LAST OF THE LAST - 20,000 Species Are Near Extinction: Is it Time to Rethink How We Decide Which to Save?

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M. Sanjayan remembers debating grad school biology classmates about the fate of the California condor back in the 1990s, when the bird was on the brink of extinction.

Should the condor, which had almost been wiped out by habitat loss, hunting, and eating carcasses that were poisoned by lead bullets, be left to die in the wild?

Or should scientists take the remaining 22 condors into captivity and breed them, which would cost millions of dollars?

Sanjayan's view was that humans had a moral responsibility to save North America's largest flying bird.

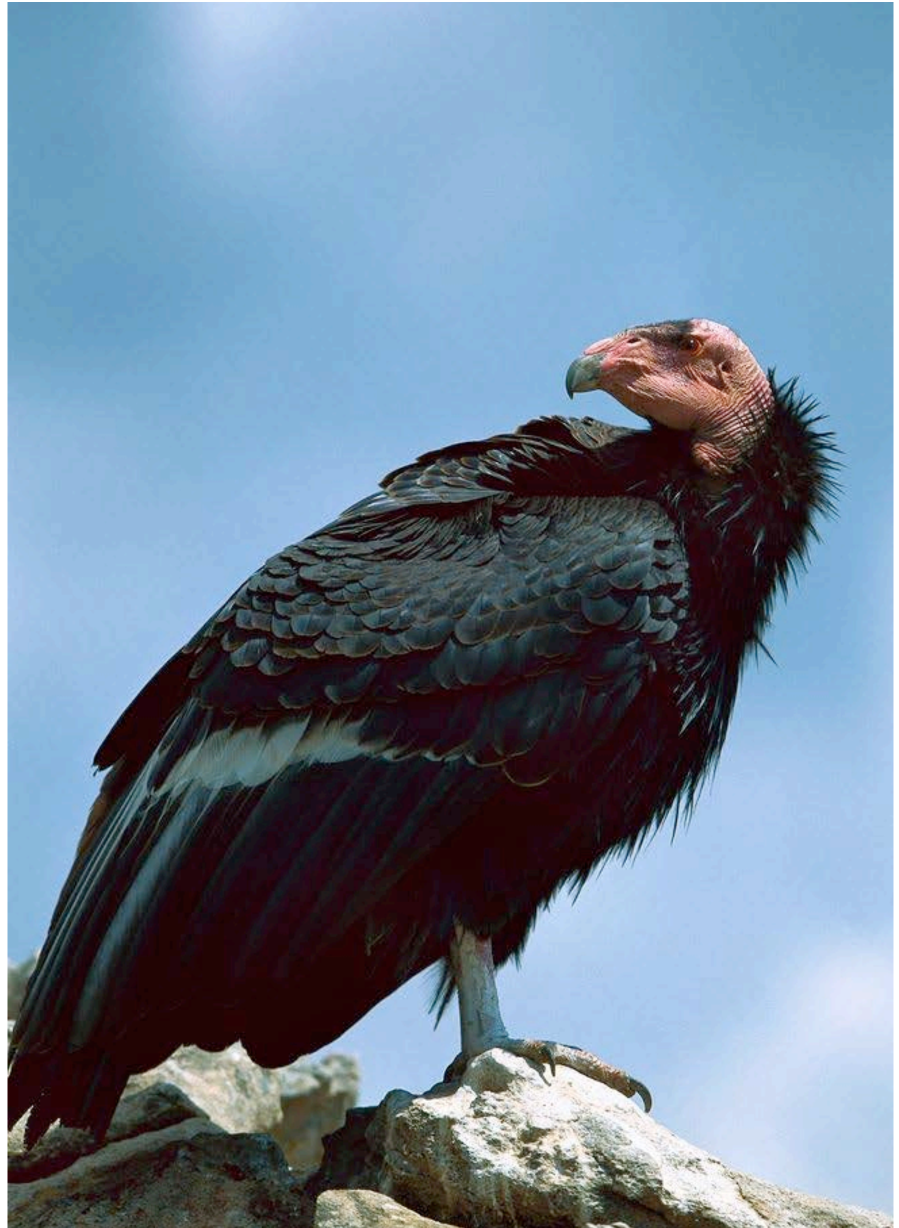
That's exactly what happened: Captive-born condors were reintroduced into the western United States in the early 1990s. There are now more than 200 in California, Arizona, and northern Mexico.

