Department of Conservation
Te Papa Atawhai

Meeting: **Conservation Services Programme Technical Working Group**
Date: 10 June 2021
Time: 9:45 am – 12:45 pm
Place: MS Teams
Chair: Graeme Taylor (Principal Advisor, Marine Species Team, email: gtaylor@doc.govt.nz)

Attendance: Patrick Crowe (WMIL), Kalinka Rexer-Huber (Parker Conservation), Yvan Richard, Katrin Berkenbusch, Edward Abraham (Dragonfly Data Science), Kath Walker, Graeme Elliot (Kath Walker & Graeme Elliot), Rosa Edwards (FINZ), Charity Puloka, (FNZ), Gaia Dell'Ariccia (Auckland Council), Tamar Wells (Te Ohu Kaimoana), Janice Molloy (SSST), Peter Frost (Science Support Service, Whanganui), Michael Donoghue (Te Tiaki Moana Associates), Imogen Foote (PhD student, Victoria University), Charles Hufflett (fishing industry), Austin Burgess (Observer Programme), Samhita Bose, Graeme Taylor, Igor Debski, Karen Middlemiss, Johannes Fischer, Georgia Hardieboys (DOC)

Apologies: Ian Angus, Lyndsey Holland

CSP TWG presentations:

1. **POP2018-04 Flesh-footed shearwater population monitoring – WMIL (Patrick Crowe)**

Patrick Crowe presented on the three-year project undertaken by WMIL focused around population studies on flesh footed shearwaters.

During this project WMIL completed long term population monitoring studies at two sites, updated estimates from five breeding sites and completed simultaneous tracking of breeding adults from both Ohinau and Lady Alice islands.

Patrick compared the data collected over the past 3 years with species population estimates collected by Baker et al in 2010. Data showed an overall population estimate increase in most of the study areas, however Patrick raised that this may be more a reflection of a larger monitoring effort than a true increase in bird population.

The group banded almost 4,000 birds on Ohinau and Lady Alice islands.

Patrick's recommendations going forward are to:
- Continue demographic studies on Ohinau and Alice Islands
- Continue to update population estimates for Titi Island, Green Island and Mauitaha and other small Chicken group Islands.

Discussion

PF: If 'competition' from other species is affecting occupancy of FFS on Lady Alice, what do we know about the population trends of these other species on this island? Is this 'competition' likely to become a longer-term factor in FFS dynamics?
PC: Both Lady Alice and Ohinau islands have significant grey faced petrel populations. There is some overlap at the tail end of the breeding season with burrow occupancy. Some FFS do not want to occupy burrows with grey faced petrels as the petrels have been known to attack the FFS chicks. Adult FFS have sometimes abandoned burrows where grey faced petrel chicks have been recently laid as they don't like the burrow disturbance. On the islands we saw a number of Little Blue Penguins 'turfing' out the burrows as they came in to moult. This is something that should continue to be monitored. Other species do not appear to have much of an impact on burrow occupancy. Other burrowing birds such as little shearwaters and Pycroft's petrel usually occupy smaller burrows anyway.

KRH: Provided there was a drought in December 2020, leading to a mahoe die off and significant overgrowth of weeds, did you try to determine your burrow detection rates, and in turn population size estimates you are getting out of it?
PC: We are confident we were detecting all burrows on the transect. Generally, we walked the transect in pairs, and if not, we would walk transects 3 times to be sure we did not miss any burrows. We just needed to be very diligent when searching for hidden burrows amongst the nightshade.
KRH: Could there be a change in colony areas since Baker's work?
PC: Yes, this is possible. In some of the previous studies we did, we believe there was an expansion in colonies as it is unlikely Baker could possibly have missed some of them previously.
GT: GPS accuracy has also improved a lot recently. The new GPS devices are now at down to 2-3 metres accuracy in forests, so colony boundary marking will not be very accurate.

