

Kōkako translocations – advice note on suitable source and release sites

Kōkako Recovery Group
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Purpose

The purpose of this document is to provide people considering kōkako translocations with the current thinking of the Kōkako Recovery Group (KRG) on the appropriateness of translocations to and from management sites. This advice is very much from a biological perspective, but we note that there are many other important perspectives involved in deciding whether a translocation should proceed. KRG advice is dynamic and will change in response to current data and observations, especially kōkako survey, alongside environmental characteristics of the proposed sites.

Context

The Kōkako Recovery Group (KRG) advises on the management of North Island kōkako from a national perspective. The KRG aims to restore kōkako within functional native ecosystems at mainland sites throughout their former range. The first priority of the group is to ensure that every relict kōkako population (natural populations as opposed to those established through translocation) is stable (for those populations at carrying capacity) or increasing through high-quality annual pest-control *in situ*. This is because relict populations hold most of the unique genetic variability that is absent from translocated populations and is irreplaceable. Therefore, translocations will always be secondary to protecting our precious relict populations.

Kōkako once formed a meta-population throughout much of the North Island, whereas today kōkako exist as isolated sub-populations. From a national perspective a goal of the KRG is to attempt to foster connectivity and genetic interchange where appropriate i.e. reconnecting the meta population. First and foremost, a potential source population for translocation should be able to sustain a harvest with no or minimal impact on that population. Second, the use of any particular source population needs to be balanced against avoiding overrepresentation of that population across the metapopulation, i.e. we want to avoid translocated populations representing a narrow subset of national kōkako genetic diversity. Therefore, translocations can also provide an opportunity for kōkako genetic diversity only found in one relict site to be protected through translocations to new sites. Ultimately, our aim is for every relict population of kōkako to be well managed *in situ* and represented at more than one managed site within the next 15 years.

Translocations can fulfil many objectives, including:

- Establishing a new population with an appropriate number of founders (demographically and genetically)
- Enhancing genetic diversity of an existing population via reinforcement translocations (adding more kōkako to a site)
- Enhancing genetic diversity via reciprocal translocations (where kōkako are exchanged between sites)

- Rescue translocations, where kōkako are moved from sites where they are unlikely to persist to more secure sites.
- Fulfilling cultural objectives and/or the return of genetic lineages to their past range.

Each objective has slightly different considerations, which are discussed below.

This document focuses on the biological aspects of kōkako translocations, though many other factors are critical when considering translocations, including early, meaningful and appropriate engagement with mana whenua at both the source and release site. Translocations require a Wildlife Act Authority issued by the Department of Conservation. Information on what is involved in obtaining a Wildlife Act Authority is available from the DOC website.

Establishing a new population

Typical criteria for the Source Population/s:

- The source population/s must not be negatively impacted by translocating birds. To ensure this KRG will consider criteria such as the following when giving advice or support to a translocation proposal:
 - Pest species are well managed, ideally annually, and there is clear indication that management will continue.
 - The population is large, ideally over 500 breeding adults, with effective pest management, **or**
 - In some circumstances harvesting from smaller populations might be supported to achieve demographic or genetic objectives, particularly if the population is at or approaching carrying capacity.
 - The source population is not over-represented at other sites.
 - The potential for natural dispersal to neighbouring areas.

Explanation:

- **Pest control:** Rapid growth at a source site requires annual, ongoing and effective control of rats, possums, and possibly stoats during the kōkako nesting season (approximately October to February).
- **Genetic diversity:** Maintaining genetic diversity is important for kōkako populations to adapt to long term changes (e.g. climate change impacts and/or novel pathogens). Populations need to grow quickly to a large size (over 500 adults) to maximise genetic diversity and minimise inbreeding.

Ideally, source sites have high genetic diversity, with a short historic bottleneck of ≥ 40 founders, or have been founded from multiple source sites themselves. If a single source population with high genetic diversity is not available, two or more source populations may be used to establish a new population as this will also increase genetic diversity in the new population.

