

the **tawaki** project

www.tawaki-project.org

YEAR

2020/21



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The Tawaki Project so far

After completing its first phase (2014-2019), that compared the marine ecology and breeding success of tawaki across their distributional range, the Tawaki Project entered the second phase in the 2019/2020 breeding season. Our previous work not only found that tawaki are extremely versatile in their foraging behaviour which allows them to thrive in highly variable marine conditions. It also indicated that Fiordland – and more specifically fjord ecosystems – may provide the species with a safe-haven that buffers significant environmental perturbations such as El Niño. The second phase of the project, therefore, focuses on the ecology of tawaki throughout their Fiordland range.

There are 14 different fjords along NZ's southwestern coasts, all of which differ greatly in their topography and thus habitat characteristics.

Milford Sound/Piopiotahi, for example, is one of the shorter fjords (distance entrance to top of the fjord ~10 km) that features steep mountain flanks dropping to great depths.

In contrast, Doubtful Sound/Patea is one of the longest fjords (>40 km long), features multiple side-branches and is connected to Thompson and Bradshaw Sounds providing tawaki foraging within the fjord with a substantial marine habitat sheltered from any perturbations that may occur in the open sea.

It is these two fjords that the project has been focusing in the 2020/21 season.

However, in the future, a southern fjord (e.g., Chalky Inlet and/or Long Sound) will also be investigated, as tawaki in that region are exposed to inshore fisheries (e.g., butterfish set netting).

Support & Funding

As in previous years, the Tawaki Project would not have happened without the support from an army of students and field helpers that donated their time and worked effortlessly under at times dramatically bad conditions.

Crucial for the success of the Tawaki Project is the generous support from **Southern Discoveries** in Milford Sound. Not only, as in previous years, did our team get free rides to and from Harrison Cove and overnight stays in Harrison Cove. The Milford team was invited to stay at the SD accommodation and enjoy the company's catering when not in the field. And all this in the face of a raging Covid-10 pandemic that put a lot of pressure on the tourism industry.

In Doubtful Sound, **Fiordland Expedition** played an equally crucial role. The *Tutuko II* became a floating research base for our team on a total of three trips.

Special thanks are due to the fantastic **Monique van Rendsburg** who was our principal contact for the Department of Conservation.

We were able to deploy animal-borne cameras that were financed through the **Birds NZ Research Fund**. The **Antarctic Research Trust** funded the satellite tracking study and the **Global Penguin Society** provided grants that helped to purchase additional tracking devices and cameras. Additional financial support was provided by the **New Zealand Penguin Initiative**.

Finally, a huge thank you to our supporters on Patreon, particularly **Andrea Faris, Gary Wayne, Janis Russell, Joanna Lankester, Ali Sortomme, Ali Thorne, Eiren Sweetman, Kean Maizels** and **Penny Gwynn**, who helped us to purchase night vision goggles, burrow-scopes and data entry devices.

The Tawaki Project: Field Report 2020/21 - Year 7



A female tawaki incubating eggs, East Shelter Island, Doubtful Sound/Patea, 11 August 2020 (Photo: Richard Seed)



Sea kayak transfer from Harrison Cove, Milford Sound/Piopirotahi, 14 August 2020 (Photo: Richard Seed)



Sites & Dates

Jackson Head, Southwestland

30 June 2020

A one-day visit of a team of two to Jackson Head provided the opportunity to check on the return progress of the penguins and identify any marked birds.

Harrison Cove, Milford Sound / Piopiotahi

18 July 2020

Harrison Cove was visited on 18 July 2020 by a team of two to re-install the transponder gate, check for any occupied nests and identify any marked birds. Trail cameras trained at the transponder gate and the landing site were maintained.

1 & 14 August 2020

Following the discovery of stoats on the trail camera footage recovered during the July trip, we returned in early August to establish a trap line in Harrison Cove with a team of five. The trap line was revisited two weeks later by a team of two for re-baiting and maintenance. The trip also allowed visual inspection of the damage caused by substantial land slides in the Moraine tawaki colony.

22 February & 10 March 2021

One-day visits were made in Harrison Cove by a team of two to re-install the transponder gate after it required repairs and to recover the gate three weeks later for the winter.

Harrison Cove & Moraine Milford Sound / Piopiotahi

8 September - 17 October 2020

Main field work (GPS tracking, blood sampling & nest checks) was carried out throughout September and October. The team was based in Southern Discoveries accommodation in Milford, stayed over night at the Discovery Centre in Harrison Cove, or camped in the

forest near the Moraine colony. Both sites were either accessed by a motorized tender or sea kayaks.

East Shelter Island & Seymour Island, Doubtful Sound / Patea

11 - 13 August 2020

A first visit of the 2020/21 breeding season was undertaken to East Shelter and Seymour Island in the second week of August. The purpose of this trip was to recover any birds still carrying satellite transmitters (see [2019/20 report](#)). Additionally, two more sites were visited - one in Lyall Bay/Thompson Sound, and another in Precipice Cove.

