

## **Chapter 10 — Freshwater Wildlife**

*Losing It, Pollution Pollution, Great Big Lakes, The Wetlands, The Cleanup Crew, We Have Rights, Going Both Ways, Tribal Knowledge*

### **Losing It**

Pollution, dam building, and invasive species are stressing 90% of fresh water ecosystems. The freshwater wildlife live in the continental creeks, streams, rivers, and lakes of our planet, with completely different lifestyles and issues compared to the marine life. Since freshwater bodies are generally smaller than seas, with the exception of extremely large lakes, such as the great lakes, freshwater species are more entwined with wildlife that live on land. This is because the terrestrial wildlife may depend on the freshwater wildlife for an important protein source. Also, land wildlife have to live with the same water impacts that freshwater species have to live in.

In the past 50 years, while global wildlife has declined by 60%, the greatest losses have been with freshwater wildlife. Did you think the status of terrestrial and marine wildlife was bad? It is. But the freshwater wildlife is even worse. Freshwater fish make up more than half of global fish species, yet fresh water is only about 1% of the total aquatic habitat. Global warming, dropping water levels, pollution, and overfishing have reduced freshwater fish by more than 80%,<sup>1</sup> and 25% of freshwater fish species are threatened with extinction.<sup>2</sup> Is that scary or what?

So how are we managing to destroy so much freshwater wildlife? Well, that's easy. Between sewer and stormwater overflows; water-borne diseases; fertilizers, insecticides and herbicides from non-point agriculture and yards; petroleum-laced road runoff; tire fragments and litter; livestock trashing land and riverbanks with their feces running into the water; logging and deforestation that increase runoff and erosion of silt into the water; and pollution from industries who choose to "cheat" on their toxic effluent discharges, it's an absolute miracle that any life at all manages to survive in our surface waters.

We've made our waterways so nasty that it's even a bad idea to swim in many of them. In 2018, researchers estimated that about 90 million people get sick every year from swimming in contaminated U.S. waterways, and that the actual number is probably higher because many of these cases don't get reported.<sup>3</sup> If that many people get sick from swimming once in a while, imagine what it's doing to wildlife that has to live in the water 24/7. It shouldn't be a surprise that our poisons are killing the freshwater wildlife.

Cyanobacteria and blue-green algae appear annually in Upper Klamath River in Oregon, and when they die, their decomposition consumes the oxygen, suffocating the fish and other organisms. The algae also produce microcystins, neurotoxins, and possible carcinogens that can't be boiled or easily filtered out of the water. Swimming in it can cause rashes, and ingesting it can cause kidney failure in humans, and sicken or kill dogs and wildlife.

Speaking of dogs, it turns out that flea treatments on dogs and cats are poisoning surface waters too. These pesticides are extremely toxic and get into the waterways either through the sewer when animals are bathed or when dogs swim. Researchers in the U.K. found high levels of fipronil and imidacloprid, two common toxins in flea powder, in rivers downstream from waste water treatment plants, which indicates that the chemicals are from urban pets and not farm animals.<sup>4</sup> Obviously this can't be healthy for the dog or anyone who pets it either. Pet owners might want to consider simply washing their pets and skipping the flea treatment. We've had dogs and cats our entire lives and never had trouble with fleas. This feels like just another completely unnecessary nasty poison that big corp has convinced most people they must have. Yeeesh.

We've also created barriers and restrictions to natural movement and migration through waterways, most notably with dams. Urbanization threatens biodiversity in streams because of extensive stream degradation. We've bulldozed rivers, turned them into unnaturally straight aqueducts, paved riversides, and built homes next to rivers and lakes. All of this causes pollution in the waterways and adds noise and light stress to the aquatic ecosystems.

And, naturally, global warming plays a huge role, warming waters to the point that fish can't live in it, sort of like how people in Phoenix can't live in 100+ °F heat without air conditioning. Except the fish don't have air conditioning, so they simply die of heat stroke unless they can migrate to cooler water. Also, warmer water holds less oxygen, which the fish need to breathe, so that can't be helping things. The warm water stresses them and increases disease. And some diseases are just as bad for us as they are for the

fish. Like brain-eating amoeba, now showing up in warmer waters. A Nevada boy died recently from it after swimming in Lake Mead.<sup>5</sup>

Also, as with every other species on the planet, overfishing is playing a huge role. Steelhead trout, for instance, once numbered 15 million in the Columbia River Basin, and overfishing had dropped it by more than 99%, down to 100,000 by the late 90s. There has been a little recovery since then, bringing the population up to around 350,000, but that's still only 2.3% of the original population. And it's unlikely that they'll ever reach anywhere near their original population as long as the water keeps warming.

