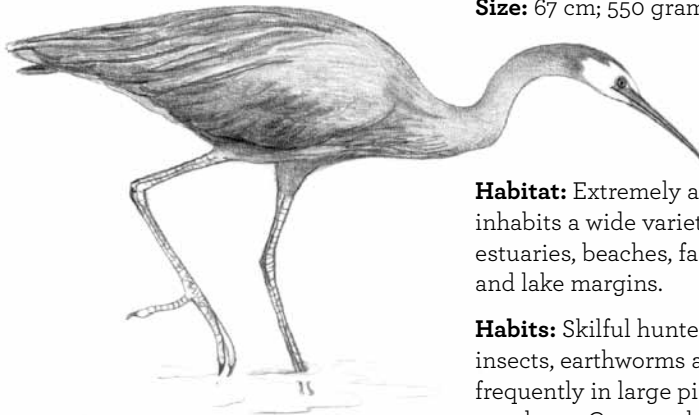
Size: 12-45 mm.

Habitat: Favours ponds, ditches and areas of permanent seepage. Changes colour to suit surroundings

Habits: They are most active at night, when they will climb trees and eat virtually eat any small insect or crustacean that moves. The call, uttered by males, is a drawn-out piping 'cree'.

White-faced heron

Ardea novaehollandiae



Status: Abundant native. Prior to the 1940s an occasional visitor from Australia, but now the most common breeding heron in New Zealand.

Size: 67 cm; 550 grams.

Habitat: Extremely adaptable bird that inhabits a wide variety of habitats: coastal estuaries, beaches, farm dams, swamps, rivers and lake margins.

Habits: Skilful hunter of small fish, frogs, insects, earthworms and mice. Pairs nest alone, frequently in large pine trees, macrocarpas and eucalypts. Commonly utters a harsh 'graw' sound in flight.

Australasian bittern/matuku

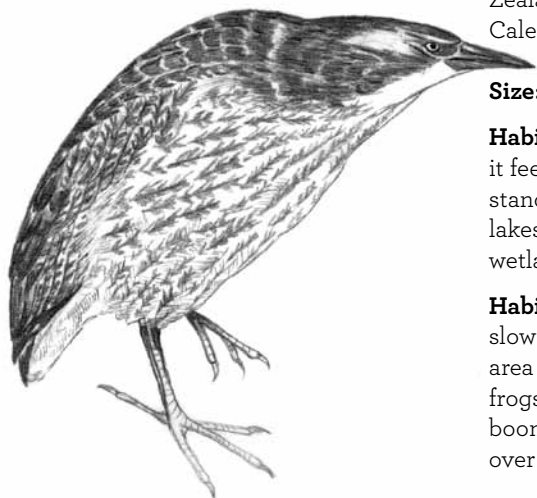
Botaurus poiciloptilus

Status: Rare member of heron family that is more often heard than seen. Native to New Zealand, but also found in Australia, New Caledonia and Loyalty Islands.

Size: 71 cm; males 1400 g, females 1000 g.

Habitat: Found in the three main islands, it feeds, nests and confines itself in dense stands of raupo and reeds surrounding lakes and in freshwater swamps. Draining of wetlands has greatly reduced its numbers.

Habits: Bitterns are extremely secretive and slow-moving, and can escape detection in an area for years. They are deadly stalkers of eels, frogs and freshwater crayfish. Their strange booming call sounds like someone blowing over an empty bottle.



Black shag/kōau

Phalacrocorax carbo

Status: Widespread and moderately common native, found on all main islands. The largest cormorant found in New Zealand.

Size: 88 cm; 2.2 kg.

Habitat: Found near water in a variety of coastal and inland habitats.

Habits: In the Mackenzie Basin this shag inhabits lakes and rivers, where it dives for eels, young trout, galaxids and freshwater crayfish. Nesting colonies are often found in large trees overhanging water. Lays 2-5 bluish-green eggs. Generally silent.



Little shag/kōau

Phalacrocorax melanoleucos



Status: Common native, found on the three main islands. The smallest of New Zealand's cormorants, with a number of different colour forms. Most birds in the Mackenzie Basin have black body plumage with white feathers on the face and throat.

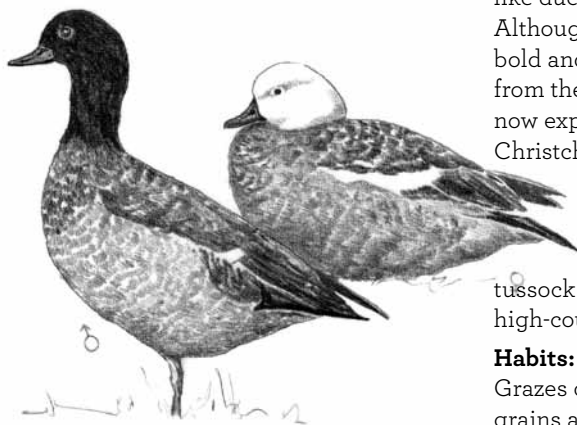
Size: 56 cm; 700 g.

