INTRODUCTION: 30 YEARS OF COUNTING WHALES

Genevieve Desportes[1], Rikke Guldborg Hansen[2] & Daniel G. Pike[3,1]

[1] North Atlantic Marine Mammal Commission, Tromsø, Norway. Corresponding author: genevieve@nammco.org
[2] Greenland Institute of Natural Resources, Nuuk, Greenland.
[3] Esox Associates, North Bay, Ontario, Canada.

We could go on and on. We could review the history of commercial whaling and how it led to the depletion of so many whale stocks. We could tell you how the North Atlantic Sightings Surveys (NASS) came about, and their long history from 1986-2015. We could explain again how abundance surveys and the resulting estimates form the very basis of the modern discipline of ecology. Then we could summarize each paper in this volume, emphasizing the importance of the results for the rational and sound conservation and management of North Atlantic cetacean populations.

We could do all that, but it would be repetitive and perhaps a little boring. If you want some history, read the introduction to the previous NASS volume (Pike, 2009). If you want to know what is in the papers, read the papers since they can speak for themselves. So instead, just for a while, we invite you to join us to find out what it is like to actually count whales from a ship or a plane. Having served as first observers then cruise leaders, we would like to offer you several vignettes from our experience to give you a taste of what life conducting surveys is really like. The frustration of sitting out in nasty weather while time and money drain away. The sheer physical pain of being in a cramped plane for hours on end, contorted like a pretzel as you try to stay focussed on the hypnotic sea below. The excitement and joy of that one sighting, maybe a rare species or a big group, that you know you will never forget. The satisfaction of working as a team, and a job well done.

DECIDERS!

Geneviève Desportes

The survey may be well planned, the crew and the vessel optimal, the cruise leader tip-top, the observers disciplined and good spotters with high social abilities in small confined areas, the methodology and equipment well thought out and impervious to rain, salt, rolling and pitching. But that's not enough, at all, to guarantee a successful survey.

Survey time or wasted time: Zeus and Aeolus decide

Rough seas and fog (Figure 1) mean no observation and no sightings, as well as an uncomfortable ride for the crew and observers, but that's just a detail. Everyone knows bad weather exists, so time for bad weather preventing observation effort is deducted from the time allocated to the survey when estimating the predicted actual hours of survey time and by the same token, the realistic amount of effort that can be sailed.

Figure 1. Is that a blow? A bad weather event during a shipboard survey (Photo: SCANS III)

Although the definition of "good" weather or acceptable survey conditions (Figure 2) will differ somewhat with the target species of the survey, in NASS surveys, acceptable sea state is mostly taken at Beaufort Sea State <= 4. Clearly larger whales with tall and high visible blows or smaller whales with very conspicuous aerial behaviour and larger groups will have a better chance to be sighted if the weather conditions and particularly the sea state deteriorate. Under heavy rain, thick fog or 5m high waves, looking for whales is easy enough, but spotting them is another story!

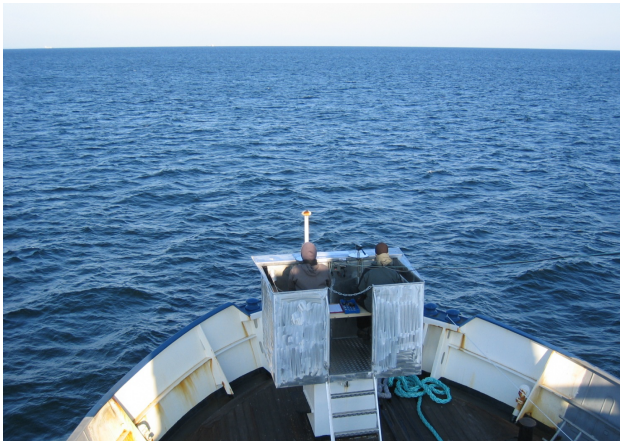

Figure 2. Acceptable sighting conditions (Photo: SCANS III).

