



HIHI CONSERVATION



2023



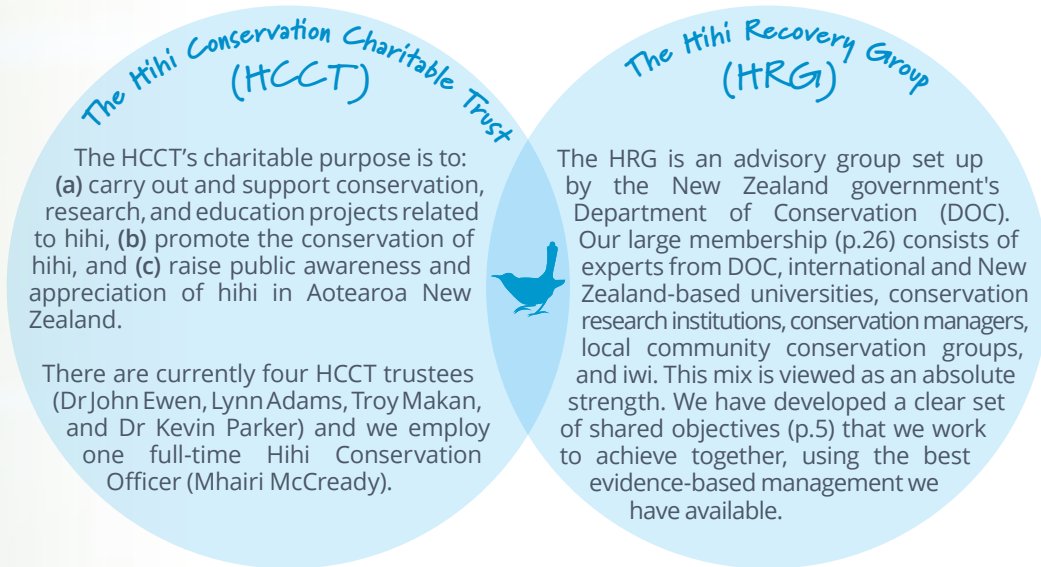
www.hihiconservation.com



HIHI RECOVERY

Who's Who

We are a bunch of people that are passionate about hihi and tasked with guiding their recovery. To do this most effectively, we are structured around two groupings:



The relationship between the HCCT and HRG?



Both groups are centered around a shared mission: hihi recovery. HCCT's mission is designed to fully support the national management objectives outlined by the Hihi Recovery Group. As a registered charity, the HCCT can seek funds to help achieve these goals.



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TIRITIRI MATANGI



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THE HIHI



He manu ririki te Hīhī (*Notiomystis cincta*) e noho kau ana i ngā ngahere o Niu Tīreni. I tēnei wā tonu, ka whakarōputia te manu Hīhī he manu mate haere ki tō te rautaki 'Threat of Extinction' o Te Papa Atawhai.

The hihi (*Notiomystis cincta*) is a small (30 – 40g) forest-dwelling passerine endemic to New Zealand. At present, the species is classified as nationally vulnerable by the Department of Conservation's 'Threat of Extinction' system.

I mua i te taenga mai o tauwi mā, ka rere whānuitia te Hīhī ki Te Ika a Māui whānui me ōna moutere. Heoi, i te paunga o te rautau tekau mā iwa, ka noho motuhake aua manu rā ki Te Hauturu-o-Toi. Nō te taenga mai o ngā kararehe tauhou, o te mate manu, me te muru kohanga, ka mate haere te Hīhī.

Pre-European times, the species was distributed throughout the North Island and its offshore islands. However, by the end of the 19th century the only population that remained was that on Te Hauturu-o-Toi. The disappearance of the hihi was most likely due to introduced predators, habitat loss and disease.



Mai rā anō ko te Hīhī he manu kaikai miere (te whānau manu o 'Meliphagidae'), he whanaunga pātata ki te komako me te tui. Ahako tonu, he tūhuratanga anō tā te aronui 'Phylogenetic', he manu motuhake te Hīhī, ā, he tātai anō tōna ki tōna ake whānau, arā ko te 'Notiomystidae'.

The hihi was long considered to be a honeyeater (family Meliphagidae) closely related to korimako and tūi. Phylogenetic analysis, however, has revealed that it is taxonomically distinct from this lineage and has been subsequently placed as the sole member of its own family, the Notiomystidae.

He rerekētanga motuhake tōna, arā, ka mahi ai te Hīhī kanohi ki te kanohi. He rerehua te tame o tēnei tū manu, he pango, he kowhai tea, he mā ōna tae. Kāore i te pērā te uha o tēnei manu, ka mau i a ia te kākāhu parauri, me ōna neko mā kei ōna parirau.

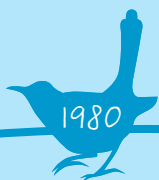
The species is also behaviourally unique as the only bird known to copulate face-to-face. The males are one of New Zealand's most strikingly-coloured birds with black, bright yellow, and white plumage. Females are a less conspicuous brown but also have white wing bars.

A Brief History of Hihi Conservation

1890s - present



Habitat loss, disease, and introduced predators drive hihi to extinction across New Zealand, except for one remnant population on Te Hauturu-o-Toi.



A group of hihi from Te Hauturu-o-Toi are released to Taranga (Hen Island) in the first ever hihi translocation. The population sadly fails but inspires the beginning of an important conservation strategy for the species.

Hihi are successfully reintroduced to several sites over the following years:

