



OBITUARY Peter Scoones: A brilliant undersea film-maker PETER SCOONES was responsible for capturing on film many of the most remarkable moments in the BBC's natural history productions such as Life In The Freezer, Planet Earth and The Blue Planet.

Perfectionist: Scoones worked on top BBC productions.

From red-bellied piranhas in Brazil to salmon sharks in Alaska, he darted between locations as one of the BBC Natural History Unit's most important technicians.

His affinity with his subjects was such that longtime collaborator Sir David Attenborough believed Scoones understood fish as other cameramen understood chimpanzees or spiders.

"He knew fish so well he could sense what they were going to do," said Sir David.

"You could see it in his footage. He moved as the fish moved."

Scoones was so enamoured by reef fish in particular that he refused to eat them as he regarded them as his subjects.

He was also a perfectionist who would never let a technical problem disrupt the perfect shot.

He once ran out of air while filming far inside the labyrinthine depths of Jamaica's Blue Holes.

Calmly he spat out one mouthpiece, fished about with one hand to find the line for his reserve air supply, and switched it on.

When the footage was viewed later the slow pan from one side of the vast chamber to the other was rock steady.

As a keen sailor in his youth, Scoones only discovered his interest in the underwater world by accident when he bought a face mask while in the Far East in the 1960s to help him scrub the hull of his racing dinghy.

"One glimpse of the colourful fish and scenery below was sufficient to arouse a passion that took him to the highest ranks of the world's most highly regarded wildlife underwater cameramen," says Colin Doeg with whom Scoones co-founded, in 1967, the British Society of Underwater Photographers (BSoUP).

Scoones was born in South Woodford, Essex.

He trained as a naval architect but when he was due to be called up for National Service instead decided to sign up for the RAF and “let them teach me something useful”.

That was photography.

He knew fish so well he could sense what they were going to do

Sir David Attenborough`s tribute:-

He learned not only to use but to repair every sort of camera and was soon developing his own equipment as well as producing results that were winning gold medals at international film festivals.

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After returning to civilian life he joined a company that made underwater cameras for the oil industry.

It was one of these that led to his big break with the BBC. Scoones had developed a special low light television camera that was wanted for an expedition to the Comoro Islands, off East Africa.

He told the producers the camera was only available if they also took him along to operate it.

Scoones won many awards, including an Emmy and a Bafta for his work on both Great White Shark and Reefwatch.

He is survived by his second wife Georgette Douwma, the lighting engineer with whom he worked for a major part of his career.

He also leaves two children by his first marriage.

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£8,000 fish on sale in Manor Park Bin the super red arowana fish that is priced at £8,000 Photo: David Mirzoeffby Janine Rasiah, Senior Reporter on the NEWHAM RECORDER

Newham is famously home to the “one pound fish” but a much more expensive variety is also on sale in the borough.

Newham is famously home to the “one pound fish” but a much more expensive variety is also on sale in the borough.

Manor Aquatics Centre is selling a £8,000 arowana, a fish which is regarded as auspicious in China.

The two foot long fish, which has a microchip implanted behind its gill to track it, is native to Malaysia, Indonesia and Singapore although this one has been specially bred in order to achieve its remarkable colour.

But, as the owner of the Romford Road shop Neil Chavda explains, finding the fish a new home is about far more than just finding someone who is willing to cough up the cash.

“We don’t want any old Tom, Dick or Harry coming to buy it,” he said, “It is like if you have a daughter and a guy wants to marry her, you would want to know what they do and how they are going to support her.

“You need to find things out, especially with specialist fish, including how big the fish tank is and what the filtration system is like. You want to make sure that it is going to go to a home not just to a guy who has got a few quid.”

The fish, which has been nicknamed “Bin” for short as its variety is known as a bintang super red, is nicknamed the dragon fish in China.

In Chinese mythology, it is believed that if you keep an arowana in your house, is he is happy then your business will prosper.

Bin has become quite an attraction to customers visiting the shop, which also stocks much cheaper arowana varieties.

“He is red but every scale is clearly defined in gold.” Neil said. “He looks at you and tries to work out what you are thinking.”

It is not the first time that Manor Aquatics has stocked an unusual (and pricey) animal. A shark used to be up for sale - and was nicknamed Belinda “because she had eyes like Belinda Calisle.





The ocean is an increasingly industrialized space. Shipping, fishing, and recreational vessels, oil and gas exploration and other human activities all increase noise levels in the ocean and make it more difficult for marine mammals to hear and potentially diminish their range of hearing.

"Hearing is the main way marine mammals find their way around the ocean," said Aran Mooney, a biologist at Woods Hole Oceanographic Institution (WHOI). It's important to know whether and to what extent human activity is negatively impacting them.

But how can we get marine mammals living in the wild to tell us what they're able to hear?

"Same way we do it with human infants," said Mooney. "You play a sound, then you measure the brain's response to the sound."

Though Mooney makes it sound easy enough, he and his colleagues are the first to publish a study of hearing in wild marine mammals with multiple marine mammals. The paper, "Baseline Hearing Abilities and Variability in Wild Beluga Whales (*Delphinapterus leucas*)" was published today in *The Journal of Experimental Biology*.

In addition to Mooney, the research team included the paper's lead author Manuel Castellote, from the Alaska Fisheries Science Center, which is part of the National Marine Fisheries Service, and the North Gulf Oceanic Society, and their colleagues from Alaska Department of Fish and Game, Alaska SeaLife Center, and the Georgia Aquarium.

The researchers worked over a two week period in southwest Alaska during the summer of 2012, capturing and testing seven Bristol Bay beluga whales, one of six subpopulations of beluga whales in the U.S. Enabling this study are recent advances in portable field testing equipment, rugged enough for field work. To conduct their hearing tests, the team temporarily maintained the individual animals as part of physical health exams. They used suction cups to attach a small speaker to its jaw -- which in whales and dolphins conducts sound to both ears -- and placed sensors on the animal's head and back.

"The advantage is that it's really fast," said Mooney. "You can get one of these data points in about two or three minutes. A whole hearing range takes about half an hour."

In human populations, there is variability in our hearing ability: older people don't hear as well as younger people; males don't hear high frequencies as well as females. But in the tested beluga population, there was surprisingly little variation.

"The bottom line is they all hear pretty well," said Mooney. "Limitations to our study were that we had just seven animals who live in a pretty quiet environment without a lot of noise exposure. These might conserve their high-frequency better than humans, which makes sense; they need it for echolocation, and if they lose that, then they could lose of their abilities to find food and communicate."

That this kind of study has never been reported before is an indication of the challenge of capturing and testing wild marine mammals.

"It's a bit of a project. It takes a lot of people and the right environment. But we've also shown that if you have the right setup it's easy to do," said Mooney.

The team used three or four small inflatable boats and worked with Alaskan natives expert in spotting belugas, which have no dorsal fin and make only the smallest of ripples at the surface when they breathe. The guide the beluga into shallow water -- shallow enough to stand in -- until they can gently capture the 8- 12-foot animals with a hoop and net.

"Then the animal won't try and swim away, once they feel contained, they're not going to fight," said Mooney. "They will hang out there. Then you put a belly band stretcher underneath them which has little holes for the flippers. Then it goes over the belly, and that holds the animal during the test."

The team caught and measure three females and four males and essentially gave them all physicals. In addition to the hearing test, they did ultrasounds on each of the animals and collected saliva or mucous from the blow hole to look for stress hormones and took a core of the blubber to look for PCBs and other organic compounds that may build up in the fats. Together, the data gives researchers a baseline of the animals' health and a way to measure change in the population's health over time and as environmental conditions change.

While hearing in the tested animals was good, the researchers note that human-caused ocean noise is believed to be a chronic stressor and has been identified as a threat to other populations of belugas. The increase in human activities in Arctic ecosystems as a result of sea ice loss is creating a special concern about increasing ocean noise in the Arctic and its potential impacts on whales and dolphins. They note that "expanding our knowledge of beluga hearing is key to an appropriate conservation management effort."

Another driver for understanding their health and hearing now is a proposed mineral exploration and mining project in the area. The Pebble Mine project would exploit large deposits of copper, gold and molybdenum in the region. "It's not clear if it will directly affect the hearing of the belugas, but it will affect the ecology of what's up there, so the baseline health information is key," said Mooney.

The results of this hearing study may also help validate studies of hearing in belugas in captivity .

The team hopes to return to the field this summer to test a larger number of animals and attach temporary data-logging tags to learn more about their foraging, diving, and social behaviors.

Story Source:

The above story is based on materials provided by Woods Hole Oceanographic Institution. Note: Materials may be edited for content and length.

Journal Reference:

1. M. Castellote, T. A. Mooney, L. Quakenbush, R. Hobbs, C. Goertz, E. Gaglione. Baseline hearing abilities and variability in wild beluga whales (*Delphinapterus leucas*). *Journal of Experimental Biology*, 2014; 217 (10): 1682
DOI: [10.1242/jeb.093252](https://doi.org/10.1242/jeb.093252)



a close-up scanned image of the bony structures in the toothy face of the catfish ...



Kryptoglanis shajii



'Alien' Catfish Baffles Scientists 'Alien' By Elizabeth Palermo, Live Science Contributor | LiveScience.com – Wed, May 14, 2014

- This tiny catfish (*Kryptoglanis shajii*) from India is just 4 inches (10 centimeters) ...
- [View Photo](#)Here, a close-up scanned image of the bony structures in the toothy face of the catfish ...

A small, toothy fish, which researchers say resembles the terrifying creature from the movie "Alien," is turning out to be a big mystery for the scientists who study it.

Kryptoglanis shajii is a tiny, subterranean **catfish** with a number of defining skeletal features, including a bulging lower jaw similar to a bulldog's. The fish's strange, bony face has baffled researchers, who have been unable to classify the odd species.

Humans rarely catch sight of the tiny catfish, and it inhabits only one area in the world: the Western Ghats mountain range in Kerala, India. Though the fish lives underground, it has been known to emerge occasionally in the springs, wells and flooded rice paddies of the region. [[See Photos of the Weird Toothy Catfish](#)]

The subterranean dweller is so elusive that scientists didn't categorize it as a new species until 2011. At that time, John Lundberg, emeritus curator of ichthyology at the Academy of Natural Sciences of Drexel University in Philadelphia, also began taking a closer look at the **new breed of fish**.

"The more we looked at the skeleton, the stranger it got," Lundberg, Drexel's resident fish zoologist and a professor in the university's School of Arts and Sciences, said in a statement. "The characteristics of this animal are just so different that we have a hard time fitting it into the family tree of catfishes."

From the outside, *Kryptoglanis shajii* looks similar to other catfish, but a closer look inside the fish yields some surprising discoveries, Lundberg said. He and his colleagues used digital radiography and high-definition CAT scans to study *Kryptoglanis*' bone structure, finding that the fish is missing several bony elements.

That discovery alone was not enough to cause a stir among the experts, who explain that many subterranean fish lack some of the bones possessed by others of their species. What did surprise the researchers, however, was that the shapes of some of *Kryptoglanis*' bones were utterly unique among fishes of any species.

Numerous individual bones in the catfish's face are modified, giving it a compressed front end with a jutting lower jaw — similar to a bulldog's snout. The tiny fish also possesses four rows of conical, sharp-tipped teeth, the researchers said.

Lundberg speculates that these multiple, unique bone structures in one part of the fish's body could mean that there is a functional purpose behind all the strangeness.

"In dogs, that was the result of selective breeding," Lundberg said. "In *Kryptoglanis*, we don't know yet what in their

natural evolution would have led to this modified shape."

The researchers seem to have ruled out the possibility that the catfish's unusual mug resulted from a highly specialized diet. That's because, based on the fish's teeth and **subterranean habitat**, it most likely eats a relatively typical diet of small invertebrates and insect larvae, Lundberg said. Video footage of live specimens at feeding time also suggests that this tiny fish — at 4 inches (10 centimeters), it's smaller than the average adult's pinky finger — is perfectly capable of eating such food.

The mystery of *Kryptoglanis* has received attention from other researchers, as well. Ralf Britz, a fish researcher at the Natural History Museum of London, led a separate study of the species' unique bone structure. The research was published in the March 2014 issue of the journal of *Ichthyological Exploration of Freshwaters*.

Unlike Lundberg's study, which used high-resolution X-ray computed tomography to create three-dimensional CAT scan images of the fish's **skeleton**, Britz and his team utilized a technique known as clearing and staining. This method of visualizing a skeleton uses chemicals to render the fish's soft tissues in clear glass and its bones and cartilage in contrasting, colored glass.

Yet, much about the catfish remains mysterious. For instance, neither study was able to definitively conclude why *Kryptoglanis* is so unique among fishes, or what species it counts as its closest relatives.

The new study, led by Lundberg, is published in the 2014 issue of the *Proceedings of the Academy of Natural Sciences of Philadelphia*.



Sometimes we think we know everything about something only to find out we really don't, said a Texas A&M University scientist.

Dr. Kevin Conway, assistant professor and curator of fishes with Texas A&M's department of wildlife and fisheries sciences at College Station, has published a paper documenting a new species of clingfish and a startling new discovery in a second well-documented clingfish.

PHOTO:- venomous (right) and non-venomous (left) Caribbean clingfish shows the differences in the subopercular bone. Credit: Texas A&M University photo courtesy Dr. Kevin Conway and Dr. Carole Baldwin, Smithsonian Institution

The paper, entitled "Cryptic Diversity and Venom Glands in Western Atlantic Clingfishes of the Genus *Acyrtus* (Teleostei: Gobiessocidae)," was published May 13 in the PLOS ONE online journal.

The scientific paper documents the study Conway and his team, including Dr. Carole Baldwin, his collaborator at the Smithsonian Institution, and Macaulay White, former Texas A&M undergraduate, have been working on for several

years.

"We are excited about the study, because it resulted in not only the discovery of an undescribed species, but also the discovery of a unique venom gland in a group of fishes nobody knew were venomous," Conway said. "New groups of venomous fishes are not discovered very often, in fact the last such discovery happened back in the 1960s. The shocking thing is that the fishes that possess the venom gland have been known to science for a long time, some for over 260 years, and have been pretty well studied."

Conway said clingfishes are globally distributed at temperate and tropical latitudes, and get their name from their ability to anchor themselves using their large belly sucker. The species Conway and his team discovered is a tiny marine fish less than an inch long that lives between pieces of coral rubble in very shallow water along the coast of Belize and islands in the Caribbean and Bahamas.

"Our work shows that even in relatively well-studied areas of the world's oceans, new species can be discovered as can unknown traits in well-documented species." Conway said.

Conway explained that in order to describe a new species, taxonomists have to make comparisons with other closely related species to ensure they are not "rediscovering" something already described by another researcher.

"During that comparison process we discovered that several species of Caribbean clingfishes, but not the new one we found, have a strange gland associated with a very sharp and spine-like subopercular bone, one of four bones that support the gill covers in fishes," Conway said. "The cells inside the gland are incredibly similar to those present inside the venom glands of scorpion fishes and certain catfish and based on this similarity, we are confident that these clingfishes are also producing some type of toxin."

"Discovering a venom gland in a group of well-studied fishes that has been known to science, some for well over two centuries, is truly remarkable," Conway said.

Conway explained that most of the world's 2,000-plus venomous species of fishes deliver their venom using a modified fin ray, sharp opercular spine or even through a large fang in their lower jaw. But the venom gland they discovered in the Caribbean clingfishes associated with the subopercular gill cover bone is the first of its kind to be discovered and in fact, is unique among all venomous fish described to-date.

"We do not know exactly what the venom is used for, but based on the position of the venom gland, it is more likely that it would be used for protection, as in most venomous fishes.

"We don't yet have any information about the toxic properties of these clingfishes, but we hope that our discovery will encourage other scientists to take a look at the venom gland we discovered in more detail," he said.

Conway said clingfishes are referred to as crypto-benthic fishes which means "small, bottom dwellers."

"Crypto-benthic fishes are not commercially important, but are considered by the scientific community to play an important role in marine ecosystems, because they are likely an important food resource for larger fishes," Conway noted.

Story Source:

The above story is based on materials provided by Texas A&M AgriLife Communications. The original article was written by Steve Byrns.

Journal Reference:

1. Kevin W. Conway, Carole Baldwin, Macaulay D. White. Cryptic Diversity and Venom Glands in Western Atlantic Clingfishes of the Genus *Acyrtus* (Teleostei: Gobiessocidae). PLoS ONE, 2014; 9 (5): e97664
DOI:10.1371/journal.pone.0097664



Rare albino blue marlin caught and released off Costa Rica

The boat's regular captain, Daniel Espinoza, posted the accompanying photos on his Facebook page, saying the group "Had an amazing day and confusión. Caught one Blue Marlin albino, first time I hear of one. Congratulations on that great job."

Sport Fishing report announced the catch on its Facebook page in all caps: "SUPER RARE ALBINO BLUE MARLIN!!!"

Red.Rum Sportfishing, based in Cabo San Lucas, shared the photos under the heading: "RARE ALBINO BLUE MARLIN!"

The Espinozas and Weavers were pre-fishing before a major tournament on Wednesday and unavailable for comment Wednesday.

Glen Mumford, owner of Maverick Sportfishing, said that his captains have seen albino sailfish, but never an albino marlin.

"It definitely was not a typical day," he said.

—Pete Thomas

—Photos are courtesy of Maverick Sportfishing
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–Photos are courtesy of Maverick Sportfishing Sportfishing report announced the catch on its Facebook page in all caps: "SUPER RARE ALBINO BLUE MARLIN



When Marine Mammals Are Drafted MAY 12, 2014

New York Times

To the Editor:

Re "Let Slip the Dolphins of War," by Philip Hoare (Op-Ed, May 5):

I have worked with dolphins since 1962, when my United States Navy co-workers and I started training dolphins to go to sea with us. While they accompanied us free in the open sea, we devised means to ask them questions. How fast can you swim? How deep can you dive? How do you find your way in the dark depths? Our results are in about 1,000 scientific publications.

Along the way, we found that dolphins were good at detecting threats. They guard harbors and find sea mines that could sink ships and kill Navy men and women. Safe from the many threats like pollution and death from fishing gear, our dolphins live longer than those in the wild.

