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Killer whale hunting of pinnipeds in the Falkland Islands



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Introduction

Killer whales (*Orcinus orca*, KW) are apex predators with variable feeding strategies, peculiar diet specializations and complex hunting tactics involving the collaboration of various socially bonded individuals. Pinniped hunting by KW has been studied in various places of the Southern Hemisphere, but not in the Falklands, where anecdotal information suggest the presence of regular predation of southern elephant seals (SES; Fig. 1) and southern sea lions (SSL). We studied KW hunting strategies at Sea Lion Island (SLI), the main SES breeding site in the Falklands (pup production ~ 650), that also shelter a SSL breeding colony (pup production ~ 60).



Fig. 1 – KW hunting on a weaned SES pup (head strike)

Methods

We studied KW at SLI from September 2013 to March 2014 (210 days). We carried out: 1) daily shore-based surveys of the coastline (5542 km walked); 2) observations (2-hours periods and ad libitum) from vantage points (6641 hours); 3) regular counts of SES and SSL (at least weekly); 4) necropsies of dead pinnipeds found on the beaches. SES were marked with flipper tags and dye marks to permit individual identification. SSL were not marked. During all KW sightings, we collected data on the location, weather and sea condition, number, group composition, general activity and hunting behaviour, and we took photos to confirm KW identity by comparison with a photo-ID catalogue.

Results

KW activity in time and space

- KW sightings (N= 428) showed a first peak in November, at the end of the SES breeding season, when the density of weaned pups was higher, and a second peak in February, at the end of the SSL breeding when pups started moving into the water (Fig. 2).
- In October-December KW sightings were concentrated off the sand beaches where 95% or more of SES females breed, while in January-March the main KW activity was a patrolling loop centred on the SSL breeding colony.

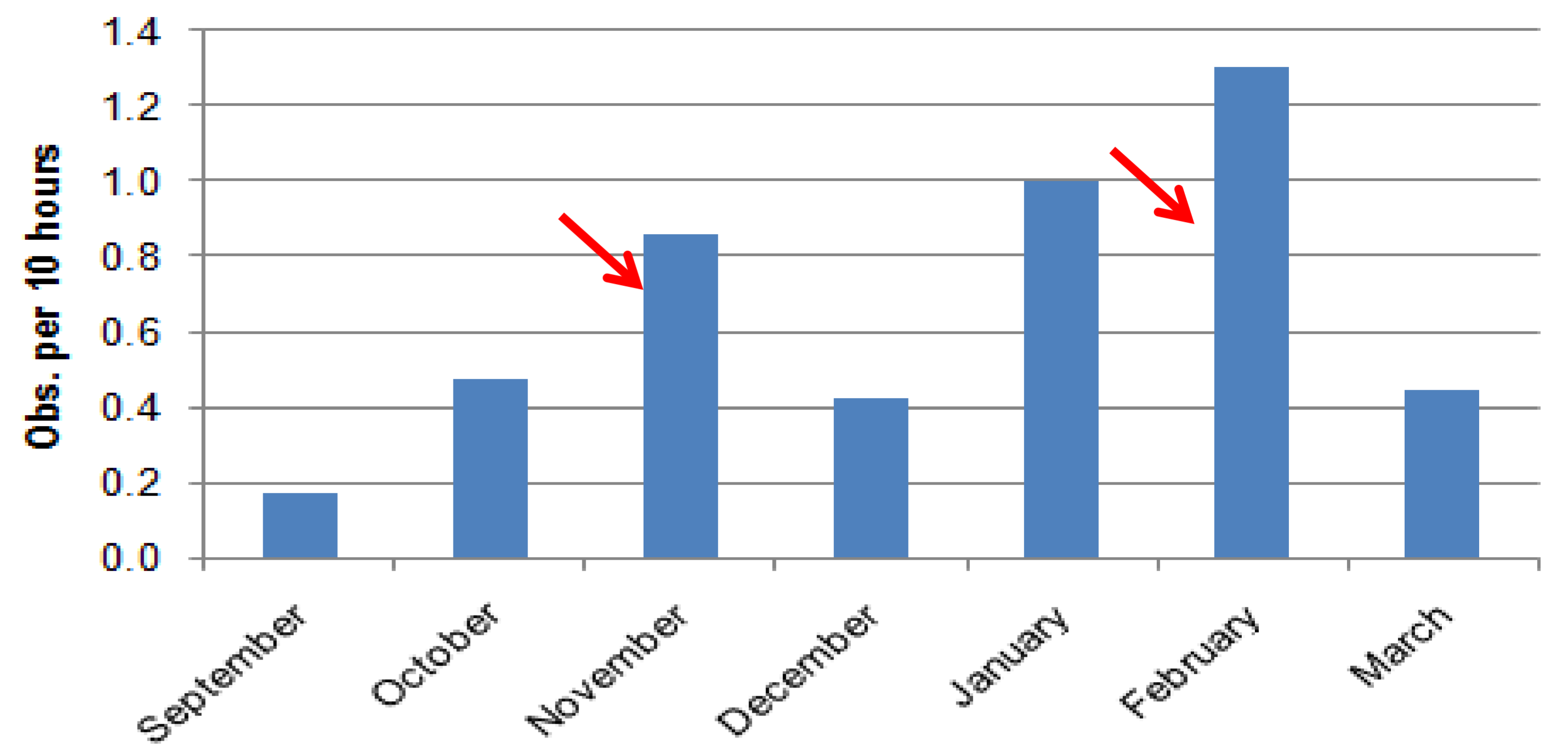


Fig. 2 – Time distribution of KW sightings, with the two peaks

Predation events

- We observed 71 likely predation events (1.07 per 100 hours of field work), 39 of which were sure (54.9%).
- Most events (67.7%) occurred in November and December, when the density of weaned SES pups was higher.
- SES were the main prey (79.1% of attempts), followed by SSL (11.6%), and penguins of different species (9.3%).
- Hunting success was 41.3% for all preys, and 42.4% for SES. All attacks on SSL were unsuccessful.
- Among SES, the success rate was sex and age class specific (Fig. 3), but was above 50% only for weaned pups (67.0%)