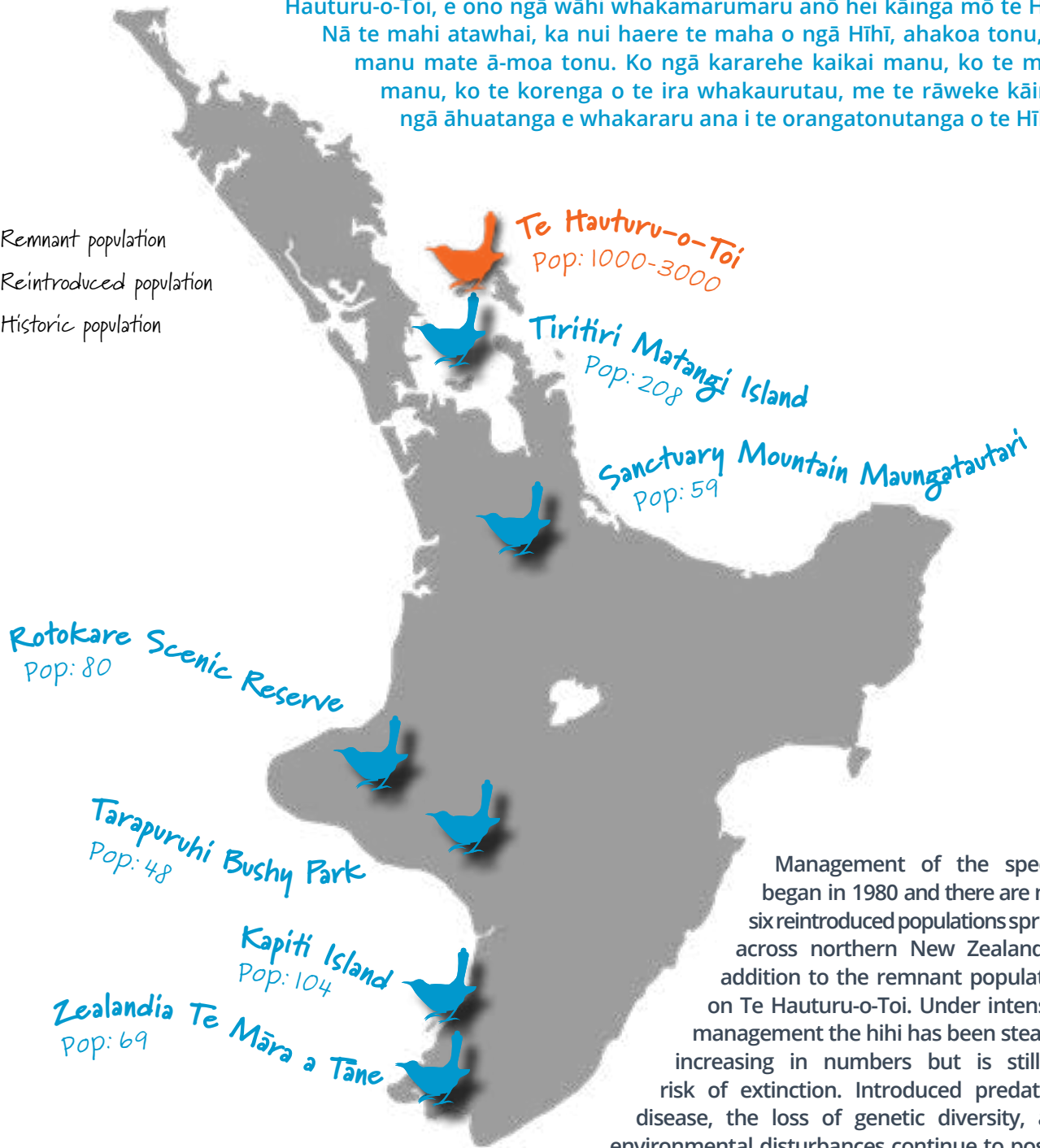


Once established, the Tiritiri Matangi Island population becomes the main source of birds for translocations.

CURRENT POPULATIONS

I te tau 1980, ka timata te mahi atawhai mō te Hīhī, nā wai nā wai, atu i Te Hauturu-o-Toi, e ono ngā wāhi whakamarumarū anō hei kāinga mō te Hīhī. Nā te mahi atawhai, ka nui haere te maha o ngā Hīhī, ahakoa tonu, he manu mate ā-moa tonu. Ko ngā kararehe kaikai manu, ko te mate manu, ko te korenga o te ira whakaurutau, me te rāweke kāinga ngā āhuatanga e whakararu ana i te orangatonutanga o te Hīhī.

- Remnant population
- Reintroduced population
- Historic population



Management of the species began in 1980 and there are now six reintroduced populations spread across northern New Zealand in addition to the remnant population on Te Hauturu-o-Toi. Under intensive management the hīhī has been steadily increasing in numbers but is still at risk of extinction. Introduced predators, disease, the loss of genetic diversity, and environmental disturbances continue to pose a risk to the long-term viability of the species.



The latest translocation (to Shakespeare Open Sanctuary) sadly fails due to a stoat incursion.

The total number of hīhī in reintroduced populations exceeds 500 for the fifth straight year.

OBJECTIVES *of the Hihi Recovery Group*



Increase the total number of hihi nationwide

We aim to increase the number of hihi populations across New Zealand and the total number of hihi in them.



Increase the natural ecological setting of the hihi

Nest boxes and sugar water are provided to help hihi survive and reproduce, but we want more natural sites without the need for these.



Reduce the cost of managing hihi populations

Managing hihi bears many financial costs, including the provision of nest boxes and sugar water, which we want to minimise. The hard work of volunteers also helps offset costs.










Increase awareness and appreciation of hihi

We wish to raise awareness and appreciation of hihi, locally and internationally, by increasing volunteer and visitor engagement.



2023 National Statistics (vs. 2022)

Reintroduced sites only

-  6 reintroduced populations (=)
-  568 adults (↓10%)
-  270+ fledglings* (↑12%)
-  47% of females using nest boxes (↑9%)
-  13,623 litres of sugar water consumed (↓6%)
-  9,176 volunteer hours (↑45%)
-  210,986 site visitors (↑23%)









METRICS

To track progress relative to the Hihi Recovery Group's objectives, we present the following metrics for 2023, summarised across our six reintroduced populations above (with % change since 2022) and site-by-site throughout the rest of this report.

The estimated number of adults in the population at the start of the last breeding season, derived from an integrated population model

At a Glance

 adults in population	 fledglings produced	 nest box use
 sugar water consumed	 volunteer hours	 visitors to the site

The number of chicks fledged from monitored nest boxes in the most recent breeding season
*Available only for the 4 sites where hihi use nest boxes

The number of females that nested in nest boxes during the past breeding season (from monitoring data) as a % of the estimated number of females in the population (from an integrated population model)

The amount of sugar water (in litres) consumed at feeders in the past year

Monitored by each site

And just for fun...

Hihi of the Year

A hihi nominated by site managers as deserving special recognition for a remarkable achievement, notable behaviour, etc.

HIHI NEWS



Hihi Recovery Group Visits Ipipiri Bay of Islands

An exciting step in any reintroduction programme is scouting potential sites for future releases. During their annual meeting in August 2022, the Hihi Recovery Group assessed the biological suitability of potential release sites for hihi in Ipipiri Bay of Islands in response to a request by Project Island Song partners Guardians of the Bay of Islands, Ngāti Kuta, and Patukeha ki Te Rawhiti. During their visit, the HRG was generously hosted on the Te Rawhiti Marae and had the opportunity to visit three of the seven pest-free islands within the Project Island Song wildlife sanctuary.

The HRG's observations from the visit will help them complete a more formal assessment of the biological suitability of these sites for hihi, which in turn will support other discussions that are required prior to any translocation. By chance, their visit also coincided with one of Project Island Song's 'Floating Classrooms' so they were able to discuss hihi conservation with an enthusiastic group of local students. Overall, the HRG left inspired by the restoration work being done in Ipipiri Bay of Islands and encouraged to continue evaluating these sites as a potential next destination for hihi.

Funding Success Bolsters Hihi Monitoring & Management

The future of hihi monitoring and management is looking brighter, thanks to three grants that were recently awarded to the Hihi Conservation Charitable Trust.

