Taxon plan for northern and southern Fiordland tokoeka (*Apteryx australis australis*)

Strategic plan for the recovery of northern and southern Fiordland tokoeka, for the period 2015–2025 and beyond

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Cover: Fiordland tokoeka, *Apteryx australis*. *Photo: James T. Reardon*

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Preface

The 2008–2018 Kiwi Recovery Plan (Holzapfel et al. 2008) provides strategic direction, at a national level, to ensure the long-term viability of all kiwi taxa[1]. The Kiwi Recovery Group is responsible for its implementation and review.

Taxon plans translate the relevant goals, objectives and actions of the Kiwi Recovery Plan into a local context for individual taxa at a level of detail sufficient to guide operational plans. They are 'best advice' for all stakeholders regarding goals, objectives, actions, priorities and opportunities for the management of individual taxa. As such, taxon plans are key documents for the implementation of the Kiwi Recovery Plan. However, although taxon plans are more operationally-focused than the Kiwi Recovery Plan, they do not provide the level of detail of a work plan or best practice.

Taxon plans are developed in collaboration with key stakeholders for the taxon, including tangata whenua, landowners, community-led kiwi projects and Department of Conservation regions involved in its recovery. Individual taxon plans are peer-reviewed by the Kiwi Recovery Group to ensure that they fulfil their role as an integral part of the Kiwi Recovery Plan.

The accountability for each taxon plan rests with a lead region in consultation and guidance with the Kiwi Recovery Group. In some cases, the implementation and review of taxon plans will be supported by a 'taxon group', which includes key stakeholders and participants in the recovery of that taxon.

Taxon plans have a 10-year term (staggered by 1 year from the recovery plan) and are reviewed every three years.

[1] **Species**—A formally described (i.e. published in scientific literature) base unit of taxonomic rank that is usually applied to groups of organisms capable of interbreeding and producing fertile offspring. Five species of kiwi have been described: North Island brown kiwi (*Apteryx mantelli*), rowi (*A. rowi*), tokoeka (*A. australis*), great spotted kiwi (*A. haastii*) and little spotted kiwi (*A. owenii*).

Taxa (singular: taxon)—A general term covering all taxonomic ranks (e.g. genus, species, subspecies, provenance). In this context, it includes the five described species of kiwi and four genetically distinct provenances of kiwi that are currently recognised but have not yet been formally described within each of the species North Island brown (Northland, Coromandel, eastern and western) and tokoeka (Haast, Northern and Southern Fiordland, and Rakiura/Stewart Island.

Executive summary

Northern and southern Fiordland tokoeka are two of four distinct taxa of tokoeka (*Apteryx australis*; also known as South Island brown kiwi), which are geographically separated by the Wilmot Pass. Historically, these taxa were abundant and widespread throughout Fiordland—although evidence suggests that there were naturally lower numbers in the southern parts of Fiordland (Reischeck 1887). However, kiwi populations have declined throughout New Zealand due to habitat loss and introduced predators such as mustelids, dogs and cats. Consequently, there are currently an estimated 10 000 northern Fiordland tokoeka and 4500 southern Fiordland tokoeka (Holzapfel et al. 2008). Studies suggest that the trapping of stoats (*Mustela erminea*) gradually increases kiwi populations by 2%, but there is no chick survival during stoat plague years. Therefore, in the absence of predator management, kiwi populations in Fiordland will continue to slowly decline.

The purpose of this taxon plan is to build on the learnings from past and current programmes, and to identify the knowledge gaps and list priorities to ultimately ensure the survival of kiwi in Fiordland. The overall aim is ***to restore and, wherever possible, enhance the abundance, distribution and genetic diversity of northern and southern Fiordland tokoeka***. This plan contains 11 goals relating to management, community relations and engagement, and research and innovation. It lists actions, priorities, timeframes and accountabilities to achieve these. The priority actions are to optimise and increase large-scale pest control to benefit Fiordland tokoeka, and to gain an understanding of the population trend and distribution of northern and southern Fiordland tokoeka throughout Fiordland National Park.

The recovery of kiwi populations is the responsibility of all New Zealanders, and this plan recognises the importance of iwi and community involvement and engagement.

1. Introduction

Kiwi are one of New Zealand's most unique and iconic species. Five species of kiwi have been formally described: North Island brown kiwi (*Apteryx mantelli*), rowi (*A. rowi*), great spotted kiwi (*A. haastii*), little spotted kiwi (*A. owenii*) and tokoeka (*A. australis*). Tokoeka were previously known as South Island brown kiwi; however, the Ngāi Tahu name tokoeka, which translates to 'weka with a walking stick', is now recognised and widely used. Within tokoeka, there are four geographically and genetically distinct provenances: Haast, northern Fiordland, southern Fiordland and Stewart Island/Rakiura tokoeka. The first three are all currently assigned the subspecies status *A. australis australis* (Shaw 1813), while the latter has been described as a distinct subspecies *A. australis lawryi* (Baker et al. 1995; Burbidge et al. 2003; Gill et al. 2010). However, the Kiwi Recovery Group recognises that all four of these distinct provenances need to be managed as separate units (Holzapfel et al. 2008).

The northern and southern Fiordland tokoeka are classified as 'Nationally Vulnerable' under the Department of Conservation's (DOC's) New Zealand Threat Classification System (Miskelly et al. 2008). The majority of kiwi recovery work to date has focused on the northern Fiordland tokoeka, including studies on productivity, and chick, sub-adult and adult survival in the Clinton Valley and the Murchison Mountains (Edmonds 2005; Tansell 2009). However, several distribution surveys have also been conducted for southern Fiordland tokoeka over the past few decades. Northern and southern tokoeka are present on two large islands (Secretary and Resolution Islands, respectively) that are the focus of large-scale stoat (*Mustela erminea*) suppression programmes.

Kiwi recovery work in Fiordland also encompasses two other taxa of kiwi: Haast tokoeka and little spotted kiwi. Three predator-free islands (Centre and Bute Islands in Lake Te Anau, and Rona Island in Lake Manapouri) have been used as crèche sites for Haast tokoeka chicks, and populations of Haast tokoeka have also been established on two Charitable Trust managed islands—Coal Island in Preservation Inlet and Pomona Island in Lake Manapouri. Little spotted kiwi were returned to Fiordland in several transfers from Kapiti Island to Chalky Island in Chalky Inlet from 2008 to 2010, and 20 little spotted kiwi have been translocated to Anchor Island in Dusky Sound (17 April 2015). Both Haast tokoeka and little spotted kiwi will be managed through their own taxon plans, but reference to these taxa is made in this plan where relevant.

This document is the first management plan for both the northern and southern Fiordland tokoeka. Where information is relevant to both taxa, they will be referred to collectively as 'Fiordland tokoeka'. This plan provides key background information on the ecology, and past and current management of Fiordland tokoeka, and identifies goals, actions, responsibilities and a timeframe for their recovery.

2. Plan term and review date

The term of this plan is 10 years, from 2015 to 2025. The aim is to review it every 3 years, beginning in 2018.

3. Context

3.1 Taxonomy

Fossil evidence indicates that brown kiwi originated in the South Island, spreading to the North Island when both land masses were connected during the Pleistocene period. In 1899, South Island and North Island brown kiwi were recognised as separate subspecies (*A. australis australis* and *A. a. mantelli*, respectively) (Rothschild 1899); they were later given full species status (Baker et al. 1995).

