



Meeting: Conservation Services Programme Technical Working Group
Date: 23 September 2026
Time: 09:30 am – 12:00 pm
Place: Microsoft Teams Meeting
Chair: Katie Clemens-Seely (Manager, Conservation Services Programme)

Attendees: Chelsea McGaw (Forest & Bird); Olivia Hamilton, Phil Heath, John Richardson, Sonja Austin, William Gibson, Karen Tunley, Hannah Stilborn (Fisheries NZ); Mel Young, Lyndsey Holland, Erin Hewetson, Dave Houston, Olivia Rowley, Cat Barnett, Lydia Uddstrom, Louise Porter, Julia Reid, Hannah Hendriks, Kat Manno, Nathan McNally, Jody Weir, Mike Ogle, Kristina Hillock, Anton van Helden (DOC); Kane O'Donnell, Tane van der Boon (Maui63); Dave Goad, Ben Steele-Mortimer (Seafood NZ); David Middleton (Pisces Research/Seafood NZ); Eiren Sweetman, Liz Slooten, Will Rayment (University of Otago); Charlie Heaphy (Sealord); Al Hall (Hall Marine Consulting); Jack Fenaughty (Sanford); Shaun Lee (STET); Megan Cornforth-Camden (Environmental Law Initiative); Steph Bennington, Jaret Bilewitch (Earth Sciences NZ); Jim Roberts (independent consultant); Deanna Clement (Cawthron Institute); Christine Rose (Māui and Hector's Dolphin Defenders); James Roberston (NZ Rok Lobster Industry Council), James Bell, Miriam Pierotti (Victoria University of Wellington)

Presentations:

- 09:30 am INT2023-06 Investigating the impact of fisheries on endangered hoiho diet, microbiome, and disease susceptibility
- 10:15 am Findings from the MAUI63 Māui dolphin winter survey
- 11:00 am INT2022-05 Determining the resilience of Fiordland corals to fisheries impacts

1. INT2023-06 Investigating the impact of fisheries on endangered hoiho diet, microbiome, and disease susceptibility

Eiren Sweetman (University of Otago) presented on hoiho diet, gut microbiome and functional potential: What a range-wide metagenomic study tells us about marine pressures and future management.

Discussion:

WG: The microsatellite stuff is really interesting and we did have a few comments on the fishing inferences you've drawn here and will send you detailed comments. It is an oversight to not look at the climate component and purely looking at disturbance. Red cod seems to primarily be driven by changes in water temperature over the South Island. Also wanted to provide feedback on overlap metrics as we don't think they characterise the overlap very well, an example is that the approach looking at suitable habitat rather than actual overlap of birds. Will provide some written feedback.

ES: Appreciate that and agree there is more to delve into with fisheries overlap, environment and other changes at sea.

JR: I was going to make a similar point with respect to climate, thinking about how observations of what subpopulations are eating predominantly and trends in availability may relate to some spatial relationship between temperature and survival. I have included a table in the chat function from the spatial risk assessment, this has a couple of interesting parts, a lot of spatial variation in SST relationship and chick survival. Think they are all impacted because juveniles are dispersing everywhere regardless of where they are produced.

ES: Happy to chat about this further.

DG: Wondering if you have any recommendations for chick supplementary feeding from these results?

ES: The challenge is knowing exactly what the healthy microbiome is, I didn't have the health metrics to relate back to the samples other than noting the dominance of particular prey within the diet. Supplementary feeding is a really important question for hoiho on the mainland, pretty much every chick gets fed by the wildlife hospital and we know there has been issues with feed in the past. A variety of prey and the right type is important, which the Wildlife hospital and DOC are striving to provide that for chicks. The ideal diet for hoiho on the mainland isn't simple to define when, for example, the Rakiura birds are eating a lot of wrasse, but the mainland birds aren't. They can really adapt, but blue cod is large and difficult for chicks to digest.

DG: The default option I imagine is that diet diversity is better.

JR: Juvenile malnutrition stood out as being a major contributor to female deaths annually, a bit of a cryptic demographic, we have good information from chicks and some from adults. Whatever information you do have from juveniles I'd attribute more weight to that.

ES: Yes, happy to discuss.