A generous award of \$130,000 from the New Zealand government's Community Matters Lottery Environment and Heritage Fund will enable the Trust to continue employing a full-time Hihi Conservation Officer for another year, which has proven essential for coordinating hihi recovery efforts nationally. Another highlight of this award is that it will directly support mātauranga Māori through the development of a comprehensive tikanga programme and joint strategy for hihi translocations going forward.

The ongoing Radio Frequency Identification (RFID) project – a high-tech upgrade to hihi monitoring that enables birds to be tracked remotely – also got a major boost from the Pacific Development and Conservation Trust (\$22,400) and Auckland Zoo Conservation Fund Small Grant Programme (a partnership with Barfoot & Thompson; \$4,320). These funds will enable HCCT to install RFID readers at more hihi sites and train volunteers to maintain them. We look forward to seeing what new insights this technology brings for hihi conservation!



Solving a Hihi Mystery through Decision Science

Every population is valuable to hihi recovery, and Zealandia Te Māra a Tāne (p.15) is no exception. The site is home to our southernmost hihi population and, historically, one of our largest, with a peak of 155 adults in 2017. Located in central Wellington, it is also an outstanding place for public outreach; Zealandia receives more visitors than all other hihi sites combined. So when the Zealandia team began to observe a decline in their hihi population, they sprang into action.



The Hihi Recovery Group enlisted help from researchers Dr. Sarah Converse (US Geological Survey/U. Washington), Hannah Sipe (PhD student, U. Washington) and Dr. Stefano Canessa (U. Bern), and the Zealandia team began to brainstorm a range of possible reasons why the population could be struggling: from birds dispersing beyond the safety of the pest-proof fence to weather patterns disrupting egg laying.

Then, using a decision analysis tool called Constructed Value of Information (CVol), the researchers asked a group of 12 hihi experts to weigh in on the proposed hypotheses. This process is still underway, with experts rating each hypothesis on a number of factors, including how much it is likely to be impacting hihi survival and breeding, their uncertainty about this impact, and how effectively site managers could intervene to improve outcomes.



Importantly, CVol is not used to determine which hypothesis is correct. Rather, the goal is to guide further research by identifying which hypotheses would be most valuable to investigate. Generally, these will be those that we are currently uncertain about but that we believe have a large impact on the population and a high chance of improvement through management.



The CVol process underscores the HRG's expertise in decision science as one of its core strengths. But equally, it is the site staff and volunteers working day-to-day to track population trends that make this science possible and will be there to drive forward management actions. The CVol process is happening alongside Zealandia's conversations with other experts including mātauranga experts, researchers, and wildlife veterinarians. With the Zealandia team on the case, there is hope that the cause behind the current decline can be identified and a best path forward determined for this population.



RESEARCH HIGHLIGHTS

A key strength of the Hihi Recovery Group is the research partners which are part of it. Hihi populations provide a world-renowned study system in small population recovery and reintroduction biology. Each year, researchers produce high-quality science examining hihi behavioural ecology, genetics, conservation, and more. Many of these studies directly inform hihi management and also go on to be published in peer-reviewed, specialist scientific journals. Below, we highlight a range of studies which have been published in the last year.

Alongside our long-term academic members, HRG is particularly proud to support a growing number of MSc and PhD students. We see this as a winning formula – growing both the number of hihi we have and the number of future conservation leaders for the world! This year, we congratulate three students who completed their PhDs: Dr Laura Duntsch (U. of Auckland – hihi genomics), Dr Fay Morland (U. of Sheffield/Zoological Society of London – causes of reproductive failure in hihi), and Dr Ashleigh Marshall (University College London/ZSL – avian egg hatching failure).

Variation in shape and consistency of selection between populations of the threatened hihi (*Notiomystis cincta*)

A key principle of natural selection is that animals that are well-suited to their environment are more likely to survive and breed, leading to local adaptation over time. But as climate change advances, environmental conditions are often in flux. Can populations of threatened species adapt quickly enough to avoid extinction?

Dr Alexis Rutschmann (former Postdoc, University of Auckland) and colleagues analysed data from hihi on Tiritiri Matangi Island and at Zealandia Te Māra a Tāne to determine whether different environmental conditions at each site favour different breeding patterns. Models suggested that hihi will be most successful if they start laying eggs earlier in the spring at Zealandia. On Tiritiri Matangi, the optimal lay date was found to be mid-spring – not too early and not too late.

There was also evidence that the optimum lay date can vary across years, particularly on Tiritiri Matangi. These findings suggest that natural selection may favour different breeding strategies across our hihi sites. The observed site differences highlight the need for management strategies that are tailored to the unique selective pressures faced by each hihi population. In other words, accounting for local conditions is necessary to mitigate the effects of climate change most effectively and ensure our hihi populations persist long into the future.

Reference: Rutschmann A., Santure A.W., Brekke P., Ewen J.G., Shanahan D., & P. de Villemereuil. 2022. *Journal of Evolutionary Biology* 35(10):1378-1386. <https://doi.org/10.1111/jeb.14088>

Early-life telomere length predicts life-history strategy and reproductive senescence in a threatened wild songbird

One of the great unanswered questions of biology is why animals experience biological aging, or 'senescence.' Many studies find that animals that develop in less favourable environments age faster and die younger. But do these individuals also have lower reproductive success?

Fay Morland (PhD student; U. of Sheffield & Zoological Society of London) and colleagues turned to the Tiritiri Matangi hihi population to find out. Using blood samples collected for standard population monitoring, they measured the lengths of DNA regions called 'telomeres' for 75 female hihi chicks hatched from 2005-2013. In many species, individuals that begin life with shorter telomeres have been found to age faster. However, the link between telomeres and reproduction is less clear.

In hihi, females with shorter telomeres as chicks exhibited steeper declines in reproduction later in life. However, telomere length did not predict overall lifetime reproductive success. This suggests females with shorter telomeres may have higher reproductive success early in life, compensating for their faster reproductive decline. This study provides compelling evidence that individuals may be able to overcome poor developmental conditions by pursuing alternative reproductive strategies, ultimately achieving equal success as their peers.

Reference: Morland F., Ewen J.G., Simons M.J.P., Brekke P., & N. Hemmings. 2023. *Molecular Ecology* 32(14):4031-4043. <https://doi.org/10.1111/mec.16981>



Parental breeding decisions and genetic quality predict social structure of independent offspring

For young animals, there are many benefits to having friends. Interactions with peers are often an individual's first experiences outside their family group, when they start learning about the wider world and setting themselves up for future success. But what predicts who an individual chooses to associate with?

Using long-term data from the Tiritiri Matangi population, Dr Vix Franks (Lecturer; University of Chester) and colleagues examined several factors that could determine early-life social bonds in young hihi. First, they found that young hihi form stronger bonds with other juveniles that fledged from neighbouring nests. Importantly, this held true regardless of the degree of genetic relatedness between individuals and even after juveniles dispersed from the nest site to other parts of the island. The study also found a more surprising result: juvenile hihi raised by more inbred males were more social than those raised by less inbred males.