Research has shown that there are genetic divergences between all four populations of tokoeka (Haast, northern and southern Fiordland, and Rakiura/Stewart Island. Work by Burbidge et al. (2003, 2005) suggests that a barrier to gene flow occurred within Fiordland around 1 million years ago (Herbert & Daugherty 1994; Baker et al. 1995; Burbidge et al. 2003, 2005). This barrier was centred on Wilmot Pass and resulted in the Fiordland birds being separated into northern and southern populations with measureable molecular differentiation. The differences between these two groups of birds are below the species level. However, data indicate that these populations are on separate evolutionary paths, and Burbidge & Baker (2005) recommended that they be recognised as Evolutionary Significant Units (ESUs) as well as Conservation Management Units (CMUs). In accordance with this, the current Kiwi Recovery Plan (Holzapfel et al. 2008) recognises these as separate taxa.

3.2 Biology and ecology

The following information on the biology and ecology of Fiordland tokoeka has been gathered from studies of northern Fiordland tokoeka in the Murchison Mountains and the Clinton Valley. Southern Fiordland tokoeka are assumed to have a similar biology and ecology.

Fiordland tokoeka are largely nocturnal, spending the daytime in a burrow, or under logs or vegetation. However, some birds in the Murchison Mountains have been found to be active during the day (J. Tansell, contractor, Te Anau, pers. comm. 2009).

As for other kiwi species, Fiordland tokoeka feed on a wide variety of invertebrates and the occasional berry. The main invertebrates include cicada nymphs, earthworms, moths, insect larvae, beetles and spiders.

Kiwi habitat in Fiordland is diverse; birds are found in beech and podocarp forest, tussock tops, shrublands and coastal regions. Studies have shown that territory size averages around 51 ha (pers. obs.; J. Tansell, pers. comm.). Information from the Murchison Mountains indicates that sub-adults travel distances of over 5 km (Tansell & Robertson unpubl. data).

Fiordland tokoeka females are considerably larger than males, with an average weight of 3300 g (range: 2550–4200 g, n = 27) and an average bill length of 125 mm (range: 116.3–142.2 mm, n = 27)—compared with 2600 g (1800–3100 g, n = 71) and 98 mm (89–109.2 mm, n = 71) for males. Individual weights vary considerably throughout the year, reaching a maximum in winter and a minimum in summer.

Pairs are monogamous. Little is known about age at first breeding, but one bird in the Murchison Mountains was suspected of nesting at 3 years old (Tansell & Robertson unpubl. data). Breeding begins in late June / early July, when eggs are laid, and hatching begins in September–October. A second clutch may be laid in November–December. One egg is laid per clutch and incubation takes 75–85 days. The male does the majority of the incubation, but the female relieves him at least twice during the night. Some nests also have a third or even fourth bird present in the nest. It is assumed that these birds are chicks from a previous season providing assistance with the incubation (pers. obs.; J. Tansell, pers. comm.). Chicks usually remain in the nest for several days before venturing out, following which they often return to the natal burrow for up to a month or more before moving on.

The longevity of Fiordland tokoeka is currently unknown. However, North Island brown kiwi have been recorded at 30 years of age in the wild, and are thought to live even longer.

3.3 Past and present distribution, and population trends

Historical and anecdotal evidence suggests that Fiordland tokoeka were once widespread throughout most of Fiordland. Southern Fiordland has fewer records, however, and Andreas Reischek (who was paid by the Government more than 100 years ago to survey birds in the area) found few tokoeka (Reischek 1887).

Today, tokoeka exist on the New Zealand mainland and on several islands in Fiordland (Fig. 1). It is estimated that there are approximately 14 500 tokoeka in Fiordland, of which 10 000 belong to the northern Fiordland group and 4500 to the southern Fiordland group (Holzapfel et al. 2008). Based on an assumed 2% decline, the Kiwi Recovery Plan states that by 2018 the projected number of tokoeka will be 8000 for the northern group and 3500 for the southern group (Holzapfel et al. 2008).

A small population (c. 30 birds) of southern Fiordland tokoeka also exists on Kapiti Island, which are descendents of birds translocated from Resolution Island in 1908 (Brook 1924). However, evidence from a kiwi found killed by a dog in Otaki in May 2014 indicates that hybridisation has occurred between Fiordland tokoeka and western brown kiwi on the island (H. Robertson, DOC, pers. comm.).

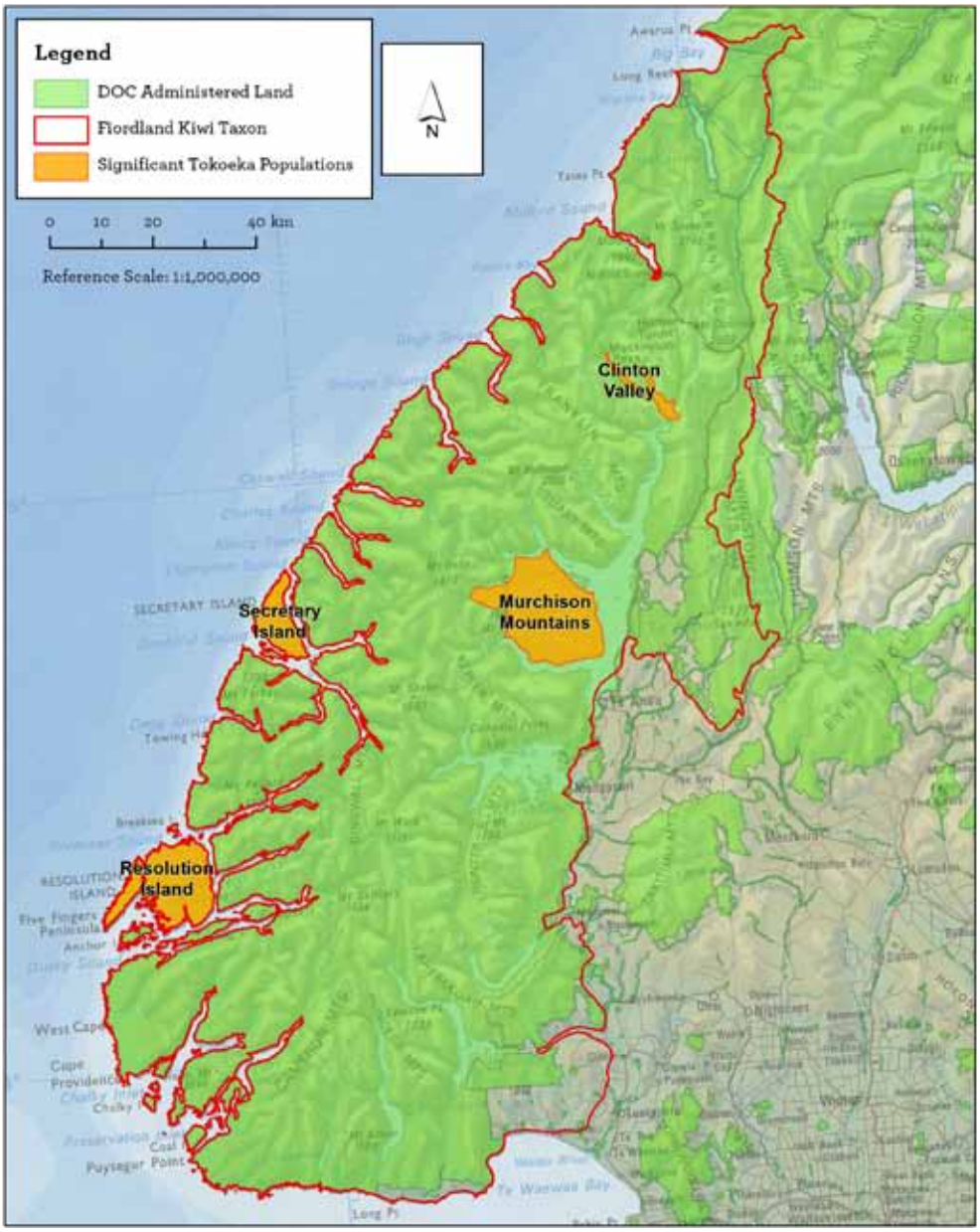

Figure 1. The distribution of Fiordland tokoeka.