Habitat: Found near water in a variety of coastal and inland habitats.

Habits: Diet varies with habitat, but inland same as black shag. Also nests with other shags in large trees located near water. Lays 2-5 pale bluish-green eggs.

Paradise shelduck/ pūtangitangi

Tadorna variegata



Status: This increasingly common goose-like duck is found only in New Zealand. Although uncommon in the 19th century, this bold and striking bird has benefited greatly from the clearing of land for farming. It is now expanding into large urban centres like Christchurch.

Size: 63 cm; males 1700 g, females 1400 g.

Habitat: Found in farm pasture, tussock grassland, and on ponds, lakes and high-country riverbeds.

Habits: Equally at home on land or water. Grazes on grass, clover and, where available, grains and peas left in stubble fields. Lays 5-15 white eggs. Nests in or under logs, barns etc; sometimes in trees. Pairs form extremely strong bonds. Male makes deep 'zonk zonk' call; females sound a shrill 'zeek zeek'.

Mallard duck

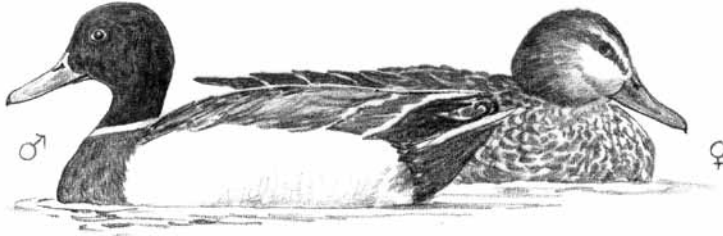
Anas platyrhynchos

Status: First introduced into New Zealand during 1860s, this Northern Hemisphere species' estimated New Zealand population is over 3 million birds.

Size: 58 cm; males 1300 g, females 1100 g.

Habitat: Town parks, estuaries, farm ponds, lakes and rivers.

Habits: Feeds mainly on aquatic plants but will exploit grains and other farm crops. They lay 10-16 eggs under dense vegetation or in tall grass. Interbreeds with native grey duck.



Grey teal/tete

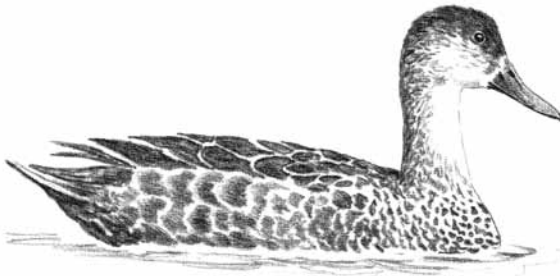
Anas gracilis

Status: Moderately common native. Dramatic increase in numbers since 1950s has been helped by several large invasions of birds from drought-stricken areas in Australia, where it is the commonest species of duck. Estimated New Zealand population is over 50,000.

Size: 43 cm; males 525 g, females 425 g.

Habitat: Prefers shallow coastal lakes and estuaries, but moderate numbers breed in lakes and wetlands near the outer ranges of the Southern Alps.

Habits: As in Australia, banding studies show that a large number of New Zealand birds are highly nomadic. Nests under dense vegetation or in the holes of trees. Lays 5-9 creamy eggs. Feeds on aquatic vegetation and the larvae of water insects.



New Zealand shoveler/ kuruwhengu

Anas rhynchos

Status: Common endemic found on all three main islands. Estimated New Zealand population in the 1980s was 150,000 birds.

Size: 49 cm; males 650 g, females 600 g.

Habitat: Prefers small lowland lakes and raupo swamps, but can be found in small numbers in higher wetlands. Rarely found on flowing rivers.

Habits: Like grey teal, shovelers are highly mobile and are known to move to new feeding sites at opposite ends of the country within a few days. Feeds on tiny aquatic seeds and insects, which it filters through fine plates found inside its large spoon-shaped bill. Lays 9–13 creamy eggs.



New Zealand scaup/ tētē papango

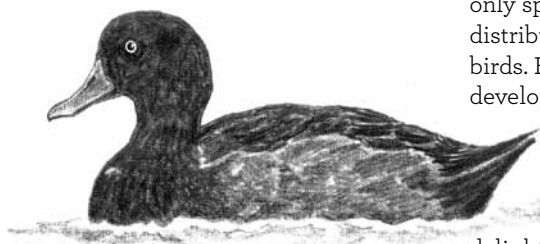
Aythya novaeseelandiae

Status: This uncommon endemic is New Zealand's only species of diving duck. The unevenly distributed population is estimated at 20,000 birds. Has benefited from full protection and the development of hydro lakes.

Size: 40 cm; 650 g.

Habitat: Scaup favour large deep inland lakes. Once rare in Christchurch these delightful ducks are increasing so rapidly that they are threatening to upstage the city's well-known population of mallards.

Habits: Feeds on aquatic plants and invertebrates. Lays 2–15 creamy eggs. Usually silent, but males sometimes utter a high-pitched whistle.