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The predicted time lost to bad weather depends very much on the latitude at which the survey is conducted and whether the area surveyed is exposed (offshore) or protected, for example by cliffs along the shore. When the Norwegians plan a whale survey in the northern North Atlantic in June–July in areas such as the Greenland or Barents Seas and around Svalbard, they know that only 20–30% of the available ship time will be survey time. In the worst case, survey time has been reduced to 15% of ship time. In more southern areas, survey time is higher, but it is rarely above more than 40% in the latitudes of the NASS surveys. This is one of the things that makes shipboard sightings surveys so expensive. It is not cheap to have a ship with 2 dozen people just waiting for better weather conditions—and getting sea-sick. The same goes for aerial surveys, the difference is that the observers don't get sea-sick but grounded.

But that's not all. You may well have planned your effort time realistically for the average local conditions, but average is a statistical concept, and in my experience, the weather is almost never average. If the month when the survey is carried out happens to be an outlier on the bad weather side, too bad. You just have to hope there are whales during the few hours on effort. Sometimes, the whole survey has to be redone the year after. This happened to the Icelandic aerial survey in 2015. The realised coverage was so poor that abundance estimates could not be calculated, and the survey had to be redone in summer 2016—happily with more weather-luck that time.

THE OTHER MINKES

Daniel G. Pike

We only fly in good weather, and we stick to our survey design. As a result, we see only the minke whales that are in areas with good weather and near the transects that we fly. We miss all the others, including:

Wind minkes: The wind minke loves feeling the pull of mountainous waves on her body as she comes up to take a breath. Enjoys surfing the wild whitecaps as they break around her. Revels in the cacophonic sounds of the turbulent water above. She follows the wind unerringly, never seeking rest in the tedious calms. We never see her.

Fog minkes: The fog minke is a timid creature, hiding from the angry sky gods under the vaporous miasmic fog above (Figure 3). She swims about, seemingly without purpose, endlessly seeking something she cannot name. We never see her.

Dive minkes: This one is tricky too. She has an acute sense of hearing, and she listens carefully at the surface when she comes up for air. If she hears a boat or a plane, she dives. For as long as she can. We fly by. We never see her.

Off-transect minkes: She is smart. Devious. And she has spies. Someone has passed her the survey design, so she knows where the transects are. She knows where and when we are flying. And she has told her friends. So, they all stay just beyond our search width, popping up occasionally to check for the plane. They laugh when they see us fly by, oblivious to their presence. But we know, somehow, that most of the whales are just off-transect. We just know.

Imaginary minkes: These ones are common on double-platform surveys. You finish a transect and the observer seated ahead of you reports that they saw 3 minke whales. You didn't see any, so you just say something noncommittal like "Yeah, cool." But you know, you just know that they couldn't have seen any minkes, because you didn't. And you don't miss sightings! They are minkes of the imagination, and they infect the mind of the other observer.

Figure 3. Perfect weather for fog minkes (Photo: D. G. Pike).

WHY BIOLOGISTS COUNT ANIMALS

Rikke Guldborg Hansen

There are not a lot of places left on earth where people live from hunting wild animals, let alone the great mammals of the sea (Figure 4). Many industrialised societies look at this way of making a living with wonder, concern or straight out disgust. Countries north of the Arctic circle have a long history of hunting seals and whales but the practice of hunting marine mammals has long been the subject of criticism by several powerful international organisations. For example, the sustainability of the hunts has been questioned on several occasions, especially with regard to reliable abundance estimates for the various species and stocks.

Figure 4. Narwhals from above in excellent sighting conditions (Photo: C. Egevang).

Aerial survey

If logistically favourable airports are present in the vicinity of the survey area, counting animals from aeroplanes is superior to any other survey method because of the great area that can be covered in a short time frame. Due to the safety risks of flying at low altitude over sea and ice, the plane must have 2 engines

and a long-range fuel tank so it can make it to an alternative airport if bad weather moves in during the flight. The use of a Twin Otter aeroplane enables us to have a double observer setup to account for perception bias as well as sufficient room for recording equipment. Four bubble windows allow for an unobstructed view in front and below the plane (Figure 5).

Figure 5. Bubble windows to ensure observers have unobstructed views ahead and under the plane (Photo: R. G. Hansen).