3.4 Threat status

The northern and southern Fiordland tokoeka are classified as 'Nationally Vulnerable' under DOC's New Zealand Threat Classification System (Miskelly et al. 2008).

3.5 Agents of decline and current threats

In Fiordland, stoats are the main threat to kiwi chicks and juveniles. Ferrets (*Mustela putorius furo*) are not considered a threat as they are only known from the Eglinton Valley, where kiwi are absent. Cats (*Felis catus*) and their sign have been seen in kiwi habitat in the Clinton Valley, as well as on the eastern shores of Lake Te Anau, Wilmot Pass and the Kepler Track. Therefore, the potential for cat expansion into Fiordland kiwi habitat makes them a serious potential future threat, although the apparent persistence of kiwi in the presence of cats on Stewart Island/Rakiura indicates some robustness of kiwi populations to cat predation. Kea (*Nestor notabilis*), have also been suspected of eating kiwi eggs and killing chicks (Tansell & Kirkman 2006).

Weka (*Gallirallus australis australis*), have been implicated in the disturbance of nests and the destruction of eggs (Edmonds 2005). Possums (*Trichosurus vulpecula*) also disturb nesting kiwi (Edmonds 2005) and may occasionally damage eggs or compete for burrows.

Due to Fiordland's remote location, dogs are not a major threat to kiwi—unlike in some parts of the North Island. Dogs are used in Fiordland National Park for hunting deer, possums and pigs (*Sus scrofa*) by a few recreational and contract hunters. All dogs and their handlers are required to pass a test to check that the dog is under good control, and all handlers must hold a permit to operate in the National Park.

Traffic has been the cause of death of adult kiwi on at least two occasions on the Wilmot Pass Road (pers. obs.). In terms of natural mortality, drowning has claimed the lives of several chicks and adults in populations studied in Fiordland (Edmonds 2005; Tansell & Kirkman 2006; Tansell & Robertson unpublished data.), and it is likely that avalanches and rock slides also cause some mortality.

3.6 Past and current management

Stoat trapping occurs in several areas that are inhabited by mainland populations of northern Fiordland tokoeka (Murchison Mountains; Clinton, Arthur and Cleddau Valleys; Sinbad Valley; the Kepler Mountains; and Glaisnock, Worsley and Castle Valleys). Aerial 1080 operations have been carried out in the past in the Clinton and Arthur Valleys and the Waitutu Forest, and have recently been undertaken in the Waitutu Forest, the Iris Burn Valley in the Kepler Mountains, and the Eglinton and Clinton Valleys. Populations of both northern and southern Fiordland tokoeka are also likely to be benefitting from a reduction in stoat numbers as a result of the significant restoration projects focused on Secretary and Resolution Islands.

3.6.1 Productivity and chick survival

Clinton Valley

The productivity of adult tokoeka and survival of kiwi chicks in relation to a linear stoat trapline (which was originally set up to protect blue duck (whio, *Hymenolaimus malacorhynchos*) was investigated for 4 years from 2001 to 2005 in c. 2609 ha of the Clinton Valley on the Milford Track (Edmonds 2005).

This study provided valuable information regarding the behaviour, breeding, genetics, morphology, survival and habitat of Fiordland tokoeka, and their interactions with other species, and found that:

- Adult productivity was 0.651 eggs per male per annum (95% confidence interval (CI): 0.371–0.930), equating to 41 eggs per male per lifetime (95% CI: 23–59).
- Chick survival to sub-adult (10–180 days) was 17.6% (95% CI: 5.6–35.1%).
- Adult survival was 98.4% (95% CI: 94–99.9%) and life expectancy was 63 years. However, another chance adult death would reduce survival to 96.83% (91.2–99.9%) and life expectancy to 31.5 years.
- Population density for the duration of the study was estimated at 61 individuals, of which 21 were known or presumed pairs.

Murchison Mountains

The productivity and survival of northern Fiordland tokoeka in the Murchison Mountains Special Takahē Area was investigated for 6 years (2003–2009), following the establishment of a large-scale stoat trap network covering 15 000 ha (30% of the Murchison Mountains total area of 51 000 ha) in 2002 to protect endangered takahē (*Porphyrio hochstetteri*).

The main finding of this study was that the population would be in slow decline (1.29% per annum) in the absence of trapping, while trapping resulted in an increase in population size (1.07% per annum). Chick survival (including chicks that disappeared before transmitter attachment) was significantly greater in the trapped area (37.09%, 95% CI 0.1902–55.28%) than in the non-trapped area (17.39%, 95% CI 05.44–34.95%;) $P = 0.03$).

By extrapolating the average territory size of Fiordland tokoeka (51 ha) across the Murchison Mountains Special Takahē Area, it is estimated that there are c. 1000 males, all of which will be under protection by stoat traps from 2009. If we assume that c. 70% of these males will be productive, this equates to c. 700 productive pairs (Tansell 2009).

3.6.2 Distribution

Several distribution surveys have been conducted in Fiordland using a variety of methods. These have mainly focused on southern Fiordland tokoeka, with sites being chosen either due to a lack of knowledge about kiwi presence or to verify a sighting. In 1987, as part of Operation Raleigh—an international programme that aimed at involving young people in a range of conservation projects—the New Zealand Wildlife Service led expeditions to Fiordland looking for kākāpō (*Strigops habroptila*), during which kiwi were listened for at numerous sites. While these data were not collected in a systematic way, they did provide call rates for specific locations, which can be compared with future sampling. At some sites, kiwi were also caught and blood samples were taken for genetic research. These sites were spread throughout Fiordland and included the Jennings Burn, Iris Burn, the Camelot River, Deep Cove to Wilmot Pass, Lake Norwest, Resolution Island, Long Island and Loch Maree on the Dusky Track. These data are held by the Kiwi Call Scheme, National Office, DOC (R. Colbourne, DOC, pers. comm.).

Call count monitoring was also set up at ten sites in the Clinton Valley and Murchison Mountains in the 1990s. Call rates were collected over 3 years from 1994 to 1998.

3.6.3 Offshore islands

Secretary and Resolution Islands in Fiordland are the focus of large-scale biological restoration projects. Secretary Island (8140 ha) in Doubtful Sound is home to an estimated 80–100 pairs of northern Fiordland tokoeka (R. Colbourne, pers. comm.). The resident stoat population on the island has been reduced to very low numbers using an intensive network of traps. Additional traps are also in place on the adjacent mainland and small islands around Secretary Island to minimise the risk of re-invasion (Golding et al. 2005). Kiwi call count monitoring was established on Secretary Island in 2005 and repeated in 2006. Resolution Island (20860 ha) in Dusky Sound is home to an estimated 200–250 pairs of southern Fiordland tokoeka (R. Colbourne, pers. comm.). Call count monitoring was also established here in 2008 and repeated in 2009. There are also records of kiwi call rates collected by the Operation Raleigh programme in 1987 for several locations on Resolution Island. Measuring the effect of stoat control on populations of tokoeka on Secretary and Resolution Island is a high priority. This could be achieved by either carrying out further call count monitoring or by using a more sensitive monitoring method, such as conducting a chick survival and recruitment study, which would provide robust information in the short term (3–5 years).

