Conservation Versus Culture

TURTLES IN TROUBLE

BY CYNTHIA GRABER

Sea-turtle populations in Mexico's Baja California are declining, despite a ban on fishing. Meanwhile, a researcher is working to protect this endangered species, whose consumption is rooted in custom.

Early morning: A light breeze barely ruffles the waters in Banderitas Estuary. Flashes of silver dart underneath the turquoise motorboat. Along the shore, bright green mangroves dip their gnarled, entwined limbs into and out of the water.

If someone knew where to look, it would be relatively easy to spot sea turtles swimming and eating in this calm arm of Magdalena Bay. On the Pacific side of Mexico's Baja California, it's the perfect spot for a meeting on sea-turtle research and conservation. Two Mexican fishermen point out where they've recently seen turtles to Wallace J. Nichols M.E.M.'92, known to everyone simply as "J." Then they climb over the side of their fishing boat onto Nichols' newest research pontoon.

The vessel is a piecemeal affair. Nichols and some friends fashioned it from an old boat that had been used in the winter and spring to bring tourists out to see whales calving in the bay. He noticed it lying dormant in a vacant lot and negotiated a good deal with the owner. Atop the flat wooden boat, there's a small stove, coolers of food, a table with a radio, a cot, and boxes to store personal belongings. Nichols, his Mexican assistant Adan Hernandez, and the two fishermen pull up plastic chairs around an Igloo cooler, top it with Nichols' hard plastic equipment case, and pull out a map of the region.

In its own way, this is an official meeting, or at least an introductory one. The fishermen head the cooperative that recently received the rights from the government to control fishing in part of the estuary. They had noticed Nichols' research pontoon floating in their area, and his work, while not threatening, excited more than mild curiosity. The evening before, they stopped by the American

CREDIT

Caption

field school Nichols uses as his base in Puerto San Carlos. Nichols told them about his most recent research project and its goals and invited them to join him on the water this morning. They agreed. He hopes to persuade them that Banderitas Estuary is the ideal site for Baja's first sea-turtle sanctuary.

Sea turtles are a crucial part of food and culture in Baja California, despite Mexico's ban on killing and consuming the animals. Baja California is also one of the most important Pacific feeding grounds for four species of endangered sea turtles. These two facts are why Nichols has dedicated his life to researching and protecting turtles in the area.

He started working with sea turtles in 1992, but his fascination with turtles began back when he was a child. "I always loved dinosaurs," he says, "and turtles are like living dinosaurs." Sea turtles, in fact, appeared on the planet about 150 million years ago, while dinosaurs roamed the Earth. They survived to see humans invade their waters. But whether they'll continue to survive is the current urgent question: All species of sea turtles in the world are endangered, faced with threats from fishing nets, pollution, and hunters who prize them for their shells, meat, and eggs.

This fascination with turtles grew after Nichols completed his first graduate degree in natural-resource economics at what is now Duke's Nicholas School of the Environment and Earth Sciences. In 1992, he worked with the Caribbean Conservation Corporation in Costa Rica on a nesting beach—walking the shoreline, counting turtle eggs, and tagging turtles, and connecting with the local community in developing a protection strategy.

With friend and colleague Jeff Seminoff, Nichols wanted to continue working with these captivating endangered creatures, so

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the two hatched a plan to visit all the turtle-nesting beaches in Mexico. The next year, after beginning their Ph.D. work at the University of Arizona, the pair packed up a truck and drove for four months, visiting fifty-two research and conservation sites, from Texas to Belize, from Guatemala to California. They met researchers and concerned citizens and made contacts that would last into their careers as turtle researchers.

"It was kind of a reconnaissance effort," says Nichols. "It seemed like a setback in terms of time, but invaluable in terms of education and contacts and friendships. Looking back, it was a genius move—but at the time it just seemed like a lot of fun."

What he learned during these travels was that Mexican biologists and researchers were doing a remarkable job protecting turtles on their nesting beaches. The populations, though, continued to decline, and Nichols saw that little research effort was focused on the animals' time in the water, where they spend 99 percent of their lives. He decided this would be his focus, and that he would concentrate on Baja California. "There were some references to the area in earlier literature," he says, referring to a scientific paper written on Baja's turtles and the fishery in the 1970s. "There was some documentation on the legal fishery. It was clearly an important feeding ground. But there was not much contemporary research on the animals there. There was clearly a big gap in both protection and knowledge of the animals."

