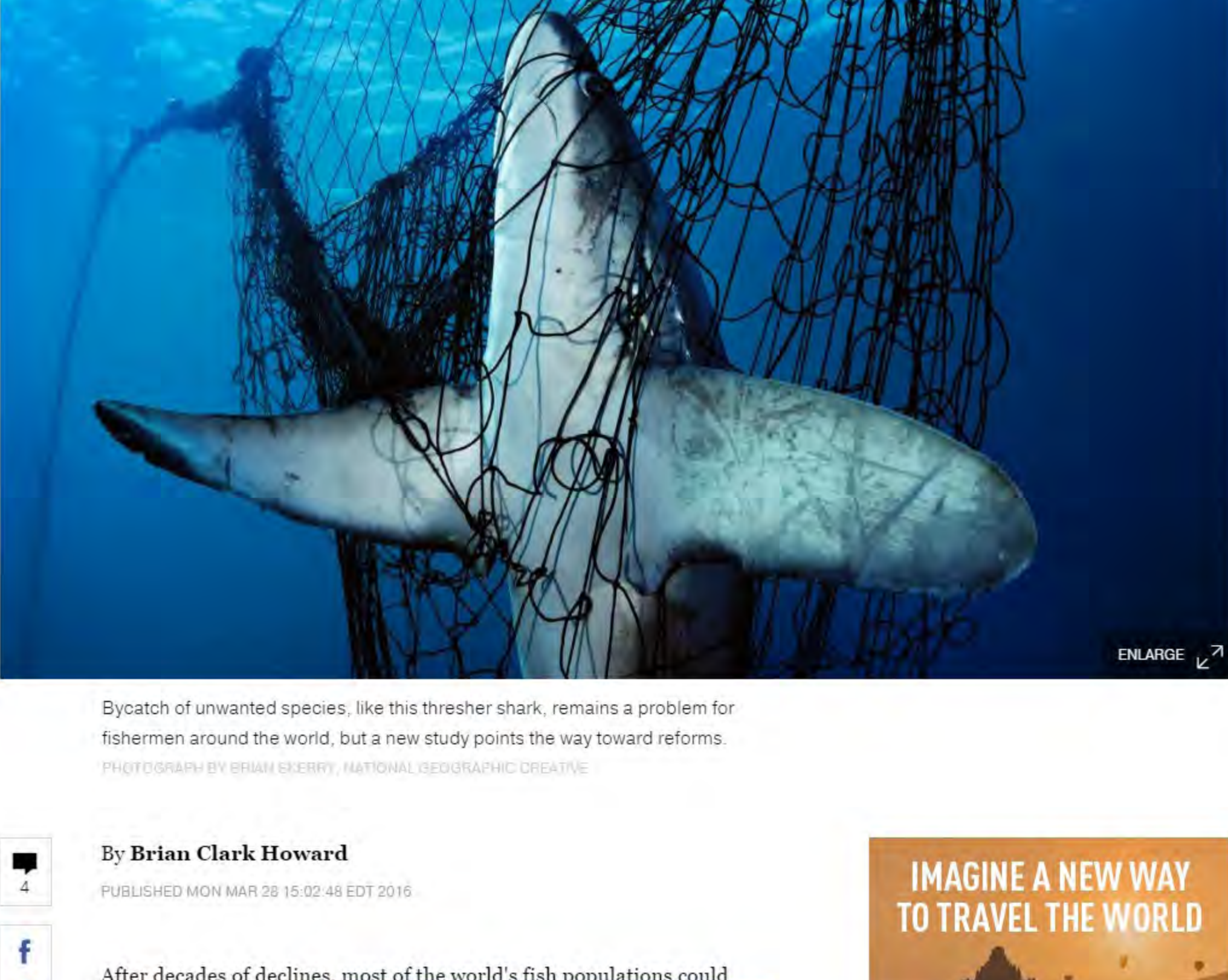


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How Our Favorite Fish Could Recover in a Decade

Here's how the world's depleted fish populations could be turned around.



Bycatch of unwanted species, like this thresher shark, remains a problem for fishermen around the world, but a new study points the way toward reforms.

PHOTOGRAPH BY BRIAN KERRY, NATIONAL GEOGRAPHIC CREATIVE

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By **Brian Clark Howard**

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After decades of declines, most of the world's fish populations could recover in just ten years, **while fishermen make more money at the same time**, scientists reported in a new study published Monday.

