

# GLOBAL RE-INTRODUCTION PERSPECTIVES

*Re-introduction case-studies from around the globe*



**Edited by  
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**Cover photo:** Clockwise starting from top-left:

- Formosan salmon stream, Taiwan
- Students in Madagascar with tree seedlings
- Virgin Islands boa

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## Wild-to-wild transfer of great spotted kiwi to the Rotoiti Nature Recovery Project, Nelson Lakes National Park, New Zealand

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### Introduction

The great spotted kiwi (*Apteryx haastii*) is one of six species of flightless ratite in the New Zealand family Apterygidae. Young kiwi weighing <1 kg are extremely vulnerable to predation by introduced carnivores, particularly stoats (*Mustela erminna*). Kiwi of all sizes are susceptible to predation by dogs. Great spotted kiwi persist in three populations in the South Island, and collectively number about 17,000. Monogamous pairs breed annually and lay one large egg which is incubated for 75 - 80 days. The Department of Conservation (DOC) threat category assigned to this species is "5, gradual decline". The IUCN ranking is 'vulnerable' (A2be + 3be). Nine adult great spotted kiwi were transferred to a 5,000 hectare site within the Rotoiti Nature Recovery Project (RNRP) during May 2004, and seven birds were transferred during May 2006. The RNRP is a DOC "mainland island": a site-based natural heritage management project with a primary focus on learning how to carry out ecological restoration. Pest control is a key activity. The release site consists of montane southern beech (*Nothofagus*) forests, alpine scrub, rock and tussock lands. It is unfenced, and is contiguous with thousands of hectares of similar habitat in Nelson Lakes National Park and beyond. All of the transferred kiwi were sourced from the wild in Kahurangi National Park (northwest South Island).



Kiwi captured at Corkscrew Creek

### Goals

- Goal 1: To learn whether a wild-to-wild transfer of adult great spotted kiwi can be used to establish a new population.
- Goal 2: An objective of the Rotoiti Nature Recovery Project is to re-introduce recently depleted species, including kiwi.

### Success Indicators

- Indicator 1: All of the critical performance standards (management and monitoring actions specified in the

translocation operational plan) were met.

- **Indicator 2:** Also 50% or more of the male kiwi and 50% or more of the female kiwi have settled into defined territories within the RNRP recovery area 10 months after their release.
- **Indicator 3:** No goals relating to breeding, recruitment or long-term persistence of the population were identified, because the wild-to-wild transfer method had not been adequately trialed or monitored before, and it was not possible to identify suitable goals beyond the initial phase of establishing the founder population.



**1 week old hatching from the Rotoiti Nature Recovery Project - January 2007**

## Project Summary

**Feasibility:** The feasibility of the transfer was assessed in terms of the Department of Conservation's Standard Operating Procedure for the Translocation of New Zealand's Indigenous Terrestrial Flora and Fauna. The southern beech forest and alpine habitat in the Rotoiti Nature Recovery Project area is further inland, cooler and drier than the majority of the habitat within the current range of great spotted kiwi; however it is broadly similar to habitat in the south-east of great spotted kiwi's current range, the eastern flanks of the Southern Alps in Canterbury. Experience with transferring other species of kiwi (e.g. Okarito Brown Kiwi/Rowi from central Westland to Motuara Island in the Marlborough Sounds) has shown that kiwi can adapt to different climates, geologies and vegetation types. The first transfer in 2004 was preceded by two years of planning and consultation. Amongst some stakeholders there was a perception that the proposal was high risk: wild-to-wild kiwi transfers had not been adequately tested and monitored, and great spotted kiwi was the least well studied of kiwi species. It was considered possible that the adult kiwi could disperse from the release area. During the planning phase a contingency plan was made to monitor and manage kiwi dispersal from the RNRP mainland island.

