

MARINE MEGAFUNA AT SEA

PROTOCOL FOR DATA COLLECTION FOR DENSITY AND DISTRIBUTION DATA USING ALL PLATFORMS OF OPPORTUNITY

Building a picture of the distribution of highly visible marine marine predators in southern Africa for the second South African Bird Atlas Project (SABAP2)

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Scope and objectives

SABAP2 is a collaborative project between the South African National Biodiversity Institute (SANBI), the Animal Demography Unit (ADU) at the University of Cape Town and BirdLife South Africa. It uses ‘citizen scientists’ to contribute data on bird distributions across the country. A pelagic component is currently being developed, and data can be collected immediately towards this.

We aim to collect distribution and abundance data on seabirds (and other marine megafauna), from any vessel, by anybody willing and able to contribute. We envisage several conservation applications using data that this project should generate, such as to define ‘ocean hotspots’, where visible marine life (such as seabirds or cetaceans) congregate in relative abundance and with some degree of consistency. Another would be to identify important areas for highly threatened species. These areas might become marine Important Bird Areas for BirdLife International, or contribute to the designation of Marine Protected Areas, special nature reserves on the high seas, no-take zones to protect sensitive species from commercial fishing, etc. This resource will be open-access, and will be updated constantly to provide the most up-to-date data and summaries.

This atlas is restricted to two groups: seabirds and other marine vertebrates that are air-breathing. You will be unable to enter data on sharks, other fish or invertebrates, or other kinds of birds or animals into the database. This is because these species are substantially less visible than air-breathing vertebrates, and require entirely different approaches for assessing their distributions and abundances.



The guiding principles in collecting data for an atlas of marine life

Numbers of species are of no use, unless there is a context to those numbers. To be useful, we need to know the *effort* that went into the counting. Effort is the time spent counting, and the area of the sea around the boat that was included in the count. It's as important to record these accurately as it is to do the actual counts properly.

A second important point is to count everything – all species are equal, even if personal preferences do not inspire you to count gulls, or you really only want to count rare petrels. Related to this is counting when there is nothing visible – knowing that a certain patch of ocean had no birds in it is potentially very useful!

A third guideline is somewhat more technical. Counting birds that are flying is very different to counting birds that are settled on the water – moving birds cover big areas – termed 'flux' – and are thus more likely to enter the count area than birds that are sitting still. Treating them the same will introduce a bias towards birds that are flying. These counts should be kept completely separate. You can do simultaneous counts of flying and settled birds, in the same area/transect if you wish, but they must be recorded separately.

Last, and as important as any of the preceding principles, is **DO NOT COUNT SHIP FOLLOWERS**. This includes birds that come in from outside the count area during the count, specifically to investigate the boat. Many birds will also circle or do zigzags around a boat, making it very difficult to know what to do. If in doubt, leave it out.

Some basic rules about counting seabirds at sea

- Do not count ship-followers
- Always count from the bow (front) of the vessel or an elevated point towards the bow, and looking forwards.
- Aside from ship-followers, it is crucial to count every single species – do not focus only rare birds or disregard really common species
- Extreme rarities are not of particular interest for the purposes of this project, but there is a provision for recording these.

In order to participate, you must be able to:

- Identify reliably and with relative ease the large majority of the species present or likely to be encountered (either seabirds or other marine species, or both)
- Record your position and the time of your observations with a GPS
- Submit your data online once you have completed the counts/cruise

Counting seabirds

Although disregarding ship-followers is important, exactly what constitutes a ship-follower is not always clear. As a guideline, if the same individuals were there at the start and the end of the count, or longer, ignore them. If birds come more-or-less straight to the boat from a long distance away, ignore them. However, if birds arrive during the count, and you can reasonably assume that they would have intersected the count area even if the boat wasn't attractive to them, you should include them.

Similarly, although rare birds are not of particular interest, it is still useful to record these even if they fall outside the count area. There is a section on the recording sheet for noting 'specials'. Give lat/long and time of sighting, as well as estimated distance from the vessel for each record if possible.