The solution is for more countries to adopt systems for sharing rights to harvesting fish, which have been effective in a handful of countries, including the U.S. and Belize.

"I've spent my career working on fisheries issues and I did not expect such a dramatic finding," says Amanda Leland, a co-author of the study in the journal the *Proceedings of the National Academy of Sciences*. Leland, a fisheries scientist with the Environmental Defense Fund, worked on the study with scientists from the University of California, Santa Barbara and the University of Washington.

The team ran computer simulations on a massive database of 4,713 fisheries, representing about 78 percent of worldwide fishing activity. By 2050, global fish populations could double if all countries switched to the best management practices. The percentage of fisheries that are considered biologically healthy would grow from around 47 percent today to 77 percent in 10 years.

Ensuring there are more fish in the ocean would improve food security for the three billion people worldwide that rely on seafood as a major source of protein.

At the same time, fishermen would make an additional \$53 billion a year (on top of the current value of \$270 billion for global fisheries, which employ 260 million people). That's a growth of 204 percent by 2050.

Leland calls the prediction a triple win: for fish, human food security, and jobs.

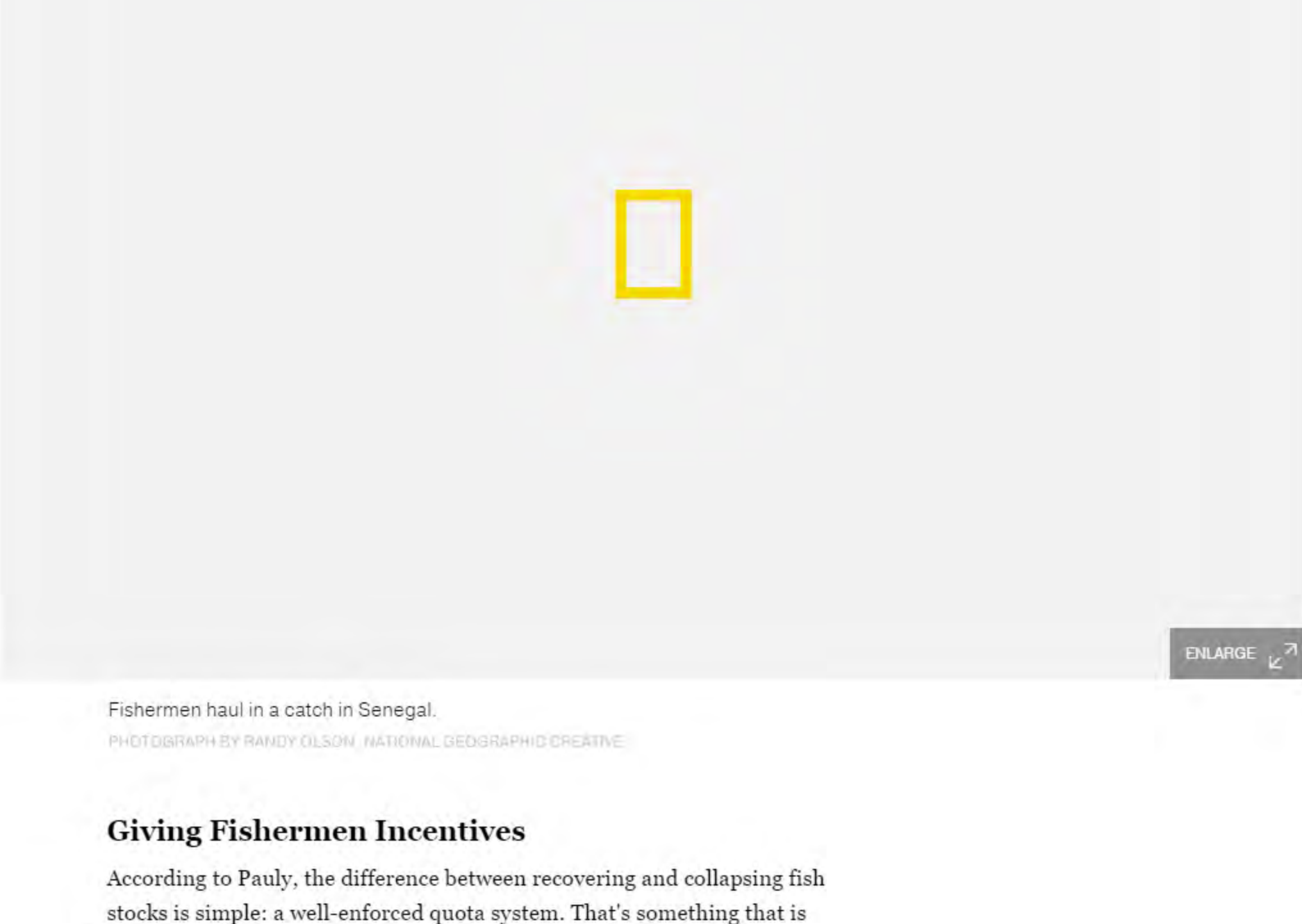
"People thought fisheries were all about tradeoffs," she says. "But we have shown there can be an upside to all these things if we get the management right."

