

Cleaning Up Ocean Pollution: Collecting "Ghost" Fishing Gear

Text and image provided courtesy of the National Fish and Wildlife Foundation.



"ghost" fishing gear

Did you know more than 10% of the pollution in the ocean is old fishing gear? Some of it got lost by accident or mistake. Some of it might have been thrown overboard from boats on purpose. Some people call these items “ghost gear.” And the ghost gear is causing big problems for wildlife in the ocean. From California to Florida to Maine, people are worried about how ghost gear is hurting ocean wildlife.

When ghost gear ends up in the ocean, it sometimes keeps fishing. Old lobster and crab cages, fishing nets, and fishing lines trap helpless animals that can’t escape. They often die. Plus, lost equipment is often worth a lot of money. When it ends up in the ocean, millions of dollars are wasted. Sometimes the old equipment can even damage boats. But across the United States, organizations are working to help solve the ghost gear problem!

In Maine, there is an organization that is focused on making a healthy ecosystem for lobsters and people. This organization, the Gulf of Maine Lobster Foundation, held special events for cleaning up lost lobster crates. Over a single weekend, more than 100 volunteers on boats

searched for and collected lost and broken lobster cages. The volunteers collected more than 3,000 traps! They returned 1,000 traps to their owners. They recycled 21 tons of steel from the non-useable traps. The money they earned from recycling was put back into the project. Now, they're working on collecting old fishing nets from professional fishers. They hope to recycle 280 tons of fishing gear!

In California, a group called Wildcoast is also getting ready to collect old fishing nets. They are setting up five different places to collect ghost fishing gear. The people at Wildcoast think they will be able to recycle 60 tons of unused fishing nets.

A group of fishers and a research center from Mississippi State University got together to work on the ocean pollution problem in Louisiana. They placed giant recycling bins at popular harbors for people to turn in old fishing gear. People who register with the program will receive a cash reward for all the gear they turn in.

These projects will encourage people to stop throwing old fishing gear in the water. The best way to protect the ocean from old fishing gear is to prevent the equipment from getting left behind. Programs like these also help to clean up what was already left behind. In this way, people can help protect the ocean and wildlife.

These conservation efforts are supported by the National Fish and Wildlife Foundation (NFWF), which specializes in bringing together individuals, government agencies, nonprofit organizations, and corporations to restore our nation's fish, wildlife, plants, and habitats for current and future generations.

How to Find Fish without Seeing Them

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a bridled darter in the Conasauga River in Tennessee

Researchers at the Tennessee Aquarium are working on a project to find two types of fish. They are looking for bridled darters and blue shiners in the Coosa River basin area. The bridled darter is a small fish named for a stripe across its snout. The stripe looks just like a horse bridle, the leather strap that fits around a horse's head and nose. The blue shiner is a 4-inch-long minnow that is bluish in color. Scientists want to find ways to protect these fish so they don't die out. But first, they need to figure out where the fish are, and where the fish are not.

Researchers study streams and rivers looking for these and other threatened fish. They also look for invasive species—the animals that don't belong there, but are trying to move in and take over. Invasive animals and plants can kill off native species. The work to find certain fish and wildlife can be difficult and take a long time. The researchers have to be in the right place at the right time to catch sight of the animal they want to find. But now, researchers are using a new way to find and track animals in and near water... without seeing them! They are using environmental DNA, or eDNA.

All plants and animals have DNA in every cell. DNA stands for deoxyribonucleic acid. It is a molecule that carries important information in every cell. In humans, DNA tells every cell in

our bodies how to grow. It's in our organs, including our skin. Plus, it's in our blood, sweat, and even poop. The same is true for fish! When fish swim in streams and rivers, they lose skin cells and poop in the water. That means they leave their DNA in the water.

Scientists have learned how to find a tiny amount of DNA in water and use it to find fish. They use a process called PCR, which stands for polymerase chain reaction. Here's how it works: First, the researchers take a sample of water from the stream or river they are studying. Then, they go to a laboratory. They analyze the water sample, looking for bits of DNA. When they find some, they mix the DNA with a special liquid. The liquid helps the DNA grow and multiply. This makes the tiny bit of DNA much bigger. Then, a special machine can analyze the DNA and tell the scientists what species the DNA comes from. Those are the species in the water!

Using eDNA gives researchers a new tool to help fish. Researchers are even taking eDNA samples from soil, too! That will allow them to help many more hard-to-see species in the future.

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How to Band Birds

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a banded bird

From songbirds in cities to shorebirds on the beach, everyone has seen a bird. But some people, such as researchers, take time and put in effort to study birds closely. One of the ways researchers study birds is through banding. Banding has nothing to do with guitars and drum sets. Instead, bird banding is when researchers place a special band on birds' legs. Bird banding has been used to study wild birds for more than 100 years!

Birds like to visit and live in areas that have good food and a safe place to rest. They look for areas with trees and bushes. So when scientists want to study the birds in a certain area, they might set up a banding station there. Using special nets, researchers and volunteers gently catch the birds to learn more about them. The researchers carefully weigh and measure the birds and keep track of their species and gender. They also put the bands on each bird's leg.

The small metal bands are lightweight. Each band has a different number on it. If the bird is ever caught again, researchers will know where the bird was found the first time. They'll also know if the bird has changed at all. Some researchers use tiny plastic bands in bright colors

in addition to the metal bands. The bright colors can be seen from a distance.

In the United States, the U.S. Geological Survey manages the bird banding program for most of North America. So many birds migrate through the continent that Canada and Mexico agreed to be part of the U.S. program. Information collected through bird banding is shared with all the scientists and researchers in the three countries.

The information that scientists have collected at banding stations helps us understand the flight patterns of different bird species. Scientists can describe the routes the birds take when they migrate. Thanks to banding, we are learning where and how long birds live. Researchers are also studying how bird size and migration routes may be changing.

