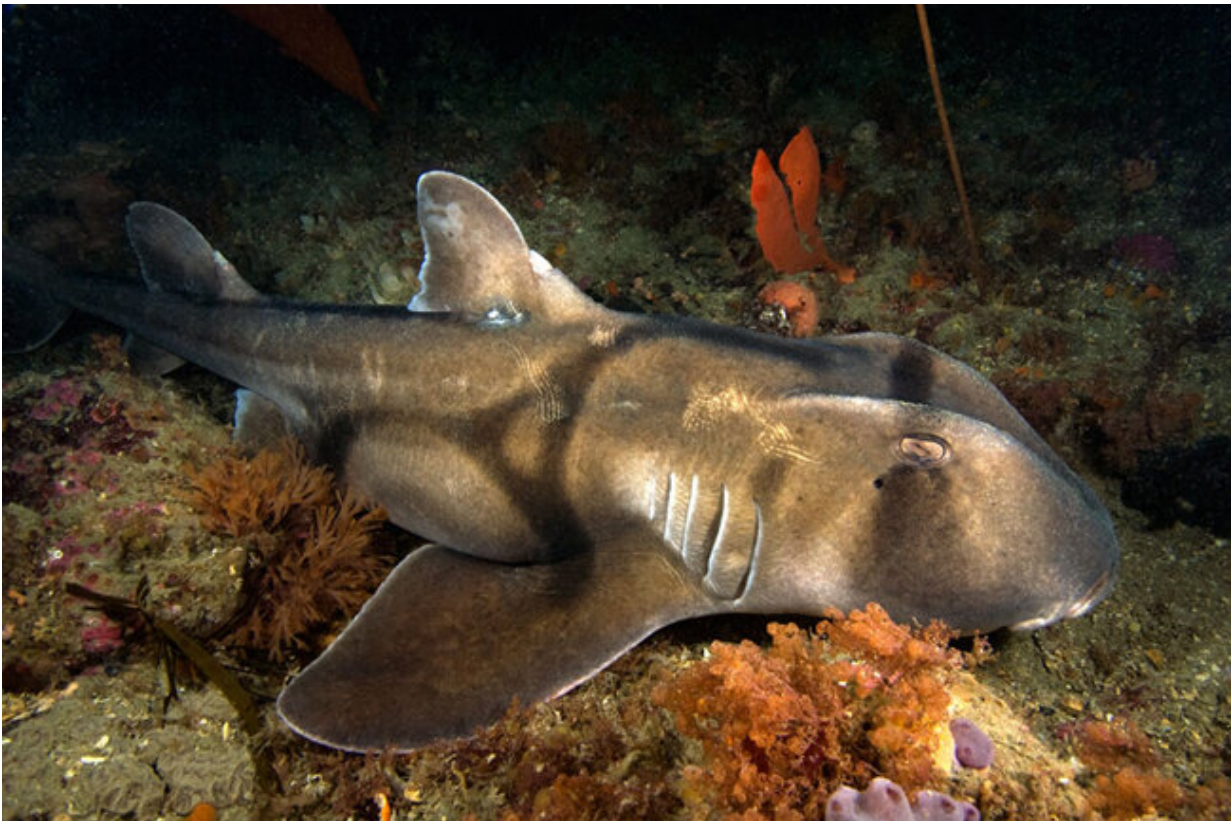


# Sharks lose their natural response with prey if not frequently rewarded

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A Port Jackson Shark, *Heterodontus portusjacksoni*, at Wilsons Promontory, Victoria. Credit: Mark Norman / Museum Victoria. Wikimedia Commons, [CC BY 3.0](#)

New research studying the behavior of Port Jackson sharks has captured their astute ability to realize when the smell of natural prey doesn't lead

to a feeding opportunity.

The study by shark ecologists at Flinders University and Macquarie University revealed sharks' response to the smell of food declined if not sufficiently rewarded by the promise of eating, suggesting they can learn to avoid wasting time and energy on inaccessible food sources.

The researchers say the results, published in *Animal Behaviour*, are a catalyst for better understanding sharks' evolutionary ability to learn and their response to tourism that uses food or smell to attract sharks to the proximity of visitors.

The researchers used three groups of captive Port Jackson sharks to study their response to smell across different reward frequencies—the first group was rewarded with food every time they reached a target, the second was only rewarded every other day, and the third group was never rewarded.

The group of sharks that was always rewarded quickly learnt the task and became better and faster at reaching the target.

However, the opposite was true for the un-rewarded sharks, where they observed a reduction of their natural response to the smell and stimulus of potential food, with sharks no longer leaving their starting position.

"Our study revealed that while shark behavior can change when frequently rewarded with food, the learnt response diminishes when reward frequency is decreased and even disappears when no reward is provided," says lead author and recently finished Ph.D. student at Flinders University, Dennis Heinrich.

"The observed decline in response to a repeated stimulus, or habituation, may act as a driver of optimal foraging strategies, enabling sharks to

quickly abandon low-yielding foraging patches in search of more productive sites."

Senior author and marine ecologist Professor Charlie Huveneers at Flinders University says there's still a lot we don't know about shark behavior.

"One of the questions I'm most often asked is how much can sharks learn, and how this relates to wildlife tourism that uses food or smell to attract sharks," says Professor Huveneers.

"From a wildlife tourism perspective, our results show that learnt behavior can be reduced by decreasing feeding frequency, but that using olfactory cues only (i.e. smell) might not always be sufficient.

"The knowledge gained from this study can help account for learnt behaviors and habituation when managing wildlife tourism moving forward. A balance needs to be found between attracting sharks for tourism purposes and minimizing behavioral response and possible learnt behaviors."

The researchers say the next step is to test their findings with species that are more commonly targeted by wildlife tourism, such as white sharks, and determine if habituation can be detected at [tourism](#) locations.

**More information:** Dennis D.U. Heinrich et al, Shark habituation to a food-related olfactory cue, *Animal Behaviour* (2022). [DOI: 10.1016/j.anbehav.2022.03.003](https://doi.org/10.1016/j.anbehav.2022.03.003)

Provided by Flinders University

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