Australasian harrier/kāhu

Circus approximans



Status: Abundant native that has benefited from the widespread clearance of forest, and the introduction by European settlers of small mammals and birds, which now form the main part of their diet. The familiar hawk of rural roadsides.

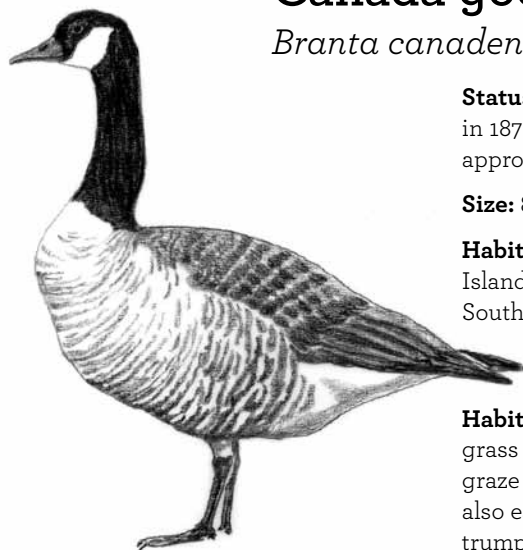
Size: 55 cm; males 650 g, females 850 g.

Habitat: Open country including farm, swamp and tussock lands, as well as riverbeds and sand dunes.

Habits: Although competent hunters, harriers readily scavenge on dead farm stock and road-kills, especially in winter. Rabbits are a favourite live prey. Also preys on native birds and their eggs. Nests on ground, commonly among raupo and bracken fern. Lays 2-7 white eggs.

Canada goose

Branta canadensis



Status: Introduced from North America in 1876. The New Zealand population is approximately 50,000 birds.

Size: 83 cm; males 5.4 kg, females 4.5 kg.

Habitat: Found in both the North and South Islands but most common in the drier eastern South Island. Breeds near rivers and lakes.

Up to 15,000 over-winter at Te Waihora/Lake Ellesmere.

Habits: Lays 2-10 eggs in a shallow nest of grass and rushes lined with feathers. Mainly graze on pasture grasses and some crops, but also eat aquatic plants. Hoarse honking and trumpeting calls.

Black swan

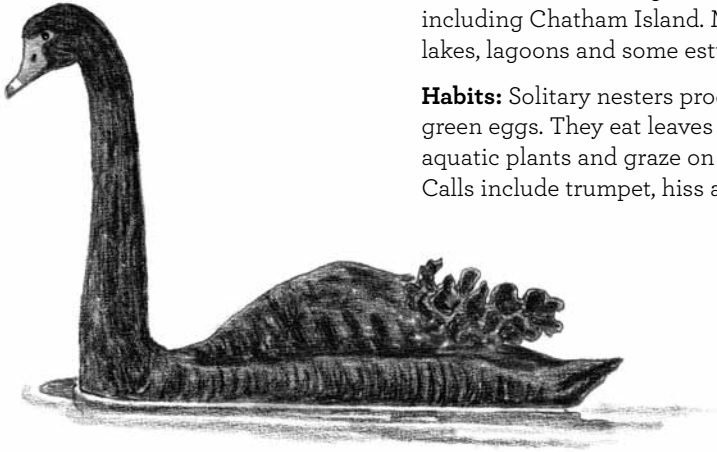
Cygnus atratus

Status: Introduced as a game bird from Australia in the 1860s.

Size: 120 cm; males 6 kg, females 5 kg.

Habitat: Found throughout New Zealand including Chatham Island. Mostly occur on lakes, lagoons and some estuaries.

Habits: Solitary nesters producing 3–10 pale green eggs. They eat leaves of submerged aquatic plants and graze on lakeside grasses. Calls include trumpet, hiss and whistle.



Pukeko/pākura

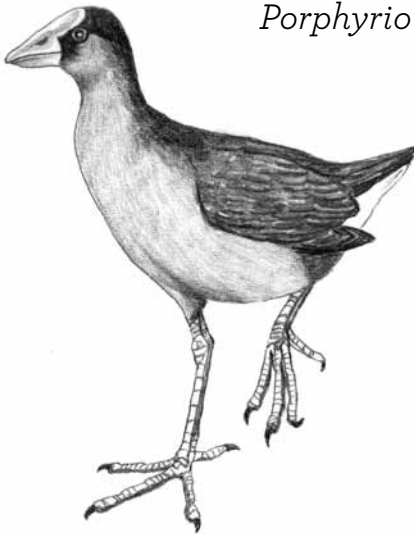
Porphyrio porphyrio

Status: Abundant native waterbird that has adapted well in spite of massive loss of natural wetlands.

Size: 51 cm; males 1050 g, females 850 g.

Habitat: Swamps and rough damp pasture near swamps, rivers and lakes.