We do not take dolphins from the wild. Our animals seem happy to reproduce. They work with us in the open sea, where they could easily swim away. To me they seem happy and enthusiastic. They like their jobs.

SAM RIDGWAY

San Diego, May 5, 2014

The writer is a retired Navy scientist and the president of the National Marine Mammal Foundation.

To the Editor:

Philip Hoare deftly highlights the moral ambiguities of protesting the military use of dolphins by the Navy, as armies have routinely deployed dogs, pigeons and even elephants in combat roles throughout time. But he didn't mention a more troubling cetacean casualty of war: whales that are driven onto beaches by high-intensity naval sonar.

Despite two decades of litigation and increased regulation, the atypical mass strandings of whales during naval exercises persist. Just last month, five beaked whales were stranded after joint exercises of the United States, Greek and Israeli Navies in deep underwater canyons offshore of Crete.

Debate will no doubt continue over the ethics of displaying captive dolphins and whales for entertainment, and of training them to detect mines and patrol harbors in combat zones. But it's difficult to fathom a moral argument to justify sonar trainings in marine habitats that result in the stranding and deaths of whales.

JOSHUA HORWITZ

Washington, May 6, 2014

The writer is the author of a forthcoming book "War of the Whales."

To the Editor:

Animals don't start wars, yet, as Philip Hoare points out, they often become the victims of ours.

Dolphin programs are just one way that animals have been exploited by militaries. Thousands of animals are also mutilated and killed in military trauma training exercises every year. Live pigs are shot, stabbed and burned, and live goats have their legs broken with bolt cutters and cut off with shears. These crude drills continue even though advanced non-animal alternatives are available and have been shown to better prepare doctors and medics to treat injured humans on the battlefield.

We may never be able to stop fighting among our own species, but we can and should stop making animals casualties in our conflicts.

LINDSAY POLLARD-POST

West Olive, Mich., May 6, 2014

The writer is a senior writer for the PETA Foundation.



An historic fish, with an intriguing past, now has had its genome sequenced, providing a wealth of information on the genetic changes that accompanied the adaptation from an aquatic environment to land. A team of international researchers led by Chris Amemiya, PhD, Director of Molecular Genetics at the Benaroya Research Institute at Virginia Mason (BRI) and Professor of Biology at the University of Washington, will publish "The African coelacanth genome provides insights into tetrapod evolution" April 18 as the cover article in *Nature*. The coelacanth genome was sequenced by the Genome Center at the Broad Institute of MIT and Harvard, and analyzed by an international consortium of experts.

Sequencing the coelacanth genome has been a long-sought goal and a major logistical milestone, says Dr. Amemiya. He and scientists throughout the world have campaigned for sequencing of the fish for over a decade. "Analysis of changes in the genome during vertebrate adaptation to land has implicated key genes that may have been involved in evolutionary transitions," he says. These include those regulating immunity, nitrogen excretion and the development of fins, tail, ear, eye, and brain as well as those involved in sensing of odorants. The coelacanth genome will serve as a blueprint for better understanding tetrapod evolution.

"This is just the beginning of many analyses on what the coelacanth can teach us about the emergence of land vertebrates, including humans, and, combined with modern empirical approaches, can lend insights into the mechanisms that have contributed to major evolutionary innovations," says Dr. Amemiya.

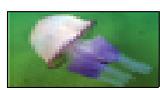
The coelacanth is critical to study because it is one of only two living lobe-finned fish groups that represent deep and evolutionarily informative lineages with respect to the land vertebrates. The other is the lungfish, which has an enormous genome that currently makes it impractical to sequence. The lobe-finned fishes are genealogically placed in-between the ray-finned fishes (such as goldfish and guppies) and the tetrapods – the first four-limbed vertebrates and their descendants, including living and extinct amphibians, reptiles, birds and mammals. A lobe-finned ancestor(s) underwent genomic changes that accompanied the transition of life in an aquatic environment to life on land. The coelacanth is undeniably a fish, however, phylogenetic analyses show that its genes are more like those of tetrapods than of ray-finned fishes. Additionally, coelacanth genes evolve at a considerably slower rate than those of tetrapods, a fact that is coincident with its apparently slow rate of morphological change.

"For evolutionary biologists the coelacanth is an iconic animal, as familiar as Darwin's finches on the Galapagos," says Toby Bradshaw, PhD, Professor and Chair, Department of Biology, University of Washington. "This paper by Chris and colleagues gives us our first comprehensive look at the coelacanth's place in our evolutionary history, and provides fascinating insights into the specific vertebrate genes involved in the critical transition from water to land – it seems that both loss and gain of gene function were required. I find the proposed gain-of-function changes in gene regulation for limb development particularly compelling, supported by experimental evidence that the lobed fins of the coelacanth really are akin to prototypical legs. Making legs from fins is a wonderful example of Francois Jacob's observation that 'evolution is a tinkerer, not an engineer.'" Adds Gerald Nepom, MD, PhD, Director of the Benaroya Research Institute, "This work represents a major accomplishment by a large and talented group of investigators, opening a new book of knowledge about adaptation that is now available to all scientists who want to better understand our complex genetic origins."

Genome sequencing is a laboratory and computational process that determines the complete DNA sequence of an organism's genome. Deciphering the genetic makeup of the coelacanth provides valuable clues for biologists studying the evolution of vertebrates. It was an international sensation when a living specimen of the coelacanth was first

discovered in 1938 as this lineage of fish was thought to have gone extinct 70 million years ago. The living coelacanth has many anatomical similarities with its fossil relatives and seems to have undergone seemingly little morphological change since the Devonian period approximately 360 million years ago. It still possesses what many would consider to be a prehistoric appearance, and, as for many similar species that do not show much change over long evolutionary periods, is often dubbed a "living fossil." The relationship of the slow rate of evolution of its genes and its morphological appearance remains unknown and largely speculative. Today, coelacanths are on the endangered species list and biological tissues can only be obtained from expired animals that have been caught accidentally by fishermen.

In addition to this landmark genome paper in Nature, several companion papers are being edited by Drs. Amemiya and Axel Meyer for publication in a special open access coelacanth genome issue of the Journal of Experimental Zoology (Molecular and Developmental Evolution).



Warning of 'giant jellyfish plague' set to reach Devon shoresBy Exeter Express and Echo | Posted: May 08, 2014

- Barrel jellyfish in Torquay harbour by Richard Randle-Jones
- A barrel jellyfish

The warm weather that is predicted to reach England in May could bring a 'plague of giant jellyfishes' to our beaches, experts have warned.

A huge barrel jellyfish has already been washed up in Dorset and the creatures were spotted off Dawlish yesterday.

The Marine Conservation Society (MCS) are warning that the predicted hot weather could bring an influx.

Richard Harrington from the Marine Conservation Society said: "This predicted hot weather to come, can mean that even more jellyfish are likely to wash up or be in the seas around places like the West Country





drogen sulphide (H₂S) is a potent inhibitor of aerobic respiration. However populations of shortfin molly fish managed to colonise springs with high concentrations of dissolved hydrogen sulphide. In a new study researchers from LOEWE Biodiversity and Climate Research Centre (BiK-F) and the Goethe University Frankfurt am Main present evidence of genetic changes minimizing the harmful effects of H₂S which enable the fish to survive in this deleterious environment. The study provides insight into the molecular mechanisms of this key adaptation for the first time. It is published online today in "Nature Communications."

Shortfin molly fishes (*Poecilia mexicana*) may only measure a few inches, but they are still exceptional. Populations of *Poecilia mexicana*, whose relatives are the well-known guppy, colonised sulphide-rich volcanic springs in Southern Mexico. In making this particular habitat their home, they have made the impossible possible, because hydrogen sulphide (H₂S), as for many other animals, is lethal. Even at low concentrations the gas blocks the cytochrome c oxidase-complex (COX). The higher the level of hydrogen sulphide, the more the activity of COX is inhibited. As it is essential for respiration, this turns out to be lethal in the end.

Changes in genetic make-up make less susceptible to poison A team led by Prof. Dr. Markus Pfenninger, LOEWE Biodiversity and Climate Research Centre (BiK-F) and PD Dr. Martin Plath, Goethe University, has taken a closer look at the survivors. Their analysis showed that the COX activity of individuals of shortfin molly fish which colonise H₂S-rich waters remains virtually unchanged under high H₂S concentrations. This is due to number of changes in the *cox1* and *cox3* genes, which have only occurred in populations living in the poisonous springs. Thus, transplanting individuals from non-sulphidic habitat to springs with high H₂S levels kills them for sure.

Molecular mechanisms of adaptation to extreme habitat "In this paper we analyse the key adaptation to an extreme habitat up to its molecular basis at the level of amino acids. This way, for the first time, we are able to point out, where exactly the adaption has taken place." Pfenninger concludes. The team also modelled three dimensional protein structures in order to shed light on necessary significant structural changes of amino acids in the *cox1* gene. Without these structural changes, the colonisation of the H₂S-containing water for the fish would have been impossible. By colonising the poisonous springs, where there are hardly any other competitors, the fish may feed on resistant midge larvae that also occur there.

Closely related fish follow different paths to adaptation The study also shows that closely related populations of a species follow parallel as well as disparate paths in response to similar environmental conditions. Three shortfin molly fish populations were sampled for study. Two of the populations show the same changes in their genetic material in adapting to the hostile conditions. However this proved to be not the case for the third population of shortfin molly fish. Whereas these fish also tolerate high levels hydrogen sulphide, the mechanism enabling their adaptation is still subject to ongoing research.

Story Source:

The above story is based on materials provided by Senckenberg Research Institute and Natural History Museum.

Journal Reference:

1. Markus Pfenninger, Hannes Lerp, Michael Tobler, Courtney Passow, Joanna L Kelley, Elisabeth Funke, Bastian Greshake, Umut Kaan Erkoc, Thomas Berberich, Martin Plath. Parallel evolution of cox genes in H₂S-tolerant fish as key adaptation to a toxic environment. Nature Communications, 2014; 5 DOI:10.1038/ncomms4873



Japan: Video Shows Extremely Rare Megamouth Shark Caught Off Coast of Japan By Hannah Osborne | IB Times – Fri, May 9, 2014

- Photograph Shows Extremely Rare Megamouth Shark Caught Off Coast of Japan

An extremely rare megamouth shark has been caught off the coast of Japan – believed to be only the 58th sighting of the alien-looking creature in history.

The shark was caught last month and over 1,000 people gathered at a museum in Shizuoka City to watch a public autopsy.

Megamouth sharks are named because of their huge heads and mouths. The shark was caught at a depth of around 2,600ft.

While the creature has been spotted in oceans across the world, at least 13 have been in waters off Japan's coast.

The megamouth shark measured 13ft in length and weighed around 1,500lbs. It is now on public display at the Marine Science Museum in Shizuoka, [The Japan Daily Press](#) reported.

Facts about megamouth sharks

Megamouth sharks, or *Megachasma pelagios*, come from the Lamniformes order of sharks commonly known as mackerel sharks, which includes the great white shark.

The first specimen was caught in 1976 and the largest known megamouth measured 18.4ft in length.

Megamouths are the third known species of planktonivorous shark, the other two being the whale shark and basking shark. Their diet mainly consists of plankton, small shrimps and jellyfish.

While they mainly live deep in the ocean, they come the surface to feed at night.

It is thought they move slowly and has been observed being attacked by sperm whales, Discovery UK reports.

As well as Japan, megamouths have been caught off the coasts of Senegal, South Africa, Brazil, Indonesia, the Philippines, Thailand and California.



Northeastern University ecologist David Kimbro claims to have watched a lot of TV growing up, particularly The Brady Bunch. "You could kind of get a flavor for how an episode was going to turn out based on how Jan or Peter were faring -- you know, the middle kids," said Kimbro, an assistant professor in the Department of Marine and Environmental Sciences.

He and his colleagues -- associate professor Jon Grabowski and assistant professor Randall Hughes, ecology experts with labs at Northeastern's Marine Science Center -- think a similar pattern shows up in oyster reefs, where the behavior of the "middle child" in the predator-prey food chain plays a strong role in determining how the reef as a whole will fare. New research from the team, published online on in the journal Ecology Letters, gives that hunch even more support.

The work complicates the evolution of a paradigm that has pervaded ecology since the 1960s, namely that the species at the top of the food web dictate the welfare of the entire system simply by eating.

For instance, observations in the Aleutian Islands in the 1970s showed that when sea otters were doing well, the nearby kelp forests below the ocean's surface also thrived. This was due, theory said, to the fact that the otters' feeding patterns naturally managed the sea urchin population, which feeds on kelp.

Fast-forward four decades and one sees a large body of evidence indicating that predators do more than eat; they frighten too. In the early 2000s, Grabowski showed that having a predatory fish scare the middle child has the same effect as predation itself. Likewise with the sea otters -- just swimming around scares the urchins enough to send them into hiding and stop eating kelp.

These observations have led researchers to assume that the mere presence of a top predator is always beneficial for habitats like oysters and kelp, Kimbro said. "But," he added, "we had a hunch that the lynch-pin of behavior is fickle. I mean, I can turn on a dime. Just ask my family when I miss snack time and the blood sugar gets low. So it seems logical that it's not always going to be the same."

To find out, the trio set up large experimental reefs along the eastern coast from Florida to North Carolina. At each site, they created three reefs: one containing just oysters; one containing oysters and their immediate predators, small mud

crabs; and one containing the oysters and the mud crabs, as well as a scary fish and large crabs that feed on the mud crabs.

What they found surprised them. In North Carolina, the picture looked exactly the same as it did in the early 2000s, when Grabowski first did his behavior experiments. But from South Carolina to Florida, the fear of predation on the mud crabs actually had a negative effect on the overall reef.

That's because as you move southward, the rivers that flow into the estuaries become muddier. And more mud means the healthy, thriving oysters start to get buried under layers of sediment. When top predators are scarce, the mud crabs feel safe enough to wander around the reef to eat baby oysters. As they do so, they kick off the river sediment and free the reef from being buried alive. It's not so good for the reef when the crabs' fear of being eaten prevents these reef strolls.

In North Carolina, there isn't as much sediment on the reef so the oysters don't benefit from the mud crabs' walking around.

"Georgia and South Carolina are super-sized value meals," Kimbro said. "It's like the whole system is on steroids. There's so much oyster food there, the crabs are so well fed they don't wander far from their home in the reef anyway." So, fear isn't as important there.

Each of these hyper-local situations causes a unique effect, complicating the age-old story of the certain benefits of top predators. "This shows that you can't just apply something across the board," Kimbro said. Instead, researchers have to consider each local community individually.

"You could walk away from our paper thinking it's just so complicated why even try," Kimbro said. "But with careful experiments and so forth you can separate a predictable pattern from what seemingly is just noise."

The research group's next step is to see how the behavior of the middle predators affect the services that oysters provide to the urban coastal communities nearby. Oysters don't just provide a tasty food source for humans (and job security for the oyster fishers that collect them), but they also filter the water of excess nutrients, which can have negative effects on the overall body of water.

As to whether the pattern Kimbro claims to have observed in The Brady Bunch is really true, well, "just go with it," he said.

Story Source:

The above story is based on materials provided by Northeastern University. The original article was written by Angela Herring.

Journal Reference:

1. David L. Kimbro, James E. Byers, Jonathan H. Grabowski, A. Randall Hughes, Michael F. Piehler. The biogeography of trophic cascades on US oyster reefs. *Ecology Letters*, 2014; DOI: 10.1111/ele.12293



Mystery Starfish Plague Extends to Canada and Mexico, but the Answer is Within Our Grasp
By Pete Raimondi, University of California, Santa Cruz

Ochre stars, the mussel police of the northwest Pacific.

Credit: Rosario Beach Marine Lab,

Starfish along much of the North American Pacific coast are dying in great numbers from a mysterious **starfish wasting syndrome**. As yet the cause of the syndrome is unidentified, and it's not clear whether it's due to an environmental change, disease or something else.

The early signs vary by species affected and include a deflated appearance, unnatural twisting of the body, and small lesions on the surface that increase in size and number. The wasting often progresses rapidly, leading to the softening of the starfish's hard body, **loss of arms**, and eventually complete disintegration and death, sometimes over a period as short as few days. Similar die-offs have occurred before in the 1970s and the 1990s, but never before at this magnitude and over such a wide geographic area.

The current bout of this wasting syndrome was first noted in ochre stars (*Pisaster ochraceus*) in June 2013 along the coast of Washington state during monitoring surveys conducted by researchers **National Park**. As ONP is part the Multi-Agency Rocky Intertidal Network, a long-term monitoring effort that extends down the whole west coast, researchers from Alaska to California were quickly alerted.

A spreading plagueThe majority of early observations were made in intertidal (tidepool) habitats and as a result most of the early reports were for ochre stars, the most common in the habitat, but others species affected include the mottled star (*Evasterias troschelii*), leather star (*Dermasterias imbricata*), and six-armed stars (*Leptasterias*).

In August, divers investigating subtidal habitats **reported** massive die-offs of sunflower starfish (*Pycnopodia helianthoides*) just north of Vancouver, British Columbia. Shortly afterwards, other subtidal sea star species in the region began showing signs of wasting. During October and November, a similar mass death of starfish occurred in Monterey, California, with another die-off of sunflower and ochre stars around **Seattle, Washington**, with the syndrome spreading throughout the Puget Sound.

In mid-December, substantial numbers of wasting starfish were spotted around southern California. By the turn of the year it had been reported in 45 of the 84 MARINE sites from Anchorage to San Diego sampled since that summer, and in the last few months it has spread to Mexico and **parts of Oregon**, which had previously been unaffected. It is also intensifying, appearing at additional sites in those regions already affected.

Making sense of the evidenceIn subtidal habitats, the sunflower star is typically the first species to succumb, followed

by the rainbow star (*Orthasterias koehleri*), giant pink star (*Pisaster brevispinus*), giant star (*Pisaster giganteus*), mottled star, ochre star and sun star (*Solaster*), leather star (*Dermasterias imbricata*), vermilion star (*Mediaster aequalis*), six-armed stars, and bat star (*Patiria miniata*).

We don't know whether the syndrome spreads sequentially from one species to the next, or if some species simply take longer to express symptoms, but the usually large populations of ochre and sunflower stars have experienced massive, geographically expansive (if patchy) and well-documented declines. Other species are less abundant, so the impact of the syndrome is not as clear.