Daniel Pauly, a leading fisheries scientist at the University of British Columbia who was not involved in the team's research, calls the new paper "excellent and methodically sound." Most previous analyses only looked at a few hundred fisheries, so the scale of this work adds new weight, he notes.

"Most of the world's fisheries are in bad shape, with the business-as-usual scenario heading toward a collapse of all stocks in a few years," says Pauly.

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Fishermen haul in a catch in Senegal.

PHOTOGRAPH BY RANDY OLSON, NATIONAL GEOGRAPHIC CREATIVE

Giving Fishermen Incentives

According to Pauly, the difference between recovering and collapsing fish stocks is simple: a well-enforced quota system. That's something that is lacking in most fisheries but is now working in a few examples.

Under traditional fishery management systems, fishermen can catch as much as they want from specific areas, or during specific periods of time. But that means they all "try to compete with each other, resulting in a race to the bottom," says Leland. The result is removing more fish than the population can replace.

A quota can prevent overfishing, but it matters how it is set up, says Leland. Giving each fisherman a cap can set up an adversarial relationship with regulators. Fishermen push for the largest quotas possible, sometimes even skirting the rules, and they have less incentive to improve the overall health of the ecosystem.

In contrast, in a catch share system (also called a fishing rights system), each fisherman is entitled to a percentage of the total allocated haul. The catch is set by scientists based on the best evidence at the time. If the number of fish in the ocean rises, the number that can be caught can quickly be revised. That gives all fishermen an incentive to use best practices and police their own waters, says Leland, so everyone's piece of the pie gets bigger.

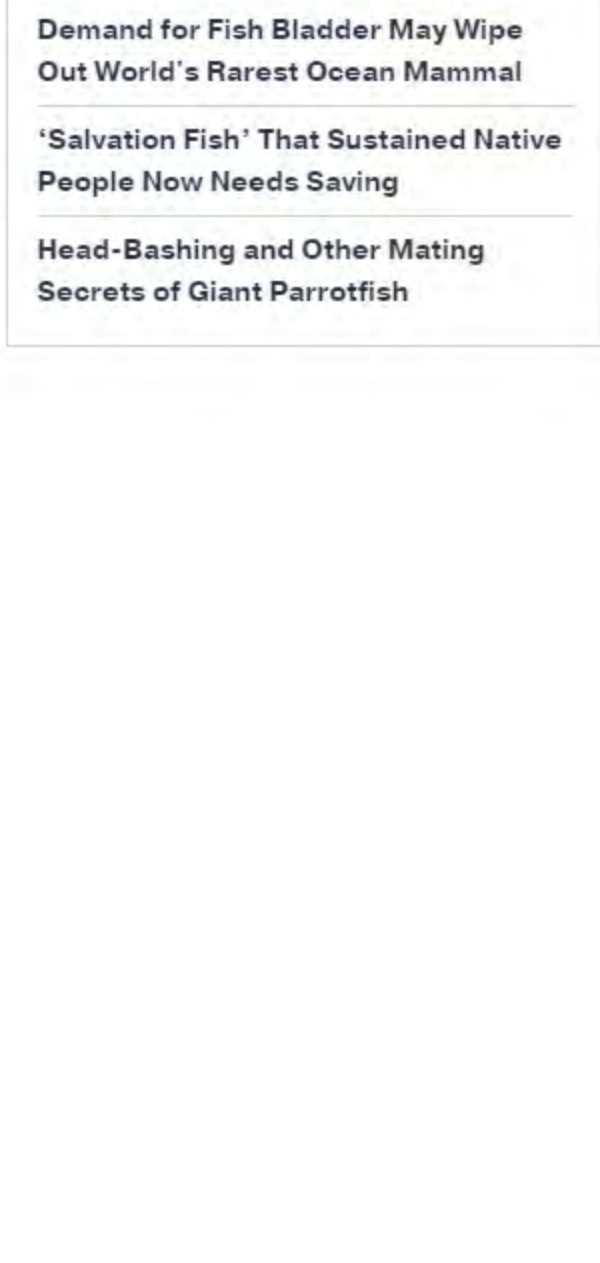
More than 200 such efforts have been underway over the past few years, in Australia, Belize, Chile, Denmark, Namibia, the United States, and elsewhere. And the results are encouraging, says Leland.

