ROYS PEAK GECKO

Hoplodactylus sp. 'Roys Peak'
(Hitchmough, unpublished)

Size

c. 70–95 mm SVL.

Colour

Grey, olive-grey or brown (individuals are capable of large colour changes). May have stripes and/or bands or blotches, and the markings range from very drab to very bold. Some specimens have striking two-tone orange and yellow spots scattered across the upper surfaces, with a broad orange area across the nape, or merging to form more extensive orange or reddish shadings. The under-surface may be lightly or heavily marked with mottling, spots or longitudinal streaks. The eye ranges from brown to pinkish. Mouth colour is vivid orange. Tongue colour uniform orange. (See Fig. 13A–I.)

Build

Of slender to robust build. The tail is often much shorter than the SVL, but can reach a similar length, even slightly longer. The toe-pads are very narrow, and the 6–14 lamellae are straight.

Distribution

Recorded from the Moke Valley at the southern end of the Richardson Mountains; Mount Alpha and Roys Peak at the northern end of the Crown Range; and from near Cludden Pass and in the Leaning Rock catchment, in the Dunstan Mountains.

Habitat

So far known only from the alpine zone, having been found at 1150–1600 m a.s.l. among rock outcrops and boulder fields.

Figure 13. Varous colour forms of Roys Peak gecko (*Hoplodactylus* sp. 'Roys Peak'). A–B. 'Roys Peak' form; C–E. 'Moke Valley' form; and F–J. 'Dunstan Mountains' form. *Photos 12A & B: Julie Brooke-White.*

Behaviour

Emerges at night onto the rocks. Readily basks by day, but can be very secretive, keeping close to the entrance of a retreat and retreating at the slightest disturbance. However, specimens have occasionally been found basking out in the open, in which case they may sit still, relying upon their camouflage, rather than fleeing. Relatively solitary.

Notes

Occurs in three forms that may represent distinct species or subspecies; however, the current sample sizes for each population are too small to allow firm conclusions to be drawn.

The 'Roys Peak' form occurs in the Crown Range and is small (70–80 mm SVL) and slender in build, with a broad shallow head, two cloacal spurs on either side, 13–14 lamellae, and the precloacal pores form a series c. 28 pores wide. The markings are usually drab and are somewhat streaked in appearance, although one brightly marked individual has been seen. About seven specimens have been found so far, and all were among large rocks, at 1400–1600 m a.s.l.

The 'Moke Valley' form occurs in the Richardson Mountains and is very large (92 mm SVL) and exceptionally robust in build, with 9–11 lamellae and bright markings. Only a single specimen, an adult female, has been found so far; it was beneath a large rock in an area of extensive tussock grassland, at 1200 m a.s.l.

The 'Dunstan Mountains' form is so far known from about 12 specimens, from among rock piles at either end of the Dunstan Mountains (1150–1400 m a.s.l.). This form grows to 85–95 mm SVL and is of moderate to robust build. The precloacal pore series is 28–37 pores wide, and there are normally 3–4 cloacal spurs on either side. The markings are usually very prominent, and most specimens have at least a few bright-orange spots on the dorsal surfaces; some have extensive orange and yellow spots.

SOUTHERN FOREST GECKO

Hoplodactylus sp. 'southern forest'
(Hitchmough, unpublished)

Size

c. 68–83 mm SVL.

Colour

Brown with creamy-yellow markings, lightening to grey with whitish markings. Some individuals are olive with expanses of dull brick-red colouring. The markings consist of a row of 'W'- or 'H'-shaped patches along the back, sometimes with partial striping linking these markings along the edges of the back. In a few individuals, the markings may be more irregular. Individuals sometimes have regular or irregular mustard-yellow patches. The under-surface is speckled and often has large pale blotches. The eye varies from brown or grey-brown (often with a bluish sheen) to sky-blue. Mouth and tongue colour are vivid orange. (See Fig. 14A–C.)

Build

Of moderate build, with narrow toe-pads supporting 11–14 straight lamellae. The intact tail is slightly longer than the SVL.