Because of programs that count and follow birds, researchers know that billions of birds have died over the past 50 years. Now that they are aware of this problem, scientists are trying to find out what is killing the birds and how to help them.

The biggest problem for the birds is the loss of habitat. People cut down forests and remove the plants in fields to build homes and businesses. The birds have fewer places to rest when they travel. When they arrive at their former homes, there are no trees left to build their nests. For birds that nest on the ground, the loss of the fields means they have no home either.

Climate change is another problem. Warmer temperatures are causing bigger storms, which might send migrating birds in the wrong direction. Big storms might also injure the birds. The warmer temperatures are also changing the growing season. Some plants are starting to bloom at earlier times. This may cause birds that migrate to miss their food source.

Another problem for birds is lights from large cities. Lights can cause birds to crash into buildings and die. Some cities have started to schedule nights with “lights out” during migration seasons.

Researchers are working to find other solutions to help the birds. Solving problems always starts with understanding the causes. By studying the birds and the problems they are facing, researchers hope to find ways to help birds thrive.

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Preserving Grasslands

Text and image provided courtesy of the National Fish and Wildlife Foundation.



grasslands in Saskatchewan, Canada

The northern grasslands of the United States stretch from the Dakotas to the foothills of the Rocky Mountains. They are also known as prairies. Researchers are learning that grasslands may help slow down some of the climate change caused by global warming.

The Earth is getting warmer for many reasons. The biggest cause is the increase of carbon dioxide in the Earth's atmosphere. Carbon dioxide traps heat from the sun. Carbon dioxide goes into the air when humans burn fuels such as coal, oil, and natural gas. Carbon dioxide is also released into the air during wildfires.

Plants absorb some carbon dioxide from the air. They convert carbon dioxide and water into their food. And the bigger the plant, the more carbon dioxide it absorbs. Based on this knowledge, people often want to plant more trees to help slow climate change. And trees are important. But researchers in California believe that in some areas with wildfires, grasslands hold carbon even better than trees.

While trees have roots below ground, most of a tree is above ground. So, when a wildfire burns trees, a lot of the carbon from the trees is released back into the air. But grasslands are the opposite. Grasses have long roots that go deep into the soil. The roots are usually bigger than the parts of the plants that you can see above the ground! The grasses in grasslands push some of the carbon dioxide into their root systems and into the soil. So

when a wildfire burns in a grassland, less carbon gets released into the air. Grasses' long roots keep more of the carbon in the ground.

There are many different types of grasses and flowers growing in the prairies. Some of the grasses include western wheatgrass, blue grama, and switchgrass. They grow with flowers like purple coneflower, hairy sunflower, and bladderpod. This variety of plants is important for many reasons. They offer food to pollinators like insects and bats. They support special birds that only live there, such as the sage-grouse and burrowing owl. They also support all sorts of mammals. Small mammals, such as the prairie dog, and large mammals, such as elk and pronghorn, are just some of the animals that call the prairie their home.

Most of this landscape is owned by ranchers. They raise cattle, who enjoy eating some of the grasses in the prairie. Both cattle and wildlife need the same grasslands to live. Ranchers are leading some conservation groups and working with others to help care for the grasslands. Caring for the landscape helps both cattle and wildlife. And now there is another reason to preserve the grasslands: saving grasslands can be part of people's efforts to slow climate change.

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Scat-sniffing Dogs are Helping to Save Orcas

Text and image provided courtesy of the National Fish and Wildlife Foundation.



an orca

Dogs love sniffing. The part of their brain that controls their sense of smell is 40 times bigger than the same part in a human brain! People have learned how to train dogs to sniff out all sorts of things. Dogs can find rare mushrooms, bedbugs, and even people with certain types of cancer all by sniffing.

Trainers work closely with a dog to teach it to find a certain scent. The trainer finds a toy or activity the dog really likes and uses that as a reward. Then, the trainer shows the dog a sample of an item to find. The dog smells the item. Then, the trainer hides the item for the dog to find. After the dog finds the item, they get the reward. Dogs can even be taught to bark or wag their tail when they find their target item.

Now, people are using dogs' sniffing skills to help save orcas. Orcas are black and white mammals also known as killer whales. They are actually the largest type of dolphin. Dog trainers at the University of Washington are working with orca scientists. They are training dogs to ride in boats and sniff for orca scat. What is scat? It's another word for poop. Scientists can analyze the scat collected from the water and learn about the orca.

Learning about the orcas in Washington is an important goal. Only about 80 orcas live in the Puget Sound in Washington. While orcas live in oceans all over the world, this particular group is called Southern Resident orcas. And they are at risk of dying out. Many scientists and researchers are trying to help them survive. But the first step is to understand why there are so few of them.

The Southern Resident orcas are not having many babies. This is one reason they are at risk of dying out. Scientists are trying to figure out why the female orcas aren't having babies. They think part of the problem may be the food the orcas eat. The orcas eat mostly fish, and they prefer Chinook salmon. Unfortunately, some of the water the fish live in is polluted. The fish absorb some of the pollutants, or chemicals. Then, when the orcas eat fish that contain chemicals, the orcas absorb the pollutants. The scientists suspect the female orcas pass the pollutants on to their babies during pregnancy or when nursing. This may be one of the reasons orca babies have died. But the researchers need to know more to help the orcas.

One way to study orcas without having to capture one is to study their scat. Scientists can analyze the scat and learn a lot. They can learn the orca's gender, tell if it's pregnant, see what the orca has been eating, and check if it's been eating any dangerous chemicals. But finding the scat can be a challenge. That's why the scientists have hired helpers: the scat-sniffing dogs!

Scientists hope that analyzing the scat and doing other research will help them find ways to save the Southern Resident orcas.