17 September - 1 October 2020

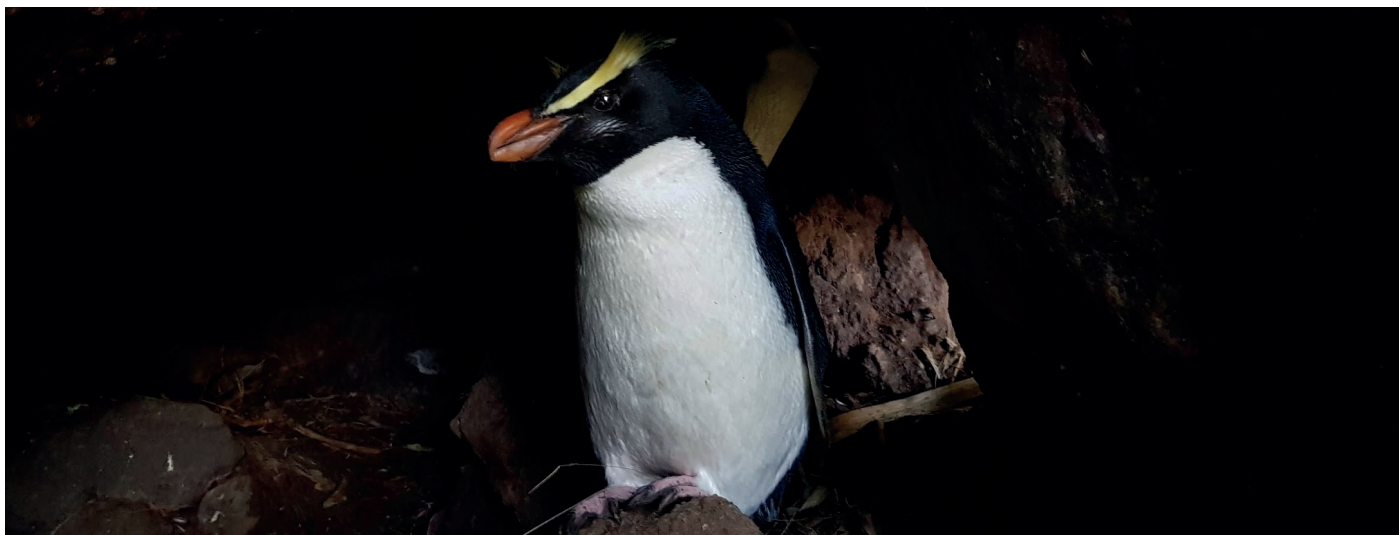
Based on the *Tutuko II*, the Doubtful Sound team deployed GPS dive loggers on East Shelter Island (fjord entrance) and Seymour Island (confluence of Thompson & Doubtful Sounds) with multiple landings both during the day and at night on both islands.

Additionally, some regions along the eastern side of Thompson Sound were surveyed for tawaki colonies. Another site on the southern shores of Doubtful Sound was visited to search tawaki nests. Further searches were conducted in Crooked Arm.

The nights were spent on board the *Tutuko II* which overnighted at the Fiordland Expedition mooring in Blanket Bay. During inclement weather, nights were spent moored in Precipice Cove.

10-12 November 2020

A team of five returned to East Shelter Island for two nights to attempt recovery of two GPS loggers that we failed to recover during the September work, to microchip chicks and to obtain blood samples from adult penguins.



Male tawaki waiting for the return of its mate, Apartment Building, Jackson Head, 30 June 2020



Tawaki breeding habitat, Lyall Bay, Thompson Sound, 12 August 2020



Evidence of substantial land slide damage at Moraine, Milford Sound / Piopiotahi, 14 August 2020



Satellite tracking 2020 (completed)

In February and March 2020, a total of 18 tawaki had been fitted with satellite transmitters to track their winter movement (see [2019/20 report](#)).

Of these, six birds were from the tawaki breeding colony on East Shelter Island. The remaining 12 birds were all fitted with satellite tags outside of the species' breeding range. Therefore, only the Shelter Island birds provided us with a chance to attempt recovery assuming that the penguins would return to the island to breed after their winter migration.

None of the Shelter Island birds could be tracked for the full duration of their winter dispersal, as transmission ceased before the birds had returned to their colony. Based on experience from previous satellite tracking studies, we assumed that this was most likely due to devices falling off.

On 12 August 2020 a team of five landed on **East Shelter Island** and visited the locations at which the birds had been fitted with satellite tags six months earlier. At two sites, satellite tagged birds - a male and a female - were resighted no longer carrying the device. Both showed varying degree of plumage damage where the device had been sitting.

The female ('Rainy'), showed only minor damage suggesting that the tape securing the device had loosened and washed off.



Female tawaki (982 000210214692, 'Rainy'), 12.08.2020

The male ('Sheldon') featured a more prominent row of feathers missing with some feather shafts cut just above the base, indicating that the bird had actively preened off the device.



Male tawaki (982 000210214932, 'Sheldon'), 12.08.2020.

The remaining four satellite tagged birds were not at the sites they had been caught for deployment. Movement on Shelter Island is difficult due to steep terrain and thick vegetation. To avoid disturbance in the colony during the sensitive nest establishment phase, recovery attempts were limited to the deployment sites, so that the remaining four satellite tagged birds were not located.



Difficult terrain on East Shelter Island, 20.08.2020.

During the main field work period, on 20 September 2020, we spotted and photographed a tawaki with some back plumage damage landing in the late afternoon. Comparison with photo records revealed that this was the female 'Maizie'.

The other three satellite tagged birds have yet to be resighted.



Recovery of satellite tracked tawaki on East Shelter Island, 12 August 2020. Top left: minor plumage damage on female penguin (982 000210214691, 'Rainy'). Top right: a visible row of feather loss on the back of male tawaki (982 000210214932, 'Sheldon'). Bottom panel: female tawaki (982 000210215470, 'Maizie') seen coming ashore in 30 September 2020; the bird was identified using photo records of its head ('mugshot') taken during micro-chipping.



