

# Year Two data confirms the importance of mussel farms as King Shag roosting site

The second year of a three-year study on King Shag, part-funded by the Marine Farming Association and Seafood Innovations Limited, shows that GPS tracked birds are exclusively roosting on mussel farms and regularly feeding in or near them.

King Shag are classified as endangered and while numbers appear stable, their small population of no more than 1000 mature birds and their restricted flight range from a small number of weather-vulnerable Marlborough Sounds nesting sites, means the future of the species remains uncertain.

After concerns emerged about the potential effects of aquaculture on the nearby populations of the birds, MFA and SIL (Seafood Innovations Limited) engaged Blenheim-based Wildlife Management International (now Toroa Consulting) on a three-year research project.

This included:

- Determining King Shags' key life history, population parameters and trends
- Tracking them at sea and potential interactions with marine farms
- Investigating their diet
- Looking at potential land based threats on the breeding grounds

The research project has included banding birds and putting GPS trackers on to understand foraging ecology.

In the Year Two his second report, Toroa Consulting principal Mike Bell says during 2019 and 2020, GPS trackers were attached to 11 mature King Shags nesting at either the Duffers Reef or Tawhitinui breeding sites in Pelorus Sound or at The Twins sites near Long Island in Queen Charlotte Sound.

He says the GPS and dive deep analysis show King Shag return to the same areas to feed on successive foraging trips.

"All 11 birds that live in areas with farms present roosted on farms and all foraged immediately adjacent or in close proximity to mussel farms." Four of the eleven chose to feed within mussel farms and one bird also foraged near a Pelorus salmon farm while four of the birds foraged within the marine farms.

The King Shag can dive to 4060m or more and hundreds of foraging dives were often recorded before the GPS trackers fell off.

A lot more birds have been fitted with identification band than those with GPS trackers. After an early trial in 2018 where a dozen birds were banded, a total of 113 chicks and 14 King Shag adults have now been banded. This banding data is critical to understanding longer term population trends. Toroa Consulting then monitored the banded birds from the Tawhitinui and Duffers Reef colonies.

It found that fledglings may only have as little as a 15-22% survival rate in their first year with considerable annual variations, the causes for which were unknown. While this low survival sounds dramatic, Mike has advised that it is relatively common among seabirds. However, although limited by a small sample of banded adult birds, the data suggests that annual adult survival is high.

The final year of the project is now about to get underway and further banding of chicks will continue along with the re-sighting trips to determine juvenile survival. The first cohort of chicks banded should also be sufficiently mature to determine the age of first breeding.

As the number of banded adults increases, Toroa Consulting says it will be better placed to measure annual adult survival. GPS tracking and the monitoring of dive behaviour will also continue.

Improvements in catching methodology will hopefully see an increase in the sample size for the final year. As the adult King Shag is notoriously shy, it is difficult to catch them, which impacts on the number of birds that can be tracked in any one season.

Mike Bell has acknowledged his company's research project would not be possible without the goodwill and co-operation of the MFA and industry which has provided guidance from the King Shag Working Group and vessels for all resighting trips.



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