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## **NCEAS Research Sheds Light on Achieving Conservation's Holy Grail**

Solutions that meet the broad, varied, and often competing priorities of conservation are difficult to come by. Research published in the March 28 edition of the Proceedings of the National Academy of Sciences takes a hard look at why, in an effort to find ways to resolve the issue.

"People often think of conservation solutions that are effective, cost-efficient, and equitable -- the so-called triple bottom line solutions -- as the holy grail, the best possible outcome," said Ben Halpern, researcher at UC Santa Barbara's National Center for Ecological Analysis and Synthesis (NCEAS), and the lead author of the paper titled, "Achieving the triple bottom line in the face of inherent trade-offs among social equity, economic return and conservation."

As stakeholders, conservationists, and governments work diligently to achieve cost-efficient and effective conservation solutions that are also fair, it becomes obvious that reaching one goal often comes at the expense of another.

"We developed and tested methods for discovering these ideal solutions and found a surprising result," said Halpern. "As you increase the equity of how conservation benefits are distributed to people, you compromise your ability to maximize conservation outcomes."

To examine the relationship of equity, which relates to how a person or group perceives the relative availability (or deprivation) of resources, to the other conservation goals in the triple bottom line, the researchers used three very different case studies dealing with marine conservation to test their ideas: the process to create marine protected areas (MPAs) off the central coast of California; the southeast Misool MPA in Raja Ampat in eastern Indonesia; and the Coral Triangle in southeast Asia. In each case, as conservation scores and outcomes were increased (usually the result of limiting access to certain areas or the amount and/or species that can be taken from those areas), equity declined.

Meanwhile, the study also showed that both equity and conservation could be achieved, but by raising total budgets, sacrificing the goal of cost-efficiency.

Although triple bottom line outcomes are touted as ideal, said Halpern, the reality is that few people probably actually want such outcomes.

"Different people have more or less invested in managed systems and so don't necessarily expect to receive equal benefits," he said. "For example, if I've fished a place for 40 years and based my entire livelihood on that, whereas my neighbor just moved to town and fishes once a month recreationally, why should we be treated equally when it comes to making decisions about managing fisheries?"

Carissa Klein, a co-author from The University of Queensland, pointed out that "although equity can compromise conservation outcomes, it plays a significant role in conservation." Highly inequitable solutions, according to the study, decrease the likelihood of success because those disenfranchised have little motivation to adhere to conservation programs. But, while increased equity increases the likelihood of self-enforcement, it is also likely that ignoring a vocal and powerful minority will lower the chances of success.

So are there any decisions that can guarantee achieving the triple bottom line of effectiveness, cost-efficiency, and equitable conservation outcomes? Yes and no, said Klein. "It depends some on how one defines equity, and people have different types of equity that they care about. It may be easy to have equity in stakeholder engagement, i.e. all affected parties engaged in the process of making a decision, even if the outcome is inequitable. This may ultimately satisfy all the stakeholder groups."

"There's no single way to achieve triple bottom line outcomes," said Halpern. "Instead, we provide a tool for transparently and quantitatively understanding where, why, and how one can increase the chances of achieving these outcomes, and in which cases it is not likely possible," he said.

Scientists involved in the research are affiliated with UC Santa Barbara's NCEAS, Center for Marine Assessment and Planning, and Bren School of Environmental Science & Management; the Australian Research Council Centre of Excellence for Environmental Decisions and Global Change Institute at the University of Queensland; Conservation International; The Nature Conservancy, and the Natural Capital Project at Stanford University.

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