Ecologists consider both sunflower and ochre stars to be **keystone species** because they have a disproportionately large influence on other species in their ecosystem. In fact it was ochre stars that **Robert Paine** experimented on when he coined the term keystone species in 1969. After removing many ochre seastars, a voracious predator of mussels, from his test area, he found that mussels out-competed other species and dominated areas where previously many species were attached to the rocky shore. Hence seastars were necessary to maintain the species composition.

So it's anticipated that the sheer number of starfish of different species that have died may lead to radical change the seascapes in the subtidal (below the tidal line) and intertidal (between high and low water marks) zones. This is what has occurred after widespread death of particular marine species on previous occasions, resulting in dramatic ecosystem-wide changes.

What we knowFrom extensive samples collected researchers have begun to identify the agent behind the syndrome, and the environmental conditions that may have led to the outbreak. One of the top priorities is to confirm that an infectious agent is involved, and if so what it is. Molecular sequencing work of samples is underway at Cornell University to identify possible viruses and bacteria that could be causative agents. Current thinking is that there is an infectious agent involved, likely a pathogen. Importantly there is **no evidence at all** that links the current wasting event to the ongoing disaster at the Fukushima nuclear facility in Japan.

Long-term monitoring by MARINE groups and other partners along the entire west coast provides the information to compare distributions of different starfish species over 30 years.

MARINE has also developed a tracking log that can be downloaded from the seastarwasting.org website, which researchers, divers, and members of the public can use to report their observations, gathering information to **help identify further outbreaks**.

Pete Raimondi receives funding from the National Science Foundation, California Ocean Science Trust, Packard Foundation, and Sea Grants from Washington and Oregon states.

[The sunflower starfish - a voracious predator brought to its knees by mystery disease.](#)

Credit: Brocken Inaglory, CC BY-SA



Sea Turtle Hatchlings Saved by LED Lights Funded by Deepwater Horizon Fines

A sea turtle's life begins in darkness. After about 60 days of incubation inside their eggs, turtle hatchlings use a temporary tooth called a caruncle to break out of their shells. That's just step one. At this point, they are still buried in nests about 50 centimeters below the beach surface. As dozens of baby turtles emerge from their eggs, they then begin to force themselves upward through the sand. Working together, they climb and scrape and push. As they get closer to the surface, they begin to feel the warmth of the sun. Instinctively, they know that the sun's rays pose the first danger of their young lives. If they get too much sun before they make it to the ocean, the hatchlings could quickly become dehydrated and die. But when they're ready to emerge—usually during the cool night or a storm—they **emerge all at once**, take a look around, and head toward the water.

That's where modern society throws them a curve. Under natural conditions, the turtle hatchlings would be faced with two choices: the dark slopes of dunes and vegetation behind them and the gentle light of the ocean horizon ahead of them. Sea turtle hatchlings instinctively head toward the light, sensing the moon and stars reflected on the water. But today the brightest light comes not from the ocean but from the hotels, condominiums, restaurants and homes that crowd most beaches. These man-made lights draw the hatchlings like moths to a flame. They quickly grow disorientated, lose their bearings and either die of dehydration, get run over by cars or are eaten by birds and other predators.

In Florida tens of thousands of sea turtle hatchlings die every year as they walk toward civilization and away from the ocean waters they need to survive. The state is home to 90 percent of the sea turtle nesting in the U.S., and the loss of so many hatchlings poses a major risk to the long-term survival of three endangered species: green (*Chelonia mydas*), loggerhead (*Caretta caretta*) and Kemp's ridley (*Lepidochelys kempii*) turtles. (Two other sea turtle species also nest in Florida in lower numbers.)

But just as light creates a danger for the turtles, it can also be the solution. New LED lights operating at a specific wavelengths and lower levels of visible light (lumens) have been shown to dramatically reduce sea turtle hatchling disorientations. In fact, David Godfrey, executive director of the **Sea Turtle Conservancy (STC)**, reports hatchling disorientations on many properties that have switched to these new LED lights have fallen from hundreds every year to zero. "It's a long-term project to replace old lights," he says, "but it is working."

The new lights, according to the conservancy's sea turtle specialist Karen Shudes, operate at wavelengths that do not attract sea turtles. "The optimal sea-turtle-friendly lighting is 580 nanometers or longer," she says. That wavelength is around the yellow/orange part of the spectrum, with red following at about 700 nanometers. LED lights fitting these parameters are available in many stores in Florida, where they are marketed as "turtle safe" and have been certified as wildlife friendly by the Florida Fish and Wildlife Conservation Commission. The lights also have other benefits: They use 70 percent less energy than incandescent bulbs and provide a more pleasing light, which the STC says can actually enhance people's safety by not overwhelming human night vision with glaring spotlights.

People first tried using yellow or red lights 30 years ago to try to stop turtle disorientations, but Godfrey says those early lights didn't actually do the trick. "Even though a bud or sodium light might look yellow to you or me," he says, "if you looked at it through a spectroscope, you would see the full spectrum of light. It may peak in the yellow region but there's plenty of light throughout the spectrum. So those lights were still attracting turtles because they were sensitive to those different wavelengths."

Beyond the LED bulbs themselves, new fixtures that point light toward the ground and are angled away from beaches also help reduce turtle disorientations. "There are several rules of turtle lighting," Shudes says. "Keep the light as low to the ground as possible, keep the lumens as low as possible, keep the light shielded and keep the wavelength long."

The STC itself has completed more than 80 major lighting retrofit projects on local hotels, resorts, condo complexes and a few homes. A lot of the money to fund these retrofits comes out of criminal penalties from the 2010 Deepwater Horizon oil spill, which killed or otherwise affected an estimated 100,000 sea turtles. The first two years of the STC's retrofit efforts were financed by the Recovered Oil Fund for Wildlife (which itself was created with money from Deepwater owner British Petroleum); the organization just received additional funding from the similar Gulf Environmental Benefit Fund, both of which are administered by the National Fish and Wildlife Foundation.

This restitution money, Godfrey says, "has allowed us to actually work with private property owners to go ahead and convert their lights, to work with them, to supplement the money they're spending. We match money they put in. In some cases where the problem is particularly heinous and the property owners just don't have the money to fix the problem, we can actually go in and do it for them. That funding mechanism, which has been made available following the spill, has allowed a lot of major progress on this issue." The changes aren't voluntary—use of turtle-friendly lights during nesting season has been mandated by state and county ordinances.

The work to date has definitely had a positive result. Not only have baby turtle disorientations diminished or been completely eliminated in many of the retrofitted areas, turtles have even started nesting at sites they avoided in the past.

Despite the progress, many areas still have too many lights, either shining directly on the beach or emanating overall from the cities adjacent to beachfront properties. Meanwhile, the effects of the BP spill on sea turtle populations may still be felt for years to come. "Sea turtles take as long as 40 years to reach sexual maturity, so when you lose an adult it's a real assault on the population," Godfrey says.

That's why efforts to save hatchlings long enough to get into the ocean matter. "We don't have to handle the turtles to save them," Godfrey says. "We're restoring their habitat and they do the rest."



Australia: Pictures Show 13ft Great White Shark Chasing 19ft Whale

13ft shark spotted chasing a whale.

Several beaches in Perth, Australia were forced to close after a huge great white shark was spotted chasing a whale.

The 13ft shark was pictured by Surf Life Saving WA, who said it was 100m from the shore of the Floreat Groyne at City Beach.

According to news.com.au, it had been attracted to shallow waters by a 19ft whale swimming nearby.

"This is the White Shark that has been cruising the coast. Last seen between Scarborough and Trigg at 12:47," Surf Life Saving WA said.

"The shark appears to be following this whale north. First sighted off Swanbourne and last seen off Waterman."

City Beach was reopened, but two other beaches remained closed for several more hours. All have since reopened.

The most common diet for great whites are seals, sea lions, elephant seals, dolphins and rays, although they have been known to hunt and eat whales.

This sighting follows the tagging of a 17ft shark off Western Australia's south coast – the biggest to ever have been tagged in Australia.

Nicknamed Joan of Shark, the creature was tagged close to Mistaken Island in water just 15m deep.



It then surfaces and begins chewing on the crew's inflatable boat, taking a chunk out of the side as it starts to deflate. Writing on their YouTube channel, the team said: "Why does a rubber inflatable boat sink in the ocean? Because a Great White Shark has just taken a Chunk out of it!"

"Is the scariest part when the Shark eyes our folks on the boat? Ah Yeah. Great White Sharks are amazing creatures. They should be respected and protected."

"The awesome Great White can grow to 21 feet in length. It is the apex predator of the sea. Except for maybe the Orca. Great Whites have been around for over 15 million years. Are they the offspring of the Megalodon? Not sure. Science is still working on that."

Viewers were keen to point out that the shark was not attacking the boat and was more likely biting out of curiosity.

"The shark's eyes weren't rolled back into its head, thus it was not making an attack. It bit the boat out of curiosity. As sharks lack suitable limbs, the only way for them to examine a new object is by biting it," one user said.



The UK's sharks are being wiped out by long lines laid by Spanish and Portuguese fishing fleets, say scientists. The fishing lines, up to 60 miles long and each bristling with baited hooks, are being laid across the routes taken by sharks as they migrate in and out of British waters. An estimated 3m-4m blue and mako sharks, the main targets, are being killed each year in the north Atlantic.

The scale of the slaughter has been revealed by researchers at the Plymouth based Marine Biological Association (MBA) who tagged 100 sharks then compared their movements with the paths of the 186 longline fishing vessels operated by the two countries.

"We found that the sharks are congregating where warm and cool currents meet. These are highly productive areas that attract fish — and that attracts sharks too, said David Sims, professor of marine ecology at the MBA. "However, it also attracts fishing vessels and we found many long lines laid in exactly the places where sharks concentrate. It is a wall of death for sharks.

The discovery could explain why shark numbers around Britain have plummeted. Boats operating from the Cornish port of Looe, the centre of British shark angling, used to catch several thousand a year but that has fallen to a few hundred, undermining what was once one of Cornwall's most lucrative tourist industries. Sims said the study was vital to work out the impact of unregulated commercial shark fishing. It kills up to 100million sharks globally each year, mostly to satisfy the Far East's taste for shark fin soup.

The surging demand for shark has coincided with a sharp decline in tuna catches because of overfishing. It means that the Spanish and Portuguese "tuna" fleets' main target is now sharks. Sims said: "We know shark populations are plummeting but we didn't know why—was it fishing or something else?

"We needed to know how much their range overlapped with fishing boats. What we found was a 76% overlap, so it is clear that these long liners are having a major effect." It was proof that the long lines were targeting the main populations of sharks.

One of the toughest parts of Sims's research was catching and tagging live sharks. Each animal had a tag fixed to a fin to send data on its movements back to Plymouth via satellite.

However, perhaps the biggest breakthrough was in persuading the skippers of two Spanish boats to hand over logbooks recording 16 years of fishing data, including the numbers, size, species and location of all the fish caught. Sims and his colleagues also obtained data from the Spanish and Portuguese governments showing the movements of all their long lining vessels over a 10-year period.

The scientists were then able to map the movements of both sharks and fishing boats. The results demonstrated that fishermen were in effect following sharks around the ocean, laying longlines wherever they congregated.

“What we see is dense networks of longlines laid where ocean currents converge,” said Sims. “Over a season the same location may have a lonline laid along it 10 times, each one left out for 12 hours.”

What most concerns scientists is that the life cycle of sharks makes them exceptionally vulnerable to over fishing and population collapse. Blue sharks take six years to start breeding while makos start at age 18, then produce just 12 young every three years. The chance of being killed before reproducing is very high.

The fishery is nominally overseen by the International Commission for the Conservation of Atlantic Tunas but it says there is insufficient data to set quotas.

Angus Bateson, chairman of the Shark Angling Club of Great Britain, said the effects were clear: “There used to be 40 boats operating from Looe but no it’s down to eight.”

Ali Hood, of the Shark Trust, which lobbies for better protection for sharks, said: “Seeing the intensity of the long line fleet’s activity mapped out is shocking”.

Reported landings of blue shark by the EU fleet have tripled since 2003, with Spain responsible for over 80%.”

Sims said: “These are awe inspiring animals but it is open season on sharks. We should hit the panic button right now rather than in 10 years’ time when it could be too late.”





Giant jellyfish one METRE wide washes up on Dorset beach - and experts say there could be moreThe huge barrel jellyfish washed up in Portland, Dorset, this week, and is thought to be one of the biggest of its kind to ever appear on British shores.

• [View PhotoRex Features - Monster: The huge jellyfish was estimated to be almost 3ft-wide. \(Rex\)](#)

A stunned beachgoer had to tread carefully after finding this enormous one METRE-wide jellyfish on a British coastline.

The huge barrel jellyfish washed up in Portland, Dorset, this week, and is thought to be one of the biggest of its kind to ever appear on British shores.

Warmer-than-average weather which is expected in the UK in the next few weeks could bring more of the super-sized sea creatures.

Suzanne Sheldon, 48, found the monster jellyfish while walking her dog on the quite beach.

The enormous jellyfish was found in Portland, Dorset. (Rex)

She said: 'It was at least three feet in width and was very bulky too. It was the largest jellyfish I have ever seen.'

Experts are now warning British beachgoers about the dangers of jellyfish.

Richard Harrington from the Marine Conservation Society (MCS) said: 'This predicted hot weather to come can mean that even more jellyfish are likely to wash up or be in the seas around places like the west Country.'

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In a paper published this week in the Proceedings of the National Academy of Sciences, scientists from the U.S., Britain and New Zealand describe catching translucent hadal snailfish at a depth of 7 kilometres (4.3 miles)

By measuring levels of a compound in the fish that helps offset the effects of pressure, the scientists say they've concluded that fish likely can't survive below about 8,200 metres (5.1 miles). That would mean no fish at all live in the deepest one-quarter of the world's oceans.

The snailfish have little pigmentation due to the lack of light in their environment, hence their translucent appearance. New Zealand marine ecologist Ashley Rowden, a co-author of the paper, said nobody had caught a snailfish in nearly 60 years and so he wasn't overly hopeful when they sent down a box-like trap into the Kermadec Trench near New Zealand in late 2011.

He said they used mackerel as bait to attract the small sandhopper-like creatures the snailfish feed upon. “When it came up, it was just amazing to see. It was ‘Oh my God, we’ve got the fish, and we’ve got more than one,’” Rowden said.

Rowden said he put on gloves and carefully picked up one of the fish.

“It was like a water-filled condom,” he said. “A sloppy, gelatinous mass that moves between your hands. It was very cool, and very strange to see its organs and everything.”

Rowden, who works at New Zealand’s National Institute of Water and Atmospheric Research, said scientists had previously speculated fish couldn’t live below certain depths but that catching the fish and studying them helped provide more scientific certainty.

The fish are the second-deepest recorded catch. In 1970, a boat off the coast of Chile reported catching a cusk eel at a depth of 8,370 metres in a trawl net, although questions remain whether that fish was caught at the ocean floor or higher up as the net was hauled in.

The paper’s lead author, Paul Yancey of Whitman College in Washington state, said they were able to measure the levels in the fish of trimethylamine oxide, a molecule that protects proteins from pressure. He said there appears to be a natural limit to the amount of the molecule a fish can contain.

Yancey said the molecule is already being studied for its human applications, including in the treatment of glaucoma. Meanwhile, he said, if the hadal snailfish look strange enough, they would smell terrible when they decompose. That, he said, is because the molecule has another property — it gives fish their distinctive smell, so the deeper they live, the stronger they stink.

Yancey is keeping his snailfish on ice.



Fishy chat-up lines and underwater love among Arctic char Scientists in Galway are attempting to eavesdrop on the sounds Arctic char make during courtship in the hope of protecting this threatened to coax the fish into breeding, researchers have tried to recreate its natural spawning conditions in freshwater tanks. (from the Irish Times)

What does the fish say? New research at Galway-Mayo Institute of Technology (GMIT) aims to shed light on just how vocal a unique Irish fish is. Biologists hope to discover whether Arctic char, a deepwater inhabitant of Irish lakes, **vocalise**. during courtship and **spawning**.

Researchers hope that, by recording char in the lab, they can use its **unique call** to pinpoint where it spawns in lakes in the hope of offering it better protection.

About 700 species of bony fish are known to vocalise. Most do this by contracting their swim bladder to produce pulsating drum-like calls. In many species, sound is produced by males as they compete with each other and try to attract mates.

Sound travels farther underwater than light, says PhD researcher Marta Bolgan, and it doesn’t dissipate as quickly as chemical signals, making it a logical communication medium for fish. But fish acoustics are poorly understood compared with those of aquatic mammals such as whales and dolphins, and freshwater fish are the least-studied of all.

At a fish farm in Galway, Bolgan has recorded what seem to be sounds produced by Arctic char. She believes these may be the first Arctic char vocalisations recorded by scientists. Bolgan now hopes to record the species spawning in the lab to confirm whether it vocalises, and to figure out why.

To coax the fish into breeding, she tries to recreate its natural spawning conditions in freshwater tanks: cold water temperatures (6-8 degrees) and a short daylight period recreated using lamps.

Bolgan keeps male and female char separately, but once the females are ripe with eggs, she transfers two males and one female to an observation tank. For the first two days she keeps the sexes separate using a divider.

Each time, the males appear to compete until one has established dominance. "One male keeps swimming around the tank and the other hides," she says. Often the female will dig a nest in the gravel bedding to prepare for spawning.

When she removes the divider, the courtship ritual begins. "The [dominant] male swims with the mouth really close to the tail of the female, and the mouth of the female is really close to the tail of the male. They swim in a circular pattern, and they can go on like this for a couple of hours."

But there's one catch: of the nine pairs she has observed at the time of writing, none have completed spawning, and Bolgan has yet to hear any vocalise. She says that because her char are from farmed populations, they may have lost the ability to breed naturally, or her observation tank may be too small for spawning.

"I have a feeling that they rely more on other communication channels. We can't exclude sound production yet, but maybe it's not their main communication channel," she says. Nonetheless, her research still provides new insight into the behaviour of Arctic char.

Later this year, Bolgan will record underwater at Lake Windermere in Cumbria, where the exact location of char spawning grounds is known. She's hoping to film the fish here too. This should provide better evidence as to whether wild char vocalise during the breeding season.