Distribution

Found in the southern coastal zone of the South Island. Recorded at Riverton and in the Catlins District (Haldane, Progress Valley, Chaslands, Tautuku, Catlins River, and Glenomaru).

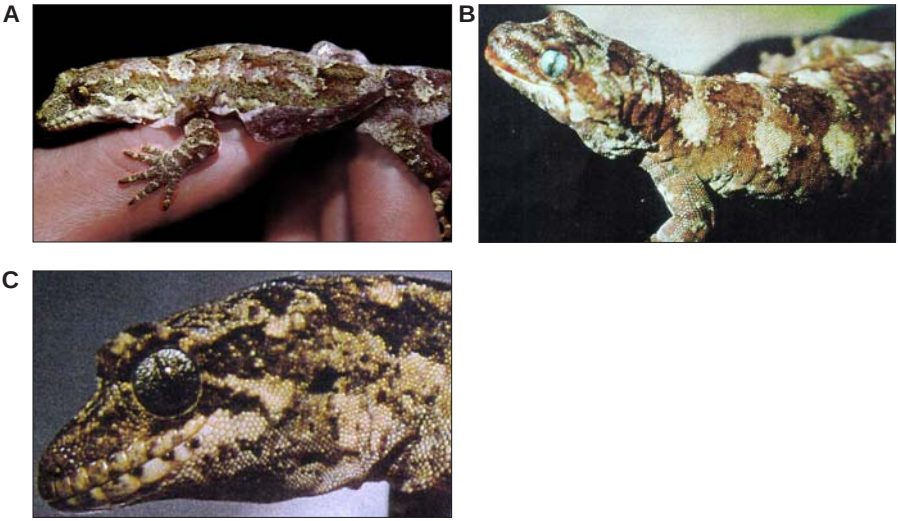

Figure 14A–C. Various colour forms of the Southern forest gecko (*Hoplodactylus* sp. 'southern forest'). *Photos 13A & C: Lyne McFarlane; photo 13B: Graeme Loh.*

Habitat

Inhabits coastal rainforest; one specimen was found in manuka (*Leptospermum scoparium*) dominated regenerating forest. Best known from podocarp/hardwood forest (e.g. rimu, southern rata and kamahi), but probably also occurs in beech forest (e.g. silver beech *Nothofagus menziesii*). Thought to normally live on the trunks and larger branches of trees, sheltering in crevices and under loose bark. In 1997, two specimens were found near the ground, one in sun-lit crown fern (*Blechnum discolour*) on the edge of a disused road, the other low on the trunk of a manuka tree.

Behaviour

Emerges on warm days to bask and feed close to a retreat site, and at night to forage more widely. Primarily arboreal.

Notes

The conservation status of the southern forest gecko is highly questionable. In recent years, only two specimens, both male, have been found, despite considerable search effort throughout the known range. Most, if not all, prior records appear to result from the logging of primary rainforest, and it is unknown how this widespread process has affected the population and its ability to cope with introduced predators. The species is undoubtedly very cryptic within its forest habitat, which may go some way towards explaining the paucity of recent sightings. However, more information is required to assess its true status; consequently, any new sightings should be thoroughly documented.

JEWELLED GECKO

Naultinus gemmeus (McCann, 1955)

Size

c. 65–80 mm SVL.

Colour

Normally bright leafy-green above, but some males from Canterbury are coloured grey/brown, and it is possible that this colour-form could also occur in inland Otago. Specimens usually have a series of white or yellow patches or stripes down either side of the back. Specimens from Southland often lack markings, and it is possible that some from inland Otago may also lack markings. Very rarely, specimens may be bright yellow rather than green. Mouth colour is deep blue or purplish-blue. (See Figs 3B & 5D.)

Build

Toe-pads not visibly expanded and support lamellae (which are straight) in a continuous series from the base of the toe to the claw; no obvious distinction between the lamellar pad and the distal phalange. Many of the scales across the top and sides of the snout are greatly enlarged and domed in shape. The tail ranges from equal in length to considerably longer than the SVL.