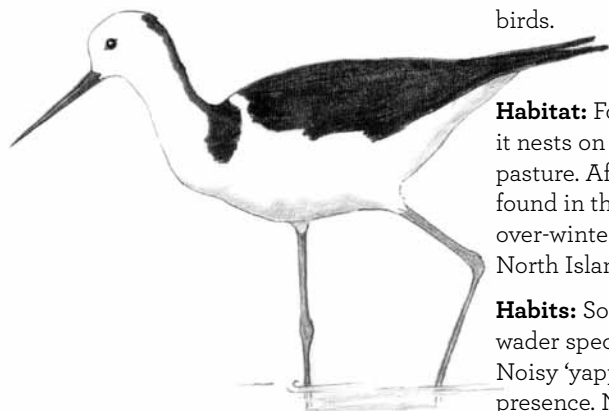
Habits: Pukeko live in extended family groups whose members share in the rearing of young. They are ground nesters and lay 4–6 yellowish-brown eggs, which are often incubated by young non-breeding birds. Feeds on a wide variety of plants and animals, including frogs and small birds. Call is a harsh screech.



Pied stilt/poaka

Himantopus himantopus

Status: Common native wader that is thought to have first colonised New Zealand from Australia during the early 19th century. New Zealand population around 30-40,000 birds.



Size: 35 cm; 190 g.

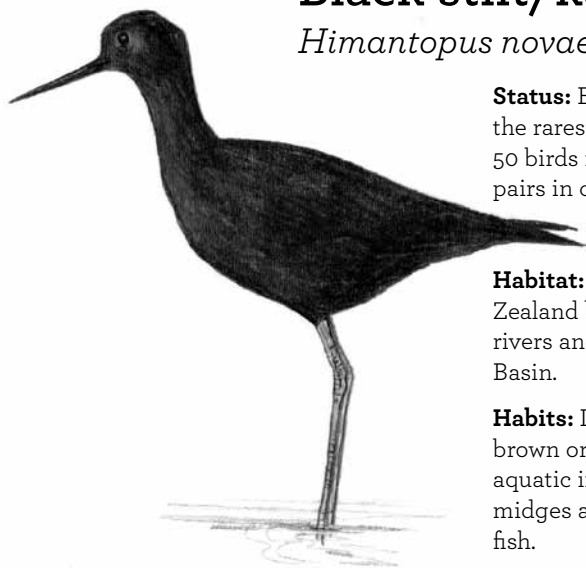
Habitat: Found on all main islands where it nests on riverbeds, lake edges and damp pasture. After breeding, many of the birds found in the Mackenzie Basin migrate and over-winter in the large estuaries of northern North Island.

Habits: Sociable with own kind and other wader species outside the breeding season. Noisy 'yapping' call soon indicates its presence. Nests in loose colonies and lays 2-5 greenish eggs. Feeds mainly on larvae of aquatic insects and small molluscs.

Black stilt/kakī

Himantopus novaezealandiae

Status: Endangered endemic that is probably the rarest wader in the world. Approximately 50 birds in the wild, with seven breeding pairs in captivity in year 2000.



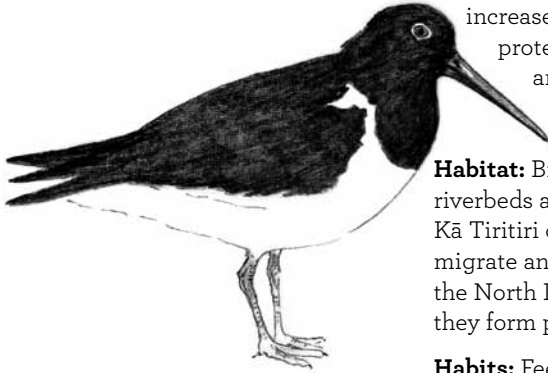
Size: 40 cm; 220 g.

Habitat: Once occurred throughout New Zealand but now restricted to the braided rivers and wetlands of the upper Waitaki Basin.

Habits: Lays 3-5 greenish eggs with dark brown or black marks. Feeds mostly on aquatic insects like mayflies, caddisflies, midges and waterboatmen, and snails and fish.

South Island pied oystercatcher/tōrea

Haematopus ostralegus



Status: Abundant native wader. Once shot as a game bird, this long-lived species has steadily increased in numbers since being granted protection in 1940. New Zealand population is around 85,000 birds.

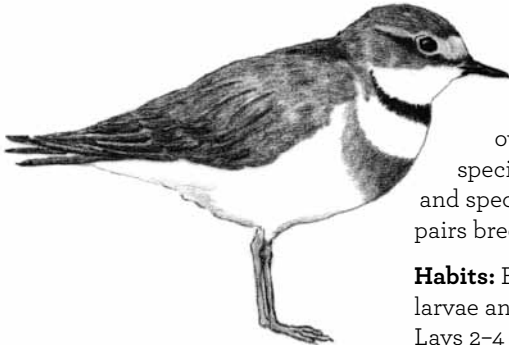
Size: 46 cm; 550 g.

Habitat: Breed almost exclusively on inland riverbeds and farmland east of the Southern Alps/Kā Tiritiri o te Moana. During late summer they migrate and over-winter on the larger estuaries of the North Island and northern South Island, where they form prominent flocks.