Catch of a lifetime for Kitcher11:19am Wednesday 30th April 2014 from Southern Daily Echo

Steve Kitcher with his 36lb 5oz fish from the Isle of Wight's Blackwater Syndicate

The Isle of Wight's Blackwater Syndicate produced a catch of a lifetime for Steve Kitcher.

He took five twenties in a 12 hour period with fish of 31 lb, 31 lb 14 oz, 33 lb, 35 lb and 36 lb 5 oz on C.C Moores

Equinox.

The legendary Monks Pool produced one of its rare carp when Lee Pettitt took a 36 lb. Tim Oatley's day ticket fishery at Rookley Park has been fishin well.

Ryan Rodford took 16 fish in a week session, including nine twenties to 28 lb, while dad Gary took fish of 23 lb 8 oz and 24 lb 4 oz.

Bournemouth's Wally Watkins had a superb haul with 10 fish including nine over 20lb including fish of 25 lb 2 oz, 28 lb 2 oz, 28 lb 4 oz, 29 lb plus The Twin at 32 lb 8 oz and Bill at 34 lb.

Andy Sweatland took a 33 lb 8 oz and Patrick Craig a 35 lb.



Astonishing picture - Fisherman discovers live frog in throat of fish By Eurosport 6 May 2014

Who says fishing is a boring, uneventful pursuit? Anyone with such thoughts should banish them immediately after seeing this breathtaking picture.

Angus James could not believe what he was seeing as he opened the mouth of the jungle perch he had just caught. Surely, it couldn't be?

The pro angler was about to release his catch back into the water when he suddenly caught a glimpse of something shuffling around in the throat of the fish.

It suddenly became all the more clear what he was seeing: a frog rediscovering its freedom!

Before he knew it, a live green tree frog was looking up at him from deep inside the fish's throat, providing him with the most incredible image.

James should be commended, partially for the catch in the first place, but mostly for having the reactions and presence of mind to take what will go down as one of the greatest photos of a sporting pursuit.

"I was shocked," James told News Limited in Australia. "I thought it might have been grass at first, then it blinked.

"I always carry a camera, so I took the pic and then he jumps out."

And thank goodness he did take the pic before the frog leapt out and hopped away to freedom

James, a professional field angler from Tackle Tactics, was fishing an hour north of Townsville, Queensland when his life changed as a result of the crazy incident.

News Limited of Australia have made their own story famous with the inspired headline: "Excuse me, I think I've got a frog in my throat...no really, I do have a frog in my throat."

James posted the image on Facebook and it has since gone crazy on social media and become an overnight sensation, quite rightly.

"It has gone all around the world," he told News Limited. "So many people have shared it.

"There's people commenting on the photo in languages I don't even understand.

"Everyone keeps saying the frog got its second chance at life."

So, now we know what an extremely exciting and pulsating activity it really is, who fancies going out for a spot of fishing on the river?



The deep red cephalopod, so named due to its blood red color, is actually a scavenger in the world of squids, unlike the giant Humboldt squids that are voracious hunters. This species has never been displayed in a public aquarium so it might be a great time to visit the aquarium and check it out.

The vampire squid lives deep in oceans with tropical and temperate waters and consumes what is called marine snow, which is a mixture of poop, dead animal matter and mucus. They are considered a living fossil in that the squid has not changed in hundreds of millions of years.

Vampire squid don't suck blood but rather eat detritus suspended in the deep ocean's water column. Photo by Monterey Bay Aquarium

The aquarium is also showing a *Japetella* octopus (*Japetella* sp.), a cephalopod that has chromatophores that help to camouflage it by enabling it to turn from see-through with spots to a near solid orange coloration. They can be found in the Monterey Bay as well as the Gulf of California.



According to the Echo newspaper the Prittle Brook is being contaminated by deicer used on the planes at the Southend

airport. It appears that the used deicer is drained into the Brook as it passes close to the air port. The Prittle Brook is a tributary of the River Roach. What is exactly in the deicer is not stated but even if it is only salt this cannot be suitable to the life in the freshwater stream. If it is Ethylene glycol as is used in automobile engines then this is even more dangerous, as if drunk by cats, dogs, or other animals even low concentrations can lead to death. The Echo was unable to tell us what the deicer consisted of.

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Deep-diving seals reveal secrets of carbon monoxideGas appears to protect elephant seals from cell damage after periods of restricted blood flow.

Elephant seals routinely dive to depths of 500 metres and stay underwater for 25 minutes at a time.

Blood samples from elephant seals may help to explain how carbon monoxide — a poison — can stop inflammation. The seals routinely dive to depths of 500 metres and stay underwater for 25 minutes at a time, surfacing for just a few minutes between plunges¹. During these forays, blood flow to nonessential tissues and organs is restricted, but the tissues are not damaged. Researchers at the Scripps Institution of Oceanography in San Diego, California, suggest that high levels of carbon monoxide in the seals' blood has a protective effect — echoing laboratory research on rats and mice that has found the gas has anti-inflammatory properties and can lead to better outcomes after organ transplant.

This unusual physiology was first observed in the mid-1950s by Lewis Pugh of the National Institute for Medical Research in London. Pugh monitored carbon monoxide levels in the blood of the men living in an Antarctic base to ensure that their stoves were not poisoning them. While there, Pugh also found surprisingly high carbon monoxide concentrations in the blood of Weddell seals killed to feed sled dogs^{2, 3}.

In the 1960s, researchers discovered that mammals produce carbon monoxide when haemoglobin and myoglobin proteins in their cells degrade. Decades later, in the early 1990s, scientists realized that the gas — previously thought of only as a toxin — can be therapeutic at some concentrations. Experiments in animals including rats and mice have shown that inhaling carbon monoxide improves outcomes after organ transplants and heart attacks, and carbon monoxide treatments for organ transplants are beginning human clinical trials⁴. Yet the mechanism behind the gas's benefits remains unknown.

Now, in research presented this week at the Experimental Biology 2014 meeting in San Diego, California, seals return to the picture.

When Michael Tift, a comparative physiologist at Scripps, analysed blood samples from 24 elephant seals on a California beach, he found high levels of haemoglobin. In adult seals, up to 10% of that haemoglobin was bound to carbon monoxide, implying high levels of carbon monoxide in the blood.

The levels of carbon monoxide in the seals' blood was comparable to that of “someone who is smoking more than 40 cigarettes a day,” Tift says. In nonsmoking humans, just 1–1.5% of haemoglobin is bound to carbon monoxide. Tift thinks that the seals' carbon monoxide levels and the gas's therapeutic benefits in medical studies have a common explanation. Just as elephant seals restrict blood flow to their nonessential tissues during deep dives, blood flow is interrupted in humans during organ transplantation, stroke, heart attack and other injuries. In humans, when oxygen-

rich blood floods back into tissues, it prompts an onslaught of chemical reactions that cause inflammation, cell death and even tissue necrosis. The seals have none of these effects.

“These animals are constantly holding their breath,” Tift says, “but they don’t have any injuries.” He proposes that elevated carbon monoxide may prevent damage from the returning blood flow.

“Carbon monoxide seems to slow the metabolism of the tissue,” says Leo Otterbein, a physiologist at Harvard Medical School in Boston, Massachusetts, who pioneered therapeutic uses of carbon monoxide. Slowing metabolism — and thus oxygen use — would delay or eliminate the formation of molecules that cause inflammation and cell death, he says.

The seals may provide a useful system to better understand how carbon monoxide works in the body to prevent problems, says Roberto Motterlini, a vascular biologist at the French medical research agency (INSERM) in Paris. Carbon monoxide may stimulate mitochondria production, he notes, something researchers could test in elephant seals.

Nature doi:10.1038/nature.2014.15131

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Fearsome 'Goblin Shark' Sighted for Only 2nd Time in Gulf of Mexico

Carl Moore accidentally caught this fierce-looking goblin shark on April 19. He later released it back into the Gulf of Mexico.

Credit: Carl MooreView full size imageA rare, deep-sea "goblin shark" caught by Florida shrimp fishermen is only the second of these creatures ever seen in the Gulf of Mexico, scientists say.

The prehistoric-looking beast, whose pink color and daggerlike teeth earn the shark its name, is usually seen in deep waters off the coast of Japan.

On April 19, fisherman Carl Moore and his crewmates were **fishing** off the coast of Key West, Florida, when they hauled up the 15-foot-long (4.6 meters) shark with a net full of shrimp from 2,000 feet (610 m) of water. They hoisted the animal up and threw it back into the ocean.

"I didn't even know what it was," Moore told *The Houston Chronicle*. "I didn't get the tape measure out, because that thing's got some wicked teeth, they could do some damage."

Fortunately, Moore was able to take **pictures of the creature** using the camera on a cellphone he had just bought. The fishermen reported the sighting to the National Oceanic and Atmospheric Administration (NOAA), where shark expert John Carlson was alerted.

"As a whole we know very little about these animals — how old they get, how fast they grow, where their nurseries are," Carlson told *LiveScience*. Scientists haven't done a lot of deepwater **surveys**, so they don't know if the sharks are really rare, or just haven't been seen, he added.

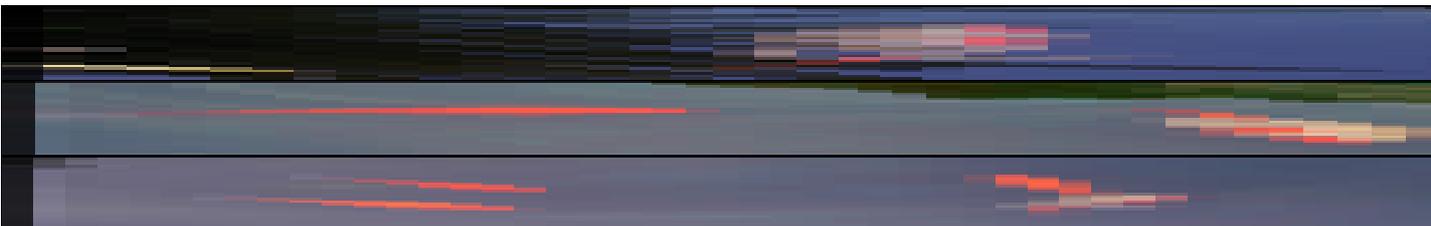
The Key West shark was slightly smaller than the first one seen in the Gulf, which at 18 feet (5.5 m) long was the largest ever recorded, Carlson said. By contrast, most of the goblin sharks seen off Japan are only about 7 or 8 feet (2.1 to 2.4 m) in length. Also, the new animal is most likely female, because it lacked male sexual appendages known as claspers, Carlson said.

The first and only other goblin shark sighting in the Gulf was in 2000, when one got caught in a ghost crab net off the coast of Louisiana, Carlson said. And the only other sighting in the western North Atlantic Ocean was near a seamount east of Bermuda in the 1970s, he said.

They are usually found between water depths of 1,000 and 3,000 feet (300 and 900 m), where the animals probably feed on small fish and squid, spearing them with their sharp teeth, Carlson said.

Sharks are an ancient type of fish that date back to before the dinosaurs, but goblin sharks are a more recent lineage, Carlson said. "They look more prehistoric, because they're adapted to life in the deep sea."

Carlson and his colleagues are currently working on a paper about the new shark sighting to submit for publication in a scientific journal.





.Hop on! Moment frog hitches a ride on the back of a GOLDFISH captured on camera by amateur photographer

By [LIZZIE PARRY](#)

This is the moment a lazy frog saw his opportunity and hitched a ride from one side of a garden pond to the other, on the back of a goldfish.

The laid-back amphibian leapt on to the bright orange fish and clung on for dear life, gripping on with its webbed feet so as not to topple off.

Wriggling from side to side, the goldfish tried to shake off its unwanted piggy back rider, but the frog refused to loosen its grip.

Andree Siwadi, 70, spotted the bizarre interaction as she sprinkled food into her garden pond in Winton, near Bournemouth in Dorset.

The retired nurse and grandmother-of-four, said: 'I saw a frog riding around on the back of one of the fish and thought it was so unusual and funny that it would be worth getting a picture.'

'Afterwards, I lifted the frog off and put it back in the weeds as I was worried it would hurt the fish, which are all owned and named after my grandchildren.'

'I have never seen anything like this before and I have lived in the countryside all my life, I have no idea why it was doing it.'

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Mrs Siwaldi, a retired nurse and grandmother-of-four, said: 'I saw a frog riding around on the back of one of the fish and thought it was so unusual and funny that it would be worth getting a picture'

The 70-year-old added: Afterwards, I lifted the frog off and put it back in the weeds as I was worried it would hurt the fish, which are all owned and named after my grandchildren. I have never seen anything it before and I have lived in the countryside all my life, I have no idea why it was doing.

As most aquarists with a pond know this is simply an over amorous male frog who can't find a mate of it's own species,



Deepwater dive in the Coral Sea reveals rare fish

DEEP SEARCH: Cairns Marine has collected a rare fish (pseudanthias Aurulentus, Golden Anthias) from the Coral Sea, believed to be an Australian first. Divers dove to a depth of 60m on the reef to collect the species, pictured at Cairns Marine. Source: News Limited

A RARE tropical fish never seen in Australian waters has been collected from the depths of the Coral Sea to be sold to an overseas aquarium.

Far North-based aquarium collectors Cairns Marine discovered a school of golden anthias at a depth of 60m during an expedition last week at Holmes Reef, about 240km east of Cairns.

The colourful fish are typically known from the Central Pacific, extending south of Hawaii.

They are regarded within the aquarium world as the perfect coral reef display fish, however they are difficult to come by in the wild due to their deep-water nature.

DEEP SEARCH: Cairns Marine has collected a rare fish (pseudanthias Aurulentus, Golden Anthias) from the Coral Sea, believed to be an Australian first. Divers dove to a depth of 60m on the reef to collect the species, pictured at Cairns Marine. Source: News Limited

Cairns Marine is Australia's largest supplier of marine life for display, supplying retail outlets, international wholesalers and public aquariums.

It is one of two aquarium companies in Australia that is licensed to collect some species within the Coral Sea.

Cairns Marine's Fenton Walsh said one of the company's divers, using a rebreather apparatus, was able to recognise the large school of thousands of golden anthias and act quickly enough to catch about 70 individuals.

"It takes a pretty keen eye. There wouldn't be too many people who would have spotted it," he said.

"The average person would just say it's just another pretty fish swimming around.

"It doesn't look any different to the other ones out on the Reef."

The company's sales and logistics manager Julian Baggio said some anthias would be sold in Japan, while others were destined for retailers across Australia.

"We're also taking some to a large aquarium trade show in Germany later next month," he said.



How did some fish evolve the ability to shock!

Take a muscle cell, modify it over millions of years, and you end up with an exciting and literally shocking evolutionary result: the electric fish. Electric fish have evolved several times in varying levels of complexity. Two groups of electric fish, one in Africa (Mormyroids) and one in South America (Gymnotiforms), have independently evolved sophisticated communication systems using these cells. By emitting and sensing weak electrical signals, the fish have bypassed the usual means of communication, such as with sounds and visual signals, and go directly to electrical signals. This allows them to quietly "talk" to each other in the dark so that most predators can't eavesdrop. Both groups of fish are incredibly diverse; one species, the famous electric eel of South America, even evolved such strong and intense electric signals that it can electrocute its prey.

A gene that is particularly important for electric cells is the voltage-gated sodium channel. During an ancestral gene duplication event, the voltage-gated sodium channel of muscle, Scn4a, duplicated to Scn4aa and Scn4ab. This caused sodium ion channel genes to diversify and in parallel the same duplicate gene, Scn4aa, specialized for electric cells in Africa and South America while the other, Scn4ab, remained specialized for muscles. The regulated currents flow through the ion channels and generate electrical signals. In the advanced online publication of Molecular Biology and Evolution, authors Ammon Thompson et al., showed that the Scn4aa sodium channel gene may have an evolutionary bias over its twin to take part in novel cell types derived from muscle cells.

Evidence for their hypothesis was provided by RT-qPCR data of Scn4aa and Scn4ab from electric fish, which were compared with non-electric fish. They speculate that the down-regulation of the Scn4aa gene leads to quicker evolution and adaptation. Also, in an exciting discovery, they found this same Scn4aa gene expression pattern in a species of fish that uses sound to communicate, showing another extraordinary evolutionary adaptation from the ancient gene duplication. The results provide a compelling hypothesis that gene duplications and gene 'expression drift' may be a more common evolutionary phenomenon in the development of new organ systems.

By peering into the evolutionary history of these genes we're starting to understand why the same gene plays a role in the repeated evolution of these unusual organs," said researcher Ammon Thompson.

Story Source:

The above story is based on materials provided by Molecular Biology and Evolution (Oxford University Press). Note: Materials may be edited for content and length.

Journal Reference:

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EUROPEAN DIRECTIVE BANS BARLEY STRAW USE IN BRITISH PONDS!

The EU move to withdraw barley straw products from gardeners and pond owners is still confused, says industry watchdog the Ornamental Aquatic Trade Association (OATA)

Barley straw is widely used by gardeners, aquarists, farmers and the water industry to control algae blooms and to help purify water organically.

New evidence has come to light that the Drinking Water Inspectorate has not been contacted by the Health and Safety Executive, the body responsible for enforcing the move, over the issue indicating that they are still free to use straw bales in drinking water.

"It seems the powers that be have more safety concerns about garden pond water than tap water. That's just plain bonkers", said OATA Chief Executive Keith Davenport.

After striving to have straw products removed from the EU Biocides Regulation, he won reprieve after officials said they would manufacturers needed to supply to enable products to remain on the shelves. The cost of demonstrating how straw works scientifically may make it uneconomical to continue production.



Scientists find natural predator to lionfish BY DAVID MCFADDEN AP Found in Japan Times

KINGSTON – Research done by U.S. scientists in the Cayman Islands suggests that native predators can be trained to gobble up invasive lionfish that colonize regional reefs and voraciously prey on juvenile marine creatures.

The invasive species with a flowing mane of venomous spines has no natural predators in the Atlantic and Caribbean Sea. Native sharks and groupers typically avoid healthy lionfish, a native to the Indian and Pacific oceans that was likely introduced through the pet trade.

However, when a University of Florida team tethered spry lionfish to lead weights on reefs off Little Cayman, underwater video cameras late showed nurse sharks and Nassau groupers gulping them down.