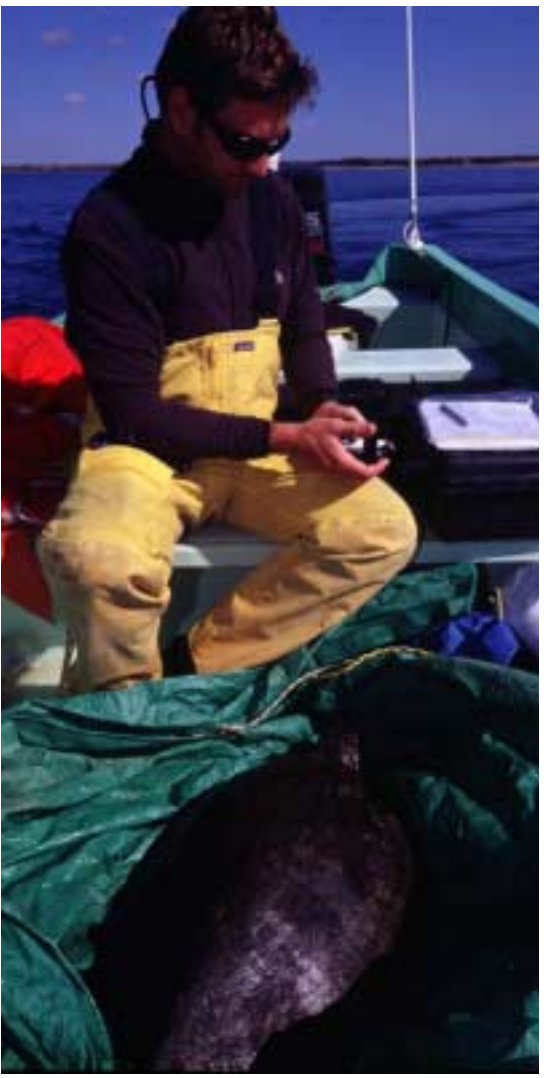
He went back to his Ph.D. committee with a proposal to study Baja's sea turtles. The committee, though, was skeptical. They said the region had basically been fished out back when there was a legal turtle fishery in the area, and that there wouldn't be enough animals to conduct scientific research.

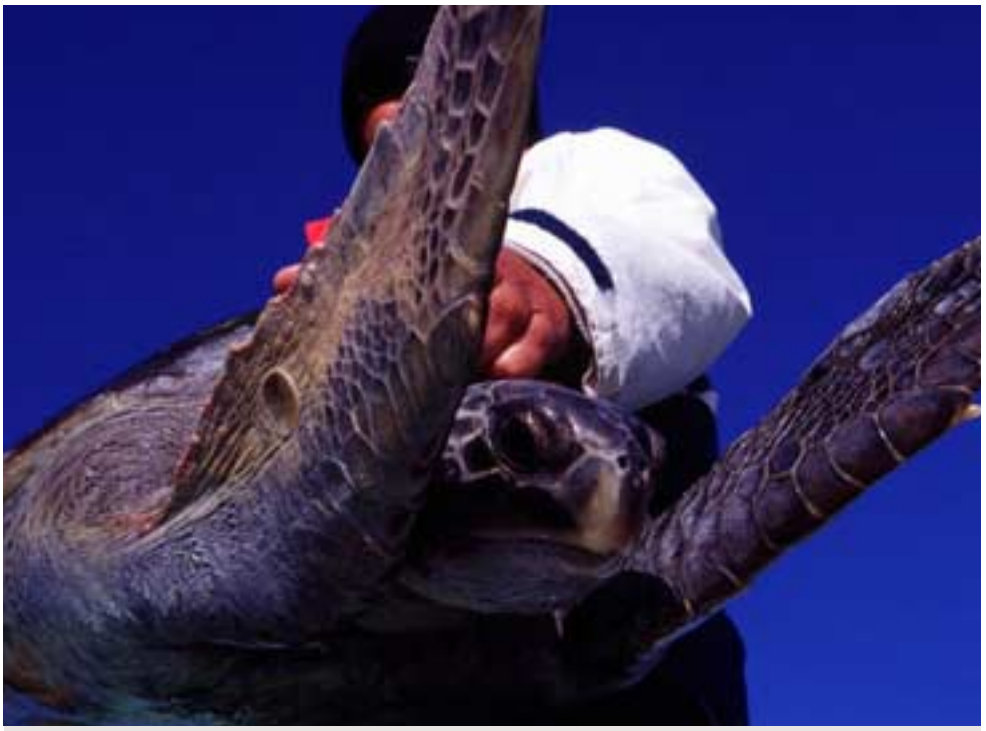
Nichols asked for a year in which to prove that a scientific study was feasible. He went out in the Gulf of California with fisherman Juan de la Cruz, who claims to have caught more than 3,000 turtles with his harpoon. Together, as dawn broke, they caught a big black turtle. "This convinced us that we could do it," says Nichols. "We could go out on the water and catch turtles. It wasn't a lot, sure, but it was one—I definitely felt like it was the beginning of something." He also worked with Antonio and Bety Resendiz, at the time the only Mexican sea-turtle researchers in the area, who had little funding or support from the Mexican government.