Another example is the silvery minnow, an indicator fish that's central to biodiversity in the Rio Grande. We've nearly driven it to extinction in the wild, and since it's an indicator fish, this means that there's probably even worse things to come.<sup>6</sup> Basically, we can expect more extinctions to follow. Fish need clean water, and with all the agricultural waste we dump into the Colorado River, along with overallocation and damming of the river itself, we're making that impossible. At the same time, we've spent more than \$150 million to try and save this little fish. Once again, we're applying a Band Aid that's not going to work until we take care of the underlying causes.

### **Pollution Pollution**

Despite all the environmental regulations that have been in place for the past 50 years, big corp industries still manage to spew innumerable pollutants into the waterways. In some cases, they actually choose to do this as a business decision, figuring that the cost of paying the fines is less than the cost of eliminating the pollution from their facilities. They try to say that they'll have to increase costs to consumers if they are forced to upgrade, which is complete and total hogwash. These big corporations make such obscene amounts of money that they can easily afford to cover the cost with the current gouging of their customers who, by the way, includes all of us, and by simply cutting the absurdly high salaries of their executives, who have more money than they'll ever need. Seriously.

Here we have Elon Musk, the richest man on Earth, whining about environmental regulations and spending billions of dollars to con the American public into electing his minion Donald Trump because he promised to reduce or eliminate the environmental regulations. And if those morons actually do that, at the end of their tortuous four-year term, they will succeed in getting rid of pretty much all the wildlife, and our planet will be past the point of no return. Now might be a good time to thank the idiots in America who allowed themselves to be conned by lies and propaganda, which they evidently wanted to hear rather than the actual truth, and which convinced them to actually vote for a fascist who is guaranteed to put the last nails in the coffin that was our planet.

An example is mine waste that flows downriver from Teck Resources' Canadian coal mines into Montana and Idaho and that contains selenium.<sup>7</sup> Selenium slowly builds up in the ovaries and eggs of the fish, causing deformities and impacting reproduction, so that young fish die before they can reproduce. Selenium also causes problems in terrestrial wildlife that drink the water. And this is but one example of the nasty chemicals that are killing our wildlife.

In Baltimore Harbor, 24,000 dead menhaden were discovered, highlighting the severe environmental challenges facing Chesapeake Bay. The cause of the fish kill was a thermal inversion made worse by nutrient-rich stormwater runoff, pollution, and rising water temperatures, which continue to degrade water quality and harm aquatic species.

The industrial agriculture waste that has created the dead zone in the Gulf of Mexico is carried into the Gulf by rivers from the midwestern and southern U.S. megafarms. The dead zone itself is more than 6,000 square miles, so you know a lot of nutrients and toxins are being carried in those rivers. And it follows that those rivers are too toxic for any wildlife, so that takes care of wildlife in pretty much a third of the U.S. Each and every one of us can help this by only buying organic food, and recovering the extra cost of the organic food by not wasting any of it. And sticking with vegetables rather than meat and dairy, which is more expensive than vegetables. How hard can it be?

Pollution is always worse in fascist regimes, which is why I'm so freaked out that we elected a fascist as the U.S. President at a time when we need actual, proactive democratic leadership to save our planet. Like we already had with Biden. Not to mention that I generally prefer democracy as a general rule. Take Russia. They actually intentionally poisoned the Seym River with chemical waste containing ammonia, magnesium, and other poisons in an act of ecocide, polluting hundreds of miles of the Desna River

downstream in Ukraine. This obviously killed all the aquatic life in the river, and likely all the land wildlife that has to drink it. It's Europe's first completely dead river, with not a single living organism in it.<sup>8</sup> Obviously, this was a strategy to cripple the Ukrainian people, since it supplies a drinking water reservoir for millions of Ukrainians. But look at all the wildlife that was lost. So it goes. Thanks a lot, Putin. All so you can beat your pathetic little chest.