Thomas Frazer, one of the researchers and the director of the University of Florida’s School of Natural Resources and Environment, said the study suggests that sharks and groupers “have the capacity to learn to pursue, capture and consume” lionfish without human intervention.

“Findings from this study simply suggest that conditioning is likely to facilitate the learning process. On a local scale, predation on lionfish by sharks and groupers is likely to enhance culling efforts,” Frazer said.

Some researchers and lionfish wranglers who were not involved in the study expressed doubt about the findings, arguing that tethered fish do not behave naturally and likely trigger an unusual feeding response in predators.

“I am highly skeptical that a native predator eating a tethered lionfish means that those predators will eat untethered lionfish,” said Mark Hixon, a University of Hawaii professor of marine ecology and conservation biology.

Lad Akins of the Reef Environmental Education Foundation, a Florida-headquartered organization of divers and marine enthusiasts, said he believes feeding lionfish to native predators in the Cayman Islands or anywhere else is dangerous.

“A number of people have been bitten, sometimes badly, by conditioned predators. The dive industry, regulatory agencies and resource managers have come out against the unsafe and unproven practice of feeding lionfish to predators,” Akins said.





A major new survey of the seafloor has found that even in the deepest ocean depths you can find bottles, plastic bags, fishing nets and other types of human litter.

The litter was found throughout the Mediterranean, and all the way from the continental shelf of Europe to the Mid-Atlantic Ridge 2,000 kilometres from land. Litter is a problem in the marine environment as it can be mistaken for food and eaten by some animals or can entangle coral and fish -- a process known as "ghost fishing."

The international study involving 15 organisations across Europe was led by the University of the Azores, and is a collaboration between the Mapping the Deep Project led by Plymouth University and the European Union-funded HERMIONE Project, coordinated by the National Oceanography Centre, Southampton. Other UK project partners that contributed to the study are the University of Southampton and the British Geological Survey.

Scientists took nearly 600 samples from across the Atlantic and Arctic Oceans and in the Mediterranean Sea, from depths ranging from 35 metres to 4.5 kilometres.

Mr Christopher Pham, from the University of the Azores, said: "We found that plastic was the most common litter item found on the seafloor, while trash associated with fishing activities (discarded fishing lines and nets) was particularly common on seamounts, banks, mounds and ocean ridges. The most dense accumulations of litter were found in deep underwater canyons."

Dr Kerry Howell, Associate Professor at Plymouth University's Marine Institute, said: "This survey has shown that human litter is present in all marine habitats, from beaches to the most remote and deepest parts of the oceans. Most of the deep sea remains unexplored by humans and these are our first visits to many of these sites, but we were shocked to find that our rubbish has got there before us."

Litter was located at each site surveyed, with plastic accounting for 41% and derelict fishing gear 34%. Glass and metal, wood, paper/cardboard, clothing, pottery, and unidentified materials were also observed.

Dr Eva Ramirez-Llodra, Marine Biologist from the HERMIONE project, said: "An interesting discovery was relating to deposits of clinker on the sea floor -- this is the residue of burnt coal that had been dumped by steam ships from the late 18th century onwards. We have known that clinker occurs on the deep-sea bed for some time, but what we found was the accumulation of clinker is closely related with modern shipping routes, indicating that the main shipping corridors have not been altered in the last two centuries."

The report outlines the path that plastics in particular can take, originating from coastal and land sources and being carried along continental shelves and slopes into deep water.

Dr Veerle Huvenne, Seafloor and Habitat Mapping Team Leader at the National Oceanography Centre, Southampton, explains: "Submarine canyons form the main connection between shallow coastal waters and the deep sea. Canyons that are located close to major coastal towns and cities, such as the Lisbon Canyon offshore Portugal, or the Blanes Canyon offshore Barcelona, can funnel litter straight to water depths of 4,500m or more."

Dr Howell added: "The large quantity of litter reaching the deep ocean floor is a major issue worldwide. Our results highlight the extent of the problem and the need for action to prevent increasing accumulation of litter in marine environments."

Story Source:

The above story is based on materials provided by University of Plymouth. Note: Materials may be edited for content and length.

Journal Reference:

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India Finds Fishy Ways to Fight Malari By **Stella Paul**

Children in India's southern city Mangalore promote demonstrations of guppy fish feeding on mosquito eggs. Credit: Stella Paul/IPS.

MANGALORE, Apr 25 2014 (IPS) - Thirteen-year-old Sampreeth Monteiro's neighbours are suddenly taking his advice seriously. "Buy a Guppy fish, it will eat all the mosquito eggs in your house. You will not get malaria again."

Last month the St Aloysius' high school in Mangalore city of southern India where Monteiro studies, launched a "Guppy movement" – an anti-malaria campaign in collaboration with the Mangalore City Corporation. The campaign aims to control malaria using natural means – such as the Guppy fish.

"Buy a Guppy fish, it will eat all the mosquito eggs in your house. You will not get malaria again."

Volunteers who have joined the campaign visit local hospitals and schools carrying jars of water with mosquito larvae

and Guppy (*Poecilia reticulata*) to demonstrate how the fish feeds on mosquito larvae.

The campaigners also stage street plays to spread anti-malaria messages. Monteiro learnt about Guppy fish at one of these plays. The campaign is drawing particular attention around Malaria Day on Friday Apr. 25.

Far away from Mangalore in Shillong, a hill city in northeastern India, the state government is organising a workshop on malaria prevention. Those attending include government staff and health activists, and they are being taught that breeding fish like Guppy is an effective way to control vector-borne diseases.

“We are doing satellite mapping to identify malaria prone areas,” Carter Sangma, district medical and health officer for the West Garo hills district tells IPS. “Once the mapping is done, the fish can be easily distributed and grown in those areas.”

Sangma says the state has already seen a 50 percent drop in all mosquito-borne diseases since it took up breeding Guppy fish for malaria control in 2012.

The first known use of Guppy fish in India for such purpose was in 1908 when a British army officer who had suffered frequent mosquito bites brought the fish from England. The officer, remembered as Major Selvy, introduced the Guppy to breed in water bodies surrounding the army cantonment in Bangalore where he was posted.

Around the same time, authorities in Mumbai also started to use Guppy to prevent malaria, importing the fish from Texas, U.S.

But despite more than a century of known use of the Guppy to control malaria, the government did not scale up such prevention. The reason, says Mangalore-based health activist Suresh Shetty, is that the government failed to introduce the practice in rural India where mosquito-borne diseases claim thousands of lives each year.

According to the World Health Organisation, an estimated 3.4 billion people are at risk of malaria. In India, malaria kills nearly 20,000 people a year, by conservative estimates. About 15 million get malaria.

Poor sanitation, untreated garbage, stagnant water and changing climatic conditions are seen as the main reasons behind the spread of malaria. Spraying of insecticide and use of bed nets are the most popular means to check malaria – which is completely preventable. But use of larvivorous fish like Guppy is the cheapest and the most effective malaria fighting tool, say experts.

In Assam state in the north-east, scientists at the Malaria Research Centre near state capital Guwahati are breeding Guppy fish large-scale now.

“Bio-control has helped Assam reduce its malaria cases significantly,” says Nripendra Kumar Sarma from the public health engineering department. “Till 2012, we had over 30,000 cases each year. But now they are no more than 3,000-4,000. This approach can very well be initiated in areas (of the country) that are prone to malaria, dengue and encephalitis, all of which are mosquito-borne diseases.”

Sarma says the government must rope in village based NGOs, community organisations and the private sector.

Bringing in corporate and financial institutions could be a good way to ensure funding, says entrepreneur Somasekhar

Gowda from Mysore city, 181 km south of the southern Indian city Bangalore. Gowda has been breeding the fish, and distributing them free since May last year after four children died of dengue fever in D Salhundi village near Mysore.

The deaths spread fear, and several families fled the village with their children. It was then that Gowda went to D Salhundi, and with the help of the villagers, released Guppies in more than 50 small tanks and puddles.

Better cooperation between government departments, and private-public partnerships can help eradicate malaria anywhere, says Gowda. "In Mumbai, lunchbox (dubbawala) carriers are now campaigning against malaria. In Mangalore, the municipality has tied up with colleges and financial institutions like the Corporation Bank to get enough funds and to find volunteers."

But while there is no doubt about the effectiveness of larvivorous fishes in controlling malaria, some scientists say that large-scale introduction of Guppy can endanger the country's biodiversity, because the fish feeds on other fish species besides mosquito larvae. The solution, they say, is to breed indigenous larvae-eating species.

"There are many larvivorous fish species that are native of India such as Tilapia, Gambusia, Manathu kanni (Aplocheilus) and Karinkana (Pseudosphromenus)," Subrata Deb, formerly professor of pharmacy at Tripura University in the north-east of the country tells IPS. "Alongside Guppy, these species can also be used to control mosquito and malaria."

Vellore city in India's southern Tamil Nadu state has been malaria-free for nearly a decade now, says local entomologist Raja Gopal. But even so, city authorities distributed 4,500 Guppy fish last month for release into local wells, to guard against spread of malaria from the thousands of medical tourists visiting Vellore each year.



Denver fish vet known as "Dr. Koi" keeps patients feeling fin
Special to The Denver Post

The doctor reached down to lift her patient, who suddenly jumped free and landed with a thud on the floor. No harm done, though — and it's her fish. She picks him up and deposits him in a container of water. The patient is a 2-year-old koi, a species bred in east Asia hundreds of years ago to add flashes of brilliant color and life to ponds and water gardens.

The doctor is Jena Questen — more popularly known by the nickname Dr. Koi. She is a veterinarian (Colorado State University, 2001) who later trained herself to treat ornamental fish because she saw so many of them dying needlessly.

On this day, Questen was demonstrating fish care to visitors at the Denver Holistic Center, a mélange of mainstream and alternative animal care practices in north Denver. She maintains Colorado's first fish hospital there.

And her treatments run the same gamut as those for other species: exams, vaccinations and x-rays, ultrasound and surgery. Like others who've encountered her work, this crowd was curious about the details.

For example: How do you know if a fish is sick?

Answer: There are a variety of clues.

"No. 1, if it's not swimming naturally," Questen said. "Or if it swims apart from other fish. If it's not eating. If there is obvious swelling. If it has growths or injuries."

She plucked a wriggling, silver-white koi, 8 inches long, from a large fish tank to demonstrate. She placed it in a plastic bucket filled with water and picked it up, turning it over to inspect it.

That's when the fish tried to make its desperate escape. The guests gasped. But Questen deftly returned the uninjured koi to the bucket.

"He had reddened fins," Questen said. "That indicates an injury or bacteria."

Questen points out an area on the fin that has turned bright red, which is similar to a human's bruise-type injury. (Kathryn Scott Osler, The Denver Post)

She routinely scrapes scales from each fish she examines to check for bacteria. The cure for either malady will be antibiotic injections or baths.

Another common question: How the heck do you operate on a fish?

"Many people are bewildered by the notion," she said. "They ask if I have to go underwater to do it."

The answer is no. You bring the water to the fish.

To show how, Questen set up two plastic containers, each about a foot tall and 14 by 18 inches wide and long. One sits on the exam table, the other on the floor, with both connected by a hose.

To perform fish surgery, Questen adds an anesthetic in the top container's water. Then the lower container gets a lid with a sponge cover, into which a "V" shape is cut. During the procedure, the fish is placed in the "V." Water from the upper container is continually pumped over it to keep the fish oxygenated and medicated.

Questen started treating koi in 2005 when she began working with the Rocky Mountain Koi Club. Her patients include other fish species as well — goldfish, bettas (also known as Siamese fighting fish) and cichlids (the fish family that includes angelfish). She also sees mammals, including dogs, cats and horses, at the clinic and through her mobile practice, East West Vet Service. And she consults, teaches, makes educational videos and does public appearances.

But her main focus on koi, a word that comes from the Japanese word for carp. Her "Dr. Koi" moniker is on a vanity plate that once adorned her car, but now hangs in the clinic.

Owner dedication to this ornamental fish can run to extremes. Koi typically live about 50 years, much longer than a dog or cat. Koi can be an expensive investment, with fanciers booking international plane trips to view and buy them.

"The priciest one I've worked on was worth \$26,000," Questen said. Her typical fee to treat a koi runs about \$175 to \$250.

But a fish's price or rarity is no indicator of its owner's devotion, or willingness to consult a vet.

"The most memorable client I had was a gentleman with a pleco" — also known as a sucker fish, a popular fish in aquariums for their ability to keep tanks clean. "He went to the grocery store every day for 30 years to get the kind of squash the fish ate."

Questen is the only Colorado koi veterinarian listed in the website Koivet.com. Nationally, koi specialists are a rare breed themselves, although some general veterinarians treat the species.

That may be changing, according to Steven Smith, a Virginia Tech professor who is president of the American Association of Fish Veterinarians. He says his organization is trying to expand the concept of veterinary medicine.

After all, Smith said. "There are 70 million dogs in America, 75 million cats.

"And 151 million pet fish."



High-Tech Tuna Researcher Uncovers Marvels of the Big Fish Stanford professor Barbara Block has pioneered tagging and tracking tools.

A voracious predator, the bluefin feeds mainly on small fish, crustaceans, and squid.

PHOTOGRAPH BY BRIAN SKERRY, NATIONAL GEOGRAPHIC Kenneth Brower for National Geographic

[From National Geographic Website](#)

We met 30 years ago, Barbara Block and I, over the body of a huge Pacific **blue marlin**. We were standing on the dock at Kailua-Kona on the Big Island of Hawaii, on opposite sides of the table supporting the fish. Professor Block, then a young post-doc, was doing research on specimens brought in by the anglers competing in the Pacific Gamefish Tournament. I was covering that contest as a journalist.

The 950-pound (431-kilogram) marlin between us was stone cold, five hours out of water, its iridescent colors long since faded to gray. Block suggested that I poke my finger in behind the marlin's large eye. I had no idea who this young woman was, but I did as she suggested.

The eye tilted forward as my finger worked its way into the socket behind. Two sport fishermen standing nearby looked away, squeamish and unhappy. My finger worked deeper. I was startled. Heat. This cold slab of marlin was warm, almost hot, behind the eye. "Heater organ," Block explained.

In marlin and other billfish, she said, some of the muscle used for movement of the eyeball has undergone evolutionary modification, enabling mitochondria there to produce heat. The phenomenon is called NST, non-shivering thermogenesis. The heater organ allows the marlin to move freely from the sunny surface to the cold depths with its eyes and brain warmed and working efficiently.

Removing my finger from the eye of the marlin, I muttered my astonishment. Block, smiling slightly, nodded farther down the dock, to a table where several big ahi, **yellowfin tuna**, awaited transport to the icehouse. In the tunas, she said, the design was even better: a countercurrent heat-exchange system that warmed the whole body.

This is not what I had learned in school. All fish are not ectotherms—cold-blooded—as many of us were taught. The tunas are endotherms of a sort, warm-blooded, as are mackerel sharks like the great white, mako, and salmon shark. In these creatures a rete mirabile, a "wonderful net" of intertwined arteries and veins, lie so close together that the heat in the former is captured by the latter and recirculated. The marlin is partway there: ectothermic aft, but endothermic forward in its eye and brain.

Barbara Block's marlin lesson that day was the best kind of hands-on education. Thirty years after the fact my fingertip still remembers the surprise of that heat behind the eye.

Tuna Research on Cannery Row

"We're doing some of the same stuff as when I last saw you," Block told me recently, when we met again. In the interim she had won the **MacArthur "Genius" Award**, a professorship at **Stanford**, and renown as a leading researcher into the biology of the bluefin tuna. I dropped by her lab at **Hopkins Marine Station**, on Cannery Row in Monterey, California, to interview her about the bluefin, greatest of tunas, a fish I was researching myself for a story. (Read "**Quicksilver**" in *National Geographic* magazine). We sat in her office and she picked up where we had left off three decades before.

"When I started my career, I was studying how animals stay warm, how animals make heat. I'm still doing that. You could ask the birds and mammals, Why do you want to be warm? It's because if you're warm, you can go wherever you want. Just like us. We're not limited by temperature. You also increase metabolic performance, because you warm up your insides. You get increased muscular performance, because you're running at a higher temperature. It doesn't matter whether you're a bird, a mammal, or a tuna. Not all tunas are as warm as bluefin, though. If there's one thing we've learned, it's that bluefin are the warmest of the animals called thunnids."

The walls of Block's laboratory are papered with charts, graphs, posters, and enlarged reproductions of pages from scientific journals. They make a kind of gallery of the professor's work. After our interview, I slowly read my way down the walls, marveling at all that Block had accomplished since that day on the Hawaiian dock.

The Secret Life of Fish

Several posters and maps told the story of the wave glider, an oceangoing robot that Block and her people, in collaboration with the maker, **Liquid Robotics**, have been deploying in various experiments. To any passing ship or albatross, the wave glider appears as a slow-moving surfboard, with a mast or pole at center jauntily flying a little flag.

To any tuna or shark encountering it underwater, the glider appears as a small, multi-winged submarine connected by a tether to the shadowy underside of the surfboard 20 feet above. The tether is designed to capture the energy in the motion of the waves and drive the glider forward. Solar panels power the onboard computers and sensors. The glider can run autonomously, or it can be remotely controlled through the Internet by technicians ashore.

Block's team had steered one wave glider in circles around the **sea stacks** of the Farallon Islands, just north of San Francisco, to monitor the gathering of great white sharks there. They had deployed another glider off North Carolina, in the rough winter seas along Cape Hatteras, to gather data on sturgeon, sandbar sharks, and bluefin tuna.

The wave glider, then, is a sea drone that blows up nothing and invades no privacy, unless you count the secret lives of the fishes. Its only job is to soak up information.

Warm Brains, Cool Hearts

Most of the scientific art on the walls of Block's lab celebrates the bluefin tuna. One graph charts the periodic rise in visceral temperature of a tagged bluefin after its feeding sessions. The heat of digestion raises a line of spikes across the graph, the sort of sawtooth pattern traced by an earthquake across seismograph paper.