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Saving the Flying Mammal

Text and image provided courtesy of the National Fish and Wildlife Foundation.



a brown bat

You might think bats are creepy. Maybe bats have a scary reputation because they come out at night. But bats are an important animal in the ecosystem. They are pollinators, just like birds and butterflies. Pollinators spread pollen from one flower to another so plants can make fruit and seeds. That makes bats important to farmers and people who like food, which is everyone! Bats also eat bugs that people consider pests, such as mosquitos. When they fly at night to hunt for insects, they use echolocation. They send out a high-pitched sound and listen for the echo to return. The returning sound helps them locate bugs.

Bats are mammals, just like humans. The bones in their wings are similar to the bones in our hands and arms! Females give birth about once a year to just one pup. There are nearly 1,400 different types of bats in the world, and about 40 species in North America. Some are named for their favorite foods, such as fruit bats. Other bats are named for their size, such as small brown bats. And some are named for their features, such as long-eared bats.

In North America, bats are in trouble. Since 2006, millions of bats have died. This is bad for bats, as well as for people. It's also bad for the environment. Starting in 2006, people in New York noticed that many bats got sick and died over the winter. No one knew why. So wildlife scientists tried to find out what was making the bats sick. They found a problem in some

places where bats were hibernating.

Most of the bats in the northern United States and Canada hibernate during winter. That means they find a safe spot, like a cave, to keep warm and rest during the cold months when there is no food. They can slow down their breathing, so they use less energy. But in New York, researchers discovered a fungus in some of the caves where the bats were hibernating. The fungus grew on the bats' faces. This caused the bats to awaken from hibernation. As a result, the bats used more energy. They got weak and thirsty during the winter. The few bats who lived until spring didn't have the strength to find food or have babies. They died.

The scientists have named the disease white-nose syndrome because that's what they see when the bats get sick. Scientists who found the fungus are now searching for ways to help bats. They are studying the bats that survived in caves where the fungus killed other bats. They want to understand how the disease spreads and how some bats stayed healthy. Other scientists are working in the bats' caves to remove the fungus. Some researchers are even trying to make a vaccine to give to bats that would prevent white-nose syndrome. People hope these efforts will help save these important flying mammals.

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Bring in the Beavers!

by ReadWorks



It was the fifth straight day of heavy rain in the town of Leith. If it kept on pouring for much longer, the river would swell with rainwater and flood the town. All the citizens of Leith would have to flee their homes and find safety on higher ground. Anna and her parents stayed glued to the television set, nervously listening to the weather reports.

For now, the weatherman said, the situation was still safe, but helicopters were ready to lift people away at any moment if the rain did not stop soon. Anna felt her palms grow sweaty as she saw the frightened expressions on her parents' faces. Her parents never looked scared. They were used to the rain, since Leith was located in the rainy country of Scotland, but it had never, ever poured like this before. The town had cancelled school in case of a sudden emergency, so all Anna could do was try to read her favorite detective stories and hope for the rain to stop. Luckily, it did. When she awoke the next morning the skies were sunny and clear. It was a miracle. They had been spared from a terrible natural disaster.

Everybody in Leith breathed a great sigh of relief, but they knew they had to take action. Nobody wanted to face this flooding danger again. The day after the downpour stopped, the Mayor of Leith called a town meeting. Anna went along with her parents to find out more. She really did not want all her books and toys, and her pet dog Noodles, to get washed away in a flood.

At the meeting, the Mayor presented three experts who had different ideas about solving the problem. One man suggested they build a concrete dam upstream to block the river's path. With such a big dam, the river would never overflow into Leith, even in heavy rain. Another lady suggested building a different structure, a high stone wall all around Leith to stop floodwater from getting in. The last speaker, a small,

slender man with a heavy Scottish accent, had what seemed to be the craziest idea of all.

"You see," he said, "if we just bring some beavers back into our landscape, we might be able to kiss our problem goodbye. About 400 years ago, there were thousands of beavers roaming around the Scottish countryside. Our ancestors killed most of them off because they enjoyed hunting them for their warm fur. What our ancestors didn't realize was that we need to keep beavers alive for our own safety. The beaver builds dams in the rivers out of sticks, mud, and leaves. These dams are strong enough to stop a river from flooding in heavy rain. If we bring the beavers back, we can solve our problem by working with nature."

After the three experts spoke, the Mayor asked the citizens of the town to think for a week and then vote for the best plan. Anna's father said, "That last guy is crazy. He thinks he can solve the flooding problem with beavers? Really, how silly."

Anna's mother looked very thoughtful. "You know, Fred," she said. "It's worth a try. What harm can it do? If workmen build just one concrete dam or a stone wall, it won't be as useful as several dams built by the beavers. And besides, beavers are very cute, and they build beautiful dams out of things they find in the forest. Concrete dams are not nearly as beautiful."

There was much whispering and discussing all over town until the final vote was cast. Anna secretly hoped that the beaver plan would win. She had always wanted to see a beaver in real life. Since Leith was in the countryside, and everyone in town loved nature and animals, Anna suspected that the rest of the town might be on her side. When the vote finally came in, Anna was proven right. They would bring in the beavers!

Over the next two years, scientists brought beavers in from other parts of Scotland, and set them free upstream and in the countryside around Leith. Everyone noticed a difference. It rained and rained, but the river did not even come close to overflowing because of three dams the busy beavers had already made. For her fourth grade field trip, Anna's teacher brought her class into the countryside to see the beavers at work. They watched in awe as the furry creatures hurried back and forth from the dam carrying twigs and bark in their claws.

Beavers almost seemed like furry, cute little people. Before they left, Anna and her classmates shouted out a loud "thank you" to their animal friends for saving their town.

What's This? One Big Bite

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



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Food can be hard to find in the deep sea, where there's too little sunlight for plants to grow. Some hungry predators lurk and wait - then swallow their prey whole.

The **black swallower** can gulp down prey 10 times its own weight, bones and all. The swallower's rows of large, pointed teeth fold back to make room in its mouth and throat. Once inside, the prey is trapped in the swallower's elastic stomach, where it's slowly digested.