Distribution

Found throughout Otago, and is also widespread in Southland and Canterbury. However, may now be extinct in Central Otago. Widespread on Otago Peninsula, and a population has recently been found in the Kakanui Mountains (in the Waianakarua River

catchment). There are a number of reports of this species around the southern base of the Lammerlaw Range, from Lake Mahinerangi to Beaumont. Other locations in Otago include Nugget Point (extinct?); Mount Cargill; the Hunter Valley, at the head of Lake Hawea; the lower Rees and Dart Valleys, at the head of Lake Wakatipu; Te Anau Downs; and near Waikawa Harbour, in the Catlins.

Habitat

Shrubland and forest. Most often found in dense, small-leaved shrubs such as *Coprosma* spp., kanuka and manuka. Typically found in old-growth shrublands or in shrublands bordering forest.

Behaviour

Arboreal. On sunny days will perch among twigs and foliage, basking and stalking insects. Distinctly less active at night than the other species of geckos in Otago, but some observations suggest that occasional feeding may occur on warm nights.

Notes

Although well known on Otago Peninsula, elsewhere in Otago the jewelled gecko appears to be a very rare, seldom-encountered species. As with the southern forest gecko, its conservation status is highly questionable, and any new sightings (besides Otago Peninsula) should be thoroughly documented.

Other species that may occur in Otago

While many of the following species are considered unlikely to occur in Otago, their distribution limits are so poorly known that the possibility cannot be entirely discounted. The diagnosis provided for each is aimed at distinguishing it from the known Otago species, and should not be used in areas outside Otago, where other species may share particular traits.

CANTERBURY GECKO

Hoplodactylus brunneus (Cope, 1868; see Hitchmough 1997). (Note: a member of the *H. maculatus* species-complex, and in some literature listed as *H. maculatus* or as *H.* aff. *maculatus* 'Canterbury'.)

Diagnosis

Lamellae curved; mouth colour pink; 55–80 mm SVL; body colour brown; iris grey-brown to yellow; looks especially like the Central Otago and Otago/Southland large geckos but the markings, particularly on the tail, include large blackish patches.

Where it could occur in Otago

In the Waitaki River catchment. So far known only from northern Canterbury: Banks Peninsula and Kaitoreti Spit northwards (plus an unconfirmed record from Peel Forest). However, the natural southern range limit is unknown due to the large-scale habitat modification in the mid- and south Canterbury lowlands. It is possible that remnant populations may yet turn up in north Otago.

DUVAUCEL'S GECKO

Hoplodactylus duvauceli (Dumeril & Bibron, 1836)

Diagnosis

Lamellae curved; mouth lining pink; adult ≥ 100 mm SVL. Again, very similar to the members of the *H. maculatus* complex, particularly the larger, western populations of Otago/Southland large gecko. However, adults are substantially larger in size, the rostral scale is in broad contact with the nostril (versus only making slight contact, or not contacting) and males have pointed (versus domed) cloacal spurs, so the species should be easily recognised.

Where it could occur in Otago

Potentially anywhere. Subfossil remains have been found in many parts of the South Island, including Central Otago (Worthy 1998), but the species is now thought to be extinct on mainland New Zealand, its large size making it easy prey for introduced predators. If any survive in Otago, they are likely to be in environments that are difficult for introduced predators to inhabit, such as large vertical rock bluffs.

BLACK-EYED GECKO

Hoplodactylus kahutarae (Whitaker, 1985)

Diagnosis

Iris shining black (which should allow for easy identification); lamellae straight; mouth colour pinkish to orange.

Where it could occur in Otago

Thought to be restricted to rock bluffs above the tree-line. Presently known only from Nelson and Marlborough, but some workers suspect that this elusive species may also range further southwards along the Southern Alps.