IN THE MIDDLE OF THE WAVES BUT OUTSIDE WAVELENGTH

Geneviève Desportes

One of the significant details about life onboard an offshore survey vessel, for weeks and even months, is the lack of continual contact with the outside world. Mobile phones only work close to land and satellite connections are functional only intermittently, and always at an exorbitant cost. Email access is slow and spotty. No bandwidth to share those wonderful photos on Facebook and Instagram! After a few hours sailing away from the shore, the ship is alone in the world. The umbilical cord is cut and peace lands on the ship and the mobile phone. Not tens of thousands of red threads that need to be nurtured and messages that need to be answered all the time. Though a bit disturbing, I find it a nice and rare feeling. It's just being here and only here, with the sea, the weather, the birds and sometimes the whales—and your companions of fortune or misfortune. I enjoyed it—until the next landfall and the renewed opportunity to contact and be part of the outside world.

This is changing now, fortunately or unfortunately, but NASS came to life at the time of Morse Code and very brief messages to the outside world, which also meant limited possibilities for sparring amongst colleagues during the course of the survey.

WHEN ALL ELSE FAILS, I SING

Daniel G. Pike

When I tell people that I do aerial surveys for whales (Figure 6), they usually respond with something like “Wow! That must be soooo exciting!” People have this romantic image of soaring the skies and dipping low to commune with friendly whales frolicking in the waves.

It’s not like that.

Almost all the time, it is a painful form of tedium, interrupted very occasionally by moments of near panic. Transects sometimes last as long as 40 minutes, and during that time you are locked in a twisted, uncomfortable position, unable to move. Isolated, just the lulling drone of the engines for company. Towards the end of a long transect, the pain in your back, your neck, your hips, begins to intrude on your consciousness. You long for the transect to end, for that brief 5-minute break when you can sit up, stretch out, and rest your weary eyes.

Sometimes, it’s really hard to keep up your concentration. It’s very easy for me to see how observers occasionally miss even really obvious sightings. The endless sea with its undulating waves as it sweeps underneath you and the harmonic rhythms of the twin engines; it’s all very hypnotic, and a few times I have been startled back to consciousness by a sighting. Not asleep, exactly, but not all there either. I try to keep my eyes moving constantly, scanning in a set pattern, but sometimes that is not enough and I can feel my concentration waning. When all else fails, I sing. I sing to myself, to the whales, to the sky and to the plane. Nobody else can hear me.

Figure 6. Wake up! (Photo: D. G. Pike).

WHY IT’S FUN (EVEN THOUGH SOMETIMES IT'S NOT)

Rikke Guldborg Hansen

There is no such thing as a typical day when you are conducting an aerial survey in the Northern hemisphere. The survey period will typically be from 2 to 5 weeks and can take place in the relatively warm summer months or in winter months with -30°C (Figure 7). One day you will just set up and test the equipment in the plane. Other days will have perfect weather conditions and you will see lots of animals in your survey area—helping you to maintain focus and concentration—and you will find yourself busy with long days in the field followed by hours in front of the computer transcribing data. Another day will be a down day—or several in a row due to bad weather in the survey area. In Greenland, aerial surveys are often conducted in areas with few settlements and even fewer airports and accommodation can be everything from a luxury hotel suite to a hut with nothing but a bed, a lamp and a rifle by the door to protect yourself from polar bears roaming around outside. In any conditions, a good and relaxed atmosphere between team members is key to happy and dedicated observers and ultimately increases the chance of a successful survey. Going for long walks in the vast surroundings of Greenland is a welcome change of scenery after

spending up to 10 hours in a small plane, concentrating on staying focused on your observer duties whilst keeping compulsive chocolate eating in check. All of this to say that while days on effort in the plane can be long and tiresome, they can also be—still long—but exciting if unexpected species or large groups of animals are encountered, either in the water or on land.

Figure 7. Why the work (and view) can feel like a religious experience. (Photo: R. G. Hansen).

I'M NOT RELIGIOUS, BUT…

Daniel G. Pike

Trying to do a whale survey in a place like Iceland does weird things to your mind (Figure 8).

Figure 8. Maybe this will help… (Photo: D. G. Pike).