### Great Big Lakes

The Great Lakes contain about 5,500 cubic miles of fresh water and more than a fifth of all the surface freshwater on Earth. These lakes are so huge that gigantic cargo ships operate there, and from one bank you can't see the other side. It seems endless, just like an ocean. These lakes, in addition to all the wildlife who live in and near them, are relied upon by about 40 million people for drinking water. Yet despite their size, we've managed to trash them, too. With climate change, invasive species, toxic chemicals, agricultural pollutants, and development along the coasts, we're causing degradation of the Great Lakes ecosystems. The most badly damaged are Lake Erie, Lake Ontario, and Lake Michigan.<sup>9</sup>

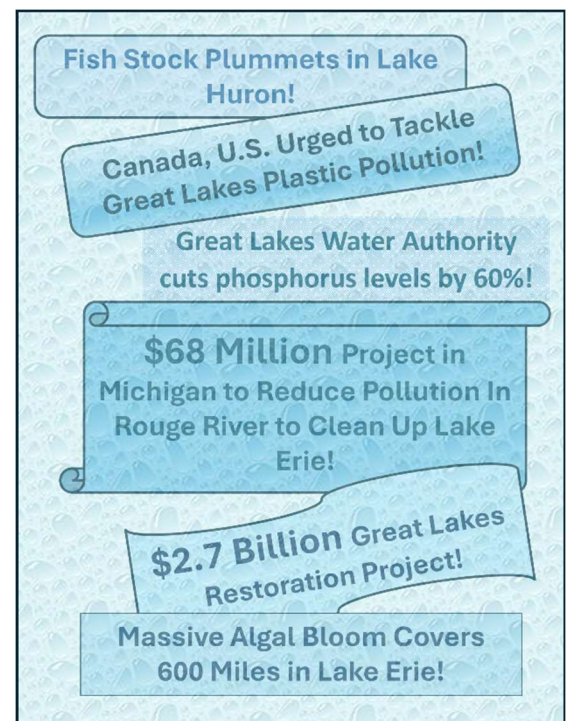
Waters are heating up from global warming, causing stress to the native flora and fauna that are adapted to the normal lake temperatures as well as reducing the number of days that the lakes are covered with ice. Agricultural runoff from fertilizers and toxic pesticides, as well as overflowing sewers, is poisoning the lakes and causing toxic algal blooms that deplete the waters of oxygen, causing septicity.

The lakes have an astounding variety of freshwater diatoms, about 3,000 identified so far. These are super-nutritious creatures at the bottom of the food chain that the next level of life, the zooplankton that feed higher levels of small fish species, rely on for food. Researchers have found that the diatoms are getting smaller, and there are less of them. One reason is that the warmer waters are less dense, and they sink to a lower level in the water, where they don't get as much light for the photosynthesis needed for growth. Obviously this can't be good for the food chain, as higher life forms have to find something else to eat, and second choices tend to be less nutritious than the original source. Over time, the fish population is likely to crash. Invasive mussels, introduced by ocean vessels, are consuming the diatoms in huge numbers in Lake Erie, causing them to drop by 90% in just the past 35 years.

Phosphorous runoff from agriculture fertilizer is causing massive algae blooms in Lake Erie, turning the lake pea green. It's also causing fish kills and beach closures and tainting to the drinking water flavor because of cyanobacteria, which is bad for humans, wildlife, and fish. Algae blooms have been starting earlier in the spring and lasting until later in the fall. Nutrient pollution from both phosphorous and nitrogen are getting worse according to an EPA study, and atrazine, an herbicide, is increasing; it is now in 30% of the lakes.<sup>10</sup>

It turns out that wetlands can take up most of the phosphorous before it enters the lakes, which in turn reduces toxic cyanobacteria, so it would help a lot to restore the wetlands surrounding the lakes and then let them do their thing. The great thing is that wetlands also provide important habitat for all kinds of wildlife, including insects, aquatic life, and birds.

Globally, major lakes around the world are evaporating faster because of warmer air, making water shortages and pollution worse and the survival of birds and fish pretty much impossible. Lake Chad in Africa is nearly gone, and Lake Urmia in Iran has shrunk by 80% in 30 years. In Eastern China, Lake Tai, which supplies drinking water to 2 million people, is being poisoned by agricultural runoff and sewage, causing cyanobacterial blooms. Lake Tanganyika in Africa has warmed so much that fisheries that supply millions of people in four countries are at risk of disappearing completely. In Bolivia, they've probably reached peak water flow from most of the glaciers, so the meltwater will continue to diminish until it stops completely. Meanwhile, demand for water has surged as Bolivia's population continues to increase—by 42% since the mid-1990s.<sup>11</sup> I mean, that's when you know it's bad.