On a recent trip to the Grand Canyon, Sanjayan — now the lead scientist at the Nature Conservancy — looked up and spied one of the big black birds soaring above.

"That's pretty incredible if you think about it," he says. "They're really out there in the wild now."

The condor's recovery shows that endangered species can be brought back from the extreme brink. And there are plenty of other examples.

Gray wolves, by the 1970s were wiped out of most of their North American range due to hunting, have bounced back to more than 3,500, thanks largely to reintroduction efforts. Northern elephant seals, hunted down to fewer than a hundred individuals, now number 150,000 along the West Coast. But with dozens of new species going extinct every day—scientists say that more than 20,000 plants and animals are on the brink of disappearing forever—deciding which species to save is a tricky question.



Choosing the ones to save is driven mostly by whether we like them or not. Fortunately, the California Condor won both the popularity contest and life for his conspecifics. Photograph by Konrad Wothe, Minden Picture/Corbis

This week, National Geographic will spotlight some of the world's most innovative and unusual efforts to save disappearing species, from the mountains of Tanzania to the plains of Missouri, in a series called "Last of the Last." The series will focus on campaigns to bring back species deemed worth saving. Which

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raises a basic question: How do we decide which species to save?

In some cases, scientists and economists use algorithms and logistical models to determine a return on investment for trying to save the last of the last: If x dollars are put toward saving the spotted owl, it's possible to determine how many might be saved.

In practice, though, scientists and conservations prioritize based on a mix of public perception and a species' economic value—for instance, whether it's a popular seafood or brings tourism dollars to a state.

And there's a another, more subjective factor: *How they **feel** about a particular piece of flora or fauna.*

"What we decide to save really is very arbitrary—it's much more often done for emotional or psychological or national reasons than would ever be made with a model," Sanjayan says.

As in the case of the condor, he says, "people end up saving what they want to save—it's as simple as that."

Some conservationists argue that how we choose which species live or die is deeply flawed, that our bias for preserving cute and fuzzy animals diverts precious resources from creatures that actually keep our planet humming.

Ants, for instance, are essential environmental helpers, distributing seeds, aerating soils, and eating other insects that are often human pests, says Marc Bekoff, an ethologist at the University of Colorado Boulder.

"If we're going to save pandas rather than ants, we need a good reason, and being cute is not a good reason," he says. (Also see "Is Breeding Pandas in Captivity Worth It?")

Hugh Possingham, an expert in environmental decision-making at Australia's University of Queensland, says our obsession with "celebrity species" is likely detrimental to as many as thousands of other creatures in need.

Snakes and Spiders Need Not Apply - Endangered species that get a lot of love are often those that elicit the broadest public interest.

Tigers are often rated the most popular animal in surveys conducted in the West, says Eric Dinerstein, lead scientist of World Wildlife Fund's (WWF) Conservation Science Program.

As a result, the endangered species may have more money spent on it than any other. In 2010, the cost of managing tiger reserves alone cost at least $82 million, according to the Economist. (Take an endangered species quiz.) Elephants are another animal fan favorite, even though there are still a half a million left on Earth.

Many lesser known species of fish and frogs are in more dire straits, with just 20 individuals left in some cases, says Jean-Christophe Vie, deputy director of the International Union for Conservation of Nature (IUCN)'s Global Species Programme.
A bias against smaller, less iconic animals also shapes the decisions of major donors.

"If you want to attract the attention of companies, you are not going to achieve that with snakes and spiders," says Vie, whose new organization Save Our Species helps match funders with conservation groups that share their interests.

"Sometimes you want to save a species because you find it extraordinary and appealing—that's the way humans are."

