

INSIDE JEB

Instead of stealth: Antarctic fur seals actively pursue startled fish



A female Antarctic fur seal (*Arctocephalus gazella*) with a data-collecting tag attached to her head.

For marine mammals, hunting in the ocean is a perennial cat-and-mouse chase. Pitched against smaller agile prey, larger predators might seem to be at a massive disadvantage. Yet, bulky southern elephant seals (*Mirounga leonina*) have overcome the challenge of capturing more nimble fish. They depend on stealth. Detecting the wakes of near-by fish, the surreptitious hunters have already been stealing up on their next snack for seconds before their victim notices. But it wasn't clear whether other, more manoeuvrable, seals follow the southern elephant seal's deceptive example, or opt for a more reactive strategy, actively pursuing prey that they have already startled. As Antarctic fur seals (*Arctocephalus gazella*) are more agile than the larger southern elephant seal, Mathilde Chevally and colleagues from the Centre d'Etudes Biologiques de Chizé, CNRS, France, decided to follow the manoeuvres of female Antarctic fur seals as they embarked from their birthing beaches on the Kerguelen Islands in the Southern Ocean on their extensive foraging journeys.

Based at an isolated hut on the island, Chevally, Tiphaine Jeanniard du Dot and

Lola Gilbert (CNRS) gently attached state-of-the-art motion-sensing tags – incorporating a depth recorder and miniature sonar – to the seals' heads to record their manoeuvres and log when fish, and other prey, were nearby as the seals dived at night. 'It was a bit stressful to let our eight females leave with thousands of euros worth of tags on their heads, but we were super excited at the idea of discovering the unprecedented data they were going to bring back', says Chevally. Eight days later, all of the seals returned with their motion-sensing tags in place, having recorded ~15,000 dives on their 400 km odysseys as the seals mounted ~4000 attacks, with the sonar successfully logging fish in range on 1117 occasions.

Analysing the fish's responses to the impending threat, the team realised that 65% of individual fish took evasive action, but only within 0.43 m range and during the second before they were snapped up, at roughly the same time the seal first noticed the fish. The fur seals were definitely not spying their prey from afar and sneaking up on them unawares. Chevally suspects that the fur seals' lack

of stealth might have something to do with the depths at which they hunt. 'In shallow waters (20–40 m) where Antarctic fur seals forage, surface turbulence and wave noise might dampen long-range cues and prevent the seals from sensing prey at long distances. On the other hand, this turbulence is reduced at the greater depths (200–600 m) where elephant seals forage', she explains.

The team also noticed that the hunting seals tended to sail along gently, propelled horizontally by front flipper strokes once every 5 s, as they searched for prey. However, as soon as a seal noticed a shoal of nearby fish, it switched to high-speed pursuit, accelerating hard in the 1–2 s prior to striking, turning and rolling swiftly before overwhelming a victim. However, when the seals encountered individual fish, they swept in more directly, striking as the fish made a bid for freedom.

Female Antarctic fur seals definitely work harder for their dinner than stealthy elephant seals that sneak up on prey unawares, but what impact does the fur seals' higher-octane lifestyle have on their diet? 'In general, active predators select highly nutritious prey, such as large muscular squid, to compensate for the high energy costs associated with bursts of acceleration', says Chevally, and Antarctic fur seals use the same strategy, preferring to dine on highly nutritious lantern fish (*Gymnoscopelus* species), and possibly even krill, to fuel their fast-paced attacks.

10.1242/jeb.247866

Chevally, M., Guinet, C., Goulet-Tran, D. and Jeanniard du Dot, T. (2024). Sealing the deal – Antarctic fur seals' active hunting tactics to capture small evasive prey revealed by miniature sonar tags. *J. Exp. Biol.* **227**, jeb246937. doi:10.1242/jeb.246937

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