Above all, you want to get the survey done in the time you have. But you need good weather; low wind speeds and good visibility, and that is quite rare around Iceland. It costs a lot of money to fly, so you don't want to take off just to find out that conditions are no good. I end up checking several weather forecasting sites many times every day, trying to find somewhere that might have conditions good enough to fly. But a lot of the time, you just don't know until you get there. It's always a gamble. When the winds are light, there is often fog or low cloud, and then you just have to turn around and come back.

Typically, less than half of the flying time is actually spent surveying. The rest is used flying between places or, worse, on flights that just don't work out because of weather. I am not religious and don't consider myself a superstitious person, but I have found myself beseeching the Weather Gods, "Please, please, please let the winds be light and make the fog go away. Please." Sometimes it even works.

WHALES OR NO WHALES: MOTHER OF THE SEA DECIDES

Geneviève Desportes

One imagines the sea full of life with majestic whales and smiling and playful dolphins everywhere, waiting for you to observe and count. One imagines also that, since the whales are, by definition, nice and positively-disposed to humankind, they will appear regularly in easy-to-count groups and close enough to be identifiable with certainty so that you, as a good observer, can collect and record all the requested information on the sightings well and without stress. There will be an excitingly large group from time to time, because this is so nice and impressive and sometimes breath-taking—and necessary for the joy and well-being of the observers. Unfortunately, this ideal scenario is a fantasy.

Wind, fog and rain showers can make the observation shifts short and sparse, with days in a row spent just rolling and pitching passively in the waves. Then there are those long, long days where nothing happens except the shift rotations and the meals; just water around—more or less flat—and the endless, empty horizon. Those days when it is so difficult to stay focussed and search in a set pattern—from 90° starboard to 90° port, from 90° port to 90° starboard, and back again, especially using binoculars or, worse, those cursed Big-Eyes. Oh, something. Starboard to port, port to starboard… Oh, the back of a sperm whale—a floating timber. Wave or dorsal fin, dorsal fin or wave—volatile flashes. Many hours pass without a single sighting. Are we having lunch soon?

Maybe whales are not mammals that have to surface for breathing once in a while...maybe are they just jeering at us and holding their breath when they hear the ship, diving and resurfacing when we have passed? Maybe there just aren't any?

In places, however, bizarre creatures rise from the horizon, single or in groups, not like flashes, but growing tall and steady, aggressive on their 4 legs (Figure 9). They constantly spit fire but look pretty apathetic. They usually hold a small floating slave on a leash. "They" do not want us too close, repeating incessantly and monotonously on the radio something like: "To all ships in the area, to all ships in the area, don't draw near, don't draw near!" Sometimes a big buzzing mosquito lands on them without them reacting. The vessel passes cautiously so as not to wake them, wanting to be small and inconspicuous. They look so inappropriate, awkward in this environment, and yet they are born of us. Sometimes the drilling platforms are more abundant than the whales—and one sees them for longer.

But where are the whales? Hours and days pass. Suddenly Mother of the Sea is back in a generous mood or has spotted us between the waves or…something. A slick or several at the surface, a non-flying dorsal fin, a powerful blow cleaving the surface. There are still whales!

Branle-bas de combat, the sighting platform comes back to life: action, recording, transmission, species, angle, distance, cue, behaviour, how many, progression…Did the other platform spot them? Is there a single large group or several smaller groups? Where is the centre of the groups? Calves or not?

Then, further away or on the other side, or the same side, or closer to the boat, another sighting, and another one, and more. Are some duplicates? Which species? How many? Same group or not? Position, angle, mixed species? Stress and chaos on the platform!