In the U.S., since 2000, there has been a 70 percent drop in the number of overfished species. The number of fish with rebuilt populations has risen from zero to 39. At the same time, the number of jobs in fishing has risen by 31 percent in the past three years while revenue has risen 44 percent.

"It's showing that we can have more fish and eat them too," says Leland.

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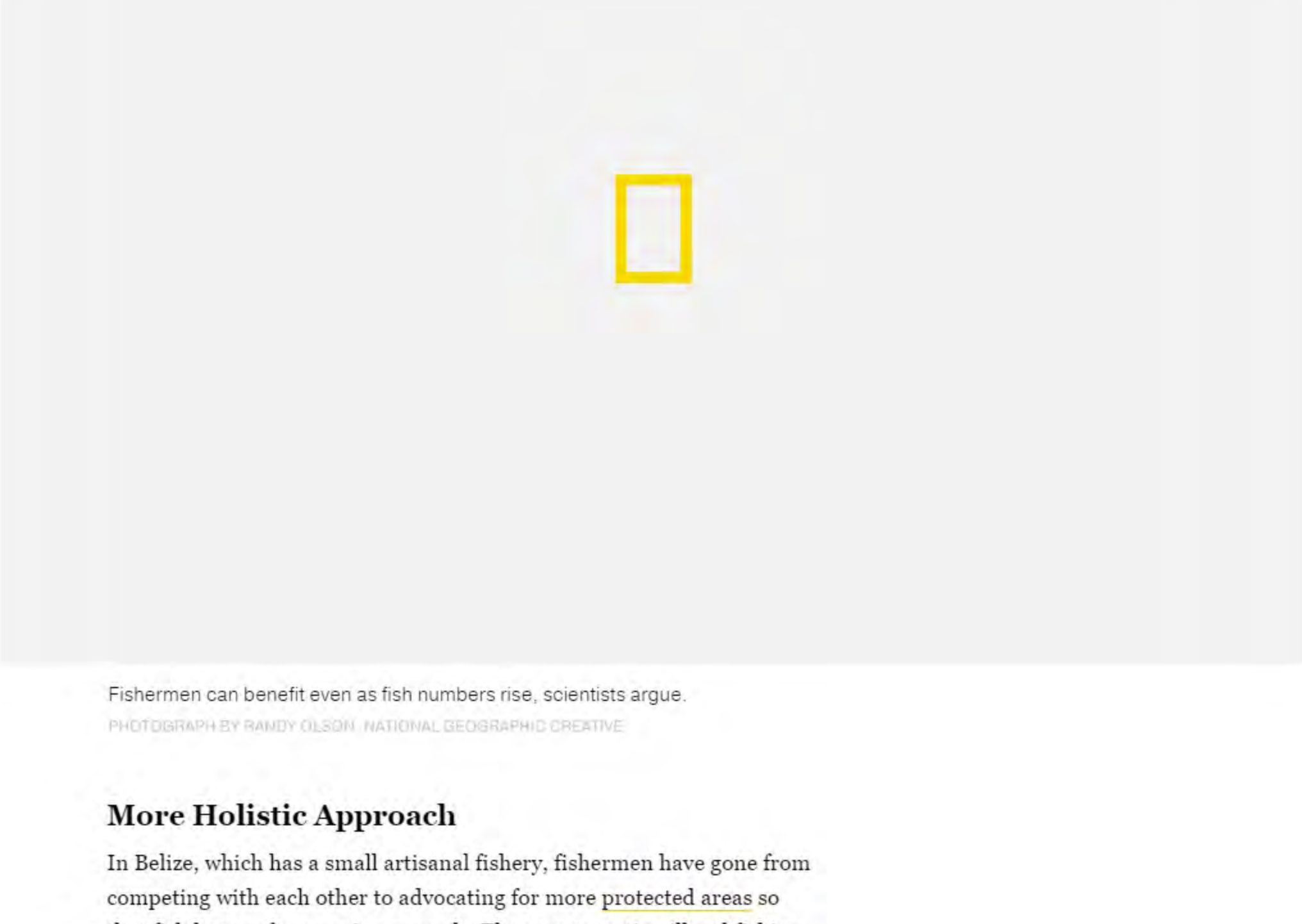
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More Holistic Approach

In Belize, which has a small artisanal fishery, fishermen have gone from competing with each other to advocating for more protected areas so that fish have safe spawning grounds. They are reporting illegal fishing activities to authorities, working to reduce wasteful bycatch, and supporting efforts to collect the best science.