**Implementation:** The transfers involved the collection of adult kiwi over approximately a week in winter 2004 and a week in winter 2006. There was a preference for collecting established pairs. Kiwi were captured at night using a variety of methods including (most successfully) a trained and certified kiwi catching dog. Kiwi were held in plywood crates until being transferred by helicopter to the release area, usually on the day after capture. Quarantining was not undertaken because there were no suitable quarantine facilities available for holding wild great spotted kiwi. Pre-transfer disease screening was considered impractical because - due to their flightiness - great spotted kiwi were expected to be difficult to capture a second time (for transfer) after having been caught for



**Kiwi capture site, Corkscrew Creek,  
Kahurangi National Park**

disease screening. Great spotted kiwi in the source population were surveyed for several common avian diseases at a study site 6 km from the source area two months prior to the transfer, with no positive results obtained. The transferred kiwi were sampled for diseases at the time of transfer, but disease status was not known at the time of release. In 2004 one kiwi's bill was injured by the lid of a transfer crate, and the kiwi was not able to be released. The transfer crates were modified to prevent the same problem from recurring in 2006. All other kiwi were

transferred and released within 48 hours of being collected, often sooner. Five males and four females were released in 2004; and three males and four females were released in 2006. Maori representing the donor and receiving *rohe* (traditional tribal areas) celebrated the 2004 and 2006 transfers with *powhiri* (welcoming ceremonies) at the public entrance to the release area. With one exception kiwi were placed into specially prepared pre-release burrows (in 2006 a single female was released directly into the territory of a single male). Members of established pairs were placed in adjacent burrows, and attempts were made to artificially pair some individuals in this manner. Different pairs were spaced 600 - 800 m apart within the release area. The spacing was considered to be approximately similar to territorial spacing in the source area. Burrow entrances were blocked to contain kiwi during the remainder of the day on which they were transferred, and were unblocked at sunset allowing the kiwi to emerge at will.

**Post-release monitoring:** The dispersal and survival of each of the transferred kiwi was monitored by radio telemetry. The transmitters were programmed to detect and report mortality. Monitoring frequency was initially daily, but was later reduced to weekly when it was determined that dispersal was low. Each adult kiwi has been recaptured yearly in order to replace its transmitter and monitor its physical condition. None of the 16 released adult kiwi are known to have dispersed from the 5,000 hectare release area, although one adult kiwi is unaccounted for. Within the release area kiwi use forest at all altitudes, and in 2007 a chick hatched successfully at the tree line, 1,440 m above sea level. One of the transferred kiwi died 21 months after release as a result of misadventure (drowning during a flood event). Previously paired kiwi stayed together following the 2004 transfer, and these pairs dispersed shorter distances than artificially paired birds. Artificially paired birds did not form lasting pair bonds. The average weight of females introduced in 2004 declined by 3% in the first year after transfer, but the average weight of males increased by 8%. The average weight of females introduced in 2006 declined by 8% in the first year, but the average weight of males introduced in 2006 stayed the same. Breeding and incubation

activity was inferred from continuous series of observations of kiwi using a single daytime shelter. Five breeding attempts were detected in the first three years of monitoring, and three juvenile kiwi were found and radio-tagged. Stoat trapping in the RNRP Mainland Island is succeeding in protecting kiwi chicks from predation: all of the three juveniles have lived to exceed 1 kg. Kiwi exceeding this weight are unlikely to fall prey to stoats.

### Major difficulties faced

- Pre-transfer disease screening and quarantining was considered too difficult to undertake, as great spotted kiwi were known to be difficult to recapture soon after an initial capture, and quarantine facilities suitable for holding wild great spotted kiwi were unavailable.
- Damage was sustained to one kiwi bill inside a transfer box (2004 transfer).
- Failure to meet collection target (2006 transfer): the project was aiming for 10 kiwi to be collected from Kahurangi National Park during a collecting trip in 2006, but only seven were caught. This reflects the difficulties of catching wild great spotted kiwi, rather than the population status in Kahurangi National Park.

### Major lessons learned

- Groups of 7 - 9 adult great spotted kiwi can be successfully transferred from the wild into large unfenced areas of similar habitat, and there is a low risk of dispersal. Established pairs are likely to remain intact. Selecting established pairs may reduce the level of dispersal.
- Methods for transporting kiwi need to take particular care of the long bill. Elevated creatinine kinase (CK) levels may result from restraining legs during handling and transport in the field.
- Great spotted kiwi chicks can reach the “safe weight” threshold of 1 kg under a predator control regime that controls stoats to below 5% tracking tunnel monitoring. Great spotted kiwi chicks may live with their parents for a year or more, and parents may not attempt to nest during this time.

### Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

### Reasons for success/failure:

- None of the released kiwi are known to have dispersed from the release site.
- Survival and health of transferred kiwi has been good: there has been only one known death, attributable to misadventure rather than poor health or predation.
- Transferred kiwi bred successfully in the release area, and all known chicks have survived the stage of vulnerability to predation by stoats.
- The injury of one kiwi during the first transfer prevented the translocation from being “highly successful”.