2. Findings from the MAUI63 Māui dolphin winter survey

Tane van der Boon and Kane O'Donnell (Māui63) presented on findings from the Māui dolphin winter survey

Discussion:

SD: Is it possible to make the AI work with video? I think that the photograph approach here is problematic because you're observing a continuous process with a very instantaneous approach. With human surveys, the movement queue is an important part of the process in terms of identifying the dolphin from waves for example. With instantaneous samples, that sampling is going to complicate the process of identifying duplicates. In a place like the west coast north island you won't have many duplicates, with video you could absolutely see and be able to watch that sighting as it evolves. Normally in a sighting survey you have several seconds in which to make a sighting and then confirm it, with a still camera you miss their diving behaviour and in a turbid environment they may disappear completely between individual breaths. This will decrease the apparent availability of the dolphins to be counted and also bias the group size estimates because you won't necessarily get to see all the individuals. I find this much more attractive as an idea to be used elsewhere if it was based on video rather than stills.

KO: With video you're not going to get high resolution, so you need to fly a lot lower and you don't get the swath to effectively cover the area quickly. Have done work where we look at dolphins as they move up and down, looking at them for a whole 45 seconds. In general, 1 second is fine and observers do have a very limited time to see individuals in the group which all feeds into the availability estimate. We can account for this in the actual availability to feed into the abundance estimate. If we could get a camera system with high resolution video, I agree this would be better, but it ends up not being as cost effective.

TB: Video is just consecutive frames so we can increase the frame rate and time we are observing the same rate. In essence, we agree with you and are working on this.

SD: The image resolution is a trade-off, not just between the sensor and the height but the field of view. For other areas its probably better if you don't try to do this but try and get a handle on density. Should be trying to estimate density and there are ways to do that.

KO: This is probably where we'd ask for input from Proteus.

HS: You mentioned that you were able to identify 26 individual dolphins, how does that work over multiple days? Doing a day flight, you can track them to not double count but how does this work over multiple days?

KO: The key thing was that the majority of dolphins we saw were over the port Waikato area and it happened all over the same time, possible that a dolphin would be counted twice but would have had to move into another transect in a very fast timeframe. Can see the direction and group size to make inferences. Not statistically significant which is something I would like to see if we look at how much they move over time to make estimates of whether one individual was a duplicate capture. Māui are relatively easy because there are only around 50, with other species such as Hector's dolphin it is more difficult

CR: You talked about the survey covering the entire range but at the same time it stops South at Kaipara, North at port Waikato and 12nm offshore. There is evidence that Hector's and Māui dolphins extend beyond that range both north and south and also out to sea. Wondering what the confidence interval range is because you saw 26 dolphins but the mark recapture research suggests approximately 40-50, we're not seeing all the dolphins so what are your assumptions about where the others are?

KO: Totally agree on the whole habitat, it would be interesting to fly the entire coast. There was a Hector's seen on the east coast of the north island during the survey. Another question is availability, generally went without about 50% availability of animals because they can be subsurface sometimes but gives you an estimate around 50 which is encouraging, more details are included in the report but for now just going off prior research.

TB: The numbers we tracked were just providing the data that we saw and then Proteus did the abundance analysis. Would love to extend the survey area but funding is needed for ongoing surveys.

CR: Whether it is 50 or 40 or in this core range, or further, we know they are very rare animals and we have lots of surveys but ultimately it is better management that is needed.

LS: You mentioned that there were 4 sightings that were missed by AI but were picked up by human detection, were those dolphins missed in the centre of the photograph or on the edges? How many of the photos were reviewed by humans to see if AI missed anything, how many more could have been missed?

KO: Early on we went to Cloudy Bay and did some flights with a set of images reviewed entirely by observers, they found 7 dolphins and the AI model found 14 but of them the AI missed 1 whereas the observers missed 10. In this case, the

dolphins that were missed were generally where there was more than one in a group.

TB: This was an end-to-end survey and every single image was reviewed.

KO: The fact we saw 26 individual dolphins when we're assuming 50% availability indicated we weren't missing that many. Didn't have enough training data to test things out fully, had about 150 images of Hector's and Māui dolphins to train the model on which makes it harder to make statistical inferences. Currently training a new model with thousands more images. It is iterative and just re-running a model is quite cheap.

JR: Wanted to talk about spatial information rather than just abundance. The winter distribution information for Māui is thin, there have been a few aerial surveys mostly operating within the core area. The spatial distribution of your sightings is highly consistent with previous aerial surveys, think that we move further offshore during the winter period but maybe not quite as much as seen in Hector's dolphins. Expanding on the distribution outside of core areas, where we are really sparse is a long-shore distribution in the winter period. Our perception of where the core distribution is based on summer surveys but we are still lacking spatial information to the north and south of the survey area particularly in winter.