GPS tracking, Milford Sound

For the second year in a row, we studied foraging behaviour of female tawaki rearing chicks using GPS dive loggers. As in the previous breeding season (see [2019/20 report](#)), we compared the at-sea movements of penguins breeding deep within and at the entrance of the fjord, deployments occurred at two sites within Milford Sound / Piopiotahi:

- **Harrison Cove**, located ca. 9 km from the open sea, the site we have worked at since 2015, and
- **Moraine**, a large tawaki colony on the southern side of the fjord with direct access to the open ocean.

Harrison Cove

A total of **8 female tawaki were fitted with GPS dive loggers** between 11 September and 16 October 2020. Deployment periods ranged from 1-14 days (**mean: 5.8 ± 4.0 days**). The birds weighed **$2,795 \pm 272$ g when fitted with devices and $2,900 \pm 336$ g when recovered** suggesting an average food load of **162.5 ± 129 g** brought home to their young chicks.

Moraine

Deployments on birds from Moraine were longer when compared to Harrison Cove, owing to logistical challenges of reaching the site, hampered by inclement conditions. **Devices deployed on a total of 5 females, stayed on between 10-18 days (mean: 12.1 ± 3.5 d).** Average weight of Moraine penguins when fitted with devices was **$2,650 \pm 200$ g and 2913 ± 156 g** when recaptured for device removal. If this difference is used as proxy for food returned to their offspring, the load would **average 325 ± 115 g.**

Preliminary results

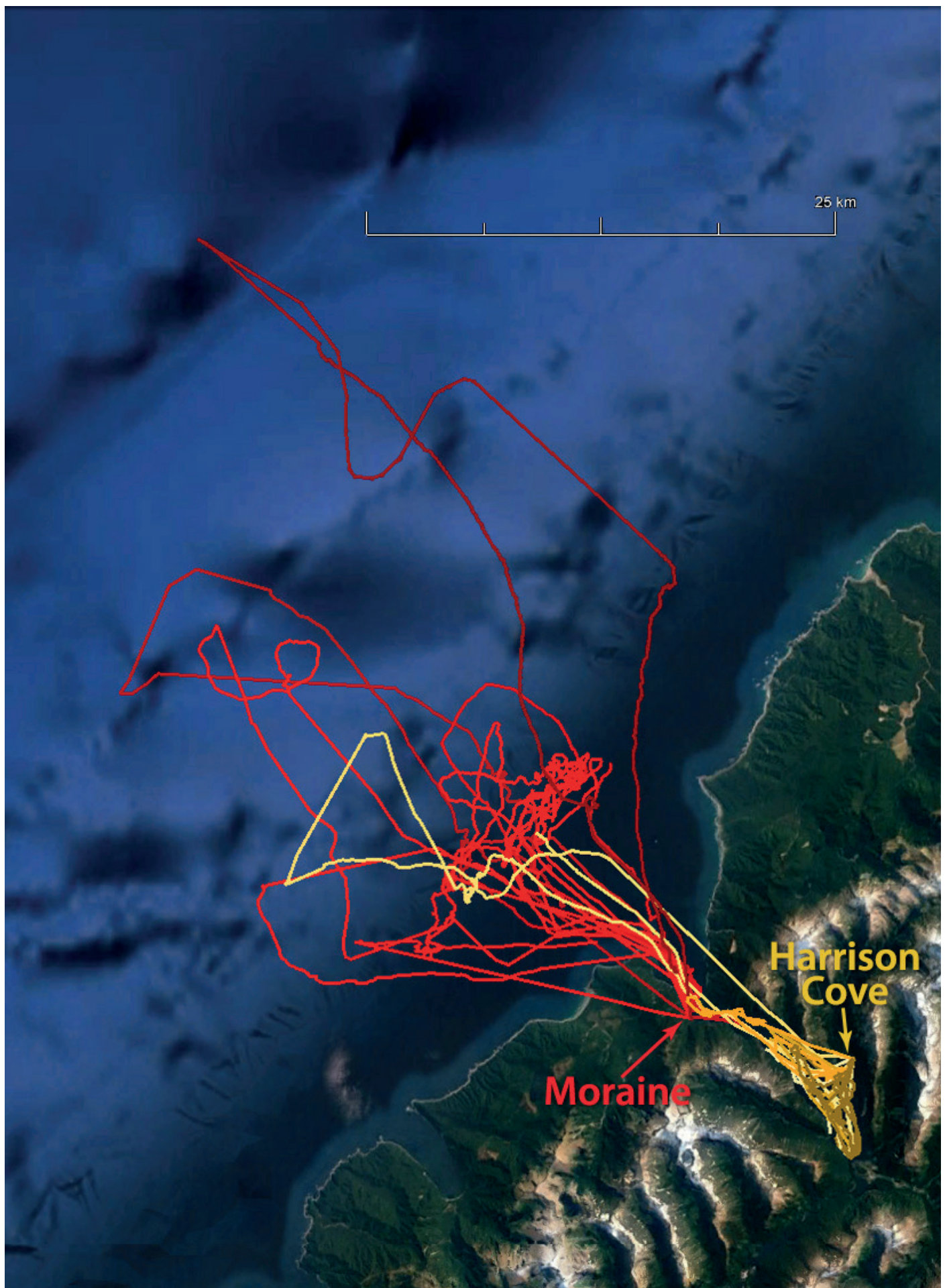
All deployments yielded GPS and dive data.