## **The Wetlands**

Wetlands are home to an amazing array of wildlife species that depend on them, from fish to insects to birds to terrestrial wildlife. For birds throughout the world, they provide extremely important layovers on migration routes. They are also extremely powerful carbon sinks; they purify water that flows into larger water bodies, like lakes, by literally removing nutrients from agricultural runoff; and they provide buffers that control flooding and help prevent erosion. Even though they only make up less than 4% of the planet's surface, they're a key factor in the future of our climate. Globally, wetlands generate about \$49 trillion in economic benefits per year for all of these services.

Yet, as always, we find reasons to drain and ruin them with coastal development, dumping our trash, draining them for agriculture, and depleting water supplies to them as our constantly growing populations demand more and more water. Agriculture for our food is the biggest driver of draining wetlands, and globally we've lost 35% of our wetlands in the past 50 years.<sup>12</sup> In the past century, we've removed half the original wetlands in the U.S., and in New Zealand they've lost a whopping 90%.

In overpopulated California, 90% of wetlands have been lost, which in turn is killing birds that nest in wetlands. As their breeding spots dry up, breeding has decreased and populations have dropped. They try to crowd together in what little is left, resulting in more disease. Last-minute efforts at conservation are useless because the human population is so high that there's no water available for the wetlands.<sup>13</sup> How ugly is that? The bodies of about 20,000 poisoned birds were collected from wetlands in the Lower Klamath watershed that are drying up. It turns out that the drying is creating breeding grounds for a botulism toxin that is fatal to birds.

In Michigan, they're experiencing severe flooding in parts of Detroit because of the loss of wetlands that used to provide a buffer from flooding. They still have a few wetlands left in the area, but Waste Management is filling in one of them for added landfill capacity. Along the southeast U.S. coastline, constant development is picking away at the marshes, and efforts to reduce coastal development are blocked by laws that prevent regulators from restricting development. It's not helping that U.S. policymakers continue to fight natural waterflows and flooding with flood-control projects that disrupt the flow of rivers and encourage development in floodplains.

We continue to make the situation worse even though increasing wetland coverage by just 10% would cut nitrate levels in rivers and streams by as much as half, and nutrient pollution would be far worse without the wetlands that we still have. In Uganda the government is showing some level of common sense and has suspended all development in the country's wetlands in an effort to preserve them.

In Florida they're finally beginning to upgrade wetlands to reduce algae that causes red tide and are working on a huge, \$1.8 billion project to restore the Everglades, including a 6,500-acre wetland. In the past century, about half the area of the Everglades has been lost, and as climate change intensifies, they're trying to preserve what's left by allowing the water that has been restricted by more and more canals to flow freely. Yet more common sense. In Florida, no less. It must be getting pretty bad for that to happen. Just saying.

## **The Cleanup Crew**

Freshwater mussels are some of the most endangered species on the planet, which is a problem because they are natural water filters. This should be really scary, because all life, including us, need clean water to survive. A single freshwater mussel can clean up to 15 gallons of water a day, keeping waterways healthy for all wildlife that depend on them. Freshwater mussels have been pushed to the edge of extinction from water pollution and habitat fragmentation.<sup>14</sup>

Mussels are actually being put to work to reduce contaminants in the Potomac River by restoring the river's mussel population.

## **We Have Rights**

A potentially exciting development in the past few years has been the idea of rewarding rights to rivers, similar to the rights of people. If it sticks, this could be a great move in the right direction that could recover some freshwater populations by giving rivers back their space.

The Magpie River in Quebec was awarded legal rights, known as rights of nature, making it the first waterway in Canada to receive this protection.<sup>15</sup> Giving the river rights acknowledges its unique natural existence instead of just valuing it as a resource to be used and abused by man.

River rights are part of a global indigenous-led campaign aligned with the Rights of Nature movement, which aims to provide solid protections for the natural landscape. Other rivers have been granted rights, including the Whanganui River in New Zealand and the Klamath River in the United States.

Rights of nature have also been granted in Colombia, Ecuador, and India with varying levels of success. In the U.S., communities in Ohio passed a law granting Lake Erie personhood rights, though the law is already being challenged, and it would be shocking to see it survive the Trump administration. In Colorado, attempts in 2017 to give the Colorado River rights of personhood collapsed after the state threatened possible sanctions against the lawyer behind the case.<sup>16</sup>

While the rights of the Klamath are awesome and way overdue, the tribes are getting harassed by nasty redneck white supremacists who have no clue. Here we have indigenous people trying their best to clean up a river that's been trashed by whites, and do so peacefully, so that fish can actually live there again, going through proper legal channels to do so, and they're constantly under fire by the marching MAGA morons. You'd think if there was one thing we could all agree on, it would be the importance of saving the last remnants of the wild world, and helping it to recover if possible. And yet these creeps are filling Facebook with anti-indigenous posts that link the basin's problems to wild conspiracy theories regarding government takeover. "Make our fish go away, and then maybe the tribes will go away."<sup>17</sup>

