

Supplementary material

The following information on species ranking is based on the final report titled “How accurate are observer reported kills of albatrosses on longlines?” prepared by N. Brothers for the Blue Ocean Institute.

All the encounter seabird species during the experiment were given a ranking from 0 to 10 to reflect their relative ability in first locating and then successfully taking baits and their capture rates based on behavioral characteristics. In increasing ranking order, the behavioral response of each species in bait-taking interactions is as follows.

Rank 0 species did not interact with fishing operations. Consequently, these species do not contribute to the risk score *emp*. Such species (OTH in Table 1) include storm petrels, little shearwater among others.

Rank 1 species were rarely encountered in this study. However, when they are present, these individuals showed limited interest in fishing activity, and tend not to follow the fishing vessel. Species in this group interact little or not at all with the same or other species.

Rank 2 species includes only great-winged petrel. This species is unique in that when present in abundance, they tend to feed amicably and safely without being hooked. When present among other species, great-winged petrels tend to avoid conflict and assume a secondary role in bait-taking events. Although capable underwater, this species has a preference for near-surface bait recovery attempts.

Rank 3 species include the larger species of albatross, the royal and the wandering, both of which are equally inept at bait location and recovery. They lack aerial agility and do not submerge fully in dive attempts. Such limitations put these species at considerable disadvantage, and they are often out-competed by most other species in bait-taking events. At the same time, dominance in terms of aggressiveness and intimidation puts these species at high risk of capture when they have the opportunity to compete directly for a bait that is already taken by another species.

Rank 4 species include cape petrel and grey petrel. Cape petrels are abundant and they have a specific role as one of the most important species for determining the location where a bait is still accessible. They are aggressive among their own species but are readily intimidated by most other species. Seldom actually caught, this species is however indirectly responsible for the capture of many other species. Grey petrel is also a locator of baits and have limited surface dive capability.

Ranks 5 to 8 species are 13 albatrosses, with the ranking reflecting their relative aggressiveness, agility and diving capabilities. In particular, two albatross species from the northern hemisphere have two remarkably similar counterparts in the southern hemisphere. Shy albatross (south) and black-footed albatross (north) are a close match, and also the pair black-browed albatross (south) and Laysan albatross (north). Both pairs of species exhibit similar physical attributes, and behavioral responses toward the bait, their own species and other species. Rank 6 species are fast and maneuverable in flight and have well developed diving capabilities, but they tend to be readily intimidated and either relinquish baits or abort bait-taking attempts.

Ranks 9 and 10 species are among the most aggressive and persistent in bait-taking attempts. Grey petrel in rank 9 is very similar to white-chinned petrel in behavioral attributes, but grey petrel is much more timid and easily intimidated whereas white-chinned petrel will fight aggressively. The risk of capture for all other species escalates when grey petrel and white-chinned petrel are present. Black petrel most resembles grey petrel and along with white-chinned petrel all three species in contrast to shearwaters are equally adept in all aspects both in day and at night. Antarctic skua are the most aggressive, persistent and successful species in bait-taking. This species may be more alert than other species to potential danger when removing bait from a hook, and is the species least often caught.

Table 1 Species ranking based on their relative ability to locate and take baits from baited hooks in pelagic longline fisheries. See Table 2 for species codes.

| Ranking | Species codes |
|---------|-------------------------|
| 0 | OTH |
| 1 | ANP, ANF, MOT, SPP, WHP |
| 2 | GWP |
| 3 | RAN, RAS, WAL |
| 4 | CAP, GPE |
| 5 | BFA, SHY |
| 6 | BUL, LMS, SAL, SOT |
| 7 | GHA, YNA |
| 8 | BBA, LAY |
| 9 | BKP, GRP, SHW, SKU |
| 10 | FFS, WCP |

Table 2 Seabird species codes.

| Code | Common name(s) | Scientific name(s) |
|------|---|---|
| ANF | Antarctic Fulmar | <i>Fulmarus glacialisoides</i> |
| ANP | Antarctic Petrel | <i>Thalassoica antarctica</i> |
| BBA | Black-browed Albatross (2 species) | <i>Thalassarche melanophris</i> and <i>T. impavida</i> |
| BFA | Black-footed Albatross | <i>Phoebastria nigripes</i> |
| BKP | Black petrel (including Westland) | <i>Procellaria parkinsoni</i> , and <i>P. westlandica</i> |
| BUL | Buller's Albatross | <i>Thalassarche bulleri</i> |
| CAP | Cape Petrel | <i>Daption capense</i> |
| FFS | Flesh-footed Shearwater | <i>Ardenna carneipes</i> |
| GHA | Grey-headed Albatross | <i>Thalassarche chrysostoma</i> |
| GPE | Giant Petrel (2 species) | <i>Macronectes giganteus</i> and <i>M. halli</i> |
| GRP | Grey Petrel | <i>Procellaria cinerea</i> |
| GWP | Great-winged Petrel | <i>Pterodroma macroptera</i> |
| LAY | Laysan Albatross | <i>Phoebastria immutabilis</i> |
| LMS | Light-mantled Sooty Albatross | <i>Phoebetria palpebrata</i> |
| MOT | Mottled Petrel | <i>Pterodroma inexpectata</i> |
| RAN | Northern Royal Albatross | <i>Diomedea sanfordi</i> |
| RAS | Southern Royal Albatross | <i>Diomedea epomophora</i> |
| SAL | Salvin's Albatross | <i>Thalassarche salvini</i> |
| SHW | Shearwater (including Sooty, Short-tailed and wedge-tailed) | <i>Ardenna grisea</i> , <i>A. tenuirostris</i> and <i>A. pacificus</i> |
| SHY | Shy Albatross (2 species) | <i>Thalassarche cauta</i> and <i>T. steadi</i> |
| SKU | Subantarctic Skua | <i>Stercorarius antarcticus</i> |
| SOT | Sooty Albatross | <i>Phoebetria fusca</i> |
| SPP | Soft-plumaged Petrel | <i>Pterodroma mollis</i> |
| WAL | Wandering Albatross (4 species) | <i>Diomedea exulans</i> , <i>D. antipodensis</i> , <i>D. dabbenena</i> and <i>D. amsterdamensis</i> |
| WCP | White-chinned Petrel | <i>Procellaria aequinoctialis</i> |
| WHP | White-headed Petrel | <i>Pterodroma lessonii</i> |
| YNA | Yellow-nosed Albatross (2 species) | <i>Thalassarche chlororhynchos</i> and <i>T. carteri</i> |