At **Harrison Cove**, the eight birds performed between 1-4 foraging trips while fitted with logger, with **trip lengths ranging between 1.9 and 23.1 hrs (mean: 11.2 ± 5.5 hrs)**. With the exception of one bird which ventured ca. 10 km out of the fjord (maximum distance from colony: 29.5 km) and dived to depths on 113 m (mean: 27.5 ± 7.2 m), the remaining **seven penguin stayed within the confines of the fjord**. Their **foraging ranges averaged 4.1 ± 1.6 km** and mean maximum **dive depths ranged between 30 and 75 m (mean: 56 ± 21 m).**

All of the **five penguins tracked from Moraine colony foraged outside of the fjord**, with birds performing between 1 and 7 trips while carrying the device. The **foraging ranges varied between 3.3 and 46.4 km (mean: 22.7 ± 12.2 km)** and **trip durations** were substantially longer when compared to Harrison Cove birds at an average **23.3 ± 12.0 hrs (range: 5.1-50.7 hrs)**. Similarly, **dive depths** were significantly deeper than in Harrison Cove birds (**mean maximum depth: 99.3 ± 14.4 m, range: 58.7-116.1 m**).

One Moraine female that could be tracked over seven consecutive foraging trips, showed remarkably consistent at-sea movements during the different trips. She principally foraged along a Northeast-to-Southwest trajectory ca. 7 km outside Milford Sound and spent most of her time within a relatively well defined region of 12 x 4 km.

An increasingly clear picture emerges that shows penguins from within the fjord occasionally may venture out, but prefer to forage inside, while birds from the fjord entrance exclusively forage in the open sea.



Foraging tracks of birds from two colonies in Milford Sound / Piopiotahi in September and October 2020. Tracks from Harrison Cove (yellow hue) were recorded between 11 September and 4 October 2020. Data representing foraging movements of tawaki from Moraine were recorded from 20-27 September 2020.



GPS tracking, Doubtful Sound

To compare foraging strategies of penguins breeding within the fjord with those nesting at the entrance, we worked on two islands

- **East Shelter Island**, located directly at the entrance of Doubtful Sound / Patea, and
- **Seymour Island**, located at the confluence of Thompson and Doubtful Sounds, sits about 10 km from the open sea.

East Shelter Island

On **19 September 2020**, a total of **6 females tawaki** (mean weights: $2,540 \pm 150\text{g}$) tending active nests were fitted with GPS dive loggers at their nest sites. Four of the devices could be recovered in the night of **23 September 2020** (deployment period: 4 days). The nest of one of the females failed during the deployment period and the bird could not be recovered despite extensive attempts to do so. One bird eluded recapture due to difficulties landing on the island; however, the bird could be recovered on **10 November 2020**, 52 days after deployment, and the device removed.



Data logger recovered after 52 days, 10.11.2020

Seymour Island

A total of four deployments on Seymour Island were carried out on **18 and 25 September 2020** (two birds on each of these dates). All devices were recovered between **22-28 September 2020** (mean deployment period: 4.0 ± 1.4 days). Average weight of Seymour Island penguins was $2,588 \pm 180\text{ g}$.

Preliminary results

Considering what was expected from the observations made in Milford Sound in previous years, the results were surprising. Penguins from **Seymour Island** exhibited on average **greater foraging ranges** ($10.0 \pm 5.0\text{ km}$) than their conspecifics from **East Shelter Island** at the fjord entrance ($6.8 \pm 1.0\text{ km}$).

