Save Our Iconic Kiwi – Fiordland
2023-24 Annual Report

Written June 2024 by 9(2)(g)(ii)

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Context

A sample population of southern Fiordland tokoeka is being monitored at Shy Lake, between Wet Jacket Arm and Breaksea Sound in western Fiordland. The goal is to determine if aerial 1080 alone can control stoats to a level where tokoeka populations can average a significant population growth over the control cycle period; and what the timing of that period should be. This will then be used to inform expanded pest control to increase Fiordland tokoeka populations in other areas. Basic behavioural and biological information is also being collected for the first time for the southern Fiordland tokoeka taxon. This report focuses on the work at Shy Lake and gives a brief outline of other SOIK work in Fiordland in the 2023-24 financial year. For more context on Save Our Iconic Kiwi and the rationale for the work in Fiordland, For further information on anything in this report, contact 9(2)(g)(ii) at the DOC Te Anau office.

This was the seventh season of recruitment monitoring at Shy Lake. The first 1080 operation took place in June 2020 and while Stoats were still present in much lower densities in the following 3 years the Shy Lake Tokoeka population was estimated to have increased by around 2%. The second operation took place in May 2023, no Stoats were detected at the site until February 2024, and no chicks were found to be predated through the season, (Four chicks were still under 1000 gm by the end of June and will continue to be monitored for the winter period, going on into the 24/25 season.

Nesting 2023-24 season

Adult males were fitted with transmitters carrying Wildtech Ltd's Chick Timer Haast v4.4 software. One Female was monitored and carried Wildtech's GSK Diagnostic v2.0 software. Four transmitters bought in December 2023 had an unknown technical fault (80PPM without any change of state code) this made estimating hatching date very difficult, relying on regularly checking nest cameras and very approximate lay dates for signs of a hatched chick. Additionally, one male (Commando) spent most of the season on incubation code, this is typical behaviour for this bird, who has not been noted to use any other roost but his nest burrow for over two years. This season there was no evidence to suggest a breeding attempt

See Appendix 1 for a map of the study area and this season's nests.

First clutch eggs were laid between approx. 21 July and 13 October. The earliest eggs were a week later than last year, spring was long and generally cold, with snow at shy lake for every trip until well into November. Second clutch eggs were laid between 13 November and 15 December. 70 days was used as the estimated incubation period, with predicted first emergence of the chick from the nest a further 5 days later.

All nests were monitored with trail cameras, starting approx. 40 days from lay date and continuing until the nest was resolved. Cameras were checked approximately fortnightly. 6 Powerex Pro rechargeable AA batteries and a 16 GB SD card were used and replaced at each visit. This proved adequate. Footage taken was a 20s video, taken repeatedly if the passive infra-red sensor camera continued to be triggered. The rest time between videos was 1 s but it is likely that some comings and goings of chicks and maybe predators were missed by the camera. It is a recognised issue that all passive infrared cameras will miss some things. Cameras are all the same brand (Browning Dark OPS PRO XD) to try to ensure consistency.

Transmitters only on adults males, combined with the size of the bird and bill, usually made it easy to tell which kiwi of the pair was seen on camera. There was no evidence of a third bird helping at any of the nests, although it's worth noting that one family (Flame, Flicker and first and second clutch offsring from this season were often found in the same burrow, including during incubation. Daytime incubation was done by the male, the female would usually changeover at approx. 20:00-21:00 until 00:00 – 01:00 each night.

Table 1 summarises nests, chicks and trailcam footage of predators. Following the second 1080 operation in May 2023 There were no Stoat detections throughout the season, (22/23 saw a 53% detection rate). No Possums were seen. Weka visited 50% of cameras. Kea visits dropped from 27% to 17%. It's also worth noting that Rifleman (58%) Robin (25%) and Tomtit (67%) sightings have risen steeply since the first 1080 drop on 2020, prior to that sightings were at Rifleman (17%), Robin (0%) and Tomtit (11%). This was the first season S.I. Robin have been seen at nest cameras and were regularly seen around the site.

Hatching success was at 73% slightly up from 70% last year, a long winter, with snow on the ground well into November was a possible cause to hatching success not rising back to 80+% as it had been after the first 1080 drop.