Nichols proved that there were enough turtles around to conduct a scientific study. Since then, he has gone even further, proving that Baja remains a vital feeding ground for four species of endangered sea turtles and that, in fact, tens of thousands of turtles still live in the region.

In the past, turtles swimming in the rich waters off Baja's coast numbered not just in the thousands, but probably in the millions. The turtle fishing industry, once simply a part of life, became a huge commercial export business in the Fifties and Sixties, but it soon crashed. In the 1980s, the government tried to manage the turtle fishery and limit the catch, but it was already too late. The number of turtles continued to drop rapidly. In 1990, the Mexican government banned the killing and eating of sea turtles altogether, even those caught as by-catch or washed up dead on shore.

Despite the ban, communities all over Baja continue to prize turtles as a delicacy. The region today is likened to the American Wild West—and just as difficult to govern. Small fishing communities and slightly larger towns and cities are separated by sometimes hundreds of miles of dry, dusty roads. More than 2,000 miles of coastline wind in and out of inlets around the peninsula. Only five government officials are responsible for all





The battle in Baja: the local community of fishermen, who once harpooned turtles for food, now help Nichols, in sunglasses and yellow waders at left, capture and tag them for research in migration and population

resource-management enforcement in the southern half of Baja—everything from poaching to forest management to protecting endangered species.

Nichols began his work by measuring, weighing, and tagging all turtles he caught to study populations—figuring out how big the turtles living there were, at what ages they arrived, and how long they stayed in the region. He did DNA studies to provide clues linking Baja's turtles with specific nesting beaches. He wanted to know exactly where the turtles were coming from and where they were going, so in 1997 he and the Resendizes put a satellite tag on a loggerhead turtle that a local named "Adelita." They tracked Adelita as she made her way all the way across the Pacific to Japan. Nichols was so excited about what he saw that he had a friend set up a turtle-tracking website so that people around the world could watch Adelita's journey (www.cccturtle.org).

Scientists had long suspected that turtles born in Japan make their way to Baja to

TURTLES OF BAJA

The rich coastal waters off Baja California provide food for four species of endangered sea turtles: black turtles, also known as East Pacific green turtles; loggerhead turtles; olive ridleys; and hawksbills. Leatherback turtles have one nesting site near the southern tip of the peninsula.

Black turtles, which feed in bays and estuaries around the peninsula, are one of the main species on which Nichols' research focuses. They nest in southern Mexico, in the state of Michoacan, and swim more than a thousand miles to feed on algae, sea grass, and occasionally invertebrates such as crabs. Most of the turtles caught in Magdalena Bay are black turtles.