Habits: Feeds on bivalve molluscs, earthworms, small fish, and insect larvae. Lays 2-3 blotchy brown eggs in a scrape of sand. Pairs occupy the same breeding territory year after year. Lures intruders away from nesting sites by a variety of strategies, including broken-wing displays.

Banded dotterel/turiwhatu

Charadrius bicinctus



Status: Common endemic wader that breeds in all main islands. Population around 50,000, mostly in the South Island.

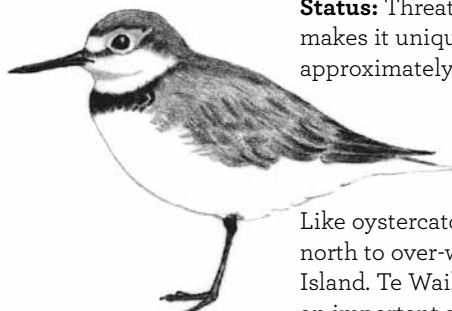
Size: 20 cm; 60 g.

Habitat: Although dotterels breed in moderate numbers on sandy coasts all over New Zealand, the stronghold of this species is the inland riverbeds of Canterbury and specifically the Mackenzie Basin, where 10,000 pairs breed each year.

Habits: Busily feeds on a wide variety of insects, larvae and worms. Highly territorial on nesting sites. Lays 2-4 eggs of variable colour (with black spots) among sand and gravel. Most common call is a metallic 'chip'.

Wrybill/ngutu pare

Anarhynchus frontalis



Status: Threatened endemic wader whose right-curved bill makes it unique amongst the world's birds. Population numbers approximately 5,000 birds and probably declining.

Size: 20 cm; 80 g.

Habitat: Breeds only in the mid-to upper reaches of the braided rivers of Canterbury and Otago.

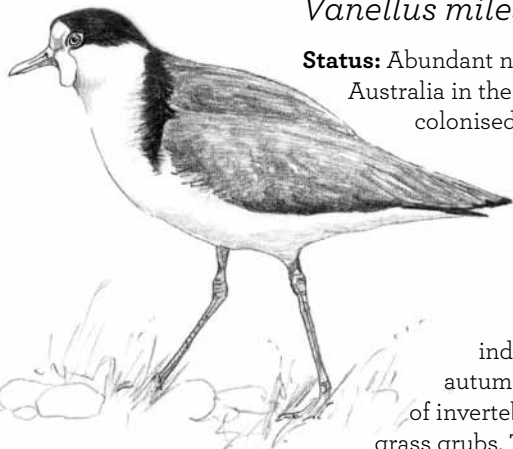
Like oystercatchers and banded dotterels, wrybills also migrate north to over-winter on the coastal mudflats of the upper North Island. Te Waihora/Lake Ellesmere, on the Canterbury coast, is an important staging point for this journey.



Habits: Uses its unique bill to extract insect larvae from under riverbed stones. Returns to breeding grounds in early August and lays two grey (marked with brown lines and spots) eggs in shingle nests. Predation of eggs, chicks and adults during the breeding season is a major threat.

Spur-winged plover

Vanellus miles



Status: Abundant native. Self-introduced to Southland from Australia in the 1930s, this bird has now successfully colonised the rural landscapes of New Zealand.

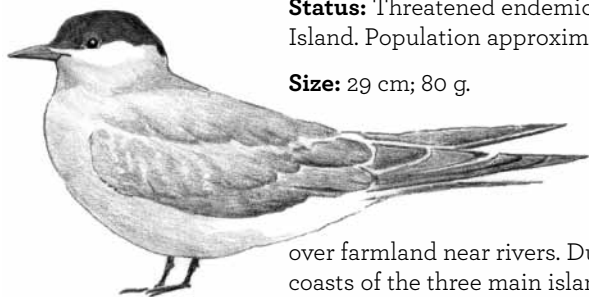
Size: 38 cm; males 370 g, females 350 g.

Habitat: Open country including farm paddocks, riverbeds and the edges of estuaries and lakes.

Habits: Noisy and striking, these plovers indulge in elaborate group displays during autumn and winter. They feed on a wide variety of invertebrates including insects, earthworms, and grass grubs. They are ground nesters and lay 1-4 khaki eggs. Call is a loud grating cackle.

Black-fronted tern/tarapirohe

Sterna albobriata



Status: Threatened endemic bird that breeds only in the South Island. Population approximately 5,000–10,000 and declining.