What's This? One Terrific Tongue

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Dori (CC BY-SA 3.0 license)

Your tongue is an amazing feature. You depend on this bundle of muscles to take in, taste, and swallow food.

Some animals, like the **giant anteater**, use their tongues to hunt. Anteaters raid anthills and termite mounds with their nozzle-shaped snouts. Their long, sticky tongues extend nearly two feet (61 centimeters) beyond the tip of the snout to pick up insects. With such a long snout and tongue, the anteater can feed while standing back from a nest and avoid getting bitten or stung.

What's This? Super-Sized Appetite

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo Courtesy of L.Herman/NOAA

The blue whale is the largest animal ever to have lived on Earth. It's even bigger than the enormous dinosaurs that lived over 65 million years ago! Blue whales migrate long distances, traveling alone or in small groups called pods. These colossal creatures breed in warm southern waters during the winter and feed in polar seas during the spring and summer.

It's no surprise that the world's largest animal has an enormous appetite. The **blue whale** needs about 8,000 pounds of food a day during its summer feeding season.

But this giant's diet is made up of some of the ocean's tiniest creatures: shrimp-like animals called krill. To feed, the whale gulps down huge amounts of water, then filters out the krill using its fine, comb-like baleen plates. It takes about 40 million krill a day to satisfy the blue whale's appetite!

What's This? Packs a Punch

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Silke Baron (CC BY 2.0 license)

In order to eat, predators must first strike, bite, or poison their prey. And no other animal strikes faster than the **mantis shrimp**.

This tropical shellfish punches prey with a pair of limbs it keeps folded under its body. When released, these spring-loaded weapons swing at speeds up to 50 miles (80 kilometers) per hour. The force is strong enough to shatter shells and sometimes even aquarium glass. Some mantis shrimp arms are tipped with spines for lightning-quick stabbing.

What's This? Iron Grip

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Jonathan Wilkins (CC BY-SA 3.0 license)

The **harpy eagle** is one of the world's largest birds of prey. With claws as long as a grizzly bear's, this eagle hunts sloths, monkeys and other mammals.

It uses its powerful talons to pluck prey from rainforest branches, puncturing the animal's organs as it flies to the top of a tree. Then, pinning the prey with its feet, it tears away bits of flesh with its beak to eat or feed its young. Its grip is strong enough to catch and carry an animal close to its own body-weight - up to 20 pounds (nine kilograms)!

What's This? Rafflesia Plant

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo by Rendra Regen Rais (CC BY-SA 3.0 license)

This is the flower of a *Rafflesia* plant.

The brilliant, red bloom of the *Rafflesia* plant is the largest flower in the world, growing up to three feet across.

And yet this rare rainforest plant doesn't have any leaves, stems, or roots. That's because it's a parasite: it feeds off its host, a type of grape vine. It attaches itself to the vine and draws all the nutrients and water it needs to survive. It also smells like rotting flesh, which is why it's also called the "corpse flower."

The Mouse that Scored

by Jane Malloy



Photo by Edgar Colomba from Pexels

basketball hoop

Reuben sat on the bench during gym class, daydreaming. As his classmates hustled up and down the basketball court, he was imagining a different game-one in which a squad of colorful bricks whirled and side-stepped and dunked. At the center of this spinning circle he could see a giant basketball... made out of Lego bricks.

Reuben had this dream all the time. A few weeks earlier, he had built exactly that kind of huge Lego basketball. It was for a city-wide art contest that everyone was excited about: the prize was a \$100 check for the student artist and a visit to the winner's school by the world-famous Harlem Globetrotters. Since he had submitted his entry, Reuben kept dreaming about his creation, imagining it would show his classmates how good he was... at something!

So even though students' sneakers made lots of loud squeaks across the floor, Reuben was caught up in his basketball ballet, envisioning the bricks move closer ... and closer ... and closer...

Suddenly, a piercing whistle cut through his daze, followed by an urgent shout from the gym teacher: "*Reuben!*"

Startled, he jumped to his feet and responded, "Yes, Ms. Henries!"

"Where is your *attention*, young man? I had to call you three times. Now go take Lamar's place."

"Who, Reuben? He's too busy building Lego contraptions in his head," Kiana yelled as their classmates laughed.

Of course Kiana was right. What made it worse was that Reuben was the tallest boy in his class, and his combination of his height, long arms, and wiry fingers screamed "basketball player." Based on his physical appearance, Reuben was expected not just to be good at basketball, he was expected to be great!

But he was neither. Chasing and shooting balls was not his thing. He loved to tinker, to build and design and draw things. Once, he even made a humane mouse trap out of wire, springs, and cups he'd collected.

"Why are you worried about *mice*?" his mother complained. "They eat our rice and are totally useless!"

"But did you know, Mom, that mice sing to communicate and feel empathy for other mice? And that some carry seeds to other parts of the environment, which helps things grow!"

"Huh," his mom said, then frowned and replied, "Even so, mice are no use to no one."

"Mice matter too, Mom!" Reuben retorted.

Back on the basketball court today, Reuben felt like an oversized mouse himself, trapped in his wiry body and just about useless in the eyes of his peers. *He* knew he mattered, but he couldn't prove it in gym class.

Now Ms. Henries wanted him on the court, so Reuben took Lamar's place. Soon, he was caught in a flurry of arms, elbows, and more screeching sneakers sliding across the gym floor.

"Shoot, Reuben, shoot!" he heard Lakeisha yell. "*And hurry up!*"

Reuben tossed the ball toward the net, praying it would go in. Would it? Could it?

Nope, it barely reached the backboard and bounced away.

"Nice shot, Shaq," Lamar taunted from the bench.

Reuben shook his head, then Ms. Henries blew her whistle and gym class was over. He ran off the court, relieved to be done today with gym and basketball.

For the rest of the day, however, Reuben couldn't shake his sadness. Why didn't people see

his usefulness? The basketball court wasn't the only place that counted, was it?