So let me get this straight: we invaded their land, filled it full of too many people to feed and too many farms sucking from the river, killing all the wildlife, and now we're so selfishly entitled that we wish they would go away so we can finish the job of trashing the environment? These people are truly disgusting examples of how ugly our species can be when their real colors come out, aren't they? Talk about backwards and anti-progress. And think about this. This is what the beginning of violence looks like when too many people are competing for too few resources.

In Montana, a Democratic senator introduced a bill, the Montana Headwaters Legacy Act, to protect 336 miles of rivers in Montana with federal protections. Advocates argue that clean water is important for agriculture and tourism as well as the environment, and it should be a bipartisan bill. I couldn't agree more. It still boggles my mind that all environmental issues aren't bipartisan. You'd think we'd all care about our planet.

In the Netherlands, where the government appears to have more sense than in the U.S., they've implemented a policy to let rivers run their course rather than try to control them with expensive and ineffective engineered flood-control infrastructure and dams that destroy ecosystems and wildlife. Their measures, such as outright prohibition of construction in floodplains and recessing levees farther from river banks, should help a lot in restoring wildlife and ecological balance. Basically, getting out of the way and letting nature take its course. In the long run, this is easier, cheaper, and works better.

### **Rights of the Magpie River**

1. Live
2. Exist and flow
3. Be preserved and protected
4. Evolve naturally
5. Be free of pollution
6. Maintain biodiversity
7. Maintain integrity
8. Perform essential functions within its ecosystem
9. Regenerate and be restored

"From New Zealand to Colombia, the powerful idea that nature has rights is taking root in legal systems. We must no longer view the natural world as a mere warehouse of commodities for humans to exploit, but rather a remarkable community to which we belong and to whom we owe responsibilities." David Boyd, U.N. special rapporteur on human rights and the environment

### **Going Both Ways**

Salmon are an interesting and unique species for a number of reasons. For one thing, they live in both fresh and salt water, and there aren't too many species that do that. They actually spawn in freshwater rivers, then they swim downstream to the ocean

and live there for their entire lives. When they are ready to die, they swim back into the river that they were born in and swim upstream to their birthplace, where they lay their eggs for the next generation and then die, giving their bodies to the ecosystem by way of whoever wishes to consume them. Nobody completely understands how they find their way home after years of ocean life; it's yet another example of the many things we don't know.

What we do know is that we've screwed up their balanced existence royally by building endless dams in their rivers for hydropower, and now they can't navigate back to their birthplace. Fish ladders have been installed in an attempt to mitigate this, but the salmon are rarely successful at getting through them, and as a result the salmon population has plummeted by 90% of its historic numbers. In addition, we have overfished them with our sheer demands, and we're destroying their habitat, which is clean, cool water, with global warming, diseases, silt, and pollution. The diseases are coming from a well-intentioned but misguided effort to mitigate the loss of Pacific salmon by farming Atlantic salmon, which carry diseases the Pacific salmon aren't used to, so when Atlantic salmon escape the farms and mix with the Pacific salmon, the Pacific salmon get sick and die.

The salmon are a keystone species, which is a special kind of species that is central to the success of entire ecosystems. All kinds of ocean and land wildlife, as well as humans, depend on salmon for food, or at least they did until we overfished them and built the dams. The Yurok tribe, which has historically relied on salmon for subsistence, are now allocated 650 salmon per year. Whales are starving because there's not enough salmon. Sea lions eat salmon, but it was only part of their diets until we built the dams, and then they started eating salmon that were stuck at the bottoms of dams in unnaturally high numbers, decimating the population even more. Now they're actually culling sea lions to reduce this decimation. Like it's the sea lions' fault. Think about how absurd that is. We ruin the ecosystem with our dams, so the salmon can't get up the rivers, then we shoot the sea lions that eat the salmon. After we drive the sea lions to extinction, what are we going to do then? Shoot all the bears for eating salmon? And the last of the whales? And then start on the penguins? The otters? People? Are we ever going to learn? Seriously?

Time and time again, when we mess with ecosystems, there are unintended and unforeseen consequences, usually at the expense of yet more species. Ultimately, if we don't knock it off, the species we impact will be us. Actually it already is, but collectively we're too clueless to see it as it creeps up on us. Like a frog thrown into cold water, then heated to a boil; the frog doesn't notice the gradual increase in heat until it's too late, and then it's dead.