For the first time since monitoring began no Stoats were seen on nest camera footage and to the date of writing no chicks were predated by Stoats.

Table 1: Summary of 2023/24 southern Fiordland tokoeka breeding season at Shy Lake

Category	Number	Comments
Males with tx	10/11	Four transmitters had a technical fault, (80PPM no Code) one of these stopped working completely before nesting began.
Females with tx	1	One who's mate was not on transmitter
Pairs monitored	12	10 Monitored Males, 1 non-transmittered male found using old nest, 1 Male and Juv found by dog team towards end of season
1st clutch nests inferred from tx activity / found	10	One pair had two eggs one month apart, (Has been classed as two nesting attempts)
2nd clutch nests inferred from tx activity / found	5	One pair renested while first chick was still alive and sharing nest site. Not all birds failing early re-nested.
Nests (with more than 1 week's trailcam footage) visited by stoats	0/12	1080 drop in June 2023. Last season (53 %) of nests were visited by stoats
Nests visited by possums	0/12	1080 drop in June 2023.
Nests visited by kea (with more than 1 week's trailcam footage)	2/12	The proportion of nests visited by kea dropped to 17% from 27% in 22/23; One visit was of a banded adult male predating a chick. The bird had been banded in 2019 and had not been sighted since
Nests visited by weka	6/12	One nest was very regularly visited (41 times by two individuals), Adult Kiwi was recorded chasing Weka out of burrow on many occasions)
Egg hatched	11/15	Hatching success rates of 73.3 were up slightly from 22/23 (70.6%).
Chick disappeared, fate unknown	1/11	One pair laid within a month of first egg, a faulty transmitter left us unprepared, and the chick left the nest before we could fit a tx.
Chick dead, stoat predation confirmed	0/10*	As of date of publish 4 chicks were still below 'Stoat proof' weight of 1000gm (ranging from 550gm – 700gm. These will continue to be monitored
Chick dead, kea predation	1/10	One Kea seen on nest camera predating a four day old Kiwi chick
Chicks surviving	7/10*	Three 1st clutch chicks have survived to 8 months, well over 1000gm in weight, while four 2nd clutch chicks are four months old and weigh between 550gm and 700gm. These will continue to be monitored

Comparing Fiordland tokoeka taxa

The breeding biology of southern Fiordland tokoeka remained unknown prior to this study.

There is no history of family groups or more than 2 adults at nests, as is seen on Rakiura; but this may well be an artefact of poor recruitment rather than innate biology. This season did see one pair and first clutch chick stay in a new nesting burrow while incubating the 2nd clutch egg. Both chicks were alive at time of writing, with eldest chick still found with adults in a different burrow at seven months old

Table 2 compares breeding statistics between southern and northern Fiordland tokoeka. Shy Lake figures include both pre and post 1080 treatment. Indications are that the southern Fiordland tokoeka at Shy Lake nest more often and produce more eggs than their northern counterparts in the Murchison Mountains and Clinton, but chick survival is lower. This increased egg production is probably directly linked to increased predation of chicks making a second nesting attempt in the season more likely.

Table 3 compares breeding statistics of each season at Shy Lake

Table 2: Breeding statistics of Fiordland tokoeka taxa

	Shy Lake southern FT 2017-24	Murchison Mntns northern FT 2003-2009 seasons	Clinton Valley northern FT 2001-2005
Males monitored	21 different males	45 different males	21 different males
Nests Monitored	120: 85 first clutch, 35 second clutch	105	41: 30 first clutch, 11 second clutch
Proportion of males recorded nesting	18/21= 86%	34/45 = 76 % nested at some point during project	14/21 = 67 % nested at some point during project, but some only monitored for one season. 47-78 % depending on season.
Eggs per male per year	1.17	0.82	0.79
Hatching success	68.60%	47 %	78 %
Chicks survival (first 183 days)	10 %	37 % in trapped area 17% in untrapped area	16 %
Chicks predated by stoats (known and suspected)	65%	78%	69%