Out in the Pacific, loggerhead turtles migrate all the way from Japan to feed on pelagic red crabs in the deep ocean waters near Baja's shores before returning to their natal beaches to nest. Catching these turtles to study them is more difficult than throwing out a net and waiting, as Nichols does to catch black turtles in the bay. Instead, he travels miles out in the Pacific on a small motorboat and searches for a small white bird that rests on the backs of basking turtles. When he and his assistants find one, they dive into the water and wrestle the turtle over to the boat.

Of the two other species that feed near Baja, olive ridleys are plentiful enough that Nichols says the need to study them is not as urgent. But the numbers of hawksbills have dwindled so significantly that scientific research is extremely difficult.

Olive ridleys, with their mottled green-gray carapaces, or shells, have been recovering in Mexico due to beach protection and the dynamics of their nesting sites and migration patterns. Like the loggerheads, they spend time offshore in the deeper waters of the Pacific.

Hawksbills live around the Pacific, but the ones that feed in Baja come from nesting sites in Mexico. Populations of these animals have been decimated because of their beautiful shells, so finding one swimming in Baja's waters today is extremely rare.

feed, but his study was the first to prove conclusively the Japan-Baja connection in detail. He also showed that these turtles, upon reaching reproductive age, take months to swim thousands of danger-fraught miles to their natal beaches.

As he continued his research, Nichols discovered something else: Conservation on nesting beaches was working. More turtles were able to safely lay eggs, and more of those eggs hatched, with more hatchlings reaching the water. But if those turtles made it to Baja, many of them never made it out again. "It's kind of like blocking off the kitchen door," he says. "They come here to feed, then they're killed as they're eating. They never leave the kitchen."

The Mexican government, though, insisted that there was no longer any problem with local consumption and, therefore, no need to focus money and effort on conservation work. Nichols criss-crossed the peninsula, talking to fishermen and to members of local communities. He counted thousands of carapaces in backyards and dumps, proving that consumption remains a serious and persistent problem. This is where he realized his resource-management training at Duke would be the most beneficial.

"Scientific research wasn't enough," Nichols says. "Now what we're doing is a lot of social sorts of things, understanding the economics and policy issues as well as marine science. Marine conservation is also really about people and fishermen and impacts to the marine environment. So it ended up being an extremely useful degree to have."

The meeting with local fishermen in Banderitas Estuary is part of his latest conservation strategy. His research there supports his belief that Banderitas is the perfect site for the first official sea-turtle reserve in Baja California, an idea he's recently been advocating. It's a calm, quiet arm of the bay that's easily protected. Turtles that feed there seem to stay in the area, and it's easily accessible to tourists. With their recently received fishing rights, the cooperative of fishermen has an incentive to begin long-term management of the region.

Nichols admits that the idea of a turtle sanctuary in an area already protected by law might sound unusual to the rest of the world. In theory, all the waters off the coast of Mexico are turtle sanctuaries. The local law isn't working, however, since there is little enforcement and follow-up. Without the communities on board, the ones that are the source of both the problem and the solution, nothing will change.

Leaning forward toward the fishermen in the boat, hands clasped, Nichols outlines his idea to make Banderitas Estuary a turtle reserve, an area the fishermen will still be able to use but one completely safe for turtles. The thirty-four-year-old scientist has an easy smile and a slow pull to his words, but his honest enthusiasm and passion are infectious. The men are drawn in as he explains that the reserve will be the first in all of Baja California, and thus could attract international attention. He tells them that tourists who flock to the area in the later winter and spring to see gray whales and their calves might stay an extra day and go snorkeling to see turtles in an area they know is protected. These men, who know the turtles' habits, would be the guides. He also tells them that their fish and oysters could command a higher price if they come with some sort of certification that they are grown in an ecologically sensitive manner that helps protect endangered sea turtles.

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The men are interested. "I'd like to protect turtles," says Arturo Gonzales Dominguez. "Both for my own benefit, and for the future. If we don't protect them now, my children when they are grown won't be able to see turtles as I have."

Nichols doesn't stop at the discussion of Banderitas. He relaxes back in his chair and continues on to another aspect of his latest conservation strategy. "Did you know that sea turtles are the most important animals in Baja?" The men pause and consider his words. He tells them that there is absolutely no other animal as tied in to the life, food, culture, and ecology in the region. "Can you think of one?" he asks. They can't. He knows he has them hooked.