'FOREST GECKOS'

Hoplodactylus granulatus (Gray, 1843), *H. nebulosus* (McCann, 1955), *H.* sp. 'Cascades' (Hitchmough, unpublished), *H.* sp. 'Open Bay Islands' (Hitchmough, unpublished) and *H.* sp. 'Okarito' (Hitchmough, unpublished)

Diagnosis

This species-complex includes many elusive, rarely-encountered species, for which the range of morphological variation and distribution are poorly understood. They all have bright orange or yellow mouth colour, and in Otago include the Takitimu, Roys Peak and southern forest geckos. Other species could also be present. Features to look out for, which may indicate a species other than those currently known from Otago, include a very boldly blotched or striped under-surface, a uniform under-surface, or scales along the centre of the snout that are twice as long as broad.

Where they could occur in Otago

Various species and 'forms' occur in Southland, Fiordland and Westland, and any of these could potentially range into Otago. Of particular note is the 'Darran Mountains' form of *H.* sp. 'Cascades', which has been found in the upper Hollyford Valley, and could well range into the rainforests or alpine rocky habitats of far-western Otago. This form is relatively large (85 mm SVL) and is difficult to distinguish from the Takitimu and Roys Peak geckos; the distal phalange is slightly longer, and the main markings on the body are more strongly highlighted, with light colouration along the posterior (versus anterior) margin.

The preferred habitats of the 'forest geckos' appear to be rainforest and alpine rock outcrops, including scree and bluffs. Many occur in a climate that is colder and/or damper than that which is tolerated by the *H. maculatus* complex, which suggests that the most likely places to find new populations in Otago are in the far western forests and in the mountains above c. 1100–1300 m a.s.l. Any new information about the members of this group is important so, as a general rule, any specimen with orange mouth colouring, which is not from one of the few known localities, should be thoroughly documented and preferably collected (see Appendix 2). A note of warning: do not rely upon returning at a later date to re-capture a specimen; the 'forest geckos' of southern New Zealand are notoriously elusive, and are often only initially found by chance encounter.

HARLEQUIN GECKO

Hoplodactylus rakiurae (Thomas, 1981)

Diagnosis

Lamellae straight; mouth colour pink, grey or blue; scales on top of snout distinctively smaller than ear opening, and often conical in shape.

Where it could occur in Otago

Wetlands and subalpine shrublands, probably in a very damp (i.e. far-western) climate. Known only from south of Pattersons Inlet on Stewart Island, but some workers suspect that it may range further northwards, even into Fiordland. If so, western Otago is another, albeit remote, possibility.

WEST COAST GREEN GECKO

Naultinus tuberculatus (McCann, 1955)

Diagnosis

Lamellae straight; mouth-lining bluish; scales across top of snout greatly enlarged, some as large as the ear opening. Very similar to the jewelled gecko (p. 48), but tends to be coloured with mottled two-tone green/olive, rather than single-tone deep green, and with smaller markings, creating an overall moss-like appearance.

Where it could occur in Otago

Far western forests and shrublands. Currently known from the Lewis Pass and northern Westland areas, but the precise southern distribution limit is unknown.

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Appendix 1

BASIC FIELD EQUIPMENT

Keeping records

Pen/pencil

Notebook

ARDS cards

Maps

Examining specimens

Ruler

Magnifying glass

'Lizard bags' or a permeated container

Vials with ethanol

Survey and habitat

Binoculars

Camera

G.P.S.

Thermometer

Useful literature

Whitaker et al. 2002 ('Conservation of lizards in Otago Conservancy 2002–2007')

This guide ('Identifying geckos in Otago')

Print-outs from DOC's 'Herpetofauna' database

Appendix 2

WHEN PROBLEMS ARISE

Identification issues that are frequently intractable in the field include juveniles, new species, highly cryptic species, previously undocumented forms or variations, range extensions, and inadequate identification methods. This report offers guidance towards identification, but is by no means the final option for field workers.

Photographs, specimens, data and/or tissue samples can be sent to specialists to be identified. This section provides a very basic overview of steps that can be taken while still in the field to improve the ability of an expert to later identify a specimen. More detailed information on some of these techniques can be found in Whitaker (1994), Jewell & McFarlane (1997: 39–40), Tocher et al. (2000: 21), and Whitaker et al. (2002: 89–90).