Graphs like this had not existed 30 years ago, when Block was a newly minted Ph.D. In the intervening years, after much trial and error, Block's team and their consulting engineers have succeeded in producing what they call the "archival tag," which is surgically implanted in the fish. The internal end measures both the temperature inside the peritoneal cavity and the depth at which the fish is swimming. The tag's stalk, which protrudes outside the body, has sensors for measuring external water temperature and ambient light.

The tag's mini-computer takes snapshot readings of this information at two-minute intervals for as long as several years. If a fisherman catches the fish and sends in the tag, he collects a \$1,000 reward. Back at the lab, the tag pours out its cornucopia of data on each fish's movements—daily, seasonal, horizontal, vertical—as well as its hunting habits and physiology.

One of the revelations of this internal tag is that the fish captures not only the heat generated by its swimming muscles, but also those spikes of visceral heat on the graph, recycling the postprandial glow of digestion.

Some months after my first visit, I was back at the Monterey lab. Block was showing me a series of graphs depicting the dive profiles of Atlantic bluefin tuna. "Here we see a lazy tuna at the surface relaxing," she said, with a nod toward a graph depicting shallow dives. "It's a very warm water column. The fish is out in the Gulf Stream."

She pointed to a graph depicting much deeper dives. "Then the tuna comes into the Gulf of Maine, and what you see is the tuna's going up and down, up and down, up and down. When I first saw this, I didn't think about it. I knew it was odd. And then at a lecture one of my colleagues said, 'Why do they act like mammals that have to come up to get air?' And I looked at the graph, and I thought, Yeah, it is kinda weird, isn't it?"

The tags were trying to tell Block something, but she and her colleagues were slow to grasp it. The tags showed bluefin diving to 250 meters, spending maybe 20 minutes down there in ice-cold water, and then going back up for a while before diving again.

"What we think is that in very cold water the tuna is getting bradycardia, a slowing of the heart. They have to come up and rewarm it. They're not like us completely, in that our heart is warm all the time. The tuna heart, close to the gills,

gets cold. What we discovered in our lab is that the capacity of the bluefin's heart to function in the cold is extraordinary."

Block explained that cardiac contraction is dependent on intracellular stores of calcium in the **sarcoplasmic reticulum**. Of all tunas tested by Block and various co-authors, at all temperatures tested, the bluefin displays the highest rate of calcium uptake in the tuna family, twice that of albacore and three times that of yellowfin tuna and bigeye tuna.

While the **bluefin's countercurrent heat-exchange system** is key to its unmatched athleticism and endurance, it turns out that its great range owes as much to the opposite capacity: a cool heart that functions well in cold. This permits the western Atlantic bluefin to travel, in just two weeks, from its Gulf of Mexico spawning grounds, at 30°C (86°F), to its Canadian foraging grounds at 10°C (50°F). And it allows the fish to commute comfortably from the warm surface to cold depths.

PHOTOGRAPH BY BRIAN SKERRY, NATIONAL GEOGRAPHIC

These 20-year-old bluefin in the Gulf of St. Lawrence are about 9 feet (2.7 meters) long and 800 pounds (363 kilograms) each.



Found in the Littlehampton Gazette

IT is a fish normally found in deep seas off the west coast of Ireland.

So when this megrim, or 'whiff' as it is also known, was caught just two miles off Littlehampton's coast in waters only 50 feet deep, the fish was clearly the catch of the day.

The deep sea dweller was caught by commercial fisherman Paul Gill on Sunday and was sold later that day by Riverside Fish, which is currently based by the oyster pond in Littlehampton while flood defences are being built.

Simon Faber, who works at Riverside Fish, said he was 'stunned' to see the 1lb 8oz fish had been caught in Littlehampton.

It was caught in nets along with other flat fish, such as plaice and sole.

He said: "For it to get here from the west coast of Ireland, from 1,000 feet deep water to 50 feet, I've got no idea how it did it.

"I can only guess when it hatched it got caught in a current somewhere and then grew here."

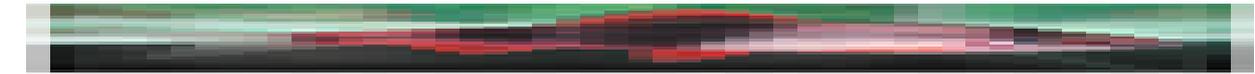
Simon said he had never heard of a megrim being caught off the south coast, though he has sold them before after buying them from Billingsgate Market in London.

Despite its unusual appearance, the megrim is a flavoursome fish, Simon said, and was quickly sold to a regular customer.

He added: "It's very, very tasty. It went to a local customer.

"Normally it takes a little bit of persuading for someone to buy a fish like the megrim because it looks a bit strange, but we do have customers who like buying fish that are a bit unusual."

Megrim is particularly popular in France and Spain, though there has been a drive in Britain for more people to eat the fish to relieve pressure on other species.



Melon barb renamed...again? from aquapress website

H. fasciata exists in a number of colour forms © Hayath

Regular readers will remember that the species formerly known as *Puntius fasciatus* plus its closest relatives were placed into the new genus *Dravidia* a few months ago as part of a larger synopsis of South Asian species which had previously been placed in the genus *Puntius*.

Subsequent to that synopsis being published it became apparent that the name *Dravida* had already been applied to a genus of **flesh fly** from the family *Sarcophagidae* meaning that the fish needed a replacement name which was recently revealed in the journal 'Zootaxa'.

The new name *Haludaria* has been chosen in honour of 'Haludar, a Bengal youth' who ca 1797 was 'the artist who made the exquisite illustrations of "Gangetic Fishes" depicted in Francis Hamilton's (1822) book on the fishes of the Ganges River (see Hora, 1931), a founder work in Indian ichthyology'. Colourful adult male defined by the following combination of characters: size small, usually less than 60 mm SL; presence of rostral and maxillary barbels present; lateral line complete, with 18-26 pored scales on body; 4 unbranched and 8 branched dorsal-fin rays, of which the last unbranched ray is weak and smooth; 3 unbranched and 5 branched anal-fin rays; gill rakers simple, acuminate (not branched or laminate); no antrorse predorsal spinous ray; infraorbital 3 deep, partly overlapping preoperculum; free uroneural and post-epiphysial fontanelle absent; presence of one or two broad, black bars on each flank, between the bases of dorsal and anal fins. Current member species are *H. fasciata*, *H. kannikkatiensis* and *H. pradhani*.

For further information see the full, open access correspondence: [Pethiyagoda, R. 2013. Haludaria, a replacement generic name for Dravidia \(Teleostei: Cyprinidae\). Zootaxa 3646\(2\): 199](#)

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Aphyosemion mengilai, new species, is described from small streams belonging to the hydrographic system of the Ikoy River basin on the northern part of the Massif du Chaillu, central Gabon. It is similar to *A. grelli* and distinguished from all other congeners in having grey to black margins in the unpaired fins in males and females. It can be distinguished from *A. grelli* by having more dorsal and anal fin rays in males and females, by the more anterior insertion of dorsal fin relative to anal-fin origin, by having more scales on transverse series, more scales around caudal peduncle, and by the presence of light blue submarginal stripes in dorsal, anal, and caudal fin in females. *Aphyosemion mengilai* belongs to a clade, herein named *A. grelli* species group, which is diagnosed by the unique distinctive colour pattern of males and females consisting of grey to black margins on dorsal and anal fins. Found on the Aquapress website



Tropical Fish collectors and the Law in Hawaii

West Hawaii Today

Hawaii residents concerned about the impacts tropical fish collectors are having on the state's reefs often hear the same response from state officials: If you see someone breaking the rules, document it.

So Paul Cox, a resident of Papa Bay in South Kona, did. He and his wife swim in the bay daily and, a few months ago, started taking pictures of fish collectors at work. A few things about how the fish collectors went about their work stood out to Cox, he said.

One was that, after he took some pictures and introduced himself to the divers, a few attempted to keep their anchors out of the coral.

"Even as hard as they tried, they were still contacting and walking on the coral," Cox said. "When they're doing their job, they're breaking the law, as far as reef protection."

Rene Umberger, of For the Fishes, said she noticed something else in the images. Long-established rules governing aquarium fish collecting require vessels undertaking that task to be clearly marked with the letters A and Q, as must equipment used underwater. The vessels must also display certain stiff flags. Cox's pictures, of two separate vessels and diving groups, showed those markings and flags were not present, Umberger said.

That right there makes any fish the collectors took illegal, she added.

Umberger contacted the Department of Land and Natural Resources Division of Conservation and Resource Enforcement to see if it would be willing to investigate the damage. An officer told her he would, but as of this week, had not contacted her or Cox.

A DLNR spokesman said Friday Hawaii Island DOCARE officials were still trying to confirm whether an investigation had been started.

Cox said his goal in taking the pictures wasn't to get any particular fish collectors in trouble.

"I would just like to not see our coral broken," he said. "If you're going to be in our front yard here, we're going to be there to document it."

Umberger said it's incidents like the ones Cox recorded the last few months that reinforce the need for better rules regarding fish collecting.

The Hawaii County Council "is considering Maui-style bills to regulate the trade," Umberger said, adding Big Island residents have been working on versions of the bill for more than a year. "The state can't do it. This is a perfect example of why the council needs to act."

Mike Nakachi, who was one of the founding members of the West Hawaii Fisheries Council, said he would like to see the county enact legislation that addresses potential acts of animal cruelty, including in how much water fish are placed for transport. He said the fish collecting industry should also be subject to spot checks to see if the rules are being followed.

Kona Councilwoman Karen Eoff, contacted Friday, said she couldn't discuss potential legislation, but did comment on the ongoing concern residents have expressed.

"Hawaii's coral reefs are some of the most beautiful and vibrant ecosystems in the state," Eoff said in an email Friday afternoon. "We have a responsibility to take care of, protect, and properly manage Hawaii's public trust resources for the benefit of present and future generations."



More on the Sailfin and it's method of feeding

Species: Atlantic sailfish (*Istiophorus albicans*)

Habitat: 200 metres under the Atlantic and Caribbean

Blink and you'll miss it. In fact, you'll miss it even if you don't blink: the Atlantic sailfish can kill so fast, its hunting strategy is briefly invisible to the naked eye. Only through high-speed video footage was the fish revealed to perform swordplay with its bill that would put even the most skilled swordsman to shame.

Like other billfish, including **swordfish** and marlin, **sailfish** have very long, sword-like bills which account for one-quarter of their total length of up to 3.5 metres.

Until now, the function of the bill has been something of a mystery. Some thought it may serve to herd the schools of sardine and other prey, or that it helps the fish glide faster through the water – they can reach speeds of up to 55 kilometres per hour.

Previous studies examining the stomach contents of dead billfish such as marlin have found prey with telltale gashes. But there were plenty of gash-free prey among them too, and marlins that had lost their bills still seem to end up with full bellies.

Very swish In a bid to find the definitive answer, Paolo Domenici of the Institute for the Marine and Coastal Environment in Oristano, Italy, and colleagues used high-speed cameras to film the sailfish hunting sardines off the coast of Mexico.

Typically, the researchers would find prey balls of as many as 1000 sardines, surrounded at any one time by up to 40 prowling sailfish. Every so often, a single sailfish would approach the mass of sardines and appear to prod its bill into the middle of the huddle before retreating again. Each sailfish would take its turn to do the same.

Not until the team later slowed down their video footage eight-fold, from the original 240 frames per second to just 30, did they discover what was going on.

On each approach, the sailfish would almost imperceptibly slash the prey ball from side to side, apparently without the majority of sardines even noticing the manoeuvre. With each swipe, sardines would lose scales and sustain wounds, gradually weakening to the point at which a sailfish could pick off and eat weakened individuals one by one.

Super acceleration Sometimes, the sailfish would rely on a second manoeuvre called "tapping", in which the bill would be used deftly to flick an individual sardine far enough from the prey ball for the fish to catch it in its mouth.

But the most dramatic and damaging manoeuvre proved to be a sideways slash – like a windscreen wiper. To achieve it, the sailfish rapidly turned their heads from side to side. The movement resulted in huge acceleration at the bill tip, creating a motion so rapid and stealthy that the sardines had no time to react, let alone flee.

Domenici thinks the bill evolved as a tool to allow a relatively large prey fish to capture much nimbler prey. "By resorting to weaponry that provides high accelerations, large predators can very effectively capture small prey," he says. Other examples include killer whales and thresher sharks, which use their tails to slap and stun smaller, schooling prey.

But few are as fast as the sailfish, which owes its agility to the length of its sword. With tip acceleration measured from the video footage at 130 metres per second per second, the acceleration is among the fastest ever recorded in aquatic vertebrates, says Domenici. "The bill travels with a much higher speed and acceleration than its base, so the speed of the bill tip far exceeds that of the prey," he says. It's thanks to this difference that the sailfish can make its kill before you'd have time to say "En garde!".

Proceedings of the Royal Society B: DOI: 10.1098/rspb.2014.0444



From the Essex Chronicle (UK) Thursday 24th April

Fish are stolen

CHELMSFORD: Fish worth
£600 were stolen from a garden

pond.

The theft took place at a home in Widford Road between 5pm on Wednesday; April 9, and 9am the next day Sergeant Zoe Insull said: "It's likely some sort of tank or vehicle was used and it would have been a long process- it's likely someone saw something.

These thieves are clever & careful-- a few years ago I have some koi stolen- from a pond surrounded by wire netting and the garden has a six foot fence- the only indication was a large lily pot on it's side. The rub was these were not even mine, I was looking after them for a client. Although I had photos of the koi I didn't reckon the police would be interested.



Neknomination drinking game contestant fined for downing goldfish

Wednesday 23 April 2014

An Army recruit has been prosecuted by the RSPCA for swallowing his pet goldfish as part of the Neknomination drinking game

Gavin Hope, 22, filmed himself drinking a pint glass of beer, spirits, a raw egg and some fish food, before downing a glass of water containing the animal. He was taken to court after footage of his stunt was posted on Facebook, the RSPCA confirmed. The society said it is the first time it has prosecuted someone in relation to the online drinking dare game.

The RSPCA's chief inspector Michelle Charlton said the video first shows the defendant preparing a pint glass with lager, chilli, tequila, a fresh egg and fish food before revealing why the fish food is going in.

Ms Charlton said: "He picks up another glass containing a small amount of water and the goldfish, which is swimming around, and shows it to the camera before drinking it down, and following it with the pint."

She said: "A vet report advised that the stomach would be a completely unsuitable place for a goldfish and that the fish would have died in time, the cause of death being a mixture of suffocation and acid ph levels in the stomach, as well as the alcohol he drank."

The society said that Hope told them that he had owned the goldfish for a couple of months.

He said he thought it was ill as it kept swimming into the sides of its tank and he was going to flush it down the toilet but decided to drink it as part of his Neknomination challenge instead.

According to the RSPCA, Gateshead Magistrates Court heard how Hope was ashamed of what he did and claimed it was an impulsive act which would not be repeated. Ms Charlton said: "Eating a live animal and posting a video of it

online for entertainment is not some light-hearted joke - it is unacceptable. The RSPCA takes the use of animals in these Neknominat challenges very seriously.

The society said Hope, of Lauder Way, Pelaw, Gateshead, appeared before magistrates yesterday, where he was also ordered to pay a £30 victim surcharge and £431.17 costs. He pleaded guilty to an offence under the Animal Welfare Act.

The offence was that on or about January 31 this year, he failed to meet the needs of a goldfish by failing to protect it from pain, suffering, injury or disease by drinking it.



Florida plans to ban the import of the invasive, venomous lionfish Jim Waymer, Brevard 11:42 a.m. EDT April 17, 2014

(Photo: CRAIG RUBADOUX/FLORIDA TODAY file)

The Florida Fish and Wildlife Conservation Commission moved forward this week with the proposed ban and several other measures to tame the lionfish invasion.

The other proposals include:

- Banning the development of aquaculture of lionfish.
- Allowing the harvest of lionfish when diving with a rebreather, a device that recycles air and allows divers to remain in the water for longer periods of time.
- Increasing opportunities for people in approved tournaments and other organized events to spear lionfish or other invasive species in areas where spearfishing is currently not allowed. This will be done through a permitting system.

Commissioners approved the proposed ban and other measures at their meeting Wednesday in Havana, Fla. The ban and other measures will be brought back before the commission at its June meeting in Fort Myers for final approval.

FWC staff also is working with the Legislature on a bill to support the proposed import ban of live lionfish and aquaculture of the fish.

"By targeting the importation of lionfish to our state, we can limit the number of new lionfish that find their way into Florida waters and, at the same time, encourage further harvest to reduce the existing invasive population," State Rep. Holly Raschein, sponsor of the House bill, said in a release. "These fish pose a significant threat to Florida's ecosystem, and I am proud to stand in support of the proposed ban. Anything we can do to limit new lionfish introductions and further facilitate the development of a commercial market for this invasive species is a step in the right direction."

Last year, FWC hosted the first-ever Lionfish Summit, held in Cocoa Beach, for scientists, divers, regulators and others to brainstorm solutions. This week's proposed changes came from ideas discussed at the summit.

These flamboyant fish have been on a destructive path for decades that in recent years has reached the Indian River Lagoon.

The popular, prickly aquarium fish first got loose into the Atlantic Ocean in the mid-1980s, and more may have been released during Hurricane Andrew in 1992. Now, they span waters from the Caribbean to Rhode Island.

Nobody knows for sure when lionfish came roaring into the lagoon, but in 2010, two Florida Tech students spotted several inside Sebastian Inlet. Since then, the ferocious fish has been found inside Port Canaveral. They've also been seen in the lagoon proper around seawalls, pilings and worst of all — mangroves, a key nursery for prized grouper, snapper and other commercial significant species. Hundreds have been found far inland inside Jupiter Inlet.

In June, Florida made it easier for divers to rid state waters of lionfish and kill as many of the dreaded fish as they can. The FWC decided to waive the recreational license requirement for divers harvesting lionfish using certain gear. Commissioners also voted to exclude lionfish from the commercial and recreational bag limits.

Those who have tried the fish swear by the white, flaky, non-fishy taste. Cleaning a lionfish presents a thorny situation, though, for those who want to eat them. The fish has sharp dorsal, pelvic and anal spines with venom.

But they're easy to filet, those who eat them say, and the spines can be cut off.

REEF's website — www.reef.org — offers tips on how to prepare them and information about what restaurants serve lionfish.

But developing a commercial market has been a challenge, because the fish is difficult to mass harvest.