As the clock ticked toward 3 PM, Reuben was counting the minutes till he could tear out of school. But just before dismissal, an announcement came over the classroom loudspeaker: "Good afternoon, students," said Mr. Green, the principal. "I have wonderful news. The citywide art contest has made its choice, and the winner is one of our students!"

The class began buzzing. Who would it be?

"I'm delighted to tell you that our fifth-grade artist Reuben King and his remarkable Lego basketball have won the contest," Mr. Green continued. "Congratulations, Reuben! Thanks to you, the Globetrotters will be coming to our school next month."

Reuben's classmates cheered, and Kiana, of all people, leaned over her desk to offer him a high-five.

And from the very back of the room, he heard a voice call, "Hey, dude, looks like you finally found a way to win!"

Reuben turned around and saw Lamar holding up a fist and giving him a distant pound.

"Finally, this mouse matters," Reuben thought. "Finally, this mouse *scored!*"

Senegalese Wrestling

by Caitlyn Meagher

Wrestling is the most popular sport in Senegal, a country in West Africa. This sport is called *laamb* in the Senegalese language of Wolof. It has been practiced in Senegal for centuries.

Senegalese wrestling began as an enjoyable activity for fisherman and farmers. These competitions took place at the end of the harvest season. The winners would often win cattle and other prizes. They gained respect in their villages as strong and courageous men.

The traditional version of *laamb* takes place in an area covered with sand. Wrestlers cannot punch each other. They must use other methods to wrestle their opponent to the ground. The more modern version of Senegalese wrestling allows for wrestlers to throw jabs or punches. When a fighter's back, rear, stomach or both their hands and knees hit the ground, that player loses. Many times, wrestling matches only last a few minutes.

These wrestling matches have spiritual elements that are connected to Senegalese culture and religion. For example, marabouts give guidance to the wrestlers before each competition. Marabouts are spiritual guides that follow Senegal's Sufi Muslim traditions. They provide the wrestlers with specific instructions and materials to keep away bad spirits. During the match, wrestlers wear leather charms and amulets. These amulets contain verses from the Quran, the sacred book of Islam. The wrestlers hope that observing these spiritual practices will help them win. Wrestlers also give an oral art performance called *bákk* before the wrestling begins. This performance can include poetry, stories and songs of praise. They do this to intimidate their opponents and gain support from the crowd. Drummers and other singers also take part in this performance.

Senegalese wrestling continues to be an important part of West African society, and is growing in popularity. Many young people in Senegal admire wrestling stars and hope to be like them. In fact, an estimated 50,000 young people currently train in the sport in Dakar, the capital of Senegal. There are multiple wrestling schools that teach young fighters specific skills. It is not easy to become a champion wrestler, but many Senegalese train hard to accomplish this goal.

Pato: Argentina's National Sport

by Caitlyn Meagher



Beatrice Murch on Flickr

A player throws the pato ball into the goal.

Pato is a unique sport, and the national sport of Argentina. Teams of four compete on horseback to score points with a large leather ball with six handles called a *pato*. This sport tests players' horseback riding skills and hand-eye coordination.

The player with the pato must hold it in their right hand and stretch out their arm as they ride. With their other hand, they hold the reins of their horse. Players on the other team try to steal the pato away, often by grabbing and tugging the pato while galloping down the field! Meanwhile, the player with the pato tries to pass it to their teammates. Their goal is to get closer to their opponent's vertical hoop at the end of the field. If a player passes the pato through their opponent's hoop, their team scores a point. The team with the most goals at the end of the game wins.



Meet Aires on Flickr

two people playing pato

Historians believe the sport was invented by gauchos in the 17th century in The Pampas, an area in central Argentina with large plains. Gauchos were expert horse riders and hunters who lived in this area. They lived off the land and roamed the plains to find work and avoid city life. Gauchos played a version of pato in an open field. When the game was first invented, players did not use a leather ball. They used a duck trapped in a bag. (In fact, *pato* means "duck" in Spanish.) But by 1822, this version of the sport was banned. Authorities banned the game because it was extreme and dangerous. Many gauchos got hurt or even died while playing. In 1938, the ban was lifted, some rules were changed, and the duck was replaced with a leather ball. Now, no ducks are used or harmed when playing pato. The name of the sport remains the same, though. In 1953, President Juan Perón declared it the national sport of Argentina.

Now, pato is a popular and exciting sport for players and spectators alike. Every year, Argentina holds the Argentine Pato Open. This championship brings together the top pato teams in the country. Audiences watch exciting displays of skill, balance, and strength on horseback. Although pato is the national sport of Argentina, not many Argentinians have seen a live game. But pato still remains an important part of Argentine history and culture.

The History of Surfing in Hawaii

by Caitlyn Meagher

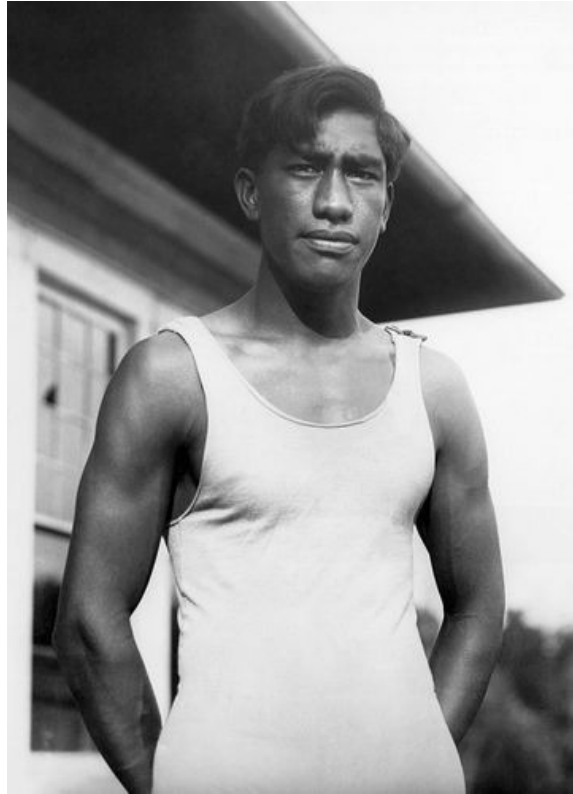
Surfing has existed in many forms for several centuries in places like West Africa and Peru. But the origins of the most popular form of modern surfing originated in Ancient Polynesia. Cave paintings from the 12th century show Polynesians riding waves. The first Polynesians arrived in the Hawaiian Islands in the 4th century. They brought with them their deep knowledge of the ocean as well as the sport of surfing. Surfing has been a major part of Polynesian and Hawaiian culture for thousands of years.