Table 3: Breeding statistics of Southern Fiordland tokoeka

	Shy Lake southern FT 2023/24 season	Shy Lake southern FT 2022/23 season	Shy Lake southern FT 2021/22 season	Shy Lake southern FT 2020/21 season	Shy Lake southern FT 2019/20 season	Shy Lake southern FT 2018/19 season	Shy Lake southern FT 2017/18 season
Males monitored	13 Males	13 Males	16 Males	16 Males	17 Males	16 Males	13 Males
Nests Monitored	15: 10 first clutch, 5 second clutch	17: 11 first clutch, 6 second clutch	15: 10 first clutch, 5 second clutch	14: 11 first clutch, 3 second clutch	22: 15 first clutch, 7 second clutch	21: 15 first clutch, 6 second clutch	16: 13 first clutch, 3 second clutch
Proportion of males recorded nesting	10/13=77%	12/13=92%	10/15=66.7%	13/17=76%	14/17=82%	14 or 15/16=88 or 94%	13/13=100%
Eggs per male per year	1	1.3	1	0.94	1.29	1.38	1.3
Infertile or very early embryo deaths	2/15=13%	Unknown	2/15=13%	Unknown	Unknown	1/14 Known=7%	1/13 Known= 8%
Hatching success	11/15=73%	12/15=70.6%	12/15=80%	12/14=86%	10/22=45%	14/22=64%	10/15=67%
Chicks survival (first 183 days)	3* (+4 chicks still alive at 4 months)	0	3	2	0	0	0
Chicks predated by stoats (known and suspected)	0%* (4 chicks still under 6 months, will continue to be monitored	76.90%	58.30%	58%	80%	86%	100%

NB. Two nests in 2017-18, 1 in 2018-19, 2 in 2020-21 and 1 in 2022-23 have been excluded from some of the percentage calculations, where there's reason to believe that human disturbance or influence may have adversely affected the outcome.

Pest & phenology monitoring

Three sets of 5 lines of tracking tunnels were run at Shy Lake. Together with a set at Mt Forster and a set at Henry Burn, both between Wet Jacket Arm and Dusky Sound. A further set of 4 lines was run this year at Beach Harbour, which were added as part of a wider spread of monitoring as opposed to specifically for the Wet Jacket Peninsulas kiwi study. These were considered representative of the Wet Jacket Peninsulas pest control block. All lines were run overnight for rodents, and 21 nights for mustelids and rodents, in August, November, February and May, except for beach Harbour which is run overnight for rodents in November, February and May, and 21 night mustelid survey in February only.

The trailcam network originally set up in collaboration with Manaaki Whenua Landcare Research continued throughout this year, with surveys run according to DOC-5990928 in conjunction with the tracking tunnel surveys. See Appendix 2 for a map of the camera network. The trailcam system appears to have fulfilled its promise to be a more sensitive tool than tracking tunnels in detecting stoats at low numbers.

Pest control

The second Wet Jacket Peninsulas SOIK aerial 1080 operation took place over approx. 40 000 ha in mid June 2023.

For further detail on the operation, see the Wet Jacket 1080 Operation Homepage DOC-7028991 and the Wet Jacket Operational Plan DOC-7205093.

Territory mapping

No territory mapping took place this season. Clinton Valley may go ahead next season

Finance

The budget for the Shy Lake study for 2023/24 financial year was $185'000 including salaries and wages. We finished the year on budget.

Staffing

9(2)(g)(ii) and 9(2)(g)(ii) remained as the core members of the SOIK Shy Lake project. 9(2)(g)(ii) joined the team between mid October and Christmas, on a Watson Foundation Fellowship from Sewanee University, Tennessee. Salaried staff from the SSI region were used for field support throughout the year.