PF: Do we know anything about those individuals that don't return to breed the following year? Are they skipping a year? Are they younger birds (perhaps less experienced at reaching necessary breeding condition) or, conversely, old birds, that may be reaching the end of their reproductive lifespan? Could they be individuals that nested late the previous year and therefore may have skipped the next year, if late breeding does not leave enough time to reach suitable breeding condition the next year? Many long-lived seabirds (and perhaps other long-lived species) appear to skip breeding rather than compromise future survival if breeding is likely to be physiologically stressful.
PC: This is not something I have looked in to yet, but something that should be borne in mind in the future.
PF: We know now that a fair number of long breeding seabirds forego a breeding opportunity (if it might jeopardise long term survival of the bird itself). It would be useful to do more research to understand when and why they choose not to breed.

2. BCBC2020-27 Salvin's albatross – breeding success and phenology – Parker Conservation

Kalinka Rexer-Huber presented the Salvin's albatross phenology project undertaken by Parker Conservation.

From time lapse images taken by cameras over a one-year period, the project team determined when chicks fledged, when adult birds departed the colony at the end of the breeding season, and when they returned to the colony. They also estimated nest success during particular periods.

An objective of the project was to evaluate whether similar phonology and breeding outcome data could be obtained from tracking data, by determining migration dates.

Parker Conservation's recommendations following the project were to:

- Implement cameras for the full season from July until after April to obtain full breeding success data (or to undertake two deployments if there is to be an island visit partway through the breeding season)
- To mount cameras differently to minimise camera disturbance by fur seals.

Discussion:

JF: Could you calculate DSR (daily survival rate) and through that account for the nests that may have failed prior to your arrival?
KRH: Yes, this would be helpful.

Action: Johannes to send Kalinka the nest survival model code that he wrote originally for the diving petrels.

PF: You note that mean failure occurs around 23 days after hatching (i.e., during the brood-guard stage, but only a few days before the end of that stage [27 days]). Could it be that these failures arise because the guarding bird, for whatever reason, stopped guarding early? Alternatively, is there anything in the visiting schedule of the non-guarding adult (e.g., less frequent than 'successful' nests, at least through the brood-guard stage)?
KRH: You could look at parental visits for feeding. We did not see bands on many of the birds and where the birds did have bands, it was difficult to identify this in the images captured. We put red bands on the birds with trackers which you could only really see if the bird was close enough to the camera. It was difficult to tell which parent was at the nest.
We noticed some birds were giving up early on brooding, though not all nest failures occurred immediately after the birds had left. The cameras only captured an image once every hour which meant that when chicks disappeared from the nests, we often missed capturing the exact moment they disappeared and therefore do not have hard evidence for what happened to these chicks. An explanation for this may be that something caused the adult to be disturbed after which it did not return soon enough to the nest, or something ran over the chick. If you had a greater frequency with cameras, you might see what had happened to chick.
ID: You could set the cameras to increase frequency of shots over key periods only. This would provide a better chance of capturing the key information, while not discharging the camera battery too early in the season.
KRH: Yes, this is a good idea. This should be considered in future deployments.

GT: I was surprised that you didn't see / capture the adult birds feeding their chicks right up to departure. Did you see adults feeding chicks just before leaving the nests?
KRH: Yes, sometimes but we may have missed feeding events because of the camera imaging frequency. There is a period where the parents feeding slows down, and if you happen to miss the parent who has the second to last feed, this could result in a longer interval.

GT: I was surprised by how quickly the birds returned. Could they be a biannual breeder? Is it possible the successful breeders don't come back to lay the following year, and therefore are at sea at the time population studies are completed?
KRH: They might be like the white headed's that can breed two times every three years.

Action: Kalinka to check whether Paul Sagar's research looked at breeding frequency.

ID: Noting the limitations of using GLS data to check the breeding frequency of birds, a

suggestion could be to look at previous years data to check what the success rate was. If all of the GLS data we get back is from birds that fail and thus return to breed the following season, this may explain the early departure dates for these birds.
GT: If a portion don't breed the following year, it certainly changes the size of the populations.