A small population of tokoeka were translocated from the Murchison Mountains to the Doubtful Islands in Lake Te Anau for the purpose of kiwi conservation and advocacy. This project was unsuccessful, however, and so some of the tokoeka were returned to their original location. At least two pairs remain on the Doubtful Islands today.

3.7 Cultural importance

The kiwi holds a special place in most New Zealanders' hearts. It is our national icon and we are proud to be known as 'kiwis'.

Fiordland tokoeka are highly valued by most members of the local and wider community. Although people no longer live in close proximity to populations of Fiordland tokoeka, many see or hear them in Fiordland National Park. Ngāi Tahu in particular have a strong affiliation with tokoeka—they share management decisions with DOC and are often involved in hands-on kiwi recovery work.

Projects managed by iwi and the wider community are beneficial to kiwi recovery in Fiordland; and the relationships that are generated and nurtured are also an invaluable aspect of these initiatives.

3.8 Public awareness, key stakeholders and associates

In the Te Anau region, there is a high level of public awareness and support for kiwi recovery in Fiordland, and there are several opportunities for the local community to be involved in kiwi conservation. The Haast tokoeka chick crèche programme provides an opportunity for the local community to see a kiwi, with local community members—including school children—accompanying DOC staff and Pomona Island Charitable Trust members when they carry out regular harness and transmitter changes on the birds. The South West New Zealand Endangered Species Charitable Trust is also actively involved in kiwi conservation, with the establishment of a Haast tokoeka population on Coal Island. Sponsors such as Real Journeys, Kirra Tours and Kiwis for Kiwi and their staff have been directly involved in kiwi translocations and monitoring.

In 2010, Air New Zealand became involved in a programme that aimed to engage Te Anau schools in conservation in the Kepler Mountains through predator trapping. This programme has enormous potential for enabling community engagement and ownership of Fiordland tokoeka management.

The establishment of the Sinbad Sanctuary at Milford Sound, through funding from the tourism company Southern Discoveries (via the Fiordland Conservation Trust), also facilitates engagement with Fiordland tokoeka, as this species has been identified as having the potential to benefit from the predator trapping established under this programme.

In 2014, the Fiordland Conservation Trust with Fiordland Helicopters set up the Kepler Kiwicam Project, which filmed a kiwi nest and beamed the live footage into the Te Anau township and school. This was great advocacy for kiwi recovery.

There is considerable scope to grow community involvement in the management of Fiordland tokoeka through engagement with community groups and private sector partners.

3.9 Preferred option for recovery and recovery principles

In line with the national Kiwi Recovery Plan (Holzapfel et al. 2008), the preferred option for recovery is to sustainably manage Fiordland tokoeka in their natural range by reducing their exposure to predators.

The selection of goals, objectives and actions in this plan has also been directed by several underlying recovery principles contained in the national Kiwi Recovery Plan:

- Prevention of extinction of any species of kiwi is the highest priority for recovery management.

- The genetic variation and distribution of each taxon will be maintained or enhanced as much as is feasible within the taxon's core distribution area.
- Where possible, kiwi will be managed within their natural (prehistoric or historical) range; if they need to be managed outside this range, the overall aim will be to restore them to such sites.
- Kiwi recovery will, wherever possible, focus on gaining maximum benefits for the wider ecosystem.

4. Goals

4.1 Long-term recovery goal

To restore and, wherever possible, enhance the abundance, distribution and genetic diversity of northern and southern Fiordland tokoeka.

4.2 Goals for the term of this taxon plan

4.2.1 Management

Goal 1.1: To maintain, enhance and expand stoat control for the long-term protection of populations of both northern and southern Fiordland tokoeka.

Goal 1.2: To support the restoration of Secretary and Resolution Islands for the security of both northern and southern Fiordland tokoeka.

Goal 1.3: To gain an understanding of the distribution and population trend of northern and southern Fiordland tokoeka throughout Fiordland National Park.

4.2.2 Community relations and engagement

Goal 2.1: To maintain, support and increase community-led projects that help with the recovery of Fiordland tokoeka.

Goal 2.2: To increase corporate sponsorship funding for the recovery of Fiordland tokoeka.

Goal 2.3: To increase awareness and involvement of the community in the recovery of Fiordland tokoeka.

4.2.3 Research and innovation

Goal 3.1: To support research into the clarification of Fiordland tokoeka taxonomy and the management of genetic diversity.

Goal 3.2: To undertake and support research into management and monitoring tools for the recovery of Fiordland tokoeka.

5. Implementation

This section outlines the objectives and actions that need to be implemented to achieve the above goals. It does this by providing background information and a summary of issues for a number of topics arranged within the three themes of management, community relations and engagement, and research and innovation.

Taxon plan actions are provided to meet both the objectives and actions of the Kiwi Recovery Plan, and any additional objectives that have since been identified. Each action is numbered, prioritised and timelined. A summary table of actions is provided in Appendix 1. Prioritisation has been assigned according to the following criteria:

- **Essential**: Needs to be carried out within the timeframe and/or at the frequency specified to achieve the goals for kiwi recovery over the term of this plan. Highest risk for kiwi recovery if not carried out within the timeframe and/or at the frequency specified.
- **High**: Necessary to achieve long-term goals. To be progressed and, ideally, completed within the term of this plan, with moderate risk if not carried out within the timeframe and/or at the frequency specified.
- **Medium**: Necessary to achieve long-term goals. To be progressed within the term of this plan, but least risk if not completed within the term of this plan or within the timeframe and/or at the frequency specified.

Actions are timelined throughout the plan period. This reflects the increasing uncertainty in assigning timeframes beyond 5 years and the need to review progress for all actions by 2018.

5.1 Management

The management of kiwi populations and the supporting systems that enable this management to be effective are at the core of recovery planning for kiwi. The advances made over the previous decades in pest control techniques, translocation methods, captive management and restoration have demonstrated that the decline in populations can be reversed if effort is applied. In the future, species recovery will be largely guided by a suite of tools and techniques collectively called the 'Natural Heritage Management System' (NHMS).

In Fiordland, recent kiwi recovery efforts have focused on gathering estimates of productivity and survival for the northern Fiordland tokoeka in relation to stoat control regimes (Tansell 2009). Studies suggest that without management, populations are subject to continued or stochastic declines and will decline by about 2% per decade.

5.1.1 Topic 1: Taxon plans

The Kiwi Recovery Plan provides strategic direction at a national level, whereas taxon plans provide detailed management for each taxon at a regional level.

The role of the taxon plan for northern and southern Fiordland tokoeka is to clearly define an effective strategy for the recovery of each of these taxa. Accountability for this plan rests with the Southern South Island Region, and will be guided and supported by the Kiwi Recovery Group.

Issues

- Taxon plans need to be consistent with the national recovery plan while stating local solutions.
- Without regular reviews or responsibilities, taxon plans become ineffectual.
- Innovation and technological advances will cause taxon plans to become outdated.

Objectives and actions

Objective 1: To ensure that the current taxon plan remains effective, and is reviewed and updated at least every 3 years, depending on technological advances or changes in management/recovery.