- **Smaller populations:** These might be used in some circumstances only if the harvest will not affect the rapid growth rate, or if the population is nearing carrying capacity. When a population is at carrying capacity, there is limited space or resources for more birds. This can result in fewer offspring and/or high juvenile mortality as young birds cannot establish territories. Birds that are removed for translocation will probably be replaced by others looking to establish territories.
- **Genetic diversity at a national scale:** Ideally, all relict populations are represented in at least one translocated population. This minimises the risk of losing genetic diversity that might currently only be represented in a single population (e.g. through catastrophic fire).

How many birds can be translocated from a source site?

The number of birds translocated from a source population should minimise the impact on population size and growth rate. Therefore, the number translocated also depends on site management, population size, and growth rate.

Consequently, we do not specify a number of birds that can be harvested from any particular site on an annual basis because of natural annual variation in productivity and survival, and annual differences in management effort. These factors affect the number of kōkako available for translocation.

However, in practice it would be rare to harvest more than 5% of the adult population annually at a source site, dependent on the balance between population size (less from small populations, more from big populations) and growth rate (less from populations with slow growth rates, more from populations with high growth rates).

What is required to establish a new population?

The KRG has a set of minimum standards that prospective kōkako sites are required to meet. These standards are intended to ensure that, based on current science and knowledge, if translocations proceed, the chances of their long-term success are maximised.

As more knowledge and insights are gained through further translocations, and continued monitoring of previous translocations occurs, these standards may change to reflect advancements in our knowledge.

It is important to consider anticipated future changes to North Island climates. Areas which are likely to suffer increasing frequency of drought may not be suitable for kōkako in future.

1. *Aim for a minimum of 40 kōkako translocated initially*

To help ensure sufficient genetic variability and to avoid demographic problems translocations should aim to establish approximately 40 unrelated individual “founders”. Not all transferred kōkako will be “unrelated” and not all will survive, pair and breed so it will generally be necessary to monitor recruitment and plan for reinforcement translocations as necessary.

2. *Translocation tactics will vary depending on the release site. For example, in continuous forest, aim for 10 kōkako released on the first day and 20 in the first season. In contrast, island or isolated mainland sites could release smaller numbers for the first release, but should still aim for 20 in the first season.*

This is because previous translocations that have only had a few kōkako (1- 3) have often failed, presumably due to post-release dispersal or Allee effects (the social impacts of very few birds being present).

3. *Habitat is assessed using the habitat assessment tool*

High growth rate in newly established populations provides demographic stability and minimises loss of the genetic diversity that might contribute to long term population persistence. High growth rate is dependent on effective pest control and good quality habitat. Based on many years of research on kōkako productivity, behaviour, habitat use and diet, the KRG has developed a habitat assessment tool to assess the quality of new sites for kōkako.

This provides an objective measure to guide decision-making which will be updated as our knowledge increases. All translocation sites for kōkako require a habitat assessment, early in the feasibility stage of the approval process, to demonstrate that a suitably diverse forest canopy and understory contain plant species important to kōkako diet.

The assessment tool is a guide only. Managers at sites receiving kōkako still need to monitor the establishing population to confirm (through territory establishment, breeding and recruitment) that kōkako will prosper at this new location.

New populations should not be established at sites with poor quality habitat because survival, growth rates and persistence are likely to be low. These populations are less likely to persist in the long term, will not be suitable as future source sites, and have little benefit to the conservation of kōkako.

4. *The release site is required to contain sufficient contiguous high-quality habitat for at least 500 breeding adults.*

Currently we estimate this as 1500-2000 ha, but this will differ between sites.

5. *Annual pest control targets of*
 - a. *<1% RTC for possums and*
 - b. *<1% tracking tunnel index for rats at the start of the kōkako breeding season each year or maintain below 5% throughout the breeding season (September to March, site dependent)*

This should be demonstrated over at least 1000 ha for a minimum of two years prior to receiving kōkako. Stoats should also be controlled at new sites using DOC best practice techniques. Note that where rats and possums are controlled with appropriate toxic baits secondary kill of stoats might be sufficient.