Combined, these results highlight the lasting effects that rearing environment can have on an individual's sociality: when you're a hihi, where you grow up and who raises you can have long-term effects on the social bonds you form once independent.

Reference: Franks V., Thorogood R., & P. Brekke. 2023. *Molecular Ecology*. <https://doi.org/10.1111/mec.17066>



Hihi Researcher Awarded Prestigious Marsden Grant



Alongside the research outputs produced by hihi scientists each year, there are always many exciting projects that are still ongoing – and others just beginning. This year, we offer special congratulations to Dr Liz Parlato (Massey University) who was recently awarded a prestigious Marsden Fund grant from the Royal Society of New Zealand Te Apārangi. As Principal Investigator of the project, Liz has already begun working with Associate Investigators Dr Patricia Brekke (Zoological Society of London) and Professor Tammy Steeves (University of Canterbury) to dive deep into the genetic considerations of conservation translocations.



Specifically, this Marsden project will focus on the demographic and genetic benefits of reinforcement translocations, where new individuals are added to existing populations. The Tiritiri Matangi Island hihi population is a prime example: it was originally established in 1995-96 from two cohorts of birds from Te Hauturu-o-Toi but was later reinforced with an additional 20 birds. A major benefit of working with hihi is the wealth of knowledge that we have about our existing populations, thanks to long-term monitoring carried out by site staff, volunteers, and researchers. For Tiritiri Matangi alone, we have over 25 years of population monitoring data including a genetically-verified pedigree spanning 27 years, 7 generations, and 3,500 individual hihi. The hope is that this project will be able to directly inform future decision-making around genetic augmentation of hihi populations and provide a framework for similar considerations in other threatened species.

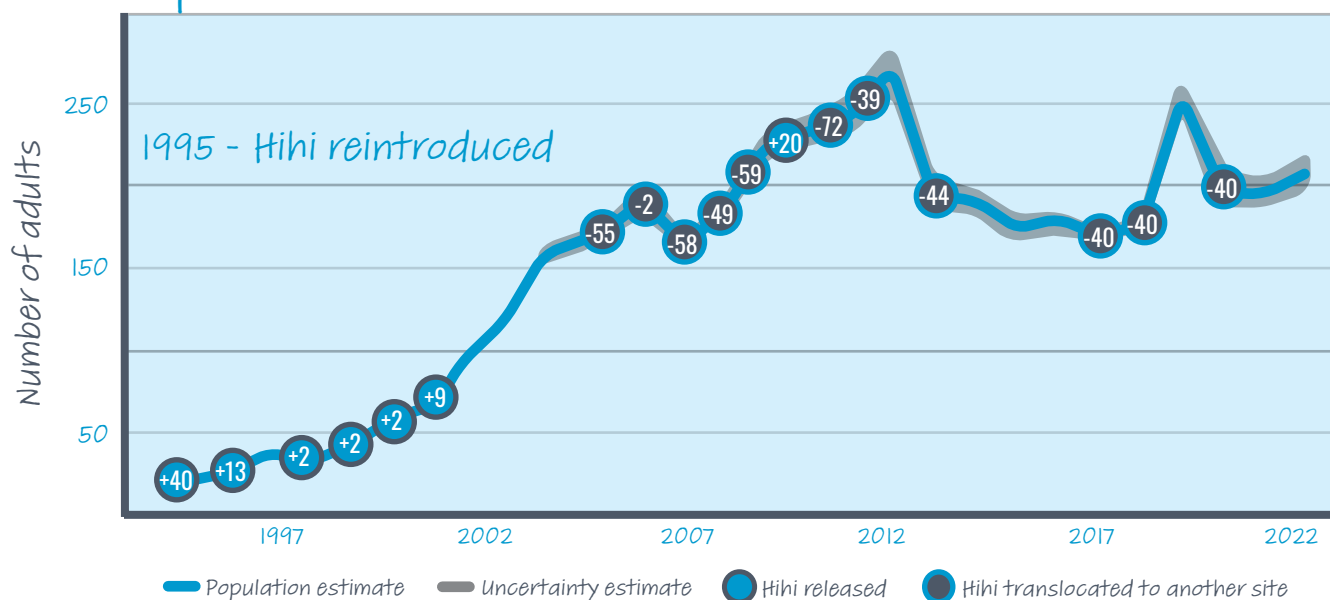
TIRITIRI MATANGI ISLAND

Background

Tiritiri Matangi Island is a wildlife sanctuary and one of New Zealand's most exciting conservation projects. The island was stripped of nearly all its native bush following human occupation. Thanks to dedicated restoration efforts, around 60% of the island is covered in native bush today. All mammalian predators have been eradicated, and the island is now home to native birds, reptiles, and invertebrates. The project is managed by the Department of Conservation in partnership with the Supporters of Tiritiri Matangi.

Tiritiri Matangi is frequently used as the source for hihi translocated to other sites and continues to be the focus of many research projects contributing to our knowledge of the species. Of the thousands of people who visit the island every year, over 4,600 are students. The Growing Minds programme, run by the Supporters of Tiritiri Matangi, funds 1,200 students from low decile schools who would not otherwise have the opportunity to visit the island.

Population Size



 208
adults in population

 193
fledglings produced

 80%
nest box use

At a Glance

 9,164 L
sugar water consumed

 1,616
volunteer hours

 15,315
visitors to the site

News

With strong winds, rain, storms, and cyclones, this year pitted the Tiritiri Matangi population against the elements. And in this battle, the birds came out victorious. After a disheartening dip to 167 fledglings last year (down from 200+ the previous three years), the population appears to be back on track. The hihi team banded 193 fledglings and spotted several unbanded juveniles from natural nests hopping around the island.

During a rare break between spring storms, almost all of the females got to work laying their first eggs in a two-week flurry of activity. This led to a banding marathon later in the season as 63 chicks reached banding age at the same time, sending the hihi team scrambling around the island to band them all in just 48 hours. Luckily this year's hihi team, led by Hihi Conservation Officer Mhairi McCready and returning contractor Emma Gray, was fortified by several veteran hihi volunteers (Christine Friis, Maree Johnston, & Deborah Smith) and two visiting early-career conservationists (Iván Alambiaga & Lex Marshall).



Tiritiri Matangi's inaugural **Hihi of the Year** is star female Light Green/Metal-Red/White, who not only produced the first nest for the fourth straight year but has also had the largest chick (52g) for two years running!