People spear them or catch them with small nets, or in traps intended for crabs.

But can we rid Florida waters of the fierce fish?

One FWC abstract from last year's lionfish summit in Cocoa Beach said eradication was "unfeasible due to both financial and logistical limitations."



Idaho Aquarium fined \$10K, placed on probation for three years By KBOI Web Staff Published: Apr 15, 2014 at 2:33 PM MD

BOISE, Idaho (KBOI) - The Idaho Aquarium has been fined \$10,000 and placed on probation after its former directors

illegally harvested marine wildlife.

On Tuesday, the U.S. Fish & Wildlife Service says a U.S. District judge sentenced the Boise-based aquarium to pay the fine, face three years of probation, face annual audits and contribute \$50,000 to the National Fish & Wildlife Foundation.

According to the United States Attorney's office, Ammon Covino and Chris Conk, directors for the aquarium, were sentenced in December for illegally harvesting spotted eagle rays and lemon sharks from an individual in Florida.

Court documents allege that in April 2013, Covino sent a text message saying he was unable to obtain the permit and asked whether it was possible he could "sneak" the rays to him in Idaho.

In a phone conversation with the owner of the animals in Florida, court documents allege, Covino responded ... "just start doing it...who gives a sh**, man."

Government officials also say the two directors, despite having the valid permits, wanted to purchase the lemon sharks "on the down low."

KBOI 2News has reached out to Idaho Aquarium for comment, but has yet to reply.



Russian tourist paralyzed after needlefish attack in Vietnam [Image via blogspot.com](#)

Apr 18, 2014 NHA TRANG, Vietnam - Doctors have saved the life of a Russian woman who was left paralyzed after being attacked by a needlefish while she was swimming in Vietnam's resort beach town of Nha Trang.

Kalinina Oxana, 44, suffered severe neck and spinal cord injuries in the waters off Hon Chong, an island off Nha Trang in Khanh Hoa Province, and was hospitalized on Sunday.

She could not move her limbs or urinate after the incident.

After a seven-and-half-hour operation at Khanh Hoa General Hospital, the tourist has recovered feeling in her limbs and the ability to make slight movements with her limbs, according to the news report.

She will have to undergo another surgery before her condition stabilizes, it said.

During the last operation, doctors recovered numerous pieces of fish bone and teeth still lodged in the patient's neck.

Experts from the Nha Trang Institute of Oceanography later confirmed that the bone and teeth were those of needlefish.

According to Khanh Hoa General Hospital, doctors here last December also saved the life of a local fisherman whose throat had been pierced by a needlefish while he was fishing at sea.

Before the fish was identified, some local fishermen had suspected that the tourist could have been attacked by sharks.

Some fishermen reported last month that since the beginning of this year they had caught dozens of baby sharks, in Van Phong Bay, some 30 kilometers east of Nha Trang.

After studying photos of the sharks, Van Quang with the Nha Trang Institute of Oceanography told Thanh Nien that they could be grey reef sharks (*Carcharhinus amblyrhynchos*) and bull sharks (*Carcharhinus leucas*), which account for more than 5 percent of worldwide shark attacks on humans.

Source: Thanh Nien

- EAST ASIA



Scientists led by Dr Yann Guiguen from the French National Institute for Agricultural Research have successfully sequenced the genome of the rainbow trout, *Oncorhynchus mykiss*.

This is an artist's impression of the rainbow trout, *Oncorhynchus mykiss*. Image credit: Timothy Knepp / U.S. Fish and Wildlife Service.

The rainbow trout, an elongated fish with sides that fade from green below the dorsal fin to yellow and white, belongs to Salmonidae, a family of fishes that also includes salmon, char, and grayling.

This fish has straddled the worlds of nature and nurture, naturally thriving in a range of temperatures and water quality while responding to domestication so well that it has been spread by human hand from the Pacific Rim to thrive in waters on six continents.

In their research, Dr Guiguen and his colleagues focused on the rate at which genes have evolved since a rare genome doubling event occurred in the rainbow trout about 100 million years ago.

Unlike most evolutionary processes involving mutations and the selection of advantageous traits, a doubling event acts like the copied draft of a piece of writing that can be edited and recast without the risk of destroying the earlier version.

Ordinarily, the consequences of such doubling events are lost to science as they get cast out by selective forces in subsequent generations. But because 100 million years is a relatively short time, evolutionarily speaking, the trout researchers could in effect glimpse the fish's evolutionary editing process.

"In humans and most vertebrates the duplication events were older so there are fewer duplicated genes still present. Most of the duplicated genes get lost or modified so much that they are no longer recognizable as duplicates over time. In the trout and salmon we can see an earlier stage in the process and many duplicated genes are still present," said Dr Gary Thorgaard of Washington State University, a co-author of the paper published in the journal *Nature Communications*.

The team used both the genome sequence and gene expression data from the rainbow trout to show that roughly half

of all protein coding genes have been deleted since its genetic doubling event.

It has retained almost all its microRNA genes, which help regulate gene expression.

The scientists also found the fish retained original or nearly original genes involved in embryonic development and development of connections between nerve cells.

The timing associated with these changes suggests gene evolution after an event such as this is a much slower process than previously thought.

“It seems that the rate of evolution can vary in different situations,” Dr Thorgaard said.

“Some animals, like the lungfish and coelacanth, are ‘living fossils’ that have been around for hundreds of millions of years without changing very much. Others, like the polar bear, seem to have evolved quite recently. After the trout gene duplication, the process happened more slowly than it has in most other vertebrate animals, and we can still watch it going on.”

Camille Berthelot et al. 2014. The rainbow trout genome provides novel insights into evolution after whole-genome duplication in vertebrates. Nature Communications 5, article number: 3657; doi: 10.1038/ncomms46



The alligator snapping turtle is the largest river turtle in North America, weighing in at up to 200 pounds and living almost a century. Now researchers from Florida and the University of Vermont have discovered that it is not one species -- but three.

Examining museum specimens and wild turtles, the scientists uncovered deep evolutionary divisions in this ancient reptile.

Once heavily hunted for turtle meat -- alligator snapper was the main ingredient of Campbell's Turtle Soup in the 1960s -- the riverine populations have been deeply depleted and are of conservation concern. The new discovery indicates that these animals are more imperiled than previously understood.

The two new species both live in the southeastern United States. The Suwannee alligator snapping turtle is found in

Florida and Georgia -- and lives only in the famed Suwannee River; it has been a distinct species for at least five million years, the scientists discovered. The Apalachicola alligator snapping turtle lives in Florida, Georgia, and Alabama -- in and around the Apalachicola River -- and developed as an independent species at least three million years ago.

The genetics work to identify the new lineages of turtles was completed by Joe Roman, a conservation biologist at the University of Vermont, and colleagues. The research was led by Travis Thomas, a Florida Fish and Wildlife Commission scientist, and is reported in the April 9 edition of the journal *Zootaxa*.

Suwannee secret

"We found a surprising result: these really deep divisions between each river," Roman says. "Unlike common snappers, these turtles do not move from river to river; they're isolated and have been for millions of years, through many glacial ages."

Roman and his colleagues caught turtles in rivers throughout the Gulf Coast region and collected blood samples from their tails. ("Watch out!" Roman says, "some people claim they can snap a broom handle," with their powerful jaws -- and one of his friends said getting his finger caught by a young turtle was like "getting it caught in a car door.") From these samples they collected DNA to determine that both male and female snappers in the rivers were genetically isolated from other populations.

"The Suwannee River turtle is way different from the others; it's been isolated -- as an independent species -- into the deep past," Roman says.

The molecular revolution that began in the 1980s has used DNA to redraw many boundaries between species. But to be fully confident in the genetic evidence they had gathered, the scientists also examined the turtles for differences in body shape and size. Close studies of the skulls and shells of museum specimens confirmed that "each of the three genetically distinct *Macrochelys* lineages can be diagnosed morphologically," the team writes in their new paper. In other words, experts can look at the turtles, particularly the back edge of the shell, and tell the species apart.

Out of turtle soup

Until early in the 20th century, alligator snapping turtles were plentiful from headwaters in the Midwest into swamps of the Deep South, but "river turtles were hit hard in the 1960s and 1970s," Roman says. Hunters, often smalltime operators, "could clean out a stretch of the river in a few weeks time by just setting traps and waiting," he says. Florida was the first state to shut down commercial trapping and eventually all other states followed -- the last one being Louisiana.

"Turtle soup was traditionally served to politicians at political dinners," Roman says, "so a senator in Louisiana fought against protecting them." Today, Roman sees bipartisan support for protecting the turtles against current threats like water pollution, illegal harvest and collection for the pet trade, and river drawdowns upstream. "These are the symbols of their rivers," he says, "and part of the cultural history of bayous and backwaters." But they're also deeply connected to the ecological and economic health of these regions, he notes. "As top predators, they're a key part of the ecosystem," Roman says. "By protecting the rivers and their unique species, you're protecting fisheries, oyster beds and the recreation economy that people living there depend on."

About a decade ago, Roman's work led to analysis of turtle meat sold in Louisiana, which uncovered widespread fraud. "Approximately one in three samples of turtle meat sold in the state were actually alligator," he says. In 2012, the

Center for Biological Diversity and others filed a petition with the federal government to protect the alligator snapping turtle and fifty-two other reptiles and amphibians, under the Endangered Species Act. Reacting to the new species discovery, on April 16 the advocacy group sent an additional appeal to the U.S. Fish and Wildlife Service.

"Now we know alligator snappers in the Suwannee River are a unique species found nowhere else in the world," Collette Adkins Giese, a biologist with the Center for Biological Diversity, said in a statement. "And the much-needed Endangered Species Act listing for these turtles would help ensure that the Suwannee River is protected for the turtles -- and for humans."

Alligator snapping turtles are secretive and so slow-moving that algae grow on their backs. A sit-and-wait predator, they have a wormlike lure on their tongue that draws in fish, "and then snap!" says Roman. "They hardly ever come onto land, and they don't swim in seawater either," he says, which helps explain how a distinct species arose, in the case of the Suwannee alligator snapping turtle, in just one river.

Story Source:

The above story is based on materials provided by University of Vermont. The original article was written by Joshua E. Brown.

Journal Reference:

1. TRAVIS M. THOMAS, MICHAEL C. GRANATOSKY, JASON R. BOURQUE, KENNETH L. KRYSKO, PAUL E. MOLER, TONY GAMBLE, ERIC SUAREZ, ERIN LEONE, JOE ROMAN. Taxonomic assessment of Alligator Snapping Turtles (Chelydridae: Macrochelys), with the description of two new species from the southeastern United States

. Zootaxa, 2014; 3786 (2): 141 DOI: 10.11646/zootaxa.3786.2.4

2. ++++++



Sailfish Stealthily Slash Prey with Bills

A still from a high-speed video of a hunting sailfish shows the predator slashing a school of sardines with its bill, inflicting injuries and making it easier to catch the prey.

Credit: Alexander Wilson, via YouTubeView full size imageThe purpose of a sailfish's iconic bill has long been a mystery. But now, new high-speed video of sailfish on the hunt reveals the fish use their bills to sneak into schools of fish before slashing and jabbing their prey.

After braving high seas and disruptive dolphins to capture the footage, researchers analyzed these high-speed sailfish videos frame-by-frame and found that the bills give their carnivorous owners the advantage of surprise. Schooling sardines don't seem to notice the slender bill poking into their midst until the blows start raining down.

"It's this combination of stealth and very high acceleration that makes this type of attack so powerful," said study researcher Jens Krause, an ecologist at the Leibniz Institute of Freshwater Ecology and Inland Fisheries and Humboldt University in Berlin. "It's a highly specialized form of attack." [Photos: The Biggest, Baddest Fish on Earth]

Evasive enigma

Krause and his colleagues were fascinated by the mystery of the sailfish, which is **one of the fastest** (and flashiest) fish in the ocean. Marine scientists have suggested the fish's trademark bill might help it slice through the water more effectively. Analyses of sailfish stomach contents turned up fish with slash marks, suggesting the animals might use the bills for hunting. But the slash marks were far from universal.

Part of the problem in solving the mystery is that sailfish hunt in the open ocean and are hard to observe. On a fish-hunting trip to Cancun, Mexico, Krause learned of a way to track these oceanic hunters, however. Local guides go offshore and search the horizon for flocks of seabirds. These birds mark places where hunting Atlantic sailfish (*Istiophorus albicans*) have pushed schools of sardines or other small fish to the surface.

Over a period of six days, the researchers donned snorkels and leaped into the water to film the hunts going on just below the surface. The work was challenging: The sardines sped off like silver darts trying to evade their predators, making it hard for human swimmers to keep up. The waves could be vicious — one day, all but one member of the team got **seasick** from body surfing the roiling ocean, Krause told Live Science. And sometimes, after all the effort to position themselves perfectly, the researchers found themselves stymied by dolphins, which sped in and dispersed the schools in their own hunt.

"They destroy everything very **quickly**," Krause said of the dolphin interlopers.

But when conditions were good, the sardines would actually shelter behind the divers' bodies, making it possible to film sailfish attacks on the schools from as little as about 10 feet (3 meters) away.

Swordfish slashers

The footage revealed how the sailfish wield their bills. Groups of the predators hunt and herd the **schools of sardines**. Then, one by one, they stealthily insert their bills into the schools. The sardines don't react, Krause said, indicating the prey don't notice the intrusion.

Next, the sailfish either swing their bills rapidly, sending multiple sardines reeling, or single out one for an attack in a behavior known as "tapping."

"Very often the fish get injured multiple times before capture," Krause said. The less-showy tapping behavior ends with capture more often than the indiscriminate slashing.

The acceleration of the sailfish bill during the attack ranks among the fastest speeds seen in marine animals, Krause said. The tip of the bill could accelerate as quickly as 430 feet per second squared (131 meters per second squared).

The findings, published today (April 22) in the journal *Proceedings of the Royal Society B*, reveal an unknown evolutionary adaptation in the hunting of schooling fish, Krause said. Fish (like birds and even humans) group together for safety. In the open ocean, where cover is nonexistent, schools make for a good defense. Predators have evolved strategies to overcome this defense, Krause said. Dolphins, for example, try to break up schools and hunt down stragglers. Killer whales and thresher sharks swing their tails into schools from the outside to stun prey. But sailfish have evolved a sneakier solution, Krause said.

"The sailfish can put the bill inside the school and they don't seem to notice it, because it is so long and thin. And then," he said, "it will hit them."



Knifefish Discovered in Brazil Apr 23, 2014 by Knifefish Discovered in Brazil

Ichthyologists have described a new genus and species of electric knifefish from the Rio Negro, the Amazonia State of Brazil.

Procerusternarchus pixuna. Image credit: Cristina Cox Fernandes et al / University of Massachusetts Amherst.

The newly discovered electric fish, named *Procerusternarchus pixuna*, belongs to **Gymnotiformes**, a group of bony fishes commonly known as the Neotropical or South American knifefishes.

True to their name, these fish produce electric discharges in distinct pulses that can be detected by some other fish.

Procerusternarchus pixuna has been described in a paper published in the journal **Proceedings of the Academy of Natural Sciences of Philadelphia**. The paper provides information about its anatomy, range, relationship to other fish, salient features of its skeleton, coloration, electric organs and patterns of electric organ discharge.

"The discovery of this species is leading to a new interpretation of classifications and interrelationships among closely related groups. The diversity of electric fishes becomes more thoroughly documented, researchers will be able to

explore possible causes of this group's adaptive radiation over evolutionary time," said lead author Prof Cristina Cox Fernandes from the University of Massachusetts Amherst.

"In the early 1990s," Dr Fernandes said, when she began her studies of the communities and diversity of electric fishes, fewer than 100 species were then scientifically described. "But with the current studies by herself and others, the number has roughly doubled today."

In 2013, Dr Fernandes and her colleagues co-authored a description of three other electric fishes.

"These fishes are of little commercial importance," Dr Fernandes said, but in her opinion fishes of the Neotropics, especially in the Amazon, are still 'under studied,' and "more taxonomic studies such as the one are needed."

"As environmental changes affect rivers worldwide and in the Amazon region, freshwater fauna are under many different pressures. Fish populations are dwindling due to the pollution, climate change, the construction of hydroelectric plants and other factors that result in habitat loss and modification. As such the need to document the current fish fauna has become all the more pressing."

Cristina Cox Fernandes et al. 2014. *Procerusternarchus pixuna*. Proceedings of the Academy of Natural Sciences of Philadelphia, vol. 163, no. 1



Scientists have conclusive evidence that the source of a unique rhythmic sound, recorded for decades in the Southern Ocean and called the "bio-duck," is the Antarctic minke whale (*Balaenoptera bonaerensis*). First described and named by submarine personnel in the 1960s who thought it sounded like a duck, the bio-duck sound has been recorded at various locations in the Southern Ocean, but its source has remained a mystery, until now.

In February 2013, an international team of researchers deployed acoustic tags on two Antarctic minke whales in Wilhelmina Bay off the western Antarctic Peninsula. These tags were the first acoustic tags successfully deployed on this species. The acoustic analysis of the data, which contained the bio-duck sound, was led by Denise Risch of NOAA's Northeast Fisheries Science Center (NEFSC) and was published April 23, 2014 in *Biology Letters*.

The bio-duck sound is heard mainly during the austral winter in the Southern Ocean around Antarctica and off Australia's west coast. Described as a series of pulses in a highly repetitive pattern, the bio-duck's presence in higher and lower latitudes during the winter season also contributed to its mystery. No one knew the minke whales were there. The identification of the Antarctic minke whale as the source of the sound now indicates that some minke whales stay in ice-covered Antarctic waters year-round, while others undertake seasonal migrations to lower latitudes.

"These results have important implications for our understanding of this species," said Risch, a member of the Passive Acoustics Group at the NEFSC's Woods Hole Laboratory. "We don't know very much about this species, but now, using passive acoustic monitoring, we have an opportunity to change that, especially in remote areas of the Antarctic and Southern Ocean."

The acoustic tags, which also recorded water temperature and pressure, were placed on the animals using a hand-held carbon fiber pole by researchers working from a rigid-hulled inflatable boat. Animals were visually tracked from the boat during daylight hours to identify behavior and group composition. No other marine mammal species were observed in the area when calls were recorded, providing further evidence that the recorded sounds were produced by the tagged whale or other nearby Antarctic minke whales.

