**Survey Planning WG**

**Skype Call 26 March 2014, 14:30 – 16:20 Norwegian time**

On call: Jill Prewitt, Genevìeve Desportes, Bjarni Mikkelsen, Thorvaldur Gunnlaugsson, Gísli Víkingsson, Rikke Hansen, and Dan Pike

Meeting Notes:

1. Review of reports and documents we have (Dan’s review, workplan)
* Recommendations for methodology for 2015 surveys
* Dan Pike gave an overview of the technical working group report from 2 years ago (SC/19/TNASS2/Final Report)
* *Stratification*
	+ main message for Iceland was that past surveys have all used the same design, despite changes seen in whale distributions. Stratification could be changed to improve abundance estimates.
	+ Key is what is the main objective for the survey- either 1) getting absolute abundance or 2) looking at trends in abundance
	+ If the goal is absolute abundance, the recommendation was to improve the stratification
	+ If the goal is looking at trends, the recommendation is not to change survey stratification nor design
* *Timing*
	+ Previously large declines in abundance were noted
	+ Recommendation was to conduct small scale surveys over summer, changes in abundance could actually be due to changes in seasonal timing of migration
	+ Only two small surveys were done, but none in mid-summer(?)
	+ Could also potentially look at this problem using other methods such as acoustics, platforms of opportunity (whale watching vessels?), etc.
* *Design*
	+ Icelandic surveys were designed in 1980’s
	+ Design is good, but there is not completely even coverage probability
	+ Again, decision to change or leave alone depends on what the main objective of the survey is (absolute abundance or trends)
* *Ancillary data collection*
	+ There were recommendations for other data that would be helpful, such as tagging, etc. to get at correction factors (availability bias, etc.)
	+ Also recommendations to redo abundance estimate using methods other than cue counting to see whether the results and variance are similar, and compare to other methods (for ex, Greenland)
	+ Also questions of whether there are other useful data that could be collected, and/or data that has been collected in the past but is never used in analysis (ex, observer recordings of uncertainty in group size)
	+ Other recommendations to use camera system to collect info such as glare, Beaufort, etc. to ease the work of the flight leader.
* *Modes*
	+ Double platform was essential.
	+ Gold standard is a plane with equal platforms (2x2 bubble windows, example, Twin Otter)
	+ If this is not possible, must make some efforts to improve existing platform
		- Such as camera for independent 2nd platform and improve visibility for front observer
	+ Also circle-back method
* *Data Acquisition/storage*
	+ The Icelandic system is dated, bulky, and the timing is designed for ship surveys (too slow for speeds of aerial surveys)
	+ Need for a system that is more compact, and timed accurately, ideally with vocal recordings directly linked to GPS
		- recommendation not to use vocal recorder that is calibrated to GPS, watches, etc. because there are too many opportunities for error
		- Ideally find a system that accepts all integrated data streams

*Discussion*

* Iceland informed the group that the platform (plane) would be the same for 2015 as in past surveys
	+ Not financially feasible to get a different plane, and likely for the next big survey there will be further technology making a “new” plane out dated (e.g., using drones next time)
	+ Also will not be able to get further correction factors (no tagging)
	+ Will be using same plane, and also a camera system to get double platform corrections
		- only space for one camera
		- located on right side, obliquely, will look at how wide the view is
		- Dan pointed out that there will be a lot of photos to go through, and also a problem when you encounter discrepancies between the observer and the photo, for example if group size is different, which one do you believe?
	+ Pilot is giving them one free day of flying this year to test equipment, but no other training or testing will occur until just before the survey in 2015
* Satellite technology
	+ recent paper came out using satellites to count large whales
	+ Conducted in a very small area
	+ Greenland informed that on their upcoming survey of belugas and narwhals, they are doing a pilot study where they have paid the space agency to point their satellites at the same area they are surveying for comparison, perhaps this can be used to survey large cetaceans in the future
1. Update from Dan regarding methods/equipment used in Canadian survey
* Dan Pike gave an update on a Canadian aerial survey he participated in last year
* focused on narwhals and belugas
* 3 Twin Otters, 4 weeks, double platform, 7 people on each plane
* Largest aerial cetacean survey
* Combination of parallel-equal spaced and zig-zag lines
* Voice recording
	+ Observers used handheld digital voice recorders, which had problems such as bulky, both hands full (inclinometer in other hand), did not have integrated timing with GPS
* Cameras
	+ 2 Nikon, oblique, pointed to each side
	+ Strip width 800 m, angle 36°
	+ Pic every 3 sec, 100 000 photos, storage is not a problem anymore but there was added effort back on land to backup all data (transfer time)
	+ Will use photos as check on visual sightings where observer was unsure of group size
		- large aggregations of narwhals/belugas, observers tend to get overwhelmed, photos could alleviate these problems
	+ plan is to read all photos
	+ Utility has yet to be proven
	+ Plan is to make 2 estimates:
		- First using just visual data (observer)
		- Second using observer combined with photos
		- Have not planned to analyse as a double platform combining observers and cameras, what Iceland is suggesting, but could be done.