For each count, always record date, time and position off your GPS, and numbers of all species seen.

Basic presence/absence data

This can be repeated as frequently as possible. There is no need to count the individuals seen, just record species. This is best done as a series of counts per 10 minutes or per hour.

Effort-based 10-minute and snapshot counts

There are three things to decide on before starting the count:

1. Decide on the arc (90° or 180°) from the bow that will be counted (this can vary between counts, as long as you **record what you are doing for each count**). Why would this change? If a low sun or strong reflections makes counting to one side difficult, or there is a sail or bulkhead or some other obstruction, or you are on your own with lots of birds around, count only to one side (90°).
2. Define the distance from the boat that you are counting – typically 50-300 m (this too can vary between counts, but again, **record what you are doing for each count**). Much further than 300 m and small species cannot be reliably identified and are very likely to go unnoticed, which would bias counts against smaller, less visible species, so don't count beyond this distance.
3. Decide on the time you will be counting – either snapshots for lots of flying birds, or 10-minute transects if manageable for flying birds. Always do 10-minute transects for birds on the water

The principle at stake is that you record effort (i.e. how much time was spent counting, and over what area were counts done). From that, regardless of the unit used (snapshot or 10-minute counts, over 50 m or 300 m) we can calculate distribution patterns and an index of abundance. It's important for you to gauge the conditions that you are in and use the units that will provide the most data without risking data quality. For example, if there are large numbers of birds around most of the time, and you do not have dedicated, undisturbed time to do transect counts, a series of 'snapshot' counts over an area that you can safely identify all the species would be best. This can be divided into sub-counts if there are too many species to count simultaneously, so essentially you do multiple 'snapshots' in rapid succession – in this case there is no need to record end time or position for each species' snapshot, as they should be effectively the same as for the first snapshot of that particular count.

Walk through a bird count

1. Note the basic date/time/weather conditions as outlined in the excel spreadsheet – but probably easiest to do this with a notebook.
2. Record the start time and GPS position (either your own or from the ship's system). You can do this in the bridge and then go to the count stations – the loss of accuracy is not a problem if you don't start counting the second you note these details.
3. Decide on the count area (arc around boat, side of boat, distance from boat) and record this
4. Start counting the numbers of each species. You can use shorthands or keys for spp, e.g. BBA for Black-browed Albatross)
5. Try to keep track of birds that come in to investigate the boat or are following – **never count from the back of the boat**
6. After 10 minutes, end the count, note the time (if it's a bit more or less than 10 minutes that's OK, just record the actual time) and record the end GSP position
7. Tally up the species' numbers and enter the data electronically onto the excel spreadsheet

OH HELL – THERE'S TONS OF BIRDS. WHAT DO I DO?

1. Do a 'snapshot count'
2. Note the basic date/time/weather conditions as outlined in the excel spreadsheet
3. Record the time and GPS position
4. Decide on the count area and record this
5. Count each species, in turn, within the count area in a single moment in time. Don't wait for lots of birds before doing the count, just go through the species as fast as you can, one- or a couple of species at a time.
6. The start and end times and GSP points **will be the same** for a snapshot count, even though you will have moved a bit

Counting other marine vertebrates (cetaceans, seals, turtles)

Air-breathing marine vertebrates that spend most of their time in the water (cetaceans, turtles and seals) are typically less visible than seabirds, and often occur at far lower densities. It's useful to count these, but they require slightly different methods for doing so.

Effort-based counts

Record the effort spent seawatching and the vessel's GPS position for each species sighting. To record effort requires:

1. the start and end times and GPS positions
2. the distance between observer and cetacean
3. whether one or both sides were being observed (depending on number of observers)

Non-effort counting

Cetaceans that are identified (and number of individuals counted) incidentally (i.e. not during a dedicated count) should be noted as such, with closest GPS position and time data.