Action		Timeframe	Priority	Accountability
1.1	Review and update Fiordland tokoeka taxon plan.	3 yearly beginning in 2018	High	Conservation Services Manager (CSM)-Biodiversity / plan author / Kiwi Recovery Group

5.1.2 Topic 2: Best practice

The Kiwi Best Practice Manual (Robertson & Colbourne 2003) provides information on best practice for kiwi management and several predator control plans are also available. These manuals are updated regularly as new information becomes available.

Issues

- The Kiwi Best Practice Manual requires regular updates.
- All kiwi practitioners are required to follow best practice.

Objectives and actions

Objective 2: To ensure that kiwi management is undertaken to a consistent and high standard across Fiordland.

Action		Timeframe	Priority	Accountability
2.1	Ensure that best practice is referred to and monitored in all kiwi recovery planning and work in Fiordland.	Ongoing	High	CSM-Biodiversity

5.1.3 Topic 3: Island strategy

The establishment of new populations of kiwi on predator-free islands or on islands where predators are controlled to a level that ensures population growth to carrying capacity is an invaluable tool in kiwi recovery. There is a need to identify and prioritise which kiwi species might be suitable for which islands, taking into account existing or potential uses of the islands for other threatened species.

Fiordland has many islands of varying sizes and security levels, several of which are already home to populations of Fiordland tokoeka and other kiwi species (see section 3.6—Past and current management). In particular, the restoration programmes on Secretary and Resolution Islands offer direct security benefits to significant populations of northern and southern Fiordland tokoeka, respectively, and as such are priority management areas for these taxa.

A restoration plan for Secretary and Resolution Islands has identified the benefits of stoat eradication/suppression to the kiwi populations existing there, as well as the recommended process to achieve this (Edge & Wickes 2011). A scoping document has also been prepared to identify suitable islands in Fiordland for kiwi populations (Russell 2004) and a national island strategy document has been produced (Colbourne 2008).

Issues

- There is a need to identify and prioritise which kiwi species might be suitable for which islands within Fiordland.

- Existing or translocated kiwi populations on islands require ongoing protection and management.
- Community groups need guidance, support and recognition for their efforts in managing threats on islands for kiwi populations / crèche sites.

Objectives and actions

Objective 3: To optimise and support the use of islands for Fiordland tokoeka and other appropriate kiwi species, and to actively establish, protect and manage these populations.

Action		Timeframe	Priority	Accountability
3.1	Liaise with the Kiwi Recovery Group, kiwi sanctuaries, community groups, iwi, trusts and sponsors around species requirements for pest-free islands in Fiordland, considering other species and island restoration requirements.	Ongoing	Essential	CSM-Biodiversity
3.2	Translocate little spotted kiwi to islands in Fiordland (Chalky, Anchor and Bauza) following national and local island strategy plans, taxon plans, the island restoration plan, quarantine protocols and the translocation Standard Operating Procedure (SOP).	Ongoing	Essential	CSM-Biodiversity
3.3	Protect kiwi populations on Resolution and Secretary Islands by controlling stoats to low numbers or undetectable levels.	Ongoing	Essential	CSM-Biodiversity
3.4	Protect kiwi populations on Indian, Parrot and Long Islands by controlling stoats.	Ongoing	Essential	CSM-Biodiversity
3.5	Guide, support and give recognition to community groups in their kiwi recovery efforts on islands in Fiordland; in particular, The South West New Zealand Endangered Species Charitable Trust (Haast tokoeka on Coal Island) and Pomona Island Charitable Trust (Haast kiwi on Pomona Island).	Ongoing	Essential	CSM-Biodiversity
3.6	Support and assist Haast tokoeka crèche efforts on islands in Lakes Te Anau and Manapouri.	Ongoing	High	CSM-Biodiversity

5.1.4 Topic 4: Island biosecurity

Populations of kiwi on islands, including *ex situ* populations, crèche sites and restoration populations, are a critical aspect of creating security for kiwi taxa. Therefore, it is essential to ensure that these islands remain safe from pests and disease. Biosecurity plans for these islands will minimise the risk of any incursions, but are no guarantee.

Issues

- An increase in threats on islands with kiwi populations, including Fiordland tokoeka, could jeopardise individual island populations and the wider recovery objective(s) associated with these taxa.

Objectives and actions

Objective 4: To maintain or improve the current threat status of islands that have resident populations of Fiordland tokoeka.

Action		Timeframe	Priority	Accountability
4.1	Update and adhere to the current Island Biosecurity Plan (Agnew & Roberts 2004).	Ongoing	Essential	CSM-Biodiversity / biosecurity plan author

Actions continued on next page

Topic 4: Island biosecurity actions continued

Action		Timeframe	Priority	Accountability
4.2	Support stoat eradication/suppression and subsequent monitoring on islands in Fiordland to ensure the recovery of kiwi populations, with specific focus on the two significant island restoration projects (Secretary and Resolution Islands).	Ongoing	Essential	CSM-Biodiversity
4.3	Support community groups in maintaining or improving the threat status of islands that are home to, or intended for, Fiordland tokoeka.	Ongoing	Essential	CSM-Biodiversity
4.4	Ensure that all kiwi translocated to islands are disease screened.	Ongoing	High	CSM-Biodiversity

5.1.5 Topic 5: Minimum secure populations

The total population of Fiordland tokoeka is relatively large compared with other kiwi taxa (e.g. rowi); however, the population is assumed to be declining overall. An important step in their recovery is to provide sustainable security for a minimum number of pairs. The national Kiwi Recovery Plan (Holzapfel et al. 2008) recommended that a minimum population size of 500 breeding pairs of both northern and southern Fiordland tokoeka should be under sustained management.

Issues

- The number of pairs of northern and southern tokoeka under sustained management is currently below the recommended minimum of 500 pairs.

Objectives and actions

Objective 5: To protect a minimum of 500 pairs of both northern and southern Fiordland tokoeka from the relevant agents of decline.

Action		Timeframe	Priority	Accountability
5.1	Protect the large estimated population of 700 kiwi pairs in the Murchison Mountains Special Takahē Area by controlling stoats to low levels.	2014, then throughout term of plan	Essential	CSM-Biodiversity
5.2	Protect the estimated population of 100 kiwi pairs in the Clinton and Arthur Valleys by controlling stoats to low levels using trapping and aerial 1080.	2014, then throughout term of plan	Essential	CSM-Biodiversity
5.3	Protect the estimated population of 80–100 kiwi pairs on Secretary Island and 200–250 kiwi pairs on Resolution Island by controlling stoats to low numbers or the target of zero density.	2014, then throughout term of plan	Essential	CSM-Biodiversity
5.4	Increase the number and scale of sites in which stoat control is carried out to protect Fiordland tokoeka.	2014, then throughout term of plan	Essential	CSM-Biodiversity
5.5	Monitor the population trend in Fiordland tokoeka in management areas to ascertain whether the minimum required number of pairs is under sustainable security.	2014, then throughout term of plan	Essential	CSM-Biodiversity

5.1.6 Topic 6: Declining populations

Populations of Fiordland tokoeka are widely dispersed and we currently have little understanding of the connectivity, density, abundance or population trends within the metapopulation. Although managed populations, such as those in the Murchison Mountains, may be stable or increasing slightly, the size of these is thought to be insufficient to prevent an overall decline of Fiordland tokoeka.