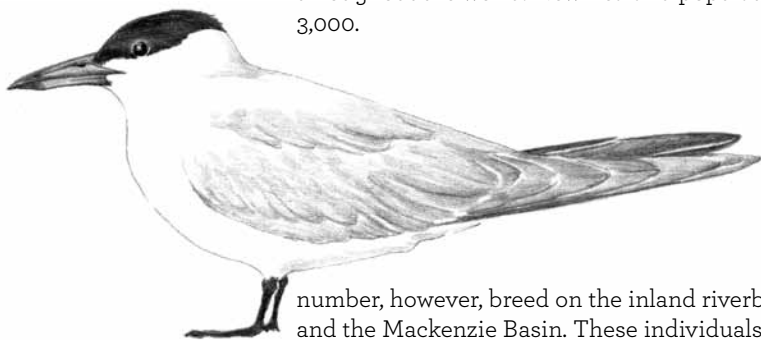
Size: 29 cm; 80 g.

Habitat: Characteristic species of the inland riverbeds east of the Alps, where it breeds almost exclusively. Frequently seen feeding over farmland near rivers. During winter, tarapirohe shifts to the coasts of the three main islands, where they will often seek food far out to sea.

Habits: On its breeding grounds these terns eat mainly insects, which they catch on the wing or in the water. However, they will also take lizards from river terraces, and earthworms and grass grubs from farmland. Lays 1–4 eggs that are stone-coloured with brown blotches. Fearlessly defend their nesting sites by ‘dive-bombing’ and defecating on any intruders including humans. Their call is a repetitive ‘kit’.

Caspian tern/taranui

Sterna caspia



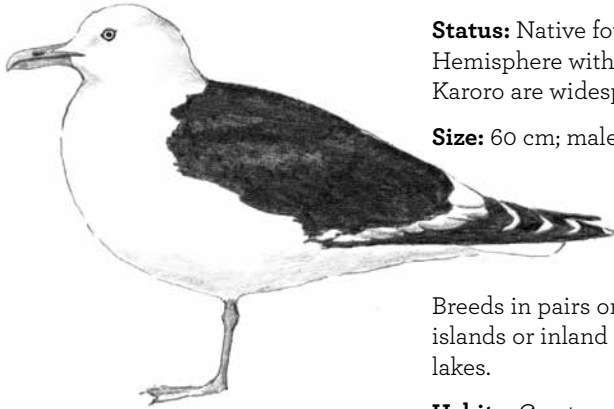
Status: Uncommon native, found in many other places throughout the world. New Zealand population approximately 3,000.

Size: 51 cm; 700 g.

Habitat: Mainly coastal bird that nests in loose colonies on beaches and sandy spits. A small number, however, breed on the inland riverbeds of Canterbury and the Mackenzie Basin. These individuals tend to migrate north and to the coast during winter.

Habits: Feeds mainly on small surface-swimming fish. Lays 1–3 grey eggs with dark spots. Call is a loud grating ‘kaaa’ uttered in flight.

Southern black-backed gull/ karoro *Larus dominicanus*



Status: Native found throughout the Southern Hemisphere with a close relative in South Africa. Karoro are widespread and locally common.

Size: 60 cm; males 1050 g, females 850 g.

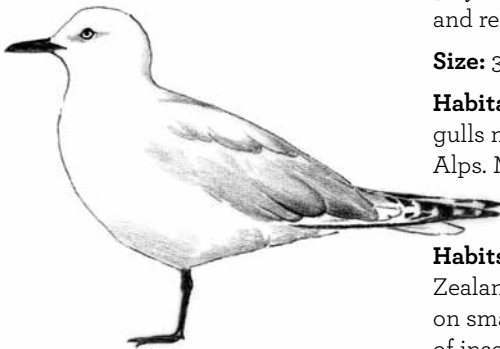
Habitat: A very versatile species that frequents estuaries, harbours, coasts, rivers, lakes, farmland and rubbish tips.

Breeds in pairs or colonies on coasts and offshore islands or inland on riverbeds and next to alpine lakes.

Habits: Can travel 30 km and more daily to feed. Lays 1-3 greyish-green eggs with brown markings. Karoro are opportunistic feeders, taking a wide range of animal and plant food.

Black-billed gull

Larus bulleri



Status: Endemic gull that has declined substantially throughout the South Island in the past 10-20 years, while the main breeding colony in the North Island has expanded its range in the past 30 years. Becoming uncommon in the South Island, and relatively rare in the North.

Size: 37 cm; 250-300 g.

Habitat: Although some nest near the coast, these gulls mostly breed inland on riverbeds east of the Alps. Many move closer to the coast and large towns in winter.

Habits: Less inclined to scavenge than other New Zealand gulls. On their breeding grounds they feed on small fish such as inanga, and also on a variety of insects and worms, which they find in freshly ploughed ground. Nests in large colonies on the edge of lakes and on the islands that form the braids of large riverbeds. Lays 2-4 eggs of variable colour.

Feral cat

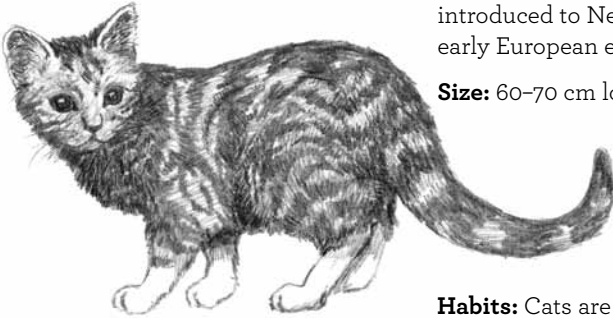
Felis catus

Status: Occurs worldwide as a human companion, and in many countries in the wild. Common predator introduced to New Zealand from 1769 onwards by early European explorers.