In Hawaii, surfing has always been more than a sport. In its earliest days in the islands, it was a cultural and spiritual activity. Hawaiians called surfing *he'e nalu*, which means "wave sliding." They followed an ancient code of rules and laws called *Kapu*. The *Kapu* system controlled religion, politics, lifestyle, and surfing customs. For example, before selecting a tree to carve to create a surfboard, Hawaiians would give offerings to the gods. They prayed to the kahuna, or expert priest, to give them good waves. Hawaiians even gave thanks after surviving a rough wipeout in the ocean. All of these traditions were a well-established part of Hawaiian surfing culture.

Hawaiian men, women, and children of all ages and social classes surfed. Back then, Hawaiian society was split into two main social classes: the royal and the common class. Only members of the royal class could surf in certain areas with the best waves. Chieftains, the highest members of the royal class, displayed their courage, skill, and power by surfing in big waves. They rode on *olo* boards, which could be as long as 24 feet and were made of heavy wood. Other Hawaiians rode *alaia* or *paipo* boards. These boards were much shorter and lighter, making them easier to ride. Although the social classes in Hawaii were strictly divided, some people in the common class gained respect from the royal class by demonstrating their surfing skills. Over hundreds of years, surfing continued to flourish as an important part of Hawaiian life.

In the late 1700s and early 1800s, white settlers began arriving in Hawaii. The first written account of surfing happened in 1778. British explorer Captain James Cook wrote that the surfer he watched seemed to feel "the most supreme pleasure, while he was driven on, so fast and so smoothly, by the sea." However, not all explorers and other white settlers felt the same way about surfing. Missionaries arrived on the islands of Hawaii. They thought surfing was sinful and tried to ban it. They also brought diseases to the islands. By 1800, the Hawaiian population had declined by 48% since Cook had arrived in Hawaii. By 1840, the

population had declined by 84%. During this time, surfing almost disappeared. However, a few dedicated Hawaiian surfers persevered and continued to keep the sport alive.



Duke Kahanamoku

Duke Kahanamoku and George Freeth, two Hawaiian surfers, helped spread surfing to the rest of the world. In 1907, Freeth gave surfing demonstrations in Southern California. People were amazed at his skill. In 1914, Duke Kahanamoku went to Australia and popularized surfing there. Soon, many people started traveling to Hawaii to learn how to surf. New, lighter boards were created that made surfing more accessible. It became an international sport.

Today, there are about 35 million surfers worldwide. In 2016, the Olympic Committee decided to make surfing an Olympic sport for future Olympic Games. Surfing continues to be a popular sport in Hawaii and the rest of the world.

Bolivian Female Wrestlers Fight for Equality

by Caitlyn Meagher



Joel Alvarez on WikiCommons

a cholita wrestling match in Bolivia

You may not think wrestling and activism have much in common. But indigenous female wrestlers in Bolivia would disagree. These athletes are called the Fighting Cholitas. They are using their wrestling platform to fight against discrimination.

The Fighting Cholitas are part of the Aymara and Quechua peoples of Bolivia. For many years, many of the Aymara and Quechua lived only in rural areas. When they migrated to cities, they faced a lot of discrimination from other Bolivians. They were treated poorly and even banned from certain public places. The Aymara and Quechua did not gain the right to vote until 1952. They were sometimes referred to as "cholos" or "cholas," disrespectful Spanish terms for indigenous people. However, these indigenous wrestlers have taken these words used against them and turned them into something positive. They call themselves "cholitas" because they are proud of their culture and history.

The Fighting Cholitas wrestle and box in a ring in El Alto, the second-largest city in Bolivia. About 20 years ago, the wrestling organizers introduced the female wrestling competition as a side act for a male wrestling show. Many Bolivian men did not think women should wrestle. They saw it as only a male sport. But the Fighting Cholitas proved them wrong. Their fights were so popular that the Fighting Cholitas quickly became the main act!

The Fighting Cholitas wrestle in traditional indigenous dress. They wear pleated skirts, shawls, bowler hats, and braids. The cholitas fight against gender stereotypes by showing their strength and skill. "We show that a woman can do whatever she puts her mind to," said Mery Llanos, a cholita wrestler, in an interview. "We show society that we are strong and we respect our Aymara culture."

Thousands of people come to watch and cheer for the Fighting Cholitas. Before a fight, the wrestlers come out to traditional indigenous music. Each match has a dramatic storyline between a "good" character and an "evil" character. Both wrestlers perform acrobatic moves to tell the story. The "good" character wins at the end and the crowd celebrates! Although the fight may be scripted, the wrestling moves and falls are real. The wrestlers show incredible acrobatic and athletic skill.

Now, there are multiple female wrestling groups in Bolivia. Through their athleticism in the ring, they show the world the strength and power of women.

The Amazing Acrobatics of Sepak Takraw

by Caitlyn Meagher



Republic of Korea

South Korea's Kim I-seul and Japan's Chiharu Yano during the Japan vs. South Korea in 2014

Sepak takraw is a very popular sport in Southeast Asia. It requires athleticism, flexibility, and teamwork. In this sport, three teammates work together to hit a ball across a net using only their feet, knees, chest and head. The ball is not allowed to touch the players' arms or hands. Players use their flexibility to twist, jump, and kick with grace and power. The goal of the game is for one team to score more points than the other team. Players score points when they cause their opponents to fault. Faults occur when players make errors like hitting the ball out of bounds or missing the ball. Each team can only hit the ball three times in a row before the other team must hit it.

