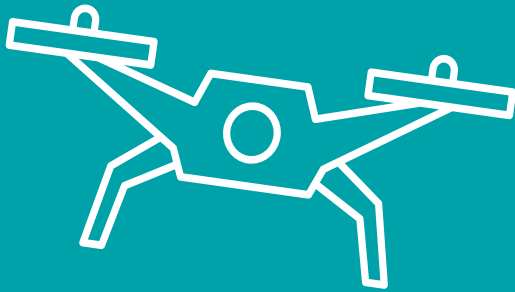


# IMPACT STORY

Sounding the alarm on the  
use of drones for recreational  
fishing in South Africa





To get an idea of when and where the popularity of drone fishing had risen, Hub researchers surveyed social media platforms for groups dedicated to drone fishing and used Google Trends to track internet searches for 'drone fishing.'

**D**rone fishing - is a relatively recent innovation in which recreational anglers use personal drones to fly baited lines into otherwise inaccessible areas of water or perform reconnaissance for optimal fishing areas. In South Africa, Hub researchers at Rhodes University and colleagues from the University of Cape Town and the Oceanographic Research Institute conducted transdisciplinary research to shine a light on this practice, making an urgent call for increased research and management.

### Research responding to community's concern

"We became aware of the practice of drone fishing in South Africa in part thanks to recreational fishers who approached us with their concerns. Anglers shared pictures of unregulated drone-assisted catches of fish in prominent fishing areas. We agreed it was an important practice to investigate, but we were faced with a challenge: few, if any, monitoring programs existed to provide data", **Alexander Winkler** (Ichthyology and Fisheries Science Department, Rhodes University) says.

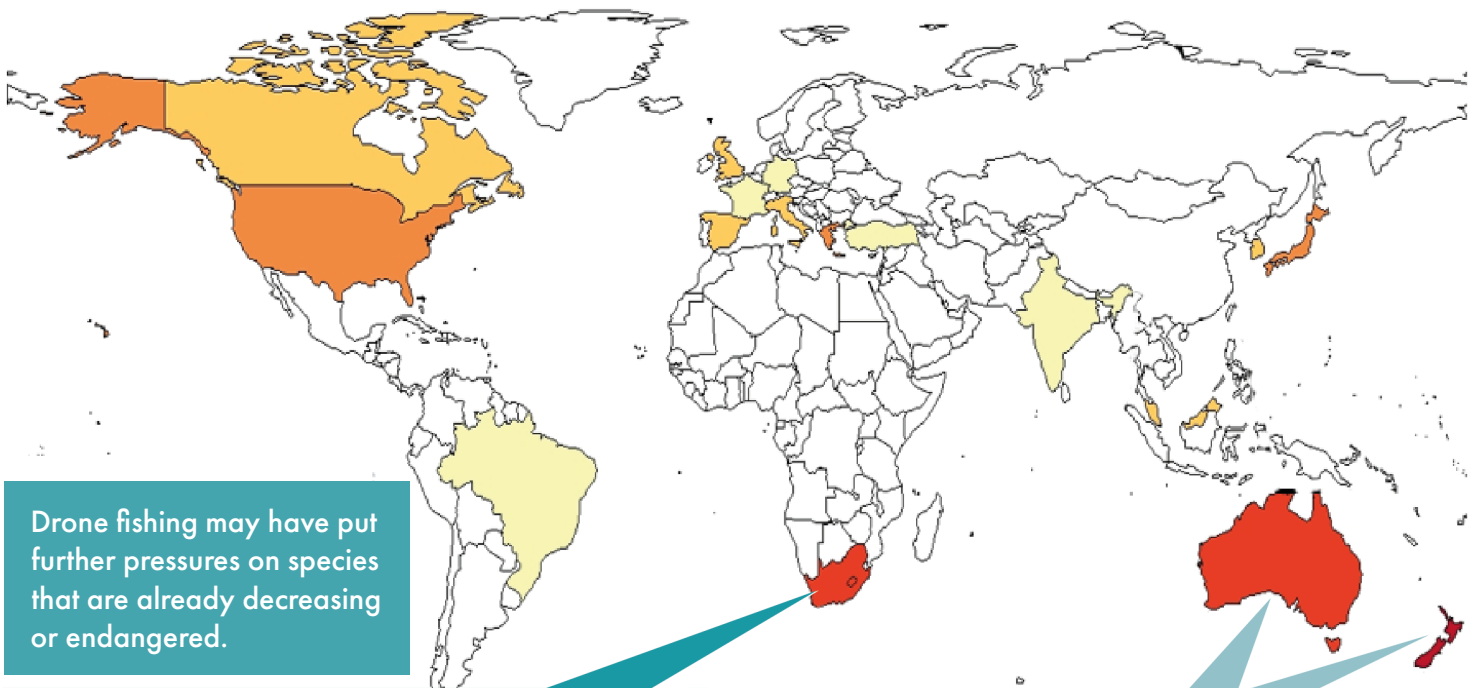
### Innovative research methods for an emerging phenomenon