Issues

- Despite population stability at managed sites, the populations of northern and southern Fiordland tokoeka are assumed to be declining overall.
- Estimated rates of decline of Fiordland tokoeka populations are based on a small number of studies.
- Declines in populations have been attributed to predator processes, but populations may also be declining due to other factors, such as natural losses of adults, low or moderate productivity and sub-adult dispersal beyond managed sites.

Objectives and actions

Objective 6: To manage a sufficient proportion of the population of northern and southern Fiordland tokoeka to prevent overall decline.

Action		Timeframe	Priority	Accountability
6.1	Maintain, improve and increase long-term landscape-scale pest control for the recovery of Fiordland tokoeka populations.	2014, then throughout term of plan	Essential	CSM-Biodiversity
6.2	Continue to support and improve stoat eradication/ suppression and subsequent monitoring on Secretary and Resolution Islands to ensure Fiordland tokoeka recovery and security.	Ongoing	Essential	CSM-Biodiversity

5.1.7 Topic 7: Distribution and genetic diversity

The overall decline of populations of Fiordland tokoeka is likely to result in further constriction of their distribution and an associated loss of genetic diversity. Genetic research (Baker et al. 1995; Herbert & Daugherty 2002; Burbidge et al. 2003; Shepherd & Lambert 2008) has confirmed that there is natural (i.e. non-human-induced) isolation of the separate taxa of brown kiwi and tokoeka, as well as fine-scale genetic variation within these taxa.

Management of these taxa needs to recognise isolation as one of the drivers of speciation, as well as the risks that this can carry (e.g. genetic inbreeding).

Where possible, a precautionary principle will be applied to the management of the genetic structure of these taxa until the importance of their genetic diversity is fully understood.

Issues

- There is a perceived continued reduction in the distribution of Fiordland tokoeka.
- Distribution data are lacking for Fiordland tokoeka.
- Two genetic entities have been recognised within Fiordland, which need to be managed accordingly.

Objectives and actions

Objective 7: To halt reductions in the distribution of Fiordland tokoeka and maintain genetic integrity within the taxa at an appropriate scale.

Actions continued on next page

Topic 7: Distribution and genetic diversity actions

Action		Timeframe	Priority	Accountability
7.1	Increase knowledge of kiwi distribution in Fiordland via surveys and access data from Tier One monitoring.	2014, then throughout term of plan	High	CSM-Biodiversity
7.2	Optimise landscape-scale management undertaken for non-kiwi-specific goals to benefit Fiordland tokoeka over their current distribution by 2014 and then throughout the term of the plan.	2014, then throughout term of plan	High	CSM-Biodiversity
7.3	Manage northern and southern Fiordland tokoeka as separate Conservation Management Units.	Ongoing	High	CSM-Biodiversity
7.4	Manage populations of northern and southern Fiordland tokoeka as much as is feasible to maintain fine-scale diversity by minimising translocations between geographic extremes and natural boundaries throughout the term of the plan.	Ongoing	Medium	CSM-Biodiversity

5.1.8 Topic 8: Data management

Kiwi recovery projects rely on good operational data management practices to allow them to work efficiently and effectively, and to report on their progress. At the same time, these projects generate data that form an important information resource for research.

Issues

- There is inconsistent data management across kiwi projects.
- Data management procedures are not regularly updated due to a lack of available software and inconsistent protocols.

Objectives and actions

Objective 8: To ensure that data obtained from kiwi recovery projects in Fiordland are managed in a consistent, efficient and effective manner, and are available for key users.

Action		Timeframe	Priority	Accountability
8.1	Ensure that current kiwi project data are up to date and consistent with other projects.	Ongoing	Medium	CSM-Biodiversity

5.2 Community relations and engagement

The recovery of kiwi both nationally and locally relies considerably upon the interest, engagement and involvement of the local and wider community. Support of these efforts is crucial for their continuation and expansion. One of the immediate outcomes identified in DOC's Statement of Intent is for more people to engage with conservation and value its benefits. DOC aims to achieve this by identifying and promoting the values and benefits of conservation and a range of activities in which people and organisations can become involved.

Several community-led or supported kiwi recovery projects have been successfully established within Fiordland. It is vital that these projects are well-informed, supported and acknowledged to ensure that they continue for the long term. There is also a need to encourage new initiatives for the recovery of Fiordland tokoeka and other kiwi species in Fiordland.

5.2.1 Topic 9: Advocacy

Advocacy is an integral component of kiwi recovery, and includes sharing information, promoting issues, and providing solutions, support and assistance. The Kiwi Recovery Group recognises the importance of advocacy and the National Mentor for Kiwi Recovery is a full member of this group.

A wide range of advocacy tools are used to reach different audiences, including kiwi hui or workshops, media, publications, websites and interpretive displays. Several community groups involved in kiwi recovery in Fiordland promote their involvement and highlight the plight of the kiwi through websites, articles in local newspapers and interpretive displays. Schools in the local and wider communities are proactive in seeking information regarding kiwi biology and recovery.

Issues

- National coordination of advocacy might not meet specific local needs.
- Advocacy is not always considered an integral part of kiwi recovery or given the time it deserves.
- Advocacy material is sometimes of poor quality or outdated, underutilising opportunities or even creating negative messages.
- Advocacy messages need to be consistent and well-delivered.
- The recovery of kiwi is reliant upon engaging and empowering the community to become actively involved.

Objectives and actions

Objective 9: To increase community awareness, knowledge and participation in kiwi recovery in Fiordland.

Action		Timeframe	Priority	Accountability
9.1	Utilise and integrate advocacy opportunities for other kiwi species to highlight opportunities and needs for Fiordland tokoeka recovery.	Ongoing	High	CSM-Biodiversity / Conservation Manager (CM)-Partnerships
9.2	Promote kiwi recovery efforts for Fiordland tokoeka via the media.	Ongoing	High	CSM-Biodiversity / CM-Partnerships

5.2.2 Topic 10: Tangata whenua

DOC is committed to giving effect to the unique relationship that tangata whenua (iwi or hapū that have customary authority in a place) have with kiwi. This includes memoranda of understanding, partnerships, protocols and legal agreements such as under the Ngāi Tahu Claims Settlement Act 1998.

Tangata whenua have a repository of knowledge about kiwi, which is invaluable when dealing with these birds. In many areas, iwi have embraced the kaupapa (principles) of kiwi recovery and kiwi habitat restoration, and are applying an active kaitiaki (guardian) role by carrying out predator control, building protection fences and implementing BNZ Operation Nest Egg™. Iwi participate in kiwi programmes in Fiordland by being kept informed, having input into decision-making and being directly involved in translocations.

Issues

- Involvement by tangata whenua in aspects of kiwi management is variable across the country, with more opportunities present than have been utilised.
- The role of iwi in kiwi recovery planning and implementation, and access to cultural materials, is not always understood or given effect to.

Objectives and actions

Objective 10: To ensure that iwi are involved at all levels of kiwi management and research in Fiordland.

Action		Timeframe	Priority	Accountability
10.1	Include tangata whenua in the development and implementation of the northern and southern Fiordland tokoeka taxon plan throughout its term.	Ongoing	Essential	CSM-Biodiversity
10.2	Regularly attend kaitiaki roopu to inform and increase tangata whenua involvement in the recovery of Fiordland tokoeka.	Ongoing	Essential	CSM-Biodiversity
10.3	Regularly communicate with the Ngāi Tahu kiwi recovery representative about the recovery of Fiordland tokoeka.	Ongoing	Essential	CSM-Biodiversity

5.2.3 Topic 11: Community-led initiatives

Community-led initiatives for the protection of kiwi have greatly increased in number and extent across the country. These initiatives and the support for them also form a vital part of kiwi recovery in Fiordland.