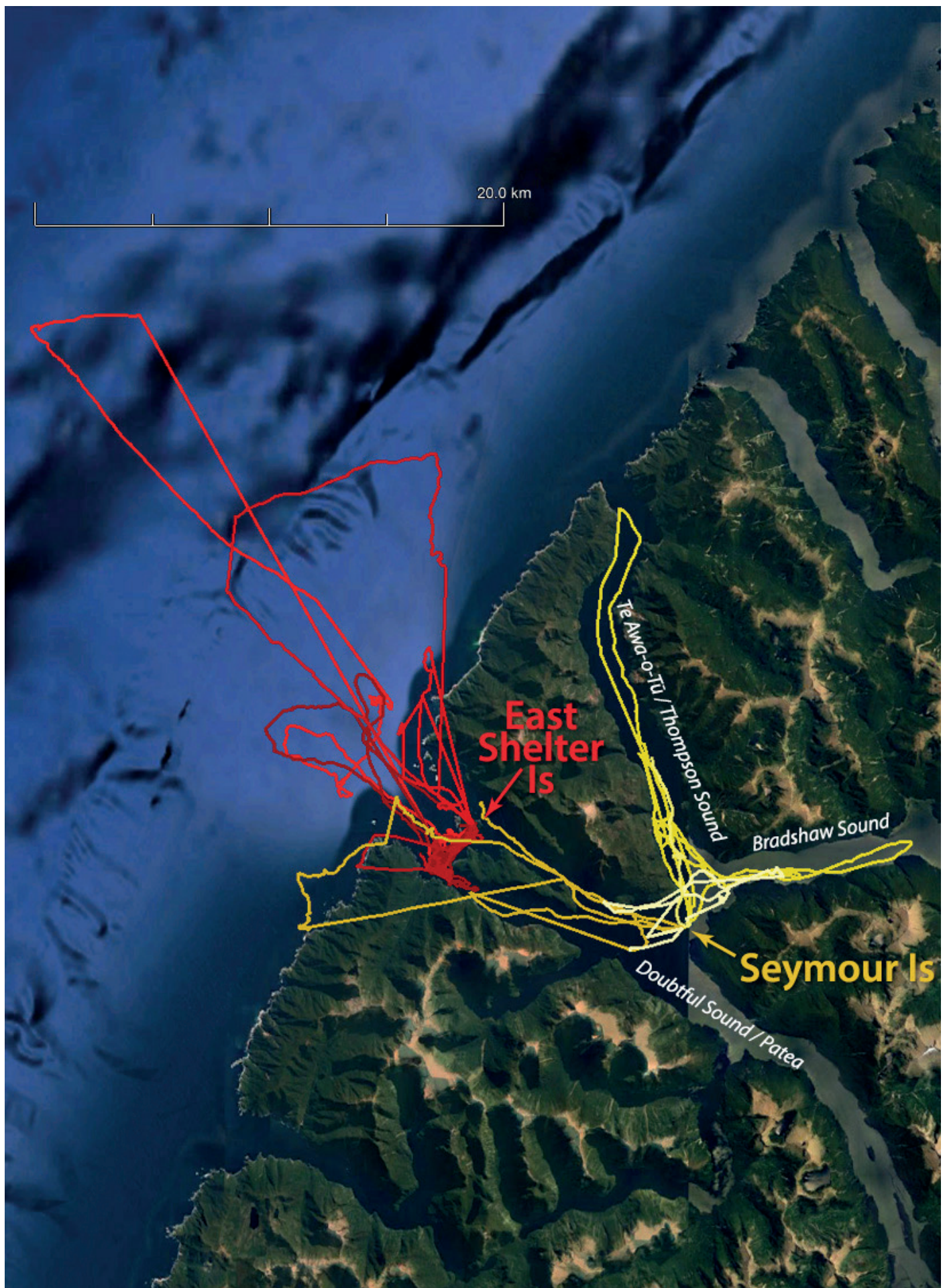
Four of the **East Shelter Island** birds principally foraged in the fjord entrance area to the **West of Bauza Island**, essentially staying within sight of the Shelter Islands. A fifth tawaki performed two offshore trips (15-30 km from the island).

Penguins from **Seymour Island** either foraged along the length of **Thompson Sound**, in **Bradshaw Sound** or around **Bauza Island** in the western reaches of **Doubtful Sound**. One penguin left the fjord and followed the coast approximately 5 km southwards before returning to the island.

Mean maximum dive depth recorded in all **East Shelter Island** birds ($n=5$) was $75.4 \pm 16.4\text{ m}$ with a maximum value of **96.93 m** recorded in the bird that foraged out at sea.

In the four birds from **Seymour Island**, mean maximum dive depths ranged between **40.0-112.3 m** (mean: $68.3 \pm 28.1\text{ m}$).

A new dive depth record was registered with a **Seymour Island** bird reaching **128.5 m**; the dive occurred ca. 5 km north of Seymour Island in Thompson Sound. **The dive was most likely a predator evasion strategy** as light levels in fjords are usually low due to a sediment rich fresh water layer sitting on top of the sea water. We lowered a GoPro action camera at the approximate location of the dive to 60 m. Light levels dropped quickly beyond 40 m depths and the camera recorded only black at 60 m.



Tawaki foraging tracks from East Shelter and Seymour Island. Tracks with a red hue belong to five chick-rearing tawaki females from East Shelter Island and were recorded between 19-24 September 2020. Yellow hue tracks represent four females with chicks from Seymour Island recorded between 18-28 September 2020.



Successful camera logger deployment

In recent years, animal-borne cameras have revolutionized the study of behaviour of seabirds. The advances in consumer electronics, especially the development of small action-cameras, have made it possible to adopt these technologies for research.

Over the past eight years, we worked with electronic specialists to develop an animal-borne camera that is small enough to be deployed on penguins, while at the same time resisting the pressure of dives that may go deeper than 100 m (10 bar). While animal-borne cameras have existed for a few years, the image quality of these devices is generally poor and of low-resolution.

With the Dunedin-based electronics company Kamahi, we have produced cameras that meet the requirements in size and weight that make the suitable for deployment on small-to-medium-sized penguins like tawaki.



Animal-borne camera with an AA-battery for scale.

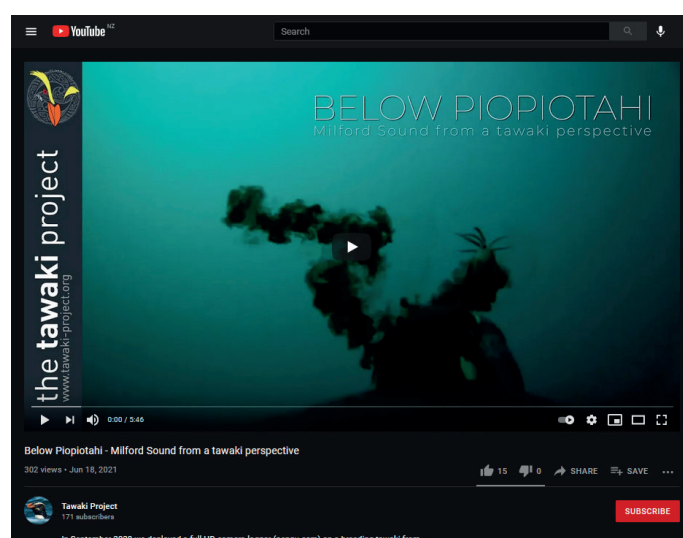
A first prototype of the cameras was deployed on a tawaki in the 2019/20 season. However, the penguin fitted with the prototype left the colony in the early hours of the morning triggering the camera to start recording hours before sunrise, so that the camera's battery was drained before the penguin started foraging.