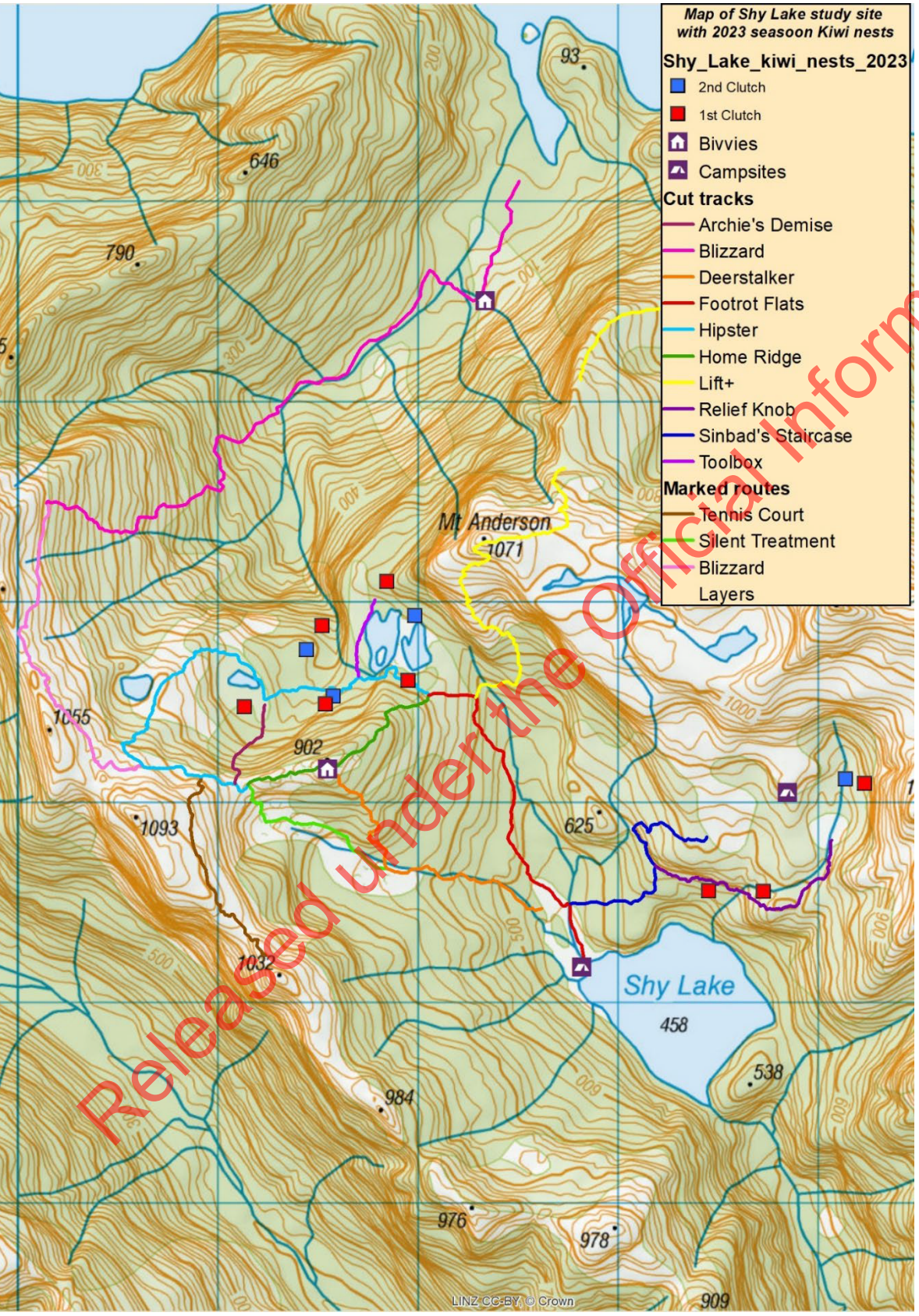
9(2)(g)(ii) and 9(2)(g)(ii) continued in their respective roles of combined predator control lead and SOIK operations planner. 9(2)(g)(ii) remained as supervisor for 9(2)(g)(ii) and with 9(2)(g)(ii) becoming Principal Ranger, 9(2)(g)(ii) replaced her as supervisor for 9(2)(g)(ii) left the Bio team and was not replaced as Senior Ranger.

Engagement & advocacy

The Kiwi Diaries series, first released in June 2023 was shortlisted for NZ Web awards 2024. Content from the series was shown 4.4 million times (including all episodes, ads, social media content about the series).

A DOC press release in January 2024, on the Southern Fiordland Tokoeka population increase since the first 1080 drop in June 2020, proved popular and was taken up by eleven media outlets, including Newshub and RNZ news.

Appendix 1: Map of Shy Lake study site with 2023 season kiwi nests



Appendix 2: Map of mustelid trailcam monitoring network

Black dots = tracking tunnel Turquoise hexagons = mustelid cameras coloured lines = track