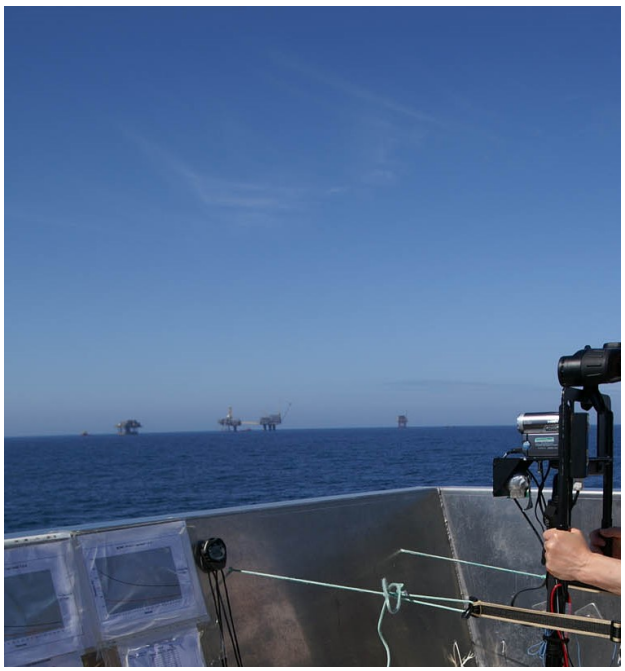

Figure 9. Bizarre creatures rise from the horizon (Photo: G. Desportes).

Whales alone or in groups, dolphins breaching the surface and coming by to bow-ride for a while. Humpback whales foraging and breaching, accompanied by their flocks of scavenging sea birds. Pilot whales spy-hopping. Fin whales swimming at their energetic and powerful pace, splitting the surface and diving again, generously offering up their right jaw so they can be identified with certainty. Calves bow-riding adults. Motionless sperm whales resting, recovering their breath. Majestic flukes sinking under the dark surface. Large flocks of dolphins—3 or 4 hundred animals (how will we count them?)—passing the ship, streaming by for minutes on end, spiralling in the bow waves, moving from bow to stern, from port to starboard and back again, fascinating and confusing. Don't forget to count them: how many calves?

The Mother of the Sea must have been generous in sowing food here: krill and fish and squids. And no, unfortunately for observers, whales are not distributed evenly in the survey blocks. They usually occur over smaller areas, places where they know, somehow, that food is easy to find and grasp or engulf. After these fantastic but a bit chaotic and demanding events, it is so nice to go back to a quieter period, finalising and clearing up recordings, when observations are still fresh in the mind. Sometimes boredom is fun too.

Mother of the Sea, we are grateful to you for sending us your beautiful creatures. Be assured that it is precisely this life, multiple and diverse, that we will bring back home and keep in our memories, not the long periods spent waiting for your grace. It is this variety and wonder and the sometimes-majestic surroundings of cliffs, volcanoes, ice and glaciers that will make us long for another survey. But, Mother of the Sea, if I could allow myself as Cruise Leader to forward you a wish: would you be so nice and understanding to express your generosity in a more sequential and regular manner next time so that we can honour every single one of your marvellous creatures with a perfect scientific record?

THIS IS WHAT I REMEMBER

Daniel G. Pike, Geneviève Desportes & Rikke Guldborg Hansen

The survey is finished.

A full month, but not only of flat seas. Both pampered and kept on track, the observer team and crew have survived the encounter with the waves and the different cultures onboard the limited, confined and unstable space with its mixed palette of odours. Work routines have been harmonised and spirits have been kept high, even after waking at 4:00 am to discover that the roughness of the sea means yet another day bobbing in the waves, waiting. The data have been entered and checked even as seasickness made the task, well, sickening.

A full month, but we only flew on half of the days. Over 5,000 nautical miles of transect, and half again just flying around. More than 80 hours in this tiny little plane. Some flights as long as 7 hours, with no room to move around. No toilet. Evenings and weather days spent listening to your voice recordings, transcribing data. Endlessly checking the weather, making flight plans, then revising them when you see the endless fog. Wondering if you will be able to do enough to make it a survey.

But afterwards, you forget about all that. You remember those few exceptional sightings, that big group of humpback whales, the dolphins twinkling in the bow wave in the moonlight or that ocean sunfish, so far beyond its range. You remember how you all laughed when Anita started singing with her cabin microphone on. You remember the beautiful landscapes you flew over on the way to another part of the sea. You remember the islands gliding like a shadow puppet across the orange sky. And you remember the people: your fellow observers, the pilots, the crews (Figure 10). Working as a team and having fun along the way. That's what you remember.

Figure 10. Observer team, Iceland, 2007 (Photo D. G. Pike).

ADHERENCE TO ANIMAL WELFARE PROTOCOLS

The work described in this article was done in accordance with the institutional and national animal welfare laws and protocols applicable in the jurisdictions in which it was conducted.

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