ROKOKARE SCENIC RESERVE

At a Glance



80
adults in population



33
fledglings produced



23%
nest box use



238 L
sugar water consumed



625
volunteer hours



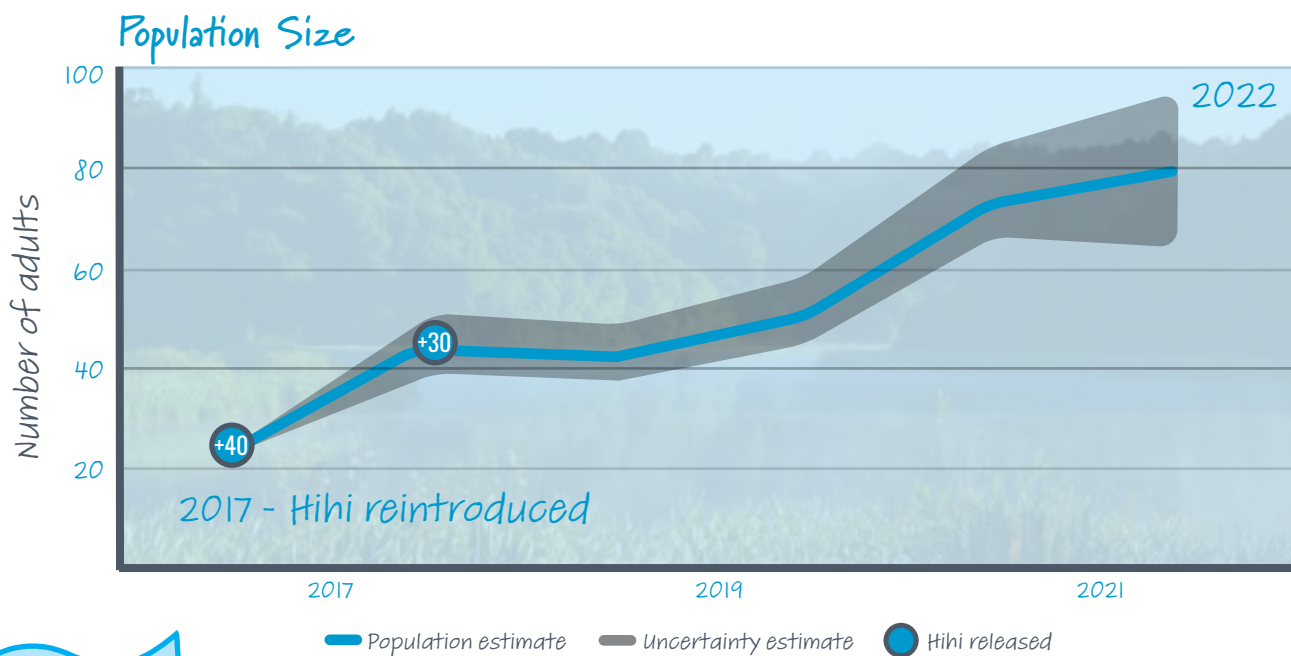
31,000
visitors to the site



Background

Rotokare Scenic Reserve is a stunning 230-ha hill-country catchment containing beautiful mature forest, wetlands, and a 17.8-ha natural lake, all protected by an 8.2-km pest exclusion fence. Hihi were reintroduced in 2017, ending a 130-year absence from the Taranaki region. Just 12 km from the township of Eltham, Rotokare is a popular recreation spot for boating, walking, and simply enjoying the beautiful scenery.

The Rotokare Scenic Reserve Trust was formed in 2004 out of concern for the declining state of the reserve. It is a community-owned, community-driven project and accommodates a wide variety of local interests including conservation and recreation. The Trust led construction of the pest exclusion fence and has continued to champion a range of conservation and recreation activities, including: high-level biodiversity restoration, total eradication of 12 introduced predator species within the fence, the establishment of a high-quality environmental education programme, revegetation of 12.5 ha of land gifted from neighbouring landowners, the establishment of on-site facilities (including a Site Manager's residence, workshop, and an education centre), and the reintroduction of native species that were previously rare or locally extinct.



News

Over its first six years, our youngest hihi population has grown and grown – and so far, it shows no signs of stopping. This year, an impressive 33 chicks were banded in nest boxes, and another 19 fledglings from natural nests were banded in March during a visit from Hihi Conservation Officer Mhairi McCready. Typically, the sanctuary team only becomes aware of natural nests when unbanded fledglings start appearing around the forest. This year, they were excited to locate a natural nest for the first time. Conservation Manager Fiona Gordon described her delight when, in the middle of a bird survey, she heard the distinct cheep of hihi chicks above. With a bit of creativity and contortion, she and her team managed to access the nest and band the three chicks inside.



Despite the success of the Rotokare hihi, the cyclones and wild weather of the past year have given the sanctuary team a few more grey hairs, causing slips in and around the reserve. None impacted the integrity of the fence, but some got a bit close for comfort. The team has taken proactive steps to ensure the fence remains secure and safe for hihi and the other native species that call the sanctuary home, no matter what the weather has in store.

While getting out in the forest to see the birds in action is one of the greatest rewards of conservation work, some of the most important tasks happen back in the office managing day-to-day sanctuary operations. Luckily, the Rotokare team didn't have to go far to get their hihi fix this year, thanks to an unbanded juvenile who has been a frequent visitor just outside the office. This young hihi is Rotokare's **Hihi of the Year** for brightening the days of the sanctuary team – and somehow managing to evade banding!



ZEALANDIA TE MĀRA A TĀNE

At a Glance



69

adults in population



34

fledglings produced



63%

nest box use



510 L

sugar water consumed



4,105

volunteer hours



123,000

visitors to the site

Background

Located just 10 minutes from downtown Wellington, Zealandia Te Māra a Tāne is the world's first fully fenced urban ecosanctuary, with an extraordinary 500-year vision to restore a Wellington valley's forest and freshwater ecosystems to their pre-human state as closely as possible.

The ecosanctuary is a groundbreaking conservation project that has reintroduced over 20 species of native wildlife back to the area, six of which were previously absent from mainland New Zealand for over 100 years. The 225-ha sanctuary valley is fully enclosed by an 8.6-km fence that excludes 14 types of mammalian predators and has seen huge success over the past 20 years thanks to dozens of community groups, hundreds of volunteers, thousands of members, and millions of dollars in donations and funding.