Issues

Community-led projects face a number of issues that endanger their long-term sustainability, including:

- A lack of knowledge or capacity to access funding.
- The need for support, advice, training and acknowledgement throughout all projects.
- Sensitivity to changes in group dynamic, e.g. the main champions or drivers leaving a project.

Objectives and actions

Objective 11: To ensure that community involvement in the protection of Fiordland tokoeka is optimised, sustained and follows best practice.

Action		Timeframe	Priority	Accountability
11.1	Continue and increase support, advice and acknowledgement for community-led initiatives.	Ongoing	Essential	CSM-Biodiversity / CM-Partnerships
11.2	Increase awareness and involvement of community members in kiwi recovery work.	Ongoing	Essential	CSM-Biodiversity / CM-Partnerships

5.2.4 Topic 12: Corporate sponsorship

Kiwi recovery has benefited from a high public profile and interest which, in turn, has made it attractive for corporate sponsorship. DOC recognises the need for more business opportunities to deliver increased economic prosperity and conservation gains, which will lead to an increase in the level of investment in conservation by the commercial sector.

Issues

- An increase in external funding is required to be able to protect Fiordland tokoeka.
- There needs to be careful management to ensure that sponsors are involved and acknowledged to the appropriate level.

Objectives and actions

Objective 12: To increase financial support for the recovery of Fiordland tokoeka by obtaining corporate sponsorship.

Action		Timeframe	Priority	Accountability
12.1	Work with Fiordland Conservation Trust and other interested parties to promote the recovery of Fiordland tokoeka and to encourage corporate sponsorship.	Ongoing	Essential	CSM-Biodiversity / CM-Partnerships
12.2	Ensure that all existing or potential sponsors are actively encouraged, involved and acknowledged.	Ongoing	Essential	CSM-Biodiversity / CM-Partnerships

5.3 Research and innovation

The recovery of kiwi has greatly benefited from research and technology that has been developed in the past, and will continue to be dependent on good scientific understanding and adequate tools. Current limitations include affordability and the scale required to monitor kiwi populations and manage pests and episodic impacts (e.g. dogs, ferrets). New technology that addresses these limitations will provide the next big leap forward in kiwi recovery.

5.3.1 Topic 1: Genetics and taxonomy

Some recently established populations of kiwi may have passed through genetic bottlenecks. Until we have a good understanding of the effects of such bottlenecks, management needs to apply a precautionary principle of minimising the risk of these occurring.

A basic requirement for recovery planning of any species is a good understanding of the actual identity of the species (or other significant taxonomic unit) that needs to be considered for recovery. While important progress has been made over the last decade in understanding kiwi taxonomy (Burbidge et al. 2003; Tennyson et al. 2003; Shepherd & Lambert 2008), some of the taxonomic work that has been completed still awaits formal publication, while other work awaits completion.

Issues

- Kiwi taxonomy is not resolved, leading to uncertainties about the taxonomic status of Fiordland tokoeka and the associated importance of distinct populations.

Objectives and actions

Objective 13: To formally clarify the taxonomy of northern and southern Fiordland tokoeka, and to maximise the genetic diversity within each taxon.

Action		Timeframe	Priority	Accountability
13.1	Support research into clarifying the taxonomy of northern and southern Fiordland tokoeka.	Ongoing	Medium	CSM-Biodiversity
13.2	Support research into the implications of bottlenecking, fine-scale diversity and genetic homogenisation of northern and southern Fiordland tokoeka.	Ongoing	Medium	CSM-Biodiversity

5.3.2 Topic 2: Population monitoring

Recovery effort needs to be directed and informed by data on population dynamics and trends in managed and unmanaged populations. Monitoring to obtain these data needs to be carried out at an appropriate scale and across an appropriate timeframe to provide sufficiently robust information. More detailed assessment of population trends requires robust data on key population parameters (mortality, recruitment, etc.), which are obtained by monitoring individual birds (e.g. using transmitters). However, this is labour intensive, limiting the scale of many projects.

The development of new techniques, such as aerial monitoring and acoustic recorders, is likely to improve the cost-effectiveness of monitoring populations on a large scale.

Issues

- Monitoring kiwi to determine population dynamics is labour intensive and expensive but crucial to understanding population trends.
- Monitoring population dynamics and trends requires a long-term commitment that is difficult to maintain with short-term funding cycles.
- Monitoring needs to be at the required level of repetition, sample size and longevity to obtain robust data that make it a worthwhile investment.
- We have not yet capitalised on the investment in the Murchison Mountains project, which showed that large-scale, low-intensity stoat control may not be enough to prevent the decline of kiwi populations.

Objectives and actions

Objective 14: To ensure that robust information is available to assess the population dynamics and trends for Fiordland tokoeka.

Action		Timeframe	Priority	Accountability
14.1	Ensure that the Murchison Mountains project is completed to an optimal level, and that any current and future stoat control in Fiordland capitalises on the results of this.	2014, then throughout term of plan	Essential	CSM-Biodiversity
14.2	Initiate, continue, improve and expand on trend monitoring of key populations of Fiordland tokoeka (Secretary, Resolution, Murchison Mountains, Clinton Valley, etc.) using robust monitoring methods.	2014, then throughout term of plan	Essential	CSM-Biodiversity
14.3	Access data on the distribution of kiwi in Fiordland (Tier One monitoring) and ensure that this is reflected in site prescriptions in NHMS.	2014, then throughout term of plan	Essential	CSM-Biodiversity

5.3.3 Topic 3: Pest management

Pest control technologies that protect kiwi (e.g. stoat trapping) have high associated labour costs. This limits their applicability, as they need to be used over large areas to halt the decline of several species of kiwi. Consequently, unless more-efficient technologies for pest control are developed and applied, kiwi will be limited to a few populations that exist in relatively small, intensively managed pockets, and unmanaged populations in the wild will continue to decline or become extinct. Several alternative pest control tools that could be used for large-scale kiwi protection are currently being tested, including aerially distributed sodium monofluoroacetate (1080) and para-aminopropiophenone (PAPP), as well as self-resetting stoat traps.

Issues

- Existing technologies for pest control to protect kiwi are labour intensive and costly, and may not be effective.

- Large-scale, long-term pest control is required to support and protect kiwi populations at a meaningful, sustainable scale.

Objectives and actions

Objective 15: To improve the cost- and labour-effectiveness of pest control management to protect Fiordland tokoeka.

Action		Timeframe	Priority	Accountability
15.1	Support and assist with the research, development and trialling of pest control methodologies.	Ongoing	High	CSM-Biodiversity
15.2	Locally implement improvements in pest control technologies to protect Fiordland tokoeka to a sufficient level.	2015, then throughout term of plan	Essential	CSM-Biodiversity

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Appendix 1

Timeline and priorities for recovery actions for Fiordland tokoeka

Actions have been abridged to include key points; see section 5 for full details.

Priorities:

E = Essential—to be carried out within the specified timeframe and/or at the frequency required to achieve the goals for kiwi recovery over the term of this plan. Highest risk for kiwi recovery if not done within the specified timeframe and/or frequency.

H = High—necessary to achieve long-term goals. To be progressed and ideally completed within the term of this plan, with moderate risk if not done within the specified timeframe and/or frequency.

M = Medium—necessary to achieve long-term goals. To be progressed within the term of this plan, but least risk if not completed within the term of this plan or within the specified timeframe and/or frequency.