Size: 60–70 cm long; 2.5–3.5 kg.

Habitat: Common in a wide range of habitats from forest to grasslands throughout New Zealand and some offshore islands.

Habits: Cats are a significant predator of native wildlife. Video evidence from the Mackenzie Basin identifies cats as the main predator at riverbed birds nests. In addition to birds and their eggs, they also eat rats, mice, rabbits, lizards and invertebrates. Home ranges of 4–6 km have been recorded.



Rabbit

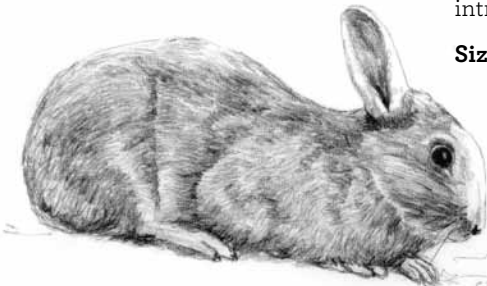
Oryctolagus cuniculus

Status: Native of the Mediterranean. First introduced to New Zealand in 1777. Occurs throughout rural New Zealand and some off-shore islands. They declined dramatically following the introduction of RHD.

Size: 49 cm long; 1.3–2.1 kg.

Habitat: Occurs in grasslands throughout New Zealand, but most common in the drier eastern South Island – Central Otago, Mackenzie Basin, North Canterbury and Marlborough. Rabbits favour sand dunes and stony riverbeds.

Habits: Rabbits eat a wide range of plants including native vegetation. Some farmers consider them a major pest species, and high rabbit numbers support high predator numbers. Female rabbits are capable of producing 45–50 young per year.



Stoat

Mustela erminea

Status: Originated in Eurasia and spread to North America. Common predator, first introduced to New Zealand in the 1870s to control rabbits.

Size: 34–39 cm long; 200–350 g.

Habitat: Common in a wide range of habitats from forest to grasslands throughout New Zealand and some offshore islands.

Habits: Stoats are a significant predator of native wildlife. Stoats are rare in the Mackenzie Basin but are more common in the higher-altitude rivers, where they are important predators of birds nests. Stoats are also significant predators of kiwi and forest birds such as yellowhead/mohua. In addition to birds, they also eat rats, mice, rabbits, lizards and invertebrates. Stoats can travel long distances (more than 60 km) quickly, but typical home ranges of males are about 100–200 ha and females 70–120 ha. They have a distinctive black tip at the end of their tails.



Ferret

Mustela furo

Status: Bred from the European polecat. Common predator, first introduced to New Zealand in the 1870s to control rabbits. Ferrets are significant TB carriers.

Size: 43–54 cm long; 0.4–1.8 kg.

Habitat: Commonly occurring in farmland throughout New Zealand but also found in forest and shrublands.

Habits: Ferrets are a significant predator of native wildlife, particularly nesting seabirds and other ground-nesting birds. Video evidence from the Mackenzie Basin identifies ferrets as the second most common predator at riverbed birds' nests. In addition to birds they also eat rats, mice, rabbits, lizards and invertebrates. Typical home ranges of males are 126 ha, and females 88 ha.



Hedgehog

Erinaceus europaeus



Status: Found throughout Western Europe. Very common predator, first introduced to New Zealand in the 1870s to control garden pests.

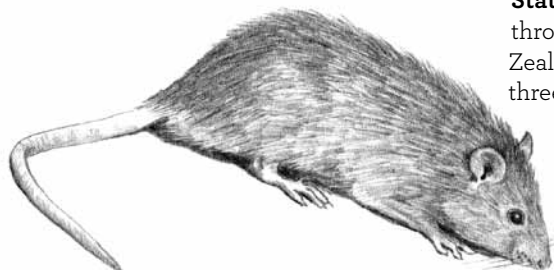
Size: 15–25 cm long; 300–1300 g.

Habitat: Common in a wide range of habitats from urban gardens, to farmland, to high-altitude grasslands throughout New Zealand. They also occur in some forest types and on some offshore islands.

Habits: Hedgehogs are mainly insectivores, but also they eat, eggs, birds and lizards. Hedgehogs are very common in the Mackenzie Basin, where they are significant predators of riverbed birds' eggs. Hedgehogs can travel long distances (10 km), but, in the Mackenzie Basin, typical home ranges of males are about 2.4–8.0 ha and females 1.4–5.2 ha.

Norway rat

Rattus norvegicus



Status: A European rodent that has spread throughout the world by ship, arriving in New Zealand from 1792 onwards. The largest of three rat species that occur in New Zealand.

Size: 39–40 cm long; 130–420 g.