3. B BCBC2020-09 Antipodean albatross – integrated population model – Dragonfly Science

Yvan Richard presented on Dragonfly Data science project on integrated population modelling.

The objectives of the project were to fit a demographic model to field data that had been collected since 1994, and to develop an online simulation tool to assess relative demographic impact of management scenarios from the model estimates.

Project conclusions were that there is a concerning decline in the survival and productivity, supported by population projections. The results of the study were similar to previous studies, although we are potentially seeing some recovery of adult survival rates in the last few years. Despite the inclusion of movements outside the study area in the model, permanent emigration may still result in an underestimation of survival rates.

The online simulation may help prioritizing management strategies to optimize the recovery of the population.

Next steps for the project will be to:
- Simplify the simulation tool before making it public.
- Make refinements based on the groups feedback.
- Finalize the report.

Discussion:

JM: Was there any evidence of mice nibbling albatross at Antipodes Island?
GT: No, not that we are aware of.

YR: The variability between years definitely correlates with when the survey season starts, how long researchers are in the field, and how many observations were recorded.

PF: Is there a way of estimating the sensitivity of various parameters as to which ones need refining, or is that difficult to do with models such as yours?
YR: If you are talking about the assumptions for example of variability over years, then yes, you can always make models more complicated if you have a reason for it. This is something we could have done. Previous studies did find potential decrease in the probability of breeding as well. That data could be interesting. The final version of the simulation tool could use that model, however it is already quite complicated, so might be better to try to keep it simple.
PF: To which of those parameters is the model sensitive in terms of outputs
YR: Adult survival is most important, but we did not run specific sensitivity tests.

KRH: The difference between observed vs modelled population lines was very small before 2006 and widened after 2006. Is this because amongst those observable states the model is accounting for, there might actually be quite a lot of birds that were dead?
YR: The difference is created by probability of detection, and the model shows the probability declined.

GE: Our on the ground interpretation is that the birds that stopped breeding might have started

to breed again.
GT: Why are we setting the age for the pre-breeder and juvenile states at 9 years? This seems quite high considering some birds begin to breed at 6-7 years.
YR: 9 years is simply the maximum age, I like to leave it to the model to decide this. We could adjust the model and run it with the maximum age of 8 years, but I don't believe it will change much with the modelling.

4. Antipodean albatross – update on 2021 field season – Kath Walker & Graeme Elliot

Kath Walker and Graeme Elliot described their trip to Antipodes Island that they undertook in summer 20/21 to complete population studies on the antipodean albatross. These trips have been occurring almost annually since 1994.

Kath and Graeme explained the population increases and decreases over previous years, the population breakdown between sexes and the breeding and nesting successes. They also presented on some of the data that has been collected from the satellite-transmitting tracking tags.

Discussion:

GT: An albatross being at sea with a transmitter still transmitting for 40 days is astounding.

YR: What will happen to this tracking data and how is it being used? It would be great to see overlap of the data over time and type.
ID: From a DOC perspective our focus has been looking at individual bird vessel overlap using methodologies we developed and presented last year. We are currently working through some improvements to the methods and will extend these to the new tracking data. MPI has a project looking at using the tracking data to model distributions. Most of this work seems to be looking at the NZ EEZ area, and not globally. Perhaps someone from FNZ could provide further information on this offline.

JM: When thinking about the interannual variation in survivorship, is it worth thinking about completing analysis of the high seas fishing effort by area by year? Can we assume the birds are going to the same place every year? Also, I think COVID will be affecting the fishing fleets. There are likely less of them around due to COVID.
KW: The difference between years may be affected by the timing of trips e.g. the 2020 trip which was late would have missed early breeding failures. There is something in this which may exacerbate apparent survival changes between years. Trends are helpful over time to even this data out.