In the night of 10 September 2020, we deployed another camera on a female tawaki tending for two chicks in Harrison Cove. The bird left just before dawn of 11 September and, with the camera programmed to start recording 3 hours after the penguin entered the water, returned with 2.5 hours of high quality footage. Bird and camera were recovered around 7 pm of 11 September.

Preliminary results

The camera returned 2 hrs 19 minutes of continuous footage; the remaining footage was fragmented in shorter clips due to low battery voltage. Footage was recorded between 9 am and 12 pm. More than 60 successful prey capture events were recorded. Most of these were fish larvae, but squid, sprat and some as yet unidentified prey items were also taken. The penguin spent considerable time foraging in relative close proximity (1-20 m) of the fjord walls or along the seafloor in shallower areas of the fjord.

We have published a [highlight reel of the footage on our YouTube channel](#).



See the video at <https://youtu.be/9b7Wg8XUKUk>



Swimming through a large group of Spotties (*Notolabrus celidotus*) without taking any interest.



Capture of a squid that had effectively 'advertised' its location to the penguin by ejecting an ink cloud.



Capture of a New Zealand Blue Back Sprat (*Sprattus antipodum*) immediately below the surface.



PIT tagging, transponder gate and blood sampling

Marking of birds with transponders

Harrison Cove, Milford Sound / Piopiotahi

In 2020, a total of 25 penguins were marked with transponders at Harrison Cove. Of these 13 were adult birds (5 males, 8 females) and the remaining 12 birds were chicks. The adults were marked with 23 mm Allflex PIT tags compatible with the transponder gate currently operating in the colony, while chicks were marked using 11 mm Trovan transponders.

Moraine, Milford Sound / Piopiotahi

At Moraine, eight adult birds were marked with 11 mm Trovan transponders (four males and four females). Additionally, 14 chicks were micro-chipped with the same transponder type.

East Shelter Island, Doubtful Sound / Patea

A total of 18 adult penguins (8 males, 10 females) were marked with 11 mm Trovan microchips on East Shelter Island. Combined with the six adults (4 females, 2 males) marked for the satellite tracking study in early 2020, this means that currently 24 adult tawaki are micro-chipped on the island. Furthermore, nine chicks were marked with similar tags prior to fledging.

Seymour Island, Doubtful Sound / Patea

Five adult tawaki (4 females, 1 male) were inserted with 11 mm Trovan transponders. No chicks were accessible for marking. Overall the difficult accessibility of most tawaki nests on this island, renders it not viable for extended mark-recapture studies.

All tagging data have been submitted to the FALCON banding database on 10 February 2021 and are stored under the Project name 'Tawaki Project'.

Transponder Gate Harrison Cove

The Automatic Wildlife Monitoring System in Harrison Cove was out of commission for most of 2020 due to technical difficulties that were difficult to fix during the Covid-19 pandemic. We were finally able to reinstall the gate in the last week of February 2021 to identify the remaining marked birds finishing their annual moult.

Over the course of 18 days, a total of 13 different individual birds were identified by the transponder gate which represents 20% of the number of penguins (n=68) marked with transponders at the site since 2015. The transponder gate was removed for the winter on 11 March 2021 and will be re-deployed in June in time for the penguins' return from their winter migration.

Blood sampling

Blood samples were collected to investigate general diet composition of penguins from the different fjords and breeding colonies. Using stable isotope analysis we will investigate at which trophic levels and in which marine environments the penguins find their food.

In Milford Sound / Piopiotahi, blood samples were obtained during two different stages of the penguins' annual life cycle. On 14 & 15 October 2020, 12 penguins (6 males, 6 females) from Harrison Cove tending chicks were caught while commuting between water and nest; 1 ml of blood taken was from the wing vein. A further five birds (3 females, 2 males) were caught after they returned from their pre-moult journeys (29 & 30 January 2021).

In Doubtful Sound / Patea, a total of 14 adult penguins (7 males, 7 females) were intercepted on their commute from the ocean to their nest sites in the evenings of 10 & 11 November 2020, i.e. late chick-rearing period (crèching stage).



Photo: Braydon Moloney

The Automatic Wildlife Monitoring System ('transponder gate') in Harrison Cove, Milford Sound / Piopiotahi



Portrait of a tawaki chick from East Shelter Island after marking it with a PIT tag (956 000012223946).



Stoat trapping in Harrison Cove

During a winter visit to Harrison Cove in July 2020 to pick-up the malfunctioning transponder gate (see page 16), we also downloaded video data recorded by the trail camera that is trained at the gate. Review of the data revealed the presence of stoats.



Stoat presence in the Harrison Cove tawaki colony.

We immediately reached out to the Department of Conservation in Te Anau to discuss measures to control potential stoat impacts on the penguins and other native wildlife in the area.

