New tool helps align investment with objectives in biodiversity conservation

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 One of the balancing acts faced by conservation agencies is how to conserve and protect as many species as possible from extinction with limited funding and finite resources. In the U.S., conservation agencies are supported and guided by the Endangered Species Act, the seminal wildlife conservation tool signed by President Nixon in 1973, but which is currently being reviewed by Congress.

Over time, the number of threatened and endangered species added to the ESA has grown faster than the funding for their recovery. As a result, conservation agencies have struggled in making decisions about how to apply the available resources to the greatest effect.

The result of this inadequate funding has been that while the ESA has brought back many species from the brink of extinction many of those species remain on “life support,” never fully recovering to independence once again. This adds fuel to the debate over the effectiveness of the ESA.

“The ESA requires that responsible agencies restore listed species to a point where they are secure, self-sustaining components of their ecosystem,” explains Leah Gerber, an Arizona State University professor in the School of Life Sciences and the founding director of the Center for Biodiversity

Outcomes. “This is arguably an impossible goal given the significant human impact on species and their habitat, and a budget that is a fraction (roughly 20 percent) of what is needed to recover listed species.”

Gerber is part of a team of researchers who developed a tool that can be used to help guide conservation scientists in making decisions on how to best use limited funds to conserve the greatest number of species. The tool was developed in collaboration with U.S. Fish & Wildlife Services (USFWS) scientists in a two-year project supported by the National Socio-Environmental Synthesis Center [1]. The tool, called the Recovery Explorer [2], can be used to evaluate potential consequences of alternative resource allocation strategies. This work was motivated, in part, by past critiques of USFWS recovery allocation processes.

The researchers write about the Recovery Explorer in “Endangered species recovery: A resource allocation problem” in the Oct. 19, 2018 issue of Science. Gerber said that Recovery Explorer can be used on a laptop or in a decision-theater type environment.

For example, it can be used to examine how different values-based inputs (e.g., desires for taxonomic representation or regional parity in funding) influence optimal allocation and recovery outcomes; or the effect of uncertainty in technical inputs (e.g., extinction risk, cost) on funding allocation and outcomes.

“The tool is meant to be exploratory, not prescriptive, allowing decision makers to examine alternative approaches to resource allocation by making the important components of the decision process transparent,” explained Gerber, who also is an ASU senior sustainability scientist.

“In my view, one of the most promising possibilities of the tool is that it can be used to estimate what outcomes will be gained for a given investment,” she added. “For example, if a private donor is willing to give $3 million toward biodiversity conservation, we can provide a list of possible actions that align with the specified objectives.”

Gerber and Michael Runge, a research ecologist with the U.S. Geological Survey’s Patuxent Wildlife Research Center, led the team of conservation scientists from around the world in developing the tool.

“We designed the recovery explorer tool to allow managers to compare the consequences of different allocation approaches,” Runge explained. “We also include options for managers to include objectives related to taxonomic, regional inclusion or other societal values.”

“This is a potentially valuable addition to the Fish and Wildlife Service’s recovery toolkit,” said Gary Frazer, assistant director of Ecological Services at USFWS. “Embracing a thoughtful and consistent approach to the allocation of recovery funding does more than improve the transparency of our decisions. It helps us more effectively conserve the nation’s imperiled wildlife, a goal everyone shares.”

The methods used by Recovery Explorer are referred to as optimal resource allocations. Other countries, like Australia and New Zealand have reported success using comparable frameworks, Gerber explained. The reason for this is fully funded recovery plans tend to be more successful than partially funded recovery plans.

“Resource allocation is not about saving some species and letting others go extinct,” the authors state. “It is about finding a way to better order the work so that as many species as possible are recovered given the limited resources available at any moment in time.”

Read the Policy Forum [3].

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ESA Decision Making [4]
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