Photographs

For the purpose of identification, there are two main considerations when selecting a camera: close-up capability (to capture fine details) and reliability. In this last respect, digital cameras have one significant advantage over their film counterparts—the image can be reviewed on the LCD monitor as soon as it is taken, ensuring that the required details are clearly captured.

The following features should be shown in the photographs:

- The whole animal, in dorso/lateral and ventral profiles
- The head in close-up, with particular attention given to the scales around the lips and nostrils and the eye

- The under-surface of the hind limbs/vent area (i.e. pores and spurs)
- The under-surface of the hind foot, including a clear view of the 4th (longest) toe

If the opportunity arises, also photograph the tongue and mouth colour (e.g. while the gecko bites a finger or licks its eyes and lips).

When to collect specimens

All gecko species are legally protected. Therefore, specimens can only be collected after permission has been obtained from DOC. For this reason, it is important to liaise with the relevant DOC authorities in an area before undertaking a gecko survey, so that the circumstances under which collection could be justified are clearly understood. However, the type of rare and unusual specimen that most warrants collection often belongs to an elusive species that has been turned up unexpectedly. To release it may be to run a serious risk of never seeing the population again, and a decision must be made right there and then, in the field, as to whether an unsanctioned collection is warranted.

If the location is readily accessible, individuals are easy to find, and there is no urgent need for an identification, it is best to take some photographs, record the exact location of the specimen and inform DOC staff at the local Conservancy office. Collection will also be unwarranted if the only question over identification is which of two similar but common species is involved (e.g. Central Otago gecko versus Cromwell gecko).

However, if the location is remote, individual geckos are difficult to find, and/or there is an urgent need to identify the species, the collection of a live sample of one or two specimens may be appropriate. Any suspected new species, or a suspected major

distribution extension, could also warrant collection. As already mentioned, *any* new population of 'forest geckos' (i.e. geckos with orange mouth colour) in Otago should ideally be collected, as these lizards tend to be very elusive. The same applies to any unusual gecko found in forested or alpine habitats, in which geckos of any kind can be hard to detect.

How to collect specimens

Lizards should not be collected unless one of the criteria outlined above has been met, and appropriate collection and holding equipment is available (see below and Appendix 1). Any lizards that have been collected must be taken to the local Conservancy office as soon as possible.

Specimens should be collected alive: live specimens can be returned if not required; gravid females may produce young, increasing the sample size; behaviour can be studied; and live specimens can be used for captive breeding, advocacy and research purposes. Specimens that are found dead, or are accidentally killed during capture, are still of scientific value and should always be collected (for preservation techniques see 'Tissue samples', p. 60).

To contain lizards while in the field, most herpetologists prefer to use either a stout plastic container permeated with air-holes, or a 'breathable' cloth bag, the opening of which can be tied securely to prevent escapes. Place some leaves or moss in the container for the gecko to hide amongst. It is important to protect lizards from extremes of temperature (5–15°C is ideal), to provide moisture in the form of dampened tissue or leaves, and to avoid crushing and shaking. Minimise handling and loud noises, both of which can be very stressful to an already frightened gecko.

Data

The most important measurement to take is the SVL; the length of the original tail is also very useful. There is a long list of morphological characters that can be examined; however, many of these must be taken in a standardised way if they are to be used in a meaningful comparison with such data from other specimens. There is currently no available guide to the morphological nomenclature and methodology for the New Zealand geckos. As a starting point, examine the characters used in the keys and descriptions in this guide. Some additional information is contained in the reports listed on p. 56. If you have a good camera, most morphological states can be recorded photographically (see p. 57).

Tissue samples

Tissue samples can be used to extract genetic data, from which accurate identification of even the most problematic specimens is usually possible.

Geckos may drop part of their tail when pursued or captured; if this happens, the discarded tail should be collected. It is also possible to remove a small part of the tail, or a toe, with a razor blade or sharp pair of nail scissors, but **prior consent, including ethical and technical guidance, must be obtained from the relevant DOC authorities before attempting to do this**. Tissue samples (and entire specimens that are found freshly dead) should be handled as little as possible, and stored immediately in 70%–100% ethanol, or deep-frozen in an air-tight container.