KO: For context, doing the whole coast is very feasible not only for Hector's and Māui dolphins but also other sea life such as birds and seals. At some stage there is an idea that we could go around the coastline and capture all species, though there are funding considerations.

KO: That's the goal, multiple times per year and all species. Want to use different kinds of lenses to look for different species and be a global leader in this area.

JR: You mentioned ocean colour and I'm wondering whether you collected information on this that could be used?

KO: The cameras are currently just exposing as normal so are not calibrated for colour. Interested in monitoring for water colour, turbidity and sea state to inform likelihood of seeing a dolphin.

JR: Wondering if along with track lines and sightings, also having continuous ocean colour observations might be useful.

MP: Combining drone technology with AI is great for the future of conservation especially in the marine environment. Going back to the end of 1989, I've seen each year

the numbers decrease. I don't know whether this is sustainable or not but good on you for coming up with such good technology.

SD: I agree there is a lot of progress here but I do think the extrapolation to abundance is not completely reliable and I'm sure the difficulties can be worked out and there is room for a lot of progress in that area but this is not an abundance estimate that we should trust. Availability information is taken from somewhere else entirely and the process here, no matter how many cameras you've got, the animals further from the camera will be harder to detect so there will be some underlying detection function. I think it's a much better approach to treat this as an input to line transect analysis, estimating detection.

KO: We are working through this now.

TB: Appreciate your feedback and we were not trying to provide abundance estimates here, just trying to capture data and work with researchers from aerial surveys and models. Can make informed decisions based on top of it, we asked Proteus to make this paper as part of what this could look like.

KO: Don't want this work to be seen as the new abundance estimate as it definitely needs a lot more work. We are working on this analysis. Might see a bias where we see them at the start of the image but not the next, may indicate a startle response. Lots more things in the work.

LS: A comment on the report that it is very important to look at whether dolphins are seen non-randomly in the image, would be good to see a simple graph or histogram for dolphin distance from the track line or distance from the photograph.

TB: We can give you access to Sea Spotter and you can grab the data to analyse it yourself. Anyone else without access can receive a login to use and analyse it as well.

KO: Some of the dolphins were seen right on the edge of the image, spotting is unbiased unless there is more solar glint on the edge of the image.

3. INT2022-05 Determining the resilience of Fiordland corals to fisheries impacts

Professor James Bell (Victoria University of Wellington) presented on determining the resilience of Fiordland corals to fisheries impacts.

Discussion:

JB: With the shallow versus deep differentiation, have you, or are you aware of, any hydrodynamic modelling to look at potential current patterns and their role in separating populations?

MP: We did a lot of CTD but nothing that we could specifically relate to the depth we were sampling and didn't have the chance to take any velocity/speed to correlate to that. But if you look at the deep populations, we know there is some ingression of larvae inflected with different genomic clusters that we found which was very different from the shallower inner fiords. Know that in the inner fiords there is freshwater circulation so potentially what we have seen could be related to the hydrodynamics of the location. Would be interesting to correlate in future.

JBell: This wasn't the result we were expecting at all, the populations are only 40-50 m apart, so it was surprising to see such differentiation.

JB: This is more common in open ocean environments.

LH: Just a note on the fishing data, we did get this from 1979 onwards but only at the statistical area resolution so this wasn't able to be combined with distribution of black corals but can see what number of pots were lifted, for example. Following electronic reporting, which started in 2019, can see that most of the effort occurs in areas that do overlap with the coral distribution. We will have the report available for review soon, just needing to clarify some fishing data and make sure we can desensitise this before it is online.

JB: In terms of the depth separation, you mentioned there's potential for a second cryptic species, but have you given any consideration as to which of the two could be the original *A.fiordensis* and which is the new species, shallow versus deep?

JBell: No, not particularly.

MP: I think that now we have the reference genome it would be possible to look at this and through genome scanning could potentially see the strongest differentiation between shallow and deep.

JB: Is the reference genome a mixture or are there separate shallow and deep genomes?

MP: The reference came from shallow, so would be interesting but it is very costly and takes a long time for processing. With the new generation of genome scanning can look at this to separate taxonomically different species.

JB: From what I've seen I was quite impressed by the quality of the genome, much higher standard than other coral species.

Any additional comments should be provided to by 5pm, 7th October 2026.

Close of Meeting @ 11:53 am.