Sepak takraw has been around in different forms for a very long time. Since the 15th century, different versions of sepak takraw have been played across many Asian countries. One version most likely came from a Chinese military program. As part of this program, soldiers would kick a ball and try to keep it in the air with their feet. At the time, the ball was made from animal hide and chicken feathers. This version of sepak takraw was less of a sport, and more of an exercise for soldiers to stretch their legs and practice their agility. Throughout Asia, people played other versions of sepak takraw for centuries with their own rules. In fact, the

game has different names in different places. In Thailand, it is called "takraw," and in Laos it is "kataw." In Malaysia, it is called "sepak raga." One distinct version of the game is found in Myanmar and is called "chinlone." In this version, teams do not compete against each other, but perform together in a playing circle. The goal of the game is to keep the ball in the air in graceful and entertaining ways.



ktphotography from Pixabay

Now, sepak takraw balls are made with plastic and other synthetic materials, but they were once woven from palm leaves.

The more modern, simplified version of sepak takraw was made official almost 200 years ago in Thailand, then called Siam. In 1829, the Siam Sports Association created the first official rules of the game. The organization added the net between the teams and hosted the first public tournament. Within just a few years, sepak takraw was played in most Thai schools. The game became very popular. It was even played to celebrate the kingdom's first constitution in 1933!

Even with this popularity, sepak takraw did not have standardized rules across Asia until the 1960s. The Asian Sepak Takraw Federation created the first set of formalized rules across Asia. The game took on the official name of sepak takraw. For many years, Thailand and Malaysia have dominated sepak takraw tournaments. And over the years, this sport has gained international popularity. Many people in Asia are calling for sepak takraw to become an official Olympic sport. Making sepak takraw an Olympic sport would broaden its audience even more.

Sepak takraw is an entertaining, fast-paced sport with a long and varied history. Spectators love to watch players do gravity-defying kicks and use their whole body to keep the ball up in the air. Have you seen or played in a sepak takraw game?

The Sport of Kabaddi

by Caitlyn Meagher



Nick Leonard on Flickr

People play a game of kabaddi.

Kabaddi is a team sport that requires quick thinking, strength, and the ability to hold your breath! People of all ages play and enjoy kabaddi. All you need is friends to play with and a large court. Today, kabaddi is one of the most popular sports in India.

To play kabaddi, two teams of seven players alternate between playing offense and defense. To start a round, the attacking team (offense) sends out one player to be the "raider." The raider's job is to cross the court and enter the defending team's territory. They must score points by touching as many of the defending players as possible. The raider must then escape past the line in the middle of the court and return to their own territory. To make things tougher, the raider has 30 seconds to score. And, as they are trying to tag players, the raider must continually chant "kabaddi" out loud in a single breath! If the raider loses their breath and stops chanting "kabaddi", they are out. Once a raider touches a player, the defending team tries to tackle the raider before the raider passes the midline. If the defending team tackles the raider and the raider loses their breath, the defending team gets a point. The two teams take turns defending and raiding. At the end of 40 minutes, the team with the most points wins. There are three different styles of kabaddi, but they all have these rules in common.

Kabaddi has a rich, long history in Indian culture. It is believed that kabaddi began in India and has been around for thousands of years. One major source of evidence for this is *The Mahabharata*. *The Mahabharata* is an epic poem that was written over 2,000 years ago in ancient India. It mentions a military operation that resembles the sport of kabaddi. It describes a warrior named Arjuna, who mastered kabaddi skills with the help of the Hindu god Krishna. He would climb over walls to attack his enemies and escape unharmed. Throughout history, Indian princes would often play kabaddi to demonstrate their strength and skill. The game continued to develop over the years in India. In many parts of India and South Asia, kabaddi was played in schools for physical exercise. It was and still is a very popular game in India's rural areas, since it does not require any special equipment.

The basic rules of kabaddi were formalized in India in 1923. India introduced the sport to the world during the 1936 Berlin Olympics at a demonstration before the games officially began. Many people enjoyed watching the sport and wanted to learn. In 1972, the Amateur Kabaddi Federation of India was founded. Today, this organization wants to make kabaddi an official Olympic sport to continue sharing this exciting sport worldwide.

Millions of people from as many as 65 countries play kabaddi in various forms. This fun, fast game continues to be extremely popular in Asia and beyond.

The Phonograph

by Rachel Howard



Adam groaned and dropped his duffel bag and backpack heavily onto the floor of the small cabin he and his family had just entered. They would be here for almost two weeks-his dad's idea of "family bonding" and a good summer vacation. It had rained the entire five-hour drive to the cabin, and the dark gray clouds that hung low in the sky didn't seem to be drifting away. Outside was the heavily forested state park and just about nothing else-they hadn't even passed a ranger's hut for miles and miles. And there wasn't even Internet or cell service here.

"This is great!" Julia, Adam's twin sister, dropped her duffel bag onto the floor and flopped back on the old, creaky couch. She was a lot like their dad, and she couldn't think of anything more fun than hiding out in the middle of nowhere for two weeks, just spending time with family and hiking when the mood struck. She and Adam had so many differences in their personalities that he couldn't believe they had shared the same womb.

"Yeah...it's awesome," Adam said. He sat down on the couch next to her and noticed the old clunky television set on the wooden console table in front of them. His dreams of faking sick to watch daytime Major League Baseball while the rest of the family hiked around the mountains quickly died.

"Look at this!" Dad exclaimed, walking through the doorway. His hair was plastered with water, and rain dripped down his face. "There's even a fireplace. Can't wait to get that all built up."