Habitat: Common in a wide range of habitats from forest to grasslands throughout New Zealand and some offshore islands. Frequently found near water and rubbish dumps.

Habits: Norway rats are a significant predator of native wildlife, particularly colonial nesting seabirds. They have also been identified as significant predators of black-fronted tern chicks in the Mackenzie Basin. In addition to birds, they eat seeds, vegetable matter, lizards, fish, snails and invertebrates.



Threats to the braided river

Introduced predators like cats, ferrets, stoats and hedgehogs eat native birds' eggs, chicks or adults. They also eat lizards and invertebrates. Predator control is needed to protect declining native wildlife populations.



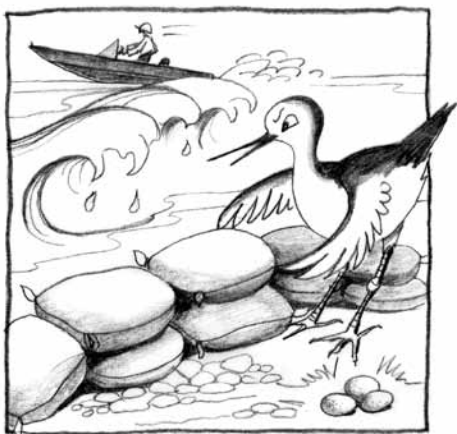
Dogs can kill many eggs and chicks, especially where birds nest in colonies. Please keep your dog off the riverbed over the bird-breeding season (September - February).



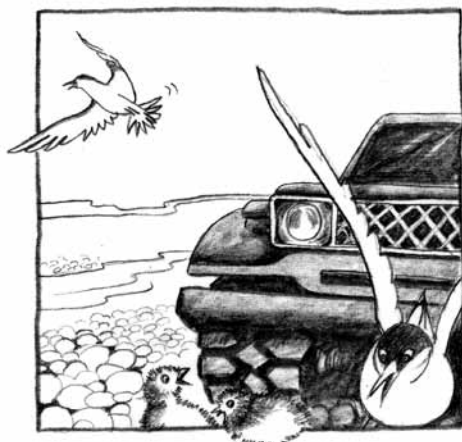
Wetland drainage, intensive land use and stock can destroy wetlands, contaminate waterways and crush birds' eggs and chicks. Fencing of wetlands, riparian plantings and exclusion of stock from riverbeds over the bird-breeding season are ways of protecting fragile wetland environments.



Birds dive-bomb people who are too close to their nest. Eggs and chicks can freeze or cook if parent birds are kept off their nests for more than five minutes. Please move away and birds will return to their nest.



Jet boats can swamp birds nests near the water's edge. Please stick to the speed regulations and keep out of restricted waterways.



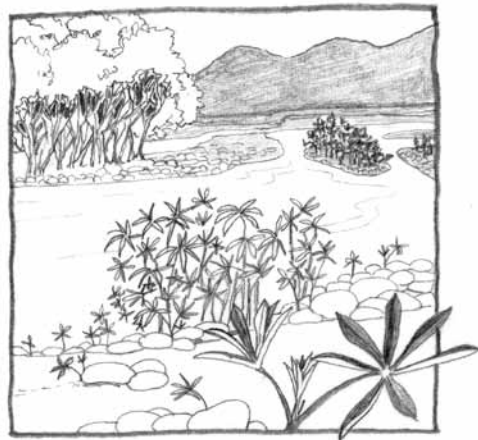
4WD vehicles can crush chicks and eggs. Please leave your vehicle at the riverside. If you need to cross rivers, keep to existing tracks.



Hydro-electric power development has flooded riverbed habitat and associated wetlands. Meridian Energy recognises the impact of this development and works with DOC to protect braided-river habitats and their special communities of native plants and animals.



Water abstraction can lead to a loss of habitat and prevention of floods that clear riverbeds of weeds. Well-managed water abstraction can result in the retention of habitat and the use of water for other important purposes.



Weeds smother feeding and breeding grounds and provide shelter for predators. Eradication of isolated weeds and intensive control elsewhere is used to maintain large areas of braided-river habitat.

Glossary

Annual – completing its life cycle within one year

Perennial – living for more than 2 years (usually flowering each year)

Endemic – native only to New Zealand

Exotic – foreign, non-native

Native – species that is naturally found in a country; not introduced by people

Nocturnal – active at night

Predator – animal that kills and eats other animals

Threatened – species that are in low numbers or declining in number and/or range, and require management or intervention to ensure their survival

Vulnerable – species facing a high risk of extinction in the wild in the medium term

Further reading

Wild Plants of Mount Cook National Park,
Hugh Wilson, Manuka Press

The Reed Field Guide to Freshwater Fishes,
R. M. McDowall, Reed Books

The Field Guide to the Birds of New Zealand,
B. Heather and H. Robertson, Penguin Books

Collins Handguide to the Reptiles of New Zealand,
Brian Gill, Collins

The Handbook of New Zealand Mammals,
edited by Carolyn M. King, Oxford University Press