To study this largely unmonitored practice, we took an unconventional approach, using publicly available online monitoring to estimate the growth of interest, global extent, and catch composition of drone fishing. To get an idea of when and where its popularity had risen, we surveyed social media platforms for groups dedicated to drone fishing and used Google Trends to track internet searches for "drone fishing." Results indicated a 357% spike in interest in 2016, after the release of a very popular YouTube video of an angler catching a large longfin tuna from an Australian beach using a drone. Online interest was predominantly in three countries: New Zealand, South Africa, and Australia.

To get an idea of which fish species were targeted, we then watched 100 YouTube videos posted by drone fishers in the three countries of highest online interest. In both New Zealand and Australia, the most frequently observed catch was red snapper, which is not a species of direct conservation concern (though recent data suggests population declines). In South Africa, though, sharks made up the majority of reported catches.

### A transdisciplinary lens

Having established interest in and the presence of drone fishing in South Africa, we sought to consider the issue holistically. How could the use of drones affect targeted fish and their environment and habitats? How might other animals inhabiting the coastal zone be impacted?



Drone fishing may have put further pressures on species that are already decreasing or endangered.

**Dusky Shark population is ENDANGERED in South Africa**

**Red Snapper population is DECREASING in Australia and New Zealand**

Importantly, how could drone fishing impact the many other people utilising the coastal zone? These different facets required a transdisciplinary approach to analyse what we term the socio-ecological system. We consulted commercial drone operators, legal researchers, and others to examine the economic, political, legal, ecological, and physiological aspects of drone fishing. Our resulting 2021 article in *Ambit* provides analysis of potential impacts, including:

- **impacts on fish stocks and individual fish** – Drones with cameras allow anglers to identify ideal fish habitats far from the shore. These areas had previously offered refuge from anglers, too far to reach by casting from the shore and yet still in the active surf zone and so dangerous for boat anglers. In addition to potentially eliminating the protection offered by such areas, drone fishing can place fish at greater risk even when they are not caught by fishers. Although a substantial proportion of recreational catches are caught and released, fish are less prone to survival when this occurs farther offshore. In our paper, we caution that a large fish hooked hundreds of metres offshore is likely to experience extreme exhaustion and physiological disturbance and may be at greater risk of depredation (being consumed by other predators).
- **impacts on habitats and other animals** – Another concern is the potential loss of fishing tackle by drone fishers. During angling, it is common to lose tackle, either when it gets stuck in rocky habitats or through tackle

failure while fighting large fish such as sharks. Both scenarios may result in hundreds of metres of fishing line remaining in the ocean. In addition to polluting the marine environment, such debris threatens to entangle birds, marine mammals, and turtles. Specialised rigs do exist that reduce debris in case of break-offs, which drone anglers can use. Our paper flags the importance of investigating the impact of drone fishing on the already serious problem of marine debris.

- **socio-economic considerations** – In South Africa, drone fishing is only accessible to affluent recreational anglers who can afford personal drones. However, those anglers target many of the same species as small-scale/subsistence fishers who fish primarily for food security. Increased catches by anglers using drones may increase intersectoral conflict between recreational

**We became aware of the practice of drone fishing in South Africa in part thanks to recreational fishers.**



- Alex Winkler (Ichthyology and Fisheries Science Department, Rhodes University)

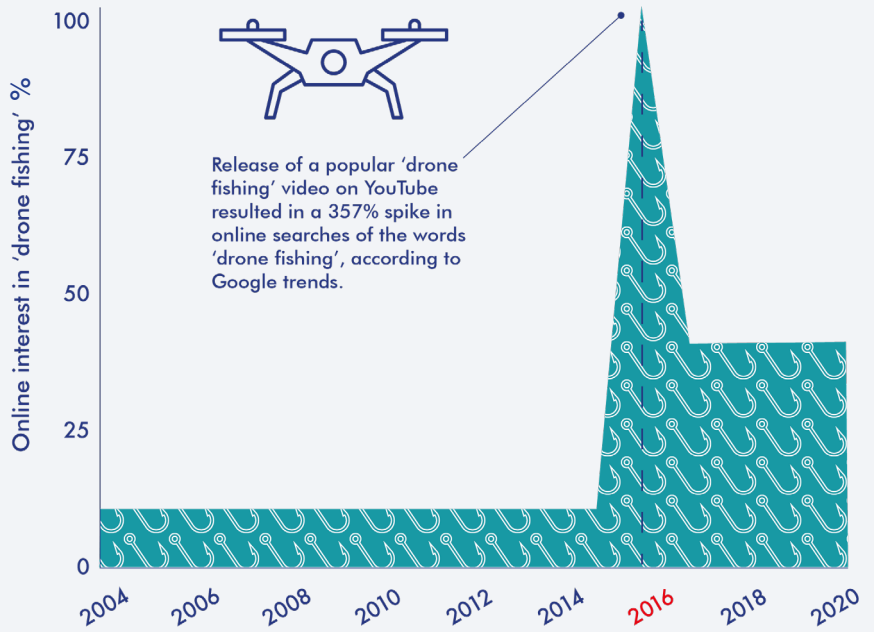


Photo: <https://gannet.co.za/products/mavic-pro-gannet-bait-release>

fishers and other fisheries groups. We urge government managers to monitor for conflicts between drone fishers and other littoral zone users.

- **privacy concerns** – Given the increased use of drones for fisheries reconnaissance and rapid advances in technology, there is a near-term possibility that drones may be used to continually monitor and broadcast live information on fish distribution and fishing conditions over the internet. This could increase already existing concerns of other public beach user groups for their privacy.
- **unclear governance** – At the time of the 2021 paper, there were no specific regulations relating to drone fishing in any country, including South Africa. Our paper draws attention to national legislation that could be indirectly used to regulate the practice. For example, the national Civil Aviation Authority law doesn't allow the dropping of payloads (such as a baited line) from recreational drones.

**Increased catches by anglers using drones may increase intersectoral conflict between recreational fishers and other fishing groups.**

Commercial drones must receive permission to drop payloads, and anyone using a drone for commercial use must be licensed as a commercial drone pilot. This could be enforced in cases of professional angling guides and drone operators charging shore anglers a fee to drop their baited hooks farther offshore.

**IMPACT!**  
Shortly after the Hub's paper was published, the South African government deemed the use of drones and other electronic devices illegal in marine recreational fishing.

**Impactful research**

Our 2021 article demonstrates the strength of transdisciplinary research in grappling with emerging practices that impact our physical and social worlds. The article establishes grounds for concern about the impacts of drone fishing and lays out suggested priorities for further research and monitoring by government agencies, conservation scientists, legal scholars, and social scientists.

In 2022, the South African Department of Forestry, Fisheries and the Environment (DFFE) took concrete action on this issue for the first time. Three of our co-authors are part of the DFFE Linefish Management Working Group, which includes marine recreational fishing, and they shared the paper with representatives of the DFFE.

Shortly after, the DFFE released a public notice warning recreational anglers that the use of drones and other electronic devices is deemed illegal under the South African Marine Living Resources Act (MLRA 1998).

The Act is interpreted as limiting recreational fishing “both from shore and from vessels, to fishing by manually operating a rod, reel and line.” The notice explicitly prohibits the use of drones and other remotely operated vehicles for angling. Considering the timing of the notice and the actors’ relationships, it’s possible that our paper alerted DFFE to the extent of drone fishing and its potential dangers to South Africa.



Large fish hooked hundreds of metres offshore are likely to experience extreme exhaustion and physiological disturbance and may be at greater risk of depredation (being consumed by other predators) .

Though we can't be sure of a causal relationship, what is clear is that the practice of drone fishing in South Africa's coastal waters was allowed to rapidly grow unregulated, without oversight or timely engagement by the relevant regulatory authority. Lead author Dr. Alexander Winkler notes that "given the length of time the practice was given to grow, this highlights the incapacity of the management authority to recognise an ongoing illegal threat to its inshore fisheries resources and potentially the need for researchers to highlight these issues." This confirms the need for a whole-of-society approach as called for by the [2022 Global Biodiversity Framework](#).

The One Ocean Hub has provided a structure in which researchers can invest in making connections – with impacted communities, across disciplines, and into spaces of governance. Communities on the ground alerted us to concerns around the practice of drone fishing before it was formally monitored.

By taking a transdisciplinary approach to fisheries research, we wove together different kinds of knowledge to provide a holistic perspective of the potential impacts of drone fishing. And our connections to bodies of governance informed our recommendations, helped spread word of the analysis, and may have pushed a government agency to decisive action.

**References:**

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Department of Forestry, Fisheries and the Environment, South Africa. 24 February 2022. "Public Notice: Use of Motorised Equipment for Recreational Angling: Drones and Remotely Operated Devices and/or Vehicles." Available [here](#).



Photo: Sandy-Nghipangelwa

Interviewing a recreational angler