Mom shut the bathroom door behind her. "At least the toilets work," she muttered. Adam immediately felt a rush of goodwill and companionship toward his mom, with whom he usually fought over the TV's remote control and the family computer (the fact that he didn't have his own computer was a whole other issue).

"This is really going to be fabulous," his dad said. He swiped his hair back over his head so that it slicked

back, and shook out his hands. He locked the door and got busy unpacking all of the groceries they had purchased at the mini-mart just outside the state park. Adam's mom rolled her eyes and sat between Adam and Julia on the couch.

Their mom had been kind of weird around their dad for a while now. Julia and Adam talked about it before they left. Mom seemed distant, always looking off in another direction whenever anyone asked her a question, washing clean dishes that were sitting in the drying rack...things like that.

Dad didn't want to talk about it; he just said that Mom had lots of things on her mind and that the twins should leave her alone. Adam hated when their dad brushed things under the rug like that, but Julia said it was his way of coping. She always seemed to have the answer to that sort of emotional thing.

"What's on TV?" Mom said, reaching towards the fat old-fashioned remote.

"Nuh-uh-uh!" Dad said, rushing over and pulling the remote out of her hands. "Let's just see how far we can go without watching TV, like we said, right?"

Mom leaned back on the couch and crossed her arms.

"I'm going to unpack," Julia said, standing up. She looked at Adam pointedly, and he followed her to the back of the house, where they would share the second room.

He closed the door behind him.

"Wow, there's a lot of tension in that room," she said, dropping her duffel onto the bed by the window.

"Yeah," Adam said. He liked to let Julia analyze certain situations before he formed an opinion about them. He supposed this was part of being a twin, but maybe he was just lazy.

"I just feel that Mom's been so distant lately, and Dad's been so weird about it. There has to be something else going on, right?" Julia stood, half-looking at him across the room, with her hands on her hips. In the gloominess from the outside rain, she looked like a shorter version of their mom, but with light hair.

"Yeah," Adam said.

"What do you think it's all about?" She sat on the bed and looked at him intently.

"I don't know," Adam said truthfully. How was he supposed to try to understand his parents' world?

"Can't you contribute *anything*, Adam?" Julia hurled at him, and stomped out of the room.

Wow, Adam thought. We haven't even been here three hours, and everyone is already angry at each other. Adam fell back onto the bed and stared at the boring wooden ceiling.

He noticed a small metal door handle in the far left corner of the ceiling, obscured by a deep shadow. Adam was curious, so he pulled the bed over to the wall and reached high above to pull down on the door handle.

It opened up a wide rectangular trapdoor in the ceiling. There must be an attic up there. Adam listened hard for any noise from his family, but he heard nothing. He assumed they were all stewing in anger, his dad trying to make a remote vacation special, his mom crippled by boredom (like Adam was), and his sister annoyed that Adam had proven (once again) to be a terrible confidant and bosom buddy. He shrugged and pulled himself up, monkey-bars-style, into the attic.

It was a big square room, with two grimy windows looking north and south. The people who owned the cabin must have stored all of their personal stuff in the attic when they rented it out to people crazy enough to actually pay to stay here, Adam thought. There were cardboard boxes stacked up to the slanted ceiling and piles of old papers stacked up on old wooden tables and chairs. A mannequin with a black lacy dress huddled next to a large whitish wardrobe, and an old clock lay overturned by a few huge, ornate trunks with gold molding on the sides. Adam moved farther into the room, coughing against the dust that billowed up off the floor.

In the corner was a large machine that had an old-fashioned horn standing up out of it. Adam had seen pictures of this object before but had never seen a phonograph in real life. He walked toward it, drawn by the dusty brass horn and heavy box that held it up. He touched the scalloped edges of the horn, running his fingertip along its circumference. It was so different from sleek technology-his iPhone and flat screen TV and Wii game console-that he used so often. This record player was not something you could just pick up and carry around in your pocket, listening to whatever music you wanted at whatever hour of the day.

Adam dusted the phonograph off with the hem of his sweatshirt, which immediately turned gray. Mom wouldn't be too happy about that. There was a brass knob on the side of the box, and Adam turned it to wind it up. Nothing happened. Adam thought it might be like a music box, and if he wound the knob the right way, it would release some kind of sound. But this didn't seem to be working. Adam stopped turning the knob and decided to try something he had only seen in cartoons: he put a sharp needle down on the black circle that had been placed on the top of the box. All of a sudden, faraway-sounding music began to play, reminding Adam of the old-time, black-and-white movies his mom used to like to watch with him and Julia when they were little. Adam sank to the old wooden floor of the attic and leaned against the wall, listening to the quiet music. He imagined people in grayscale, dancing together in circles to the music. He imagined bonnets and hoop skirts and suits. Sitting there, in the gloom and dust of the unloved attic, Adam felt transported back to another time.

After what was at least an hour, and when it finally stopped raining, Adam climbed back into the bedroom. Julia was calling for him from outside the door, her muffled voice sounding annoyed. He closed the trapdoor carefully and hoped Julia wouldn't notice it when she came in to go to sleep.

"Did you fall asleep?" Julia asked when Adam opened the door.

"No." Adam pushed past Julia to the kitchen, where his mom and dad were sitting at opposite ends of the table, waiting for the twins.

"Let's have a nice dinner," Mom said, noticing the annoyance on both of her children's faces.

They ate pasta and salad for dinner, with some chocolate cake for dessert afterwards. Everyone's moods seemed to have quieted down, and they were able to laugh with each other. Even Mom was engaged, joking around with Dad about the sad contents of the tiny mini-mart, and how she didn't know if they'd be able to survive off of canned foods and whatever they could forage from the state park.

After dinner, and after everyone else had fallen asleep, Adam thought about waking Julia up to tell her about the phonograph. After considering it for a few minutes, he decided not to. He would keep it his secret, his special place, reserved for the times his family let the tension build up and bubble around them. He would vacation in the attic with the lovely old music and drift away to another time when he needed to.