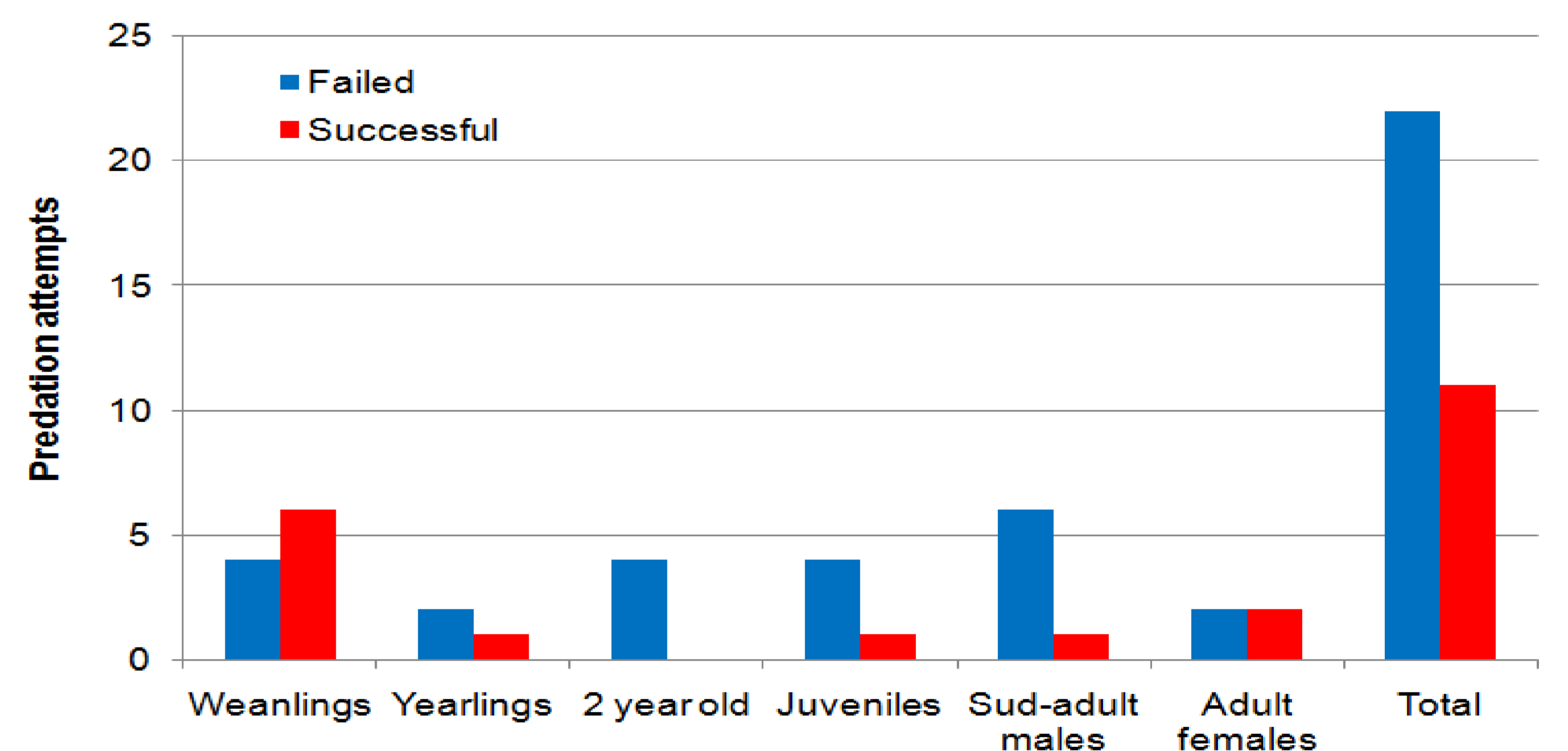


Fig. 3 – Class specific success of hunting attempts on SES

Hunting behavior

- KW showed patrols close to the coastline (~30% of time budget), active search of SES and SSL, and chases of them.
- KW successfully adopted a peculiar technique to hunt SES weaned pups, doing complex maneuvering to enter a small, shallow water, cove with a very narrow access channel.
- KW showed cooperative hunting, with up to 8 individuals involved in chase, capture, and/or consumption of the prey.

Conclusions

- The distribution of sightings, synchronized in time and space with the distribution of SES and SSL, suggest that pinniped hunting is possibly the main reason of presence of KW at SLI.
- KW show complex and effective SES hunting techniques, that permit them to kill even large adult male, but their overall success is low, and has a limited effect on SES demography.
- The general diet of KW in the Falklands is still unknown, and the energetic contribution of pinniped preys to it is uncertain, and deserves further study.