In short, Belize fishermen are becoming better stewards of their resource. The fact that they will be able to pass their catch share down to their children provides even more incentive to make sure there are more fish in the future, says Leland.

Still, Pauly cautions against focusing too much on catch shares.

"It doesn't matter to the fish who catches them, what matters is that there is a quota that is enforced," he says. "The exact technique you use to limit the catch should depend on the country and what is politically acceptable."

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12 minutes ago

In many parts of the world there are introduced fish that are considered invasive to the natural environment. They take over and compete with native species. It's also a certainty that they made assumptions in their models that guaranteed that conclusion no matter what data set was used, or as the saying goes: garbage in, garbage out. One should always take conclusions drawn from numerical modeling with a grain of salt - it's easy to get a model to say whatever you want with the right adjustments and I bet their study wouldn't hold up the scientific scrutiny of a freshman biology student. If you're interested in learning about how catch shares actually impact fisheries, then steer clear of EDF's work. The best study is the Lenfest Ocean Study, which examined virtually every catch share program for which data was available and found, much to the authors' surprise, that these programs don't alter either mean fish biomass or exploitation rates. After all, as Pauly says above, it doesn't matter to the fish who catches them. Unfortunately for fishermen, a re-arrangement of that statement summarizes EDF's approach to fisheries - the people who catch the fish don't matter. Catch shares simply work to re-direct fishing income away from active fishermen into the hands of the investors who buy the shares or "quota" and lease them to fishermen for exorbitant fees. The result has been to shut down most small family fishing businesses in favor of industrial scale harvesting operations who will pay the highest lease fees for quota while devastating local economies and ecosystems. Nice work EDF.

43 minutes ago

"It's easy to get a model to say whatever you want" - yes @Wild Fish - true words, from your perspective and mine - meaning we promote our own beliefs at the expense of the truth. Skepticism is necessary, but not cynicism. Stop being a denier, and get off board - being a fisher does not make you an expert on managing a global problem. Or maybe you don't think there's a global problem, and you're not part of it.

31 minutes ago

@anne boad Being a fisherman certainly gives one a solid perspective on the merits of various methods of managing fisheries. Combine that with the fact that I'm an educated scientist who reads voraciously about fisheries management and I think it's fair to conclude that I am an expert. What exactly do you want me to get on board with? I'm not denying that globally fisheries are poorly managed. I'm just insisting that catch shares aren't the solution and they haven't been demonstrated to be an effective solution to overfishing. Additionally, I believe that we should apply social values to fisheries management as well, and catch shares are certainly a social disaster, leading to massive wealth inequality, unemployment, loss of traditional and indigenous cultures, and the elimination of social mobility in fishing communities. I think YOU should get on board and stop being a denier and recognize the flaws in these programs.

7 hours ago

It's not surprising that the Environmental Defense Fund (EDF) collaborated on a study that concluded that catch shares will save most fisheries. It's also a certainty that they made assumptions in their models that guaranteed that conclusion no matter what data set was used, or as the saying goes: garbage in, garbage out. One should always take conclusions drawn from numerical modeling with a grain of salt - it's easy to get a model to say whatever you want with the right adjustments and I bet their study wouldn't hold up the scientific scrutiny of a freshman biology student. If you're interested in learning about how catch shares actually impact fisheries, then steer clear of EDF's work. The best study is the Lenfest Ocean Study, which examined virtually every catch share program for which data was available and found, much to the authors' surprise, that these programs don't alter either mean fish biomass or exploitation rates. After all, as Pauly says above, it doesn't matter to the fish who catches them. Unfortunately for fishermen, a re-arrangement of that statement summarizes EDF's approach to fisheries - the people who catch the fish don't matter. Catch shares simply work to re-direct fishing income away from active fishermen into the hands of the investors who buy the shares or "quota" and lease them to fishermen for exorbitant fees. The result has been to shut down most small family fishing businesses in favor of industrial scale harvesting operations who will pay the highest lease fees for quota while devastating local economies and ecosystems. Nice work EDF.