News

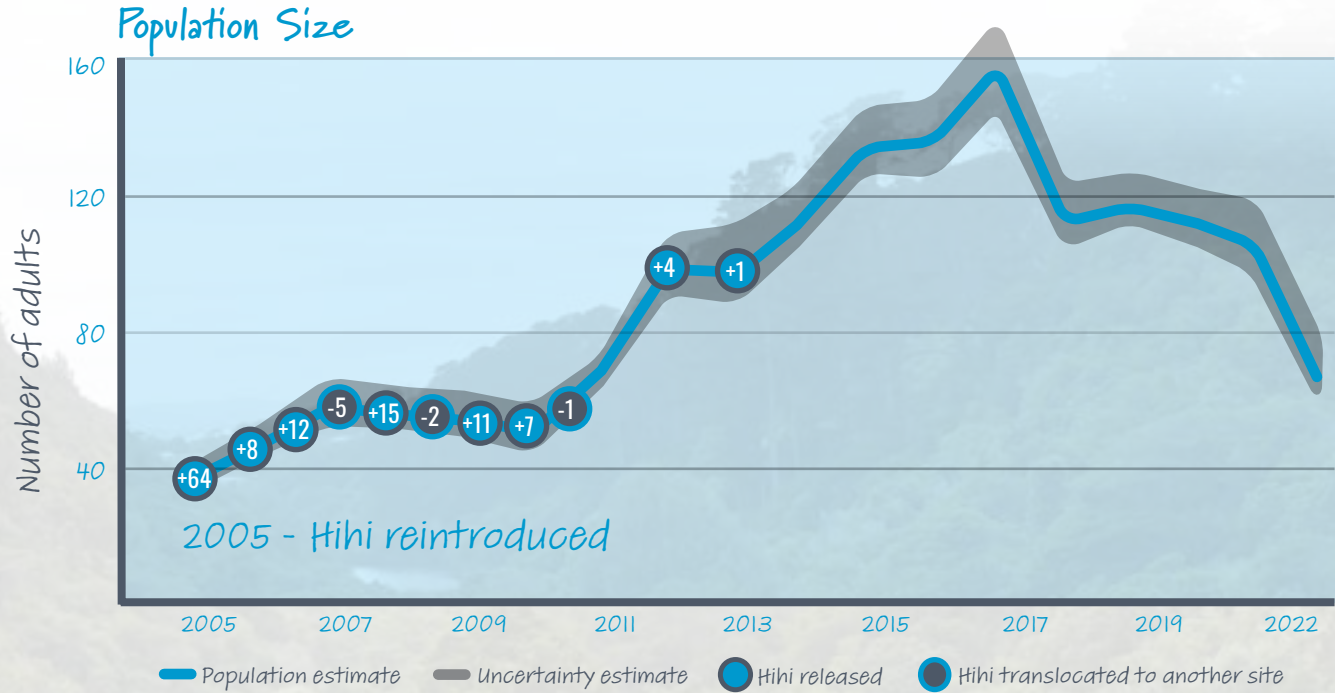
The last few years have been challenging for the hihi of Zealandia Te Māra a Tāne, with a steady decline in overall population size and record low fledgling numbers in the 2021-22 season. Sadly, very few of those fledglings survived the winter, and there was also a sizeable loss of females. Despite starting the breeding season with only 12 females, however, there were some glimmers of hope. Hatching success was high at 66%, and 34 chicks fledged (one more than last year). While not necessarily the dramatic comeback the Zealandia team was hoping for, it was nevertheless a decent showing for a population of this size.



The Zealandia Te Māra a Tāne team is actively strategising for how best to reverse the population's decline. An important step is determining the cause of the decline, which they are currently exploring with the help of expert decision scientists (p.8). In addition, the team is trialling changes to their daily management of the population, which they hope will boost breeding success. So far, they have begun insulating nest boxes to protect against cold snaps and switched to a new style of feeder to reduce wasp presence. While there are still many mysteries to solve, two things are clear: the fighting spirit of the hihi and the unwavering commitment of the people who care for them.



Despite the struggles of this season, one female (Red/Metal-Black/Black) proved herself to be a super-mum. She successfully laid three clutches and added eight fledglings to the population, earning her the title of *Hihi of the Year*!

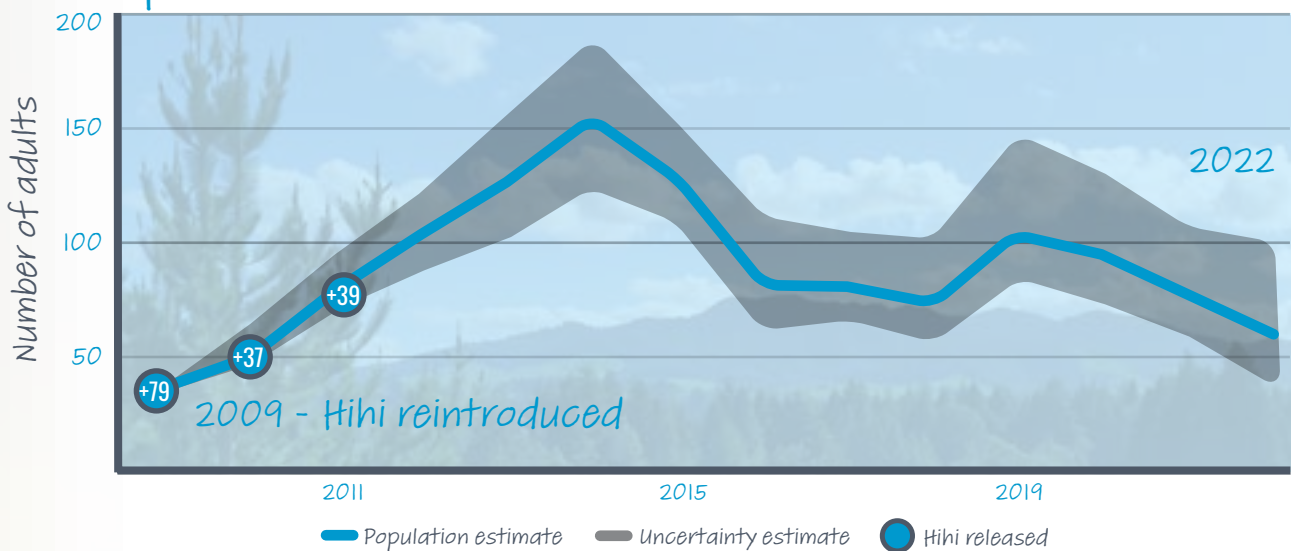


Background

Sanctuary Mountain Maungatautari is a mainland ecological island and New Zealand's largest fenced sanctuary. Located in the heart of the Waikato on the North Island, this beautiful mountain sanctuary contains nearly 3,400 ha of broadleaf podocarp forest and is surrounded by a 47-km pest exclusion fence, which was completed in 2006. All mammalian predators were eradicated from inside the fence by 2007, except for mice. Today, this pest-free environment is maintained by dedicated staff and volunteers, and hundreds of thousands of dollars annually.

The mountain's ancient forest offers a thriving ecosystem for populations of many of our most endangered species – including North Island kōkako, long-tailed bats, Hochstetter's frogs, forest geckos, tuatara, and giant wētā. Hihi are just one of 15 species that have been reintroduced to the site since the completion of the pest exclusion fence, with the latest being kākāpō in July 2023.

Population Size




News

In vast, rugged forests, hihi monitoring requires creativity, teamwork, and persistence. All three were on full display by the Sanctuary Mountain Maungatautari team this year. After several delays due to Covid restrictions, the team launched a new hihi survey in late 2022. Over 40 strenuous hours, volunteers located hihi in several areas across the sanctuary that would have been difficult to reach with a smaller team. This new initiative will support the annual survey carried out by Hihi Conservation Officer Mhairi McCreedy and help build a base of experienced volunteers to expand future survey efforts.