Establishing kōkako populations must be monitored to determine how many individuals recruit into the breeding population within managed areas, and adjustments to the location of pest-control areas made if required. Similarly, monitoring of population expansion over time should guide expansion of the pest-control infrastructure.

6. *Release site managers must forward data to the KRG annually*

Details should include known dispersal of translocated birds outside managed areas, recruitment of birds and evidence of breeding. Communication with the KRG regarding a perceived need for reinforcement translocations should also occur. Most sites are likely to require a second (or more) translocation to achieve 40 breeding founders.

7. *Minimum monitoring standards*

The minimum standard for monitoring is an annual territorial kōkako census using existing best practice methods to count every territorial kōkako in the population, including the identity of each bird (band combination/unbanded), and monitoring the breeding success of at least five breeding pairs, until 25 adult territorial pairs are confirmed. After that, four-yearly censuses are required.

Reinforcement translocations aimed at enhancing population establishment may be recommended if the initial transfer demonstrates success. Assessment will be informed by the proportion of initially translocated kōkako known to recruit within the managed area, adult mortality and juvenile recruitment. Reinforcement translocations will not work if pest management is insufficient and/or the birds don't thrive within the new habitat. Consultation with the KRG will be necessary to determine appropriate management responses in such cases.

Enhancing genetic diversity of an existing population via reinforcement translocations (adding more kōkako to a site)

“Top-up” translocations may be required to add genetic diversity to a site. This usually happens during the establishment of a translocated population but has also been used to enhance genetic diversity (and numbers) at relict sites e.g. Hunua and Manawahe.

What makes a suitable source site?

The same criteria apply as for “Establishing a new population” above.

What determines a suitable site for a reinforcement translocation?

- A site that has less than 40 founders but has pest management and habitat quality that is demonstrably sufficient to support population establishment and growth. This requires confidence in ongoing management and meeting pest control targets as stated above.

Re-connecting natural populations to allow gene-flow via reciprocal translocations.

Small numbers of kōkako could be ‘swapped’ between sites to allow some gene-flow to resume between currently isolated sites. In practice, reciprocal translocations will mostly be between nearby sites. However, in some cases, with supporting evidence, other sites may be considered.

What makes sites suitable for reciprocal translocations?

- At least one population has been through a recent population bottleneck, or has been small for an extended period of time.
- Sites that have pest management and habitat quality that are currently supporting population growth. There must be confidence in ongoing management and meeting pest control targets as stated above.
- Both sites are NOT at carrying capacity, because otherwise new birds would have difficulty establishing territories.

Recently translocated birds and their offspring are unlikely to be well represented genetically at a site so should not be moved to another site.

Rescue translocations

What makes a suitable source site for a rescue translocation

Rescue translocations, where kōkako are moved to a safer site, can be considered when there is little confidence in the persistence of kōkako at the site. The aim of these translocations is to allow the rescued kōkako an increased likelihood of breeding within the national population, incorporating any genetic diversity that might not be represented elsewhere.

What makes a suitable receiving site for a rescue translocation

The receiving site should be a site which offers the best chance of survival and breeding of the rescued kōkako, i.e. as stated above for other translocations.

Balancing the demand for kōkako

Often there is a greater demand for kōkako than there are kōkako available for translocation. In this case the KRG will recommend priorities for translocation based on:

- whether it is a new or reinforcement translocation (existing translocations should be completed before establishing new translocated populations).
- the growth rate of the translocated population.
- the size and habitat quality at the new release site.
- the risk of the loss of a relict site or significant national range contraction, e.g. it is currently a priority for the KRG to translocate kōkako to or from Northland in an attempt to prevent relict kōkako from becoming extinct from the entire region.
- national “metapopulation” management requirements and priorities.

Translocation from wild into captivity

The KRG doesn't currently consider there is any need for kōkako to be held in captivity, and would therefore oppose any such application. It is also against DOC policy.

Translocation outside the historic range of NI kōkako

Support from the KRG for translocation outside their known historic range will only be provided under exceptional circumstances.