Show Me the Money - Whether a threatened species has any economic value can go a long way in determining whether or not it disappears.

Murray Rudd, an environmental economist at Britain's University of York, recalls working for the Canadian government in the early 2000s, when Nova Scotia's Atlantic salmon population dropped precipitously and mysteriously to about 250 fish.

Government scientists decided to take the expensive step of capturing some of the fish and breeding them in captivity to prevent their local extinction and to keep their genes diverse and healthy. The cost likely ran into the millions of dollars.

But for many Canadians, the expense was worth it: A survey of 2,800 Canadian households revealed that most were willing to pay $86 a year (U.S. $81.21) to support conservation of Atlantic salmon.

Such reverence has made Atlantic salmon an important part of Canada's economy, even though Canada hasn't allowed commercial Atlantic salmon fishing since the 1990s (most of the Atlantic salmon people eat is raised on fish farms).

In 2010, Atlantic salmon was worth $255 million in gross domestic product and supported 3,872 full-time jobs or their equivalent, according to a report commissioned by the Atlantic Salmon Federation, a conservation group.

Those numbers encompass recreational fishing and fishing by Canada's native peoples, collectively called the First Nation; tourism; education; and spending by governments, universities, and nongovernmental organizations.

The report was commissioned to "bolster the business case for ongoing intensive efforts to protect wild Atlantic salmon," Rudd says, an effort that he called "completely legitimate."

"But does that sort of lobbying take away funds from other species?” he asks. "Almost certainly, given the government of Canada's sparse budgets and light interest in environmental resources that do not have direct industry relevance."

And Rudd says the Nova Scotia program was a futile effort, since Atlantic salmon in the southern edge of their range had dropped to such low numbers that they were never going to rebound.

"Everyone loves Atlantic salmon," he says, but "funding salmon conservation was taking a lot of money that could go to leatherback turtles, right whales, or [other] lesser known endangered species in that area."

"Common Sense" Conservation

Rudd is keenly aware of the politics around species revival. In 2011, he led a study that asked nearly 600 conservationists around the world big questions about saving endangered species—including how priorities should be set around which to save.

The study, published in the journal Conservation Biology, found that 54 percent of conservationists agreed that scientists need to set criteria for a controversial concept known as "conservation triage."

Such thinking holds that conservationists need to quickly decide which species can be saved while realizing that others, in Rudd's words, "can't be saved no matter how much money we pour into them."

The University of Queensland's Possingham supports a logistical model he helped develop to determine the cost-effectiveness of saving a species, which he says is "just common sense."

The method builds on other logistical models that assess a species' value and threats against it by including two previously ignored criteria: the cost of management and the likelihood that the management will succeed—that a species will be saved from extinction.

Possingham says the model, called Project Prioritization Protocol (PPP), showed that focusing on just a species' value and threats to it is inefficient and that considering other factors substantially increases the numbers of species that can be managed successfully.

New Zealand has adopted this strategy and is getting more than twice the bang for its conservation buck, he says. In December, Australia announced they would also take this mathematical approach to conservation.

Defending the Defense of Furry Animals

Some groups that focus on the cute and fuzzy, meanwhile, say their efforts are often mischaracterized as benefiting only "celebrity animals."

WWF "gets criticized a lot because we focus on big furry animals," says Dinerstein. But he says that a lot more species benefit from the efforts to save particular animals.

By setting aside land for wide-ranging tigers, for instance, lots of smaller, lesser-known species—like pangolins, sloth bears, swamp deer, and pygmy hogs—will receive an umbrella of protection. (Also see "5 Winners and Losers on New 'Red List' of World's Rarest Species.")

That argument echoes a wildlife management approach known as "the ecosystem method," which involves setting aside species-rich regions, rather than trying to save a single species.

"If we protect vast swaths of habitats that have value to people," says Sanjayan, "we also pick up benefits to endangered species along the way."

That goes a long way toward solving conservationists' dilemma of what to save by trying to save a lot all at at once. As conservationists know all too well, he says, "it's bloody hard to pick and choose."

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