On 1 August 2020, a set of ten DOC150 double tunnels traps provided by DOC was deployed in a 50x50 m grid throughout and around the Harrison Cove tawaki colony. The work was a team effort by DOC, Southern Discoveries as well as the New Zealand Penguin Initiative and members of the Tawaki Project.

At that stage, egg laying had started in several tawaki nests so that the the establishment of the trap line could not have been more timely.



Trap maintenance in Harrison Cove.

The traps were checked two weeks later and contained two rats as well as one stoat. Until February 2021, a total of five stoats were caught probably preventing significant predation events in the tawaki colony.



Stoat trapped in Harrison Cove, 14 August 2020.

The trap line now will be maintained permanently with staff of Southern Discoveries volunteering to maintain the traps while the Tawaki Project is inactive.

After a warm March 2020, models predict a potential beech mast year for the coming summer, which could initiate a population explosion of rats, which in turn could attract more stoats into the penguin breeding colonies. Therefore, having a permanent trap line will have long-term beneficial effects for the penguins and other wildlife.

In 2016, almost the entire breeding population of tawaki at Jackson Head was affected by a stoat incursion which wiped out most eggs and chicks (see [2016/17 report](#)). Only the deployment of traps put an end to the disappearance of chicks. DOC and the local community have since established a trap line of self-setting traps all across Jackson Head. No further stoat incursions affected the penguins since then. Moreover, it appears as if the number of passerines at Jackson Head has increased significantly.



Establishment of the Harrison Cove stoat trap line.



Outlook 2021

For the second season in a row, the Tawaki Project will be active in Milford Sound / Piopiotahi and Doubtful Sound / Patea. The aim is to repeat last year's successful GPS tracking study to examine time-dependent variability of foraging patterns between the fjords.

This year, we will focus our efforts on the entire chick-rearing as well as the pre-moult periods.

Tracking of chick rearing tawaki

In Milford Sound / Piopiotahi we will focus our work once again on Harrison Cove as it will provide us with a sixth consecutive season. In the light of substantial La Niña conditions that prevail since July 2020, this season will allow us to compare the penguins' foraging strategies when ocean temperatures are warmer with the data we recorded in 2015, when one of the strongest El Niño's on record occurred (see [2015/16 report](#)). If logistically feasible, we will also try to get additional data from the Moraine site.

In Doubtful Sound / Patea, we will expand our deployments to include penguins from Rolla Island in the tracking study, so that we can examine foraging behaviour across a cross section of one of New Zealand's largest fjords.

At the same time, we plan to investigate environmental variables in the fjord using advanced oceanographic methodologies. To that end, Blake Hornblow a MSc student from the Department of Marine Science, University of Otago, will join the Tawaki Project.

Study prey composition with cameras

After the successful trial of animal-borne cameras on tawaki in Milford Sound, we plan to expand this aspect of our work significantly and deploy and fit up to 10 penguins in each fjord with cameras to investigate the birds' prey

encounter and capture rates, as well as gain a better understanding of the prey species the penguins pursue.

Using GPS dive loggers during pre-moult

The satellite tracking study we conducted in 2016 (see [2016/17 report](#) and [associated scientific publication](#)) raised many questions as to why the penguins travel substantial distances when food availability closer to their breeding colonies should be more than adequate for their moult preparations.

Moreover, preliminary analysis of stable isotope data from feather samples seem to indicate that the birds indeed may primarily utilize food resources closer to the NZ mainland further underpinning the hypothesis that the pre-moult marathon tawaki exhibit is an instinctual remnant rather than a necessity.

The gain a better understanding of what the penguins are doing during this crucial period, we plan to deploy GPS dive loggers on a few birds leaving on their pre-moult journeys. These devices will provide us with detailed dive information, that allows us to quantify foraging behaviour in a spatial context. However, since it is necessary to recover the devices to access the data, we will first conduct a pilot study on only a few birds from Harrison Cove this year.

Subantarctic expedition

In April 2021, we finally received 5-year research permits to study Erect-crested and Rockhopper penguins on the subantarctic Bounty and Antipodes Islands. While a 2021 expedition was initially green-lit by the T-Gear Charitable Trust, the funder withdrew support in July 2021 even though planning of the expedition had progressed significantly. We now will work towards realizing a first expedition in 2022.