The mysterious sounds were thought to be made by submarines, by some oceanographic phenomenon, or even by fish. They were eventually identified as the bio-duck through comparisons with sounds in the published literature. They also matched recordings on long-term, bottom-mounted recorders from several other locations in the Antarctic, including the Perennial Acoustic Observatory in the Antarctic Ocean (PALAOA), and near Dumont D'Urville and Ross Island. Germany's PALAOA is an autonomous observatory with underwater hydrophones, or microphones, located on the Ekström Ice Shelf in western Antarctica. Dumont d'Urville on Petrel Island is the main French scientific research station in Eastern Antarctica.

Findings from this study will allow researchers to interpret numerous long-term, acoustic recordings, and improve understanding of the distribution, abundance, and behavior of this species. Minke whales are the smallest of the "great whales" or rorquals, a group that includes the blue whale, Bryde's whale, and humpback, fin, and sei whales. Rorqual whales are relatively streamlined in appearance, have pointed heads and, with the exception of humpback whales, small pointed fins.

The authors note that identifying the bio-duck sound will allow for broader studies of the presence of minke whales in other seasons and areas. That ability to monitor minke whales is critical for a species that inhabits an environment that is difficult to access, has rapidly changing sea-ice conditions, and "has been the subject of contentious lethal sampling efforts and international legal actions."

The study was supported by a grant from the National Science Foundation's Office of Polar Programs and conducted under National Marine Fisheries Service Permit 14097, Antarctic Conservation Act Permit 2009-013, and Duke University Permit IACUCA49-12-02. Denise Risch's research was also supported by the U.S. Navy Environmental Readiness Division (N45).

Story Source:

The above story is based on materials provided by NOAA Northeast Fisheries Science Center. .

Journal Reference:

1. D. Risch, N. J. Gales, J. Gedamke, L. Kindermann, D. P. Nowacek, A. J. Read, U. Siebert, I. C. Van Opzeeland, S. M. Van Parijs, A. S. Friedlaender. Mysterious bio-duck sound attributed to the Antarctic minke whale (*Balaenoptera bonaerensis*). *Biology Letters*, 2014; 10 (4): 20140175 DOI:10.1098/rsbl.2014.0175

2. =====



Marine biologists have described a new species of beaked whale known only from seven specimens found stranded on tropical islands in the western and central Pacific.

Photo:- Mother, right, and calf of the Deraniyagala's beaked whale (*Mesoplodon hotaula*) at Palmyra Atoll in 2007. Notable are the cookie-cutter shark bites healed in dark skin callercolor, pronounced melon and beak, and large blow hole. Image credit: S. Baumann-Pickering, via R.L. Brownell et al.

Beaked whales are the members of Ziphiidae, a little-known family of toothed whales distantly related to sperm whales. **Marine biologists have described a new species of beaked whale known only from seven specimens found stranded on tropical islands in the western and central Pacific.**

Beaked whales are the members of Ziphiidae, a little-known family of toothed whales distantly related to sperm whales.

These aquatic mammals have elongated beaks and are moderate in size, measuring up to 13 m and weighing up to 15 tones.

They are found in deep ocean waters beyond the edge of the continental shelf throughout the world's oceans.

"They are rarely seen at sea due to their elusive habits, long dive capacity and apparent low abundance for some species. Understandably, most people have never heard of them," said Dr Merel Dalebout from the University of New South Wales, Australia, the lead author of the paper published in the journal *Marine Mammal Science*.

In 1963, Dr P.E.P Deraniyagala of the Sri Lanka's National Museums of Ceylon described a 4.5-m-long blue-grey beaked whale found stranded near Colombo as a new species, *Mesoplodon hotaula*. The Deraniyagala's beaked whale was given as a common name.

However, in 1965, biologists reclassified *Mesoplodon hotaula* as an existing species – the Ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*).

“Now it turns out that Dr Deraniyagala was right regarding the uniqueness of the whale he identified,” Dr Dalebout said.

“While it is closely related to the Ginkgo-toothed beaked whale, it is definitely not the same species.”

Dr Dalebout with colleagues used a combination of DNA analysis and physical characteristics to describe *Mesoplodon hotaula* from other seven specimens.

They were able to get good quality DNA from tissue samples from only one specimen. For the others, they drilled the bones of the whales in order to analyze short fragments of ‘ancient DNA’ relying on techniques commonly used with old sub-fossil material from extinct species.

They also studied all other known beaked whale species to confirm the distinctiveness of the Deraniyagala’s beaked whale, including six specimens of the closely related, ginkgo-toothed beaked whale.

“A number of species in this group are known from only a handful of animals, and we are still finding new ones, so the situation with the Deraniyagala’s beaked whale is not that unusual,” Dr Dalebout said

“For example, the Ginkgo-toothed beaked whale, first described in 1963, is only known from about 30 strandings and has never been seen alive at sea with any certainty. It’s always incredible to me to realize how little we really do know about life in the oceans. There’s so much out there to discover.”

With the discovery of *Mesoplodon hotaula*, there are now 22 recognized species of beaked whales.

Merel L. Dalebout et al. Resurrection of *Mesoplodon hotaula* Deraniyagala 1963: A new species of beaked whale in the tropical Indo-Pacific. *Marine Mammal Science*, published online February 05, 2014; doi: 10.1111/mms.12113



We would like to welcome all 438 of our visitors!



Fish exposed to the antidepressant Fluoxetine, an active ingredient in prescription drugs such as Prozac, exhibited a range of altered mating behaviours, repetitive behaviour and aggression towards female fish, according to new research published on in the latest special issue of Aquatic Toxicology: Antidepressants in the Aquatic Environment.

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The authors of the study set up a series of experiments exposing a freshwater fish (Fathead Minnow) to a range of Prozac concentrations. Following exposure for 4 weeks the authors observed and recorded a range of behavioural changes among male and female fish relating to reproduction, mating, general activity and aggression. On a positive note, author Rebecca Klaper, Director of the Great Lakes Genomics Center at University of Wisconsin-Milwaukee, emphasizes that the impact on behaviour is reversible once the concentration level is reduced.

"With increased aggression, in the highest level of concentration, female survivorship was only 33% compared to the other exposures that had a survivorship of 77-87.5%. The females that died had visible bruising and tissue damage," according to Rebecca Klaper.

There is an increasing proportion of antidepressants prescriptions, and like most prescription drugs, they end up, not fully broken down, back into our aquatic ecosystems, inducing their therapeutic effects on wildlife. Although concentrations observed in our rivers and estuaries are very small, an increasing number of studies have shown that these incredibly small concentrations can dramatically alter the biology of the organisms they come in contact with.

The impact of pharmaceuticals is currently not only of interest amongst scientists but also amongst environmental regulators, industry and general public. Some US states are looking to charge pharmaceutical companies with the cost of appropriate drug disposal, some of which is currently being challenged in the courts.

"This is just one of an increasing number of studies that suggest that pharmaceuticals in the environment can impact the complex range of behaviours in aquatic organisms," said Alex Ford, Guest Editor of the special issue of Aquatic Toxicology in which the study was published. "Worryingly, an increasing number of these studies are demonstrating that these effects can be seen at concentrations currently found in our rivers and estuaries and they appear to impact a broad range of biological functions and a wide variety of aquatic organisms."

This is one of the reasons why Alex proposed a full special dedicated to this topic. Antidepressants in the Aquatic Environment, includes among other studies, research that demonstrates that antidepressants affect the ability of cuttlefish to change colour and a fish study whereby reproductive effects were observed in offspring whose parents who were exposed to mood stabilizing drugs.

Ford emphasizes that although the results from this study and others published in the issue show troubling results for

aquatic species, this doesn't indicate that these results are applicable to humans.

"This special issue focuses on the biology of aquatic systems and organisms and results only indicate how pharmaceuticals could potentially have effects on this particular environment."

Story Source:

The above story is based on materials provided by Elsevier. Note: Materials may be edited for content and length.

Journal Reference:

1. Joel Weinberger, Rebecca Klaper. Environmental concentrations of the selective serotonin reuptake inhibitor fluoxetine impact specific behaviors involved in reproduction, feeding and predator avoidance in the fish *Pimephales promelas* (fathead minnow). *Aquatic Toxicology*, 2014; 151: 77 DOI: [10.1016/j.aquatox.2013.10.012](https://doi.org/10.1016/j.aquatox.2013.10.012)

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Ozarcus mapesae: Fossil Species Reveals Sharks aren't Living Fossils

Apr 17, 2014

Paleontologists from the American Museum of Natural History have described a shark species that lived during Carboniferous period, about 325 million years ago. The analysis of its fossilized skull shows that living sharks are actually quite advanced in evolutionary terms, despite having retained their basic 'sharkiness' over millions of years.

Photo:-

The exceptionally well-preserved fossil of *Ozarcus mapesae* from two different lateral views. Scale bar is 1 cm. Image credit: © AMNH / F. Ippolito.

"Sharks are traditionally thought to be one of the most primitive surviving jawed vertebrates. And most textbooks in schools today say that the internal jaw structures of modern sharks should look very similar to those in primitive shark-like fishes. But we've found that's not the case. The modern shark condition is very specialized, very derived, and not primitive," said Dr Alan Pradel, who is the lead author of the study published in the journal *Nature*.

The well-preserved shark fossil has been found by Ohio University scientists in Arkansas, where an ocean basin once

was home to a diverse marine ecosystem, and described as the new species, *Ozarcus mapesae*.

The heads of all fishes – sharks included – are segmented into the jaws and a series of arches that support the jaw and the gills. These arches are thought to have given rise to jaws early in the tree of life. Because shark skeletons are made of cartilage, not bone, their fossils are very fragile and are usually found in flattened fragments, making it impossible to study the shape of these internal structures. But the *Ozarcus mapesae* specimen was preserved in a nearly 3D state, giving the paleontologists a rare glimpse at the organization of the arches in a prehistoric animal.

“This beautiful fossil offers one of the first complete looks at all of the gill arches and associated structures in an early shark. There are other shark fossils like this in existence, but this is the oldest one in which you can see everything. There’s enough depth in this fossil to allow us to scan it and digitally dissect out the cartilage skeleton,” said study co-author Dr John Maisey.

A 3D reconstruction of the skull of *Ozarcus mapesae*. The braincase is shown in light grey, the jaw is shown in red, the hyoid arch is shown in blue, and the gill arches are shown in yellow. Image credit: © AMNH / A. Pradel.

The team imaged the *Ozarcus mapesae* fossil with high-resolution X-rays to get a detailed view of each individual arch shape and organization.

“We discovered that the arrangement of the arches is not like anything you’d see in a modern shark or shark-like fish. Instead, the arrangement is fundamentally the same as bony fishes,” Dr Pradel said.

“It’s not unexpected that sharks – which have existed for about 420 million years – would undergo evolution of these structures. But the new work, especially when considered alongside other recent developments about early jawed vertebrates, has significant implications for the future of evolutionary studies of this group.”

Dr Maisey added: “bony fishes might have more to tell us about our first jawed ancestors than do living sharks.”

Alan Pradel et al. A Palaeozoic shark with osteichthyan-like branchial arches. *Nature*, published online April 16, 2014; doi: 10.1038/nature13195



20-year assessment of Nicaragua's legal, artisanal green sea turtle fishery has uncovered a stark reality: greatly reduced overall catch rates of turtles in what may have become an unsustainable take, according to conservation scientists from the Wildlife Conservation Society and University of Florida.

Photo:-

A green turtle is being unloaded by fishers in Río Grande Bar community. A 20-year assessment of Nicaragua's legal, artisanal green sea turtle fishery by the Wildlife Conservation Society and the University of Florida has uncovered a stark reality: greatly reduced overall catch rates of turtles in what may have become an unsustainable take.

Credit: Photo by Cathi L. Campbell.

During the research period, conservation scientists estimated that more than 170,000 green turtles were killed between 1991 and 2011, with catch rates peaking in 1997 and 2002 and declining steeply after 2008, likely resulting from over-fishing. The trend in catch rates, the authors of the assessment results maintain, indicates the need for take limits on this legal fishery.

The study now appears in the online journal PLOS ONE. The authors are: Cynthia J. Lagueux and Cathi L. Campbell of the University of Florida (formerly of the Wildlife Conservation Society), and Samantha Strindberg of the Wildlife Conservation Society.

"The significant decrease in the catch rates of green turtles represents a concern for both conservationists and local, coastal communities who depend on this resource," said Dr. Lagueux, lead author of the study. "We hope this study serves as a foundation for implementing scientifically based limits on future green turtle take."

Caribbean coastal waters of Nicaragua contain extensive areas of sea grass, principal food source for green turtles, the only herbivorous sea turtle species. Green turtles in turn support a number of indigenous Miskitu and Afro-descendent communities that rely on the marine reptiles for income (by selling the meat) and as a source of protein.

The catch data used by the researchers to estimate trends was gathered by community members at 14 different sites located in two geographically political regions of the Nicaraguan coast. The research team analyzed the long-term data set to examine catch rates for the entire fishery, each region, and for individual turtle fishing communities using temporal trend models.

Over the duration of the assessment, the scientists recorded that at least 155,762 green turtles were caught; the overall estimated catch (factoring in estimated take during periods when data were not recorded) was 171,556 turtles. The average catch rate per fishing trip (assuming average fishing effort in terms of nets used and trip length) revealed an overall decline from 6.5 turtles to 2.8 turtles caught, representing a 56 percent decline over two decades.

In individual communities, catch rate declines ranged between 21 percent and 90 percent in green turtles caught over the 20-year period.

"These declining catch rates align with our survival rate estimates of green turtles exposed to the Nicaragua turtle fishery and population modelling, which suggested the fishery was not sustainable at high take levels reported in the 1990s," said Dr. Cathi Campbell.

The steep declines in green turtle catch rates, the researchers maintain, indicate a potential decline of green turtle populations that use Nicaragua's foraging grounds, particularly smaller rookeries in the Caribbean. The scientists note that the study results highlight the need for not only close monitoring of rookeries in the region, but also in-water aggregations of green turtles. Further, future research efforts should include the use of molecular technology to better refine Caribbean green turtle genetic stocks, specifically to identify populations most at risk from turtle fisheries.

"Given the importance of green turtles to Nicaragua's past, present and future, we encourage the communities, governmental agencies, and conservation groups to take measures that conserve and sustain these globally threatened populations, and to work together to ensure that the communities have alternative sources of protein and income into the future," said Dr. Caleb McClennen, Director of WCS's Marine Program.

Growing up to 400 pounds in weight, the green turtle is the second largest sea turtle species next to the leatherback turtle. The reptile inhabits the tropical and subtropical waters of the world. The species is listed as Endangered on the IUCN's Red List and on CITES (Convention on International Trade in Endangered Species of Wild Flora and Fauna) as an Appendix I species, a designation which prohibits all international commercial trade by member countries. In addition to the threat from overfishing (intentional take), the green turtle is at risk from bycatch in various fisheries (unintended take), poaching of eggs at nesting beaches, habitat deterioration and loss due to coastal development and climate change effects, and pollution.

Story Source:

The above story is based on materials provided by Wildlife Conservation Society. Note: Materials may be edited for content and length.

Journal Reference:

1. Cynthia J. Lagueux, Cathi L. Campbell, Samantha Strindberg. Artisanal Green Turtle, *Chelonia mydas*, Fishery of Caribbean Nicaragua: I. Catch Rates and Trends, 1991–2011. PLoS ONE, 2014; 9 (4): e94667
DOI:10.1371/journal.pone.0094667

During the research period, conservation scientists estimated that more than 170,000 green turtles were killed between 1991 and 2011, with catch rates peaking in 1997 and 2002 and declining steeply after 2008, likely resulting from overfishing. The trend in catch rates, the authors of the assessment results maintain, indicates the need for take limits on this legal fishery.

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Caribbean coastal waters of Nicaragua contain extensive areas of sea grass, principal food source for green turtles, the only herbivorous sea turtle species. Green turtles in turn support a number of indigenous Miskitu and Afro-descendent communities that rely on the marine reptiles for income (by selling the meat) and as a source of protein.

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DOI:10.1371/journal.pone.0094667





Aquarium breeds rare goby fish in 'species first'

Hundreds of rare goby fish have been bred at an aquarium in Devon in what is believed to be the first instance of the species being successfully produced in captivity.

Hundreds of rare goby fish have been bred at an aquarium in Devon. Credit: PA The colourful fish, which are covered in bright red and orange 'leopard' spots, were bred at Blue Reef Aquarium in Newquay.

Gobies were virtually unknown around the British coast until the introduction of modern scuba equipment.

The species is native to the south west of England, with further populations reported in the north east of the country.

It is believed to be the first time the species has been successfully bred in captivity Credit: PA Jenny Youngs, who is rearing the tiny hatchlings at Blue Reef's aquarium nursery, said: "Leopard spot gobies are definitely one of the most attractive of our native species.

"Their bright markings are all the more unusual as most other members of the goby family are far more drably coloured to match their rocky or sandy habitat." "We're looking after literally hundreds of microscopic hatchlings with even more due to hatch out any day.



Dams and Turbines can damage fish.

Think of the pressure change you feel when an elevator zips you up multiple floors in a tall building. Imagine how you'd feel if that elevator carried you all the way up to the top of Mt. Everest -- in the blink of an eye.

That's similar to what many fish experience when they travel through the turbulent waters near a dam. For some, the change in pressure is simply too big, too fast, and they die or are seriously injured.

In an article in the March issue of the journal Fisheries, ecologists from the Department of Energy's Pacific Northwest National Laboratory and colleagues from around the world explore ways to protect fish from the phenomenon, known as barotrauma.

Among the findings: Modifying turbines to minimize dramatic shifts in pressure offers an important way to keep fish safe when passing through dams. The research is part of a promising body of work that aims to reduce such injuries by improving turbine designs in dams around the world.

PNNL researchers are working with officials and scientists from Laos, Brazil, and Australia -- areas where hydropower is booming -- to apply lessons learned from experience in the Pacific Northwest, where salmon is king and water provides about two-thirds of the region's power. There, billions of dollars have been spent since 1950 to save salmon endangered largely by the environmental impact of hydropower.

"Hydropower is a tremendous resource, often available in areas