Supplementary feeding stations are also helpful places to take stock of population numbers, particularly as colour bands are challenging to read higher up in the dense canopy. The Maungatautari team visits feeders in Te Tū a Tāne (Southern Enclosure) regularly and uses camera traps at the more remote Over The Mountain feeders. These cameras helped identify Light Green/Orange-Light Green/Metal as the first hihi to find all three Over the Mountain feeders. For his adventurous spirit, he is recognised as this year's **Hihi of the Year**!

Overall, feeder use has declined in recent years, which the team hopes is a sign of hihi enjoying natural foods out in the forest. In the long run, this may make population surveys more difficult. But having more natural populations is one of the core objectives of hihi recovery (p.5) so, in this case, more challenging surveys could be something to celebrate.



 59
adults in population

 ?
fledglings produced

At a Glance
 0%
nest box use

 55 L
sugar water consumed

 660
volunteer hours

 15,820
visitors to the site

KAPITI ISLAND

Background

Kapiti Island is one of New Zealand's oldest protected areas, with most of its landmass being gazetted as a Nature Reserve in 1897. Located 5.5 km off the west coast of the lower North Island, it is 1,965 ha in size and 521 m at its highest point. The island was largely cleared for farming in the 1800s but has been naturally regenerating since. Possums and rats were eradicated by 1997, leaving the island free of introduced mammalian predators. Following a stoat incursion in 2010, the island was once again declared 'introduced predator free' in January 2013.

Hihi releases began on Kapiti in 1983 but were unsuccessful until 1991, when the current population took hold. Today, hihi favour two main areas of the island within major catchments descending from the summit. These areas have the highest plant diversity and rainfall and contain a large portion of the island's mature trees and old growth forest, which offer natural nesting cavities.



News

This year, the Kapiti team faced the challenging task of scaling back their work due to budget reductions for the hihi programme by the Department of Conservation. Supplementary feeding was the first priority, as past monitoring on Kapiti has shown that hihi populations can quickly crash if feeding is reduced. Rangers and volunteers were able to maintain feeding at previous levels, which is no small feat even in full budget years given the time needed to traverse Kapiti's rugged terrain. However, the reality is that this will be difficult to maintain in the long run, putting this population at risk. The DOC team are currently working on a solution to maintain the required capacity for hihi management on Kapiti, and we have high confidence that the programme will be restored to full capacity in the coming season.

The team's next priority was to complete the annual population survey and attempt to band new juveniles so monitoring is possible into the future. Two volunteers from Spain and England – hand-picked for their bird monitoring experience – put in long hours carefully identifying hihi at feeders. Even a record 4°C cold snap in October couldn't stop these intrepid observers! Despite best efforts, monitoring levels across the year inevitably had to be reduced, and fewer hihi were able to be banded. The Kapiti team hopes this is the reason behind the drop in estimated population size, rather than a true decline, but reduced monitoring makes it difficult to evaluate population health and determine when intervention is needed.

Hihi of the Year is an unbanded male who set up his territory at the base of the hill, away from other hihi. He circles his territory calling to all, delighting visitors who don't make it up the hill. Hopefully his persistence will pay off and he will attract some hihi company someday!



At a Glance



104
adults in population



?
fledglings produced



0%
nest box use



3,426 L
sugar water consumed



1,365
volunteer hours



15,451
visitors to the site

Population Size



TARAPURUHI BUSHY PARK

Background

Tarapuruhi Bushy Park is a 98-ha conservation area situated 24 km northwest of Whanganui on the North Island's West Coast. It comprises 87 ha of mature lowland temperate forest with tawa, pukatea, northern rātā, rimu, and rewarewa predominant; a multi-year revegetation programme for 5 ha of pasture areas; and 6 ha of gardens and pasture around a historic Edwardian-era homestead.

This sanctuary sits within the rohe of Ngaa Rauru. The land was bequeathed to the Royal Forest and Bird Protection Society in 1962 by the late G.F. Moore, a prominent Whanganui farmer. Today, the sanctuary is governed by the Bushy Park Trust in partnership with Forest and Bird and Ngaa Rauru Kaitiaki, plus significant support from Horizons and DOC. Protected from major disturbance for over 100 years, the forest is a prime example of an intact forest ecosystem. Predator control was achieved in 2005 following construction of a pest exclusion fence. This has allowed successful reintroductions of toutouwai, tīeke, pōpokotea, titipounamu, and hihi.

At a Glance

 48
adults in population

 10
fledglings produced

 50%
nest box use

 230 L
sugar water consumed

 805
volunteer hours

 10,400
visitors to the site

News

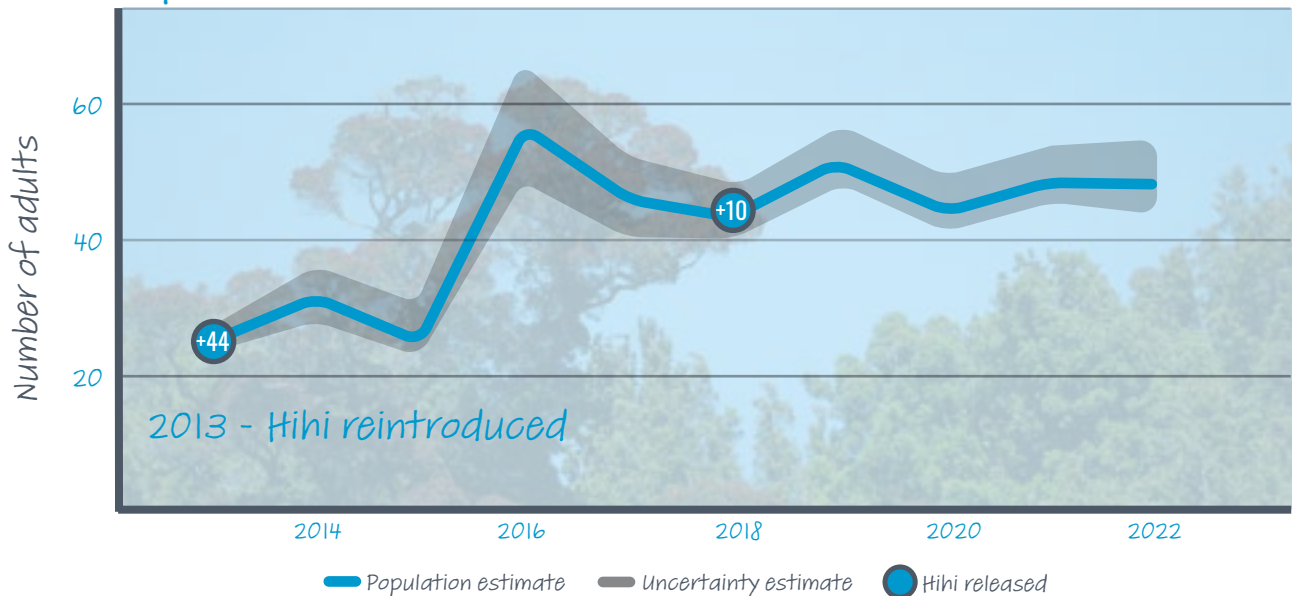
It was a slow breeding season for the Tarapuruhi Bushy Park hihi. A dedicated group of volunteers faithfully checked the 44 nest boxes weekly throughout the season but, disappointingly, only 10 chicks fledged from four nests. However, sometimes all it takes is a visit from Hihi Conservation Officer Mhairi McCreedy to brighten the outlook. During the post-breeding survey, Mhairi managed to mistnet and band nine males and five females and spotted another five unbanded hihi that will have to wait until her next visit. This brought the current population estimate up to 48 adults – not far from the coveted goal of 50 birds that the team has long been waiting for