This simple statement is a carefully thought-out tactic. He says he believes if he says it enough times to enough people—"Turtles are the most important animals in the entire peninsula"—they will start repeating it. And if enough people repeat it to others, then idea will take hold.

After years of conducting research in Baja, and befriending fishermen and community members, Nichols has seen that is how things work. Decisions are not made in the air-conditioned offices in Mexico City, and turtles aren't protected by the government officials who pull into town in clearly marked vehicles. Meetings take place on the side of the road, around pick-up trucks, sitting around a cooler on a boat in the estuary, and turtles either will or won't be protected by the people who work near them every day.

His theories on information flow in Baja are supported later that evening, when he stops by a local taco stand to pick up dinner. "Did you hear?" one man says to him. "They're thinking of starting a turtle sanctuary in Banderitas Estuary." Nichols simply nods and looks interested.

It's taken years to get people in communities around Baja to trust and accept him. When he first pulled into Puerto San Carlos four years ago, armed with a pitted pick-up truck, a research permit, and fluent Spanish, locals saw him as an odd gringo with a passion for turtles. They tolerated his questions. Nichols says it wasn't difficult to figure out who the poachers were, that "if they know about exactly where turtles feed and what they eat and where to find them—well, these are things you know only if you spend a lot of time thinking about turtles."

And the locals, even the poachers, are exactly the ones he approached to learn more about Baja's turtles. Since they're the ones who know the most about the animals living there, Nichols saw every conversation as an opportunity to share some information about turtle biology and why the animals might disappear forever. It's the people's passion for sea turtles that may help the turtles survive. "Sometimes I'd look at these people and think, 'you're made of turtle, eating so many turtles over the years, drinking the blood, part of you is turtle protein,' " he says. "Instead of reacting to that in a disgusted way, I just listened. I realized that this connection to the animal is one of the reasons why it's endangered, but it's also a tool and the reason why they will be protected, and why people will be enthusiastic about working for their recovery."

Nichols says that about 25 percent of the animals he's tagged are killed. That estimate is supported by two fishermen who started their own basic tagging system, tying fishing wire onto the shell of turtles caught accidentally before throwing them back in the water. Of the four turtles they tagged their first few weeks, one turned up eaten.

Today, Nichols splits his time between working in Baja and in northern California, where he writes papers and grant proposals and works for Wildcoast, the nonprofit he helped form that focuses on conservation in

Baja (www.wildcoast.net). Widely recognized as the leading expert on Baja's turtles, he frequently presents papers about his research at scientific meetings. He's careful to thank all the fishermen, his assistants, and the people who made his work possible, which does not always sit well with some of his fellow scientists. One once congratulated him on a successful research presentation but told him he had spent too much time on the "little people."

These "little people" are the very people Nichols considers his colleagues. He says the best way to learn from them, and to teach them, is to do things a little bit differently from the norm. He doesn't slide into town with shiny new equipment, drop anchor, work for a couple of weeks, and leave. Even if he had more money for research, he says, he'd rather employ more locals to conduct research and use local equipment than buy some fancy new boat.

All species of sea turtles in the world are endangered, faced with threats from fishing nets, pollution, and hunters who prize them for their shells, meat, and eggs.

"These are the real heroes of sea-turtle conservation," says Nichols. "They're making decisions that are not popular, that are ridiculed by their families, and are really sincerely working to protect an endangered species that is food for most people. I can't imagine what it would be like to be in a community where I grew up and go against something that's such a deep tradition."

That tradition appears to be slowly changing. Only two weeks after the first meeting on the pontoon, the hundred men of the fishing cooperative called a town meeting and announced that Banderitas Estuary will be the first turtle sanctuary in all of Baja California. They even went one step further, announcing their intention to go house to house, notifying poachers—who might be friends and relatives—that poaching will no longer be tolerated in their area. Government officials and the local branch of the navy were at the meeting to back them up.

Farther up the coast, the fishing community of Punta Abreojos is virtually a reserve, says Nichols, because they so carefully manage their fishery and have recently begun to enforce the Mexican turtle ban. Two areas on the gulf side are also being considered for future turtle sanctuaries. Nichols hopes these will be the beginning of a string of protected areas around the coast.