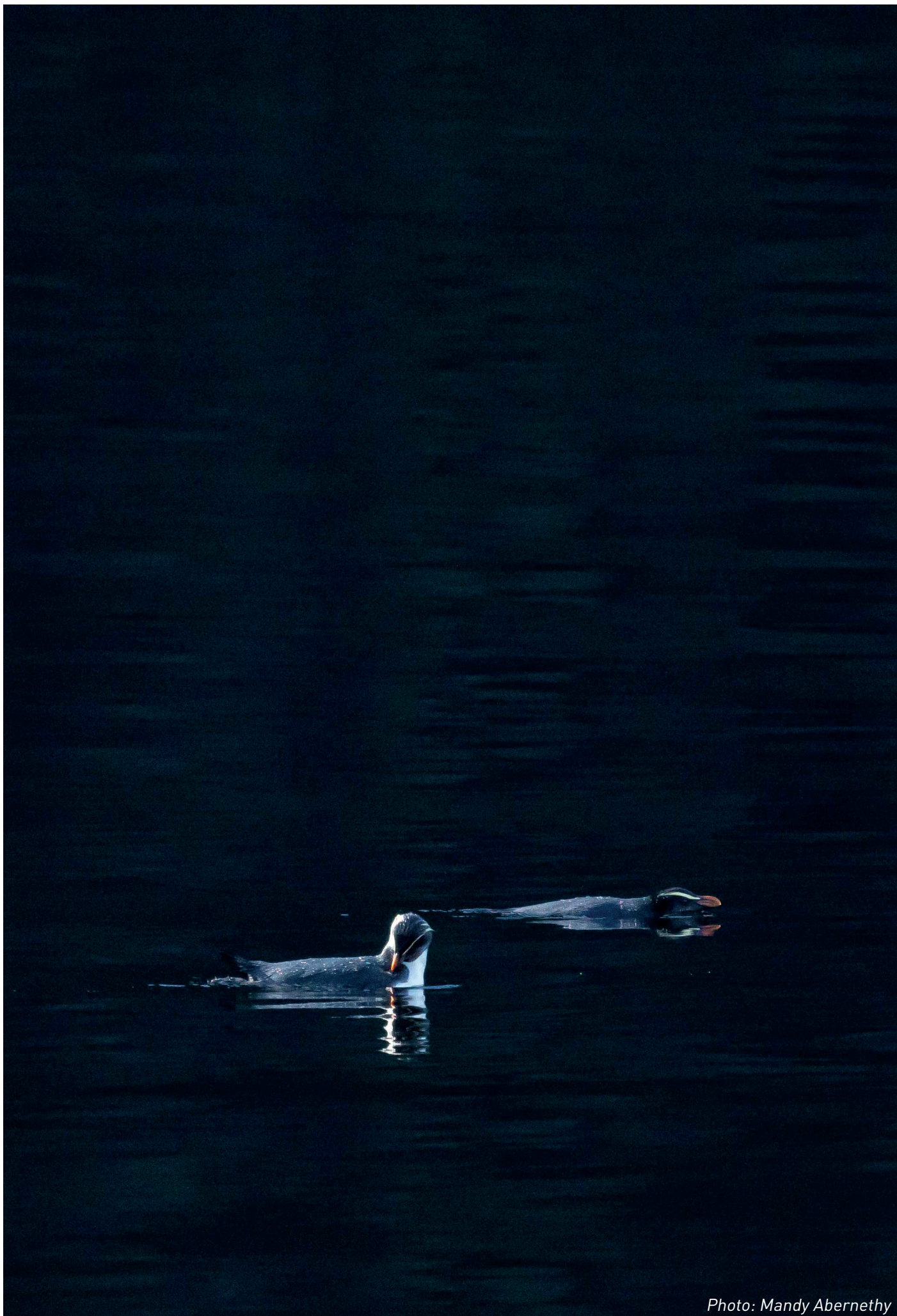


Photo: Mandy Abernethy



Acknowledgments

The last field season was one of the toughest for all involved. Even though New Zealand so far managed to negotiate the global Covid-19 pandemic really well, it nevertheless had a substantial impact - especially for some of our supporters.

For this reason, we must start our acknowledgment section with the amazing folks at Southern Discoveries in Milford Sound / Piopiotahi. The tourism industry was hit particularly hard by the pandemic, and the SD crew in Milford was no exception. A lot of the staff had to be let go with the skeleton crew that remained not sure what the future would bring. Under these circumstances it is incredible that **Andrea Faris, Dan Crook, Emma Thompson, Joe Masters, and Jacob Barrett** from the Discovery Centre soldiered on and helped the Tawaki Project as if nothing had changed. Milford Sound SD manager **Wolfgang Hainzl** and skipper **Neil McCulloch** made sure our crew got to where they needed to go, despite severe logistical challenges due to weather and sea conditions. Finally, special thanks for Southern Discoveries CEO **Tim Hunter** for the company's ongoing commitment to support our work in Fiordland!

Similarly, the support we received from **Richard "Abo" and Mandy Abernethy**, the owners of Fiordland Expeditions in Doubtful Sound / Patea was incredibly generous. Having the *Tutuko II* as our floating base of operations is more than anyone could have asked for.

2020 was the first year we worked with two full teams simultaneously. In Milford Sound / Piopiotahi, the **#TawakiGirls Ursula Ellenberg, Myrene Otis, Robin Long** and their field helpers **Delece McLaren, Lindsay Chan and Sylvain Zar** (honourary tawaki girl) did stellar work

getting not only GPS dive logger data but also the first penguin camera footage.

In Doubtful Sound / Patea, Abbo's incredible tawaki finding ("sniffer dog") and Mandy's equally incredible field skills made sure that **Thomas Mattern and Richard Seed** could get a lot of work done as team **#TawakiBoys**.

As in the previous years, Birds New Zealand had our backs. Finally, we were able to deliver on the promised video footage that **Ingrid Hutzler** and the **scientific committee from Birds New Zealand** had made possible through a Birds NZ Research Fund grant way back in 2018.

And as always, **the final round of thanks goes out to the tawaki from Milford Sound / Piopiotahi and Doubtful Sound / Patea**. Although most of you might not have carried devices or received microchips entirely voluntarily, your cooperation resulted in data sets that help us to understand you and your marine environment much better. That the [IUCN down-rated you from "vulnerable" to "near-threatened"](#) shows that the work you are helping us do can make a huge difference!



<http://www.tawaki-project.org>



<https://facebook.com/TawakiProject>



<https://twitter.com/TawakiProject>



<https://youtube.com/c/TawakiProject>

The Tawaki Project was supported by:

