Study reveals unintended impact of conservation policies

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New research involving the University of East Anglia (UEA) shows how conservation polices can avoid having unintended consequences for local ecosystems and people.

The study investigates the closure of a marine area in the western Pacific Ocean to fishing and the possible impact on offshore fish supply chains and nearshore ecosystems. The landmark Palau National Marine Sanctuary (PNMS) came into force in January and protects 80 per cent of Palau's waters, making it one of the largest marine protected areas in the world.

The research, conducted by scientists at the Stanford Center for Ocean Solutions (COS) and University of Hawai'i at Mānoa, with partners in Palau and economists in Italy and the UK, shows that the PNMS policies which restrict industrial offshore fishing could drive up offshore fish prices and, in turn, increase tourists' consumption of reef fish.

However, the results also highlight how food branding provides economic opportunities—if tourists are offered a local and sustainable offshore fish choice, this unintended environmental impact on nearshore reef ecosystems can be avoided.

Published in the journal *Nature Food*, the study is part of ongoing efforts to investigate how the PNMS can help Palauans conserve biodiversity and ensure future food security.

As other nations look to meet international protected area agreements and conservationgoals, studies that analyze socioeconomic trade-offs for food systems will becomeincreasingly important for designing effective and sustainable protected areas, as well assound conservation policies.

"Our study highlights why actions to protect nature need to consider impacts to local food supply and how food branding could curtail these impacts," explained lead author Dr. Staci Lewis at COS. "The establishment of a sustainable brand of offshore fish could minimize the [PNMS's] unintended impacts to reef fish consumption as well as generate economic opportunities for local fishers."

The research team surveyed more than 400 tourists in Palau to understand how conservation policies might impact tourists' behavior and food preferences. In particular, they explored how food systems respond to conservation policies, yet also create potential win-win solutions benefiting local economies and reef ecosystems.

Co-author Dr. Silvia Ferrini, from UEA's School of Environmental Sciences, said: "This research brings under scrutiny the challenges of conservation policies. Local decision makers, scientists and economists worked together to broaden our understanding of conservation policies and design solutions to overcome unintended consequences.

"The moral is that the protection of natural resources commands a systematic analysis of the three pillars of sustainability: environment, economic and society. We anticipate that other conservation policies, for example the Fisheries Act 2020, might experience negative effects, and so timely and collaborating research is vital."

According to this study, tourists are willing to pay up to $15 more for a local, sustainable offshore fish meal. By offering tourists this choice, their demand for reef fish meals would not increase, avoiding environmental impacts to cultural and ecologically important Palauan reef systems.

One of the study's Palauan researchers, Lincy Marino from Palau International Coral Reef Center, said the research was important for Palau: "We Palauans rely on our natural resources, not just for food, but for our culture and traditions. This paper provides important information to our leaders so they can create policies that ensure the PNMS will benefit all of us."

More information: Lewis, S.A., Fezzi, C., Dacks, R. et al. Conservation policies informed by food system feedbacks can avoid

unintended consequences. *Nat Food* (2020).
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