But these are only four communities out of hundreds around the coast. Even if the turtles do survive, they have to swim thousands of miles back to their nesting beaches, encountering nets, fishing lines, pollution, and hunters along the way. In the face of such challenges, Nichols has one vision that keeps him going. "Sometimes I imagine being an old man and sitting around with some of these fishermen that are my age with our grandkids, and seeing some turtles swim by in a place that's beautiful," Nichols says. "And I think, God, that's going to be great." ■

LOCAL USES

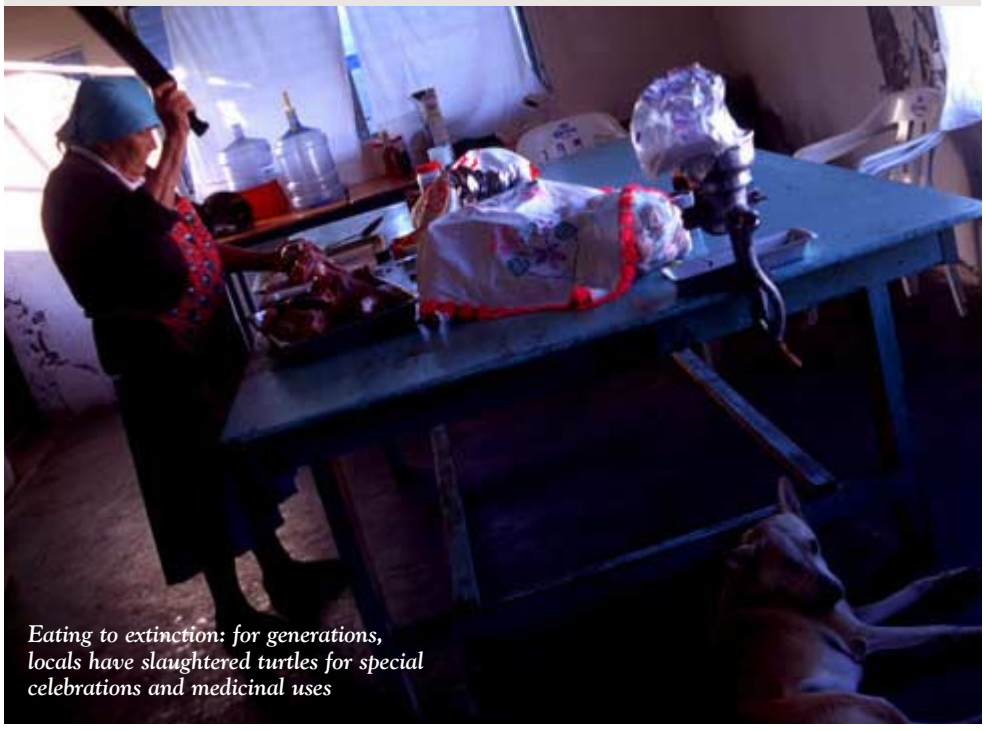
Despite a ban on killing and eating sea turtles that has been in effect for more than a decade, they remain an integral part of family celebrations. On *Semana Santa*, or Easter Week, thousands of turtles are consumed in households all around the peninsula.

The turtles have also been used for generations as medicine. The blood is seen as a cure for anemia, the oil to treat coughing and colds.

Adan Hernandez, one of Nichols' assistants, believes turtles saved his life about twenty years ago, before there was a medical center in town. Hernandez says that when he was very young, he stopped eating. All food disgusted him. His parents tried to give him a little bit of beer at night to help give him an appetite, but it didn't work.

His family then spoke to one of the oldest fishermen in town, who told them to give the sick child fresh turtle blood and oil. Every day, before every meal, Hernandez took some turtle oil. About three times a week, his parents fed him turtle blood. "I do believe that's why I started eating," he says.

He also says that this is one reason saving turtles is so important to him. "I owe too much to the turtles. It's time to start giving something back to them."



Eating to extinction: for generations, locals have slaughtered turtles for special celebrations and medicinal uses

Graber is a freelance writer and a reporter with the National Public Radio program Living on Earth. *An audio report on Nichols and his research aired on the show in March.*