This year's banded birds were all fitted with the brand-new Radio Frequency Identification (RFID) tags that have been rolled out across sites over the last few years. These high-tech bands will enable hihi visits to supplementary feeding stations to be monitored remotely. The Tarapuruhi Bushy Park team is seeking funding to install RFID readers on their feeders and looks forward to what new knowledge this data will bring.



Population Size



While the team patiently awaits the 50 hihi milestone, they still have much to celebrate. They recently hosted Forest & Bird's Big Birthday Bash, celebrating the organization's 100th year. They also recently marked one year since their pōpokotea reintroduction and are eagerly awaiting the first sightings of hihi tagging along with groups of feeding pōpokotea, which other sites have reported.

Hihi of the Year goes to Blue/Metal-White, Tarapuruhi's oldest female who hatched on Tiritiri Matangi and was part of the initial 2013 reintroduction. Although retired from breeding, she is still frequently spotted enjoying her forest home alongside her many descendants.

TE HAUTURU-O-TOI

Background

Located 80 km northeast of Auckland, Te Hauturu-o-Toi (or Little Barrier Island) is described as 'the most intact ecosystem in New Zealand.' Established as a nature reserve in 1895, it is considered one of the most important reserves of its kind in the world. Entry is strictly by permit only.

The island is managed in partnership between Ngāti Manuhiri and the Crown, by the Auckland region of the Department of Conservation. Te Hauturu-o-Toi is an iconic site for Ngāti Manuhiri and is of cultural, spiritual, and historic significance. The island's name comes from its highest point, 'the windblown summit of Toi.'

Te Hauturu-o-Toi's 3,083-hectare landmass makes it one of New Zealand's largest offshore island reserves. It is home to a greater number of endangered birds than any other island in the country. In addition, the island's biodiversity includes two species of bat, an endemic giant wētā, reptiles such as the northern tuatara, and over 400 species of native plants.

Te Hauturu-o-Toi is home to our most enigmatic hihi population. Protected by the island's strict biosecurity protocols, the hihi are otherwise left to their own devices. With some of the most majestic forest in all of New Zealand, they have abundant natural foods and nest cavities available to them. As a result, our typical management activities are not needed. Without regular monitoring, we do not know exactly how many hihi are on the island, but estimates range from 1000-3000. As far as we can tell, the hihi here appear to be thriving on their own – serving as an inspiration for all of our reintroduced populations.



Opportunities to visit Te Hauturu-o-Toi are few and far between. When hihi researchers do step foot on island, the data collected are extremely precious and can be pored over for years to maximise learning.

This year, new research led by Sarah Bailey from Dr Anna Santure's lab (Waipapa Taumata Rau - University of Auckland) was published using archived samples from Te Hauturu-o-Toi. Two hihi genomes were sequenced and assembled (one male sampled in 2017 and one female sampled in 2018). Since all reintroduced hihi trace their roots back to this one remnant population, samples from Te Hauturu-o-Toi provide the best representation of the species' genetic diversity. Sequencing these genomes opens the door for further investigation into how inbreeding impacts hihi populations, so many new and important findings are expected to follow.



With support from Ngāti Manuhiri as kaitiaki for Te Hauturu-o-Toi and for hihi, all sequencing, assembly, analysis, and data storage for this study was carried out in Aotearoa, to ensure kaitiakitanga for these precious samples and information.

Reference: Bailey S. et al. 2023. *Molecular Ecology Resources*. <https://doi.org/10.1111/1755-0998.13823>

OUTREACH HIGHLIGHT

Raising awareness and appreciation of hihi – in New Zealand and beyond – is a key objective of hihi recovery. It is something that each site contributes to every year, alongside their tireless work looking after our hihi populations. In the past year, over 210,000 people of all ages have visited these sites and had the opportunity to view these amazing birds up close. Learning about their recovery and witnessing it firsthand helps build support, inspire action, and instill a sense of conservation optimism.

Below we feature just one of the unique hihi outreach projects completed in the past year, but we also extend our sincere thanks to the education teams, other site staff, and volunteers who contribute to sharing knowledge of this incredible species with the public every day.



Hihi Volunteer Chronicles Experiences in Graphic Novel

If you have ever wondered what it would be like to work hands-on with hihi, a new graphic novel provides a glimpse into the highs and lows of life as a hihi volunteer. Written and illustrated by Freya O'Sullivan, the book is based on her experiences serving as a Volunteer Hihi Field Assistant on Tiritiri Matangi Island (2021-22 season) for a placement position for her Master of Wildlife Management degree at the University of Otago. Here, Freya shares more about her time volunteering and creating this unique outreach piece.

What inspired you to volunteer with hihi?

During my studies, I had heard of the adaptive management model used for hihi as a successful case study. It was really rewarding to know that the work I would be undertaking has a very real impact on the future of hihi populations.

What were your main duties as a hihi volunteer?

As a volunteer, I had the opportunity to participate in many aspects of hihi management, including supplementary feeding, nest box monitoring, a bit of morphometrics and banding, and the post-breeding season survey. I also piloted a phenological study on hihi food plants as part of my master's programme.

What motivated you to write a graphic novel?

This piece was created for my Creative Non-Fiction Science Communications class. I wanted to package the hihi story in a fun, new format – I do think science communication must be fun! The more I delved into the power of comics and graphic novels for generating awareness, the more my motivation grew.

What do you hope readers will learn about hihi recovery?

For me, science communication is another tool in the toolbox for a wildlife conservation manager and is key for generating activism and support. My main goal was to connect the public to hihi and create further awareness about the challenges and successes of hihi recovery. To develop a sense of jeopardy in the piece, I really dug into the uncertainties for hihi in the future, but my own perspective is even more hopeful than the comic suggests. The conservation story of hihi fills me with optimism!



The "Team Hihi" graphic novel is best viewed on a handheld device and can be found at: www.tinyurl.com/hihicomix

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Hihi Annual Report

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