*Discussion on Canadian survey and plans for Icelandic survey*

* Main weak points of the Canadian survey was data acquisition, mainly voice (see above)
* Iceland would need to decide on picture interval vs altitude and speed of plane
	+ video may be better option for minke whale cuing and Icelandic surveys
* Iceland confirmed that they will be using cue counting
* Iceland is considering 1 pic/sec to get cuing profile
	+ Dan recommended looking at specifications of camera and processing time, may not be able to handle 1 pic/sec
	+ Rikke informed that Greenland aims for 10% overlap of pictures, and take 1 pic/ 3 seconds
		- their pictures are mainly used for missed parts of the trackline, species ID, and ice cover
		- Student went through pics, found only 1 sighting that was not also seen by observer
* Gísli asked if Iceland can only use photos or video, which one is best?
	+ Rikke mentioned that their system did not use HD, so resolution was better on cameras, but this may have been updated recently (is checking with manufacturer), and Dan also mentioned that any difference may not be meaningful
	+ For still photos, the recent Canadian survey had one person sit with the camera to make sure light balance is OK. In Greenland, they had a fixed iso and did not have a dedicated person (did this apply for still photos too?)
	+ Video is OK with a fixed setting (especially when it is just open water, although high sea state can be a problem).
1. Additional info from Rikke regarding methods/equipment used in Greenlandic surveys
* Rikke informed the group on the data acquisition system that they have been using in Greenland
	+ Integrated system (Redhen) for voice, GPS trackline, sightings, camera and video
	+ Uses microphones connected to headphones
	+ Observers have a button they press when there is a sighting, and because it is linked with GPS tracklines, it is easy to see duplicates between observers
	+ Use software called Media Mapper, get map with tracklines, video, pics, voice recordings all at once
	+ Can be used for 4 independent observers, each with own voice recording, sightings tracking (button to press), video, photos
	+ Greenland will be using this system for TNASS2015 again
	+ Rikke will send Iceland the specifications of their system
* Rikke also informed the group that they have collected tagging data on minke whales, and have applied for additional funding to tag more minkes and also fin whales

*Discussion on other data acquisition systems*

* Dan pointed out that there are other systems with multiple channel recording capabilities
* One example is Logger- the system is good but you have to be fast to get all data in quick enough
* Look at whether the computers can have multiple sound cards to record voice from multiple observers

*Discussion of priorities for Icelandic survey*

* Gísli informed the group that Iceland’s priority is absolute abundance (versus trends in abundance)
* Dan suggested that this could involve changing the stratification
	+ look at the areas of highest densities observed in the past, allocate more effort there
	+ For example, Block 8 where no whales were seen in the last 2 surveys
* Gísli asked about an adaptive strategy that was mentioned in the report
	+ Change plan based on what is seen in the first tracklines?
	+ Dan mentioned that statisticians didn’t like it- the problem is that you are selecting low variance areas, leading to bias in your variance estimates
	+ Survey redesign could be done using DISTANCE software
	+ For absolute abundance, re-design for equal coverage
	+ Change to parallel equally spaced lines, gives rest time for and even though more flying time it is a small amount

1. Going forward
* Faroes is not planning any aerial surveys
* Greenland has no news on E Greenland surveys, but will use same data acquisition system
	+ No large whale surveys before 2015
* Jill mentioned a planned SCANS-III workshop on aerial surveys in first week of May. It would be good to send a NAMMCO sponsored person (Dan?). Jill has asked Phil Hammond if this is possible, and is waiting for his response. Jill will keep Dan informed.

What information do we still need and who has it

* Aerial and also for ship-based surveys
* What information does Iceland need to decide between double platform methods for the shipboard survey?
* Iceland will aim for BT mode, can turn off audio to switch to IO
	+ Genevìeve mentioned that there was no point in spending lots of money for audio communication methods and high power binoculars if doing IO, suggested deciding beforehand
	+ Also instructions to observers are very different. In IO both platforms search the same area of water, in BT the tracker has to search ahead of the primary. Some platforms can also be suitable for tracking, but not for IO.
* Bjarni mentioned that the Faroes would like to coordinate and use the same method as Iceland, however IO may be better for pilot whales, while BT may be better for minke whales, if they are the target species
* Need information from Debi Palka on what methods she is currently using, and also equipment. Genevìeve had emailed Debi and will let the group know as soon as she responds (Jill believes she is currently out on a ship so may not respond for a little while)
1. Schedule next meeting
* Iceland will review information from Greenland on the aerial data acquisition system and see whether they need another Skype meeting to talk over the details with the group, especially Dan and Rikke
* May is potentially best time to get Phil and Debi on Skype, for a meeting mainly focused on ship-based surveys. We will wait for Debi’s response on ship methods, and then decide on specific agenda items and information needed from Phil and Debi before scheduling a meeting with them