	Action	Priority	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
1.1	Complete Fiordland tokoeka taxon plan	Essential	√								
1.2	Review and update Fiordland tokoeka taxon plan	High			√			√			√
1.3	Continue and improve recovery of Fiordland tokoeka by following taxon plan guidelines, and consulting with Kiwi Recovery Group and other stakeholders	Essential	√	√	√	√	√	√	√	√	√
2.1	Refer to and monitor best practice in all Fiordland kiwi recovery planning	High	√	√	√	√	√	√	√	√	√
3.1	Liaise with key stakeholders about kiwi requirements for pest-free islands in Fiordland	Essential	√	√	√	√	√	√	√	√	√
3.2	Translocate little spotted kiwi to islands in Fiordland (Chalky, Anchor and Bauza) following national and local island strategy plans, taxon plans, the islands' restoration plans, quarantine protocols and the translocation Standard Operating Procedure (SOP).	Essential	√	√	√	√	√	√	√	√	√
3.3	Protect kiwi populations on Resolution and Secretary Islands by controlling stoats to low numbers or undetectable levels	Essential	√	√	√	√	√	√	√	√	√
3.4	Protect kiwi populations on Indian, Parrot and Long Islands by controlling stoats.	Essential	√	√	√	√	√	√	√	√	√
3.5	Guide, support and give recognition to community groups in their kiwi recovery efforts on islands in Fiordland; in particular, The South West New Zealand Endangered Species Charitable Trust (Haast tokoeka on Coal Island) and Pomona Island Charitable Trust (Haast kiwi on Pomona Island).	Essential	√	√	√	√	√	√	√	√	√
3.6	Support and assist Haast tokoeka crèche efforts on islands in Lakes Te Anau and Manapouri.	Essential	√	√	√	√	√	√	√	√	√
4.1	Update and adhere to the current Island Biosecurity Plan (Agnew & Roberts 2004).	Essential	√	√	√	√	√	√	√	√	√
4.2	Support stoat eradication/suppression and subsequent monitoring on islands in Fiordland to ensure the recovery of kiwi populations, with specific focus on the two significant island restoration projects (Secretary and Resolution Islands).	Essential	√	√	√	√	√	√	√	√	√
4.3	Support community groups in maintaining or improving the threat status of islands that are home to, or intended for, Fiordland tokoeka	Essential	√	√	√	√	√	√	√	√	√
4.4	Ensure that all kiwi translocated to islands are disease screened	Essential	√	√	√	√	√	√	√	√	√

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Appendix 1 continued

	Action	Priority	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
5.1	Support and assist with the research, development and trialling of pest control methodologies.	Essential	√	√	√	√	√	√	√	√	√
5.2	Protect the estimated population of 100 kiwi pairs in the Clinton and Arthur Valleys by controlling stoats to low levels using trapping and aerial 1080.	Essential	√	√	√	√	√	√	√	√	√
5.3	Protect the estimated population of 80–100 kiwi pairs on Secretary Island and 200–250 kiwi pairs on Resolution Island by controlling stoats to low numbers or the target of zero density.	Essential	√	√	√	√	√	√	√	√	√
5.4	Increase the number and scale of sites in which stoat control is carried out to protect Fiordland tokoeka	Essential	√	√	√	√	√	√	√	√	√
5.5	Monitor the population trend in Fiordland tokoeka in management areas to ascertain whether the minimum required number of pairs is under sustainable security.	Essential	√	√	√	√	√	√	√	√	√
6.1	Maintain, improve and increase long-term landscape-scale pest control for the recovery of Fiordland tokoeka populations.	Essential	√	√	√	√	√	√	√	√	√
6.2	Continue to support and improve stoat eradication/suppression and subsequent monitoring on Secretary and Resolution Islands to ensure Fiordland tokoeka recovery and security.	Essential	√	√	√	√	√	√	√	√	√
7.1	Increase knowledge of kiwi distribution in Fiordland via surveys and access data from Tier One monitoring.	High	√	√	√	√	√	√	√	√	√
7.2	Optimise landscape-scale management undertaken for non-kiwi-specific goals to benefit Fiordland tokoeka over their current distribution by 2015 and then throughout the term of the plan.	High	√	√	√	√	√	√	√	√	√
7.3	Manage northern and southern Fiordland tokoeka as separate Conservation Management Units.	High	√	√	√	√	√	√	√	√	√
7.4	Manage populations of northern and southern Fiordland tokoeka as much as is feasible to maintain fine-scale diversity by minimising translocations between geographic extremes and natural boundaries throughout the term of the plan.	Medium	√	√	√	√	√	√	√	√	√
8.1	Ensure that current kiwi project data are up to date and consistent with other projects.	Medium	√	√	√	√	√	√	√	√	√
9.1	Utilise and integrate advocacy opportunities for other kiwi species to highlight opportunities and needs for Fiordland tokoeka recovery	High	√	√	√	√	√	√	√	√	√
9.2	Promote kiwi recovery efforts for Fiordland tokoeka via the media.	High	√	√	√	√	√	√	√	√	√
10.1	Include tangata whenua in the development and implementation of the northern and southern Fiordland tokoeka taxon plan throughout its term.	Essential	√	√	√	√	√	√	√	√	√
10.2	Regularly attend kaitiaki roopu to inform and increase tangata whenua involvement in the recovery of Fiordland tokoeka	Essential	√	√	√	√	√	√	√	√	√
10.3	Regularly communicate with the Ngāi Tahu kiwi recovery representative about the recovery of Fiordland tokoeka.	Essential	√	√	√	√	√	√	√	√	√
11.1	Continue and increase support, advice and acknowledgement for community-led initiatives.	Essential	√	√	√	√	√	√	√	√	√
11.2	Increase awareness and involvement of community members in kiwi recovery work.	Essential	√	√	√	√	√	√	√	√	√
12.1	Work with Fiordland Conservation Trust and other interested parties to promote the recovery of Fiordland tokoeka and to encourage corporate sponsorship.	Medium	√	√	√	√	√	√	√	√	√
12.2	Ensure that all existing or potential sponsors are actively encouraged, involved and acknowledged.	Medium	√	√	√	√	√	√	√	√	√
13.1	Support research into clarifying the taxonomy of northern and southern Fiordland tokoeka.	Medium	√	√	√	√	√	√	√	√	√

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Appendix 1 continued

	Action	Priority	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
13.2	Support research into the implications of bottlenecking, fine-scale diversity and genetic homogenisation of northern and southern Fiordland tokoeka.	Medium	√	√	√	√	√	√	√	√	√
14.1	Ensure that the Murchison Mountains project is completed to an optimal level, and that any current and future stoat control in Fiordland capitalises on the results of this.	Essential	√	√	√	√	√	√	√	√	√
14.2	Initiate, continue, improve and expand on trend monitoring of key populations of Fiordland tokoeka (Secretary, Resolution, Murchison Mountains, Clinton Valley, etc.) using robust monitoring methods.	Essential	√	√	√	√	√	√	√	√	√
14.3	Access data on the distribution of kiwi in Fiordland (Tier One monitoring) and ensure that this is reflected in site prescriptions in NHMS.	Essential	√	√	√	√	√	√	√	√	√
15.1	Locally implement improvements in pest control technologies	High	√	√	√	√	√	√	√	√	√
15.2	Locally implement improvements in pest control technologies to protect Fiordland tokoeka to a sufficient level.	Essential	√	√	√	√	√	√	√	√	√