What's really insane is that the vast majority of these dams, which were installed to produce hydropower, aren't even being used any more. They just sit there ruining the salmon runs. According to the National Inventory of Dams maintained by the Army Corps of Engineers, there are 92,468 dams in the U.S., and only 3% of these dams produce electricity. Wouldn't it make sense to get rid of them? Actually a few have been removed, with great success for salmon runs, but not enough of them at this point. We need to get rid of them all. That should be a no-brainer.

And what's even more ludicrous is that most of us who use electricity waste a good portion of it without even using it. Think about that. Look around. I have seen people who claim to care about the environment leave the lights on in their house when they're not even home, as one example. Leaving phantom energy plugged in because they can't be bothered to unplug every time. One of my personal favorites is the all-night outdoor light that also stays on all day if they forget to turn it off. Whatever. When I say everything we do matters, this is what I mean. It does matter. When we piss away electricity that we don't even need, we're a part of problems that we can't see, and just because we can't see them doesn't mean they're not real.

It seems that in recent years some government administrations are getting some level of common sense, and a few dams have been breached. The Biden administration was actually working with states and tribes in the Pacific Northwest to remove dams from the Snake River to help restore the salmon population. Of course, now that we've elected a fascist crook to lead the country, that's probably come to a screeching halt. It turns out that removing dams is very effective at increasing salmon populations, as has been demonstrated in the recent removal of Klamath River dams. The return of salmon was expected, but it's happening much faster than anticipated, proof that if we get out of the way, the salmon will bounce back. This is likely true of many other wildlife species as well. They'll eventually also return to an ecological balance with all the other life that depends on them. And then, maybe in a decade or so, I can actually enjoy some salmon and feel good about it.

Another unique fish that can live in both fresh and seawater is the Pacific lamprey, a bizarre eel-like sucker fish that has existed for 350 million years. They have survived five mass extinctions, and now their numbers have dropped by 65% in the past few decades. Even the lamprey may not survive our mass destruction.

## **Tribal Knowledge**

The indigenous people in the U.S. have proven with their mere existence over thousands of years that they are much better than the rest of us at maintaining balance with their environment and its bounty. They are also exceptionally resourceful in these times, as they are demonstrating in the Lower Snake River. The Nez Perce Tribe in Idaho are working to replace the generating capacity of the river with solar power as dams are breached in order to help the salmon, which are at about 2% of their original population, recover.

The Amazon is losing wildlife and freshwater species just like everywhere else as its habitat gets destroyed for agriculture and overpopulation leads to overfishing. Global warming is taking its toll in a big way, with record high temperatures of 102 °F in the Amazonian lake killing record numbers of the much-loved pink river dolphins—157 dolphins croaked in just a few days, amounting to about 10% of the lake's population.<sup>18</sup> At that rate, in addition to the overfishing and poisoned water, it doesn't sound like river dolphins are long for it.

If you think about it, these water temperatures should be really scary for the 47 million people who live near these rivers because eventually nothing much will be able to live in the water, so there goes their protein. Some awesome local activists are trying to mitigate the situation. *National Geographic* explorers have become prominent advocates for the dolphin's protection.<sup>19</sup> They lead education and conservation projects in South American communities that are frequently in contact with the animals. They're also promoting safe wildlife-watching, reforestation of riverbanks, and doing their best to foster empathy for the dolphins among fishermen, while collaborating with native communities. I have to applaud these efforts to get people to at least care.

The Amazon is also home to the largest freshwater fish on Earth, the enormous arapaima, an air-breathing fish that evolved millions of years ago. The indigenous population has depended on this fish for sustenance for thousands of years, but then the fish got discovered and became popular in the cities. Naturally, commercial fishing all but decimated them to satisfy the demands of the overpopulated cities. In this case, the locals started working with a government-supported nonprofit in 1999 to work out rules to restore balance, and these rules are still enforced.<sup>20</sup> They basically excluded outside fishing boats, and they had to build floating guardhouses that they occupy in shifts, armed with shot guns, to prevent poaching. They even imposed strict limitations on their own fishing. This is a great example of a serious and focused effort that works. Now, 20 years later, the population of arapaima has surpassed 300,000 in 35 protected areas.

Where there's a will, there's a way. If we can all muster the will, it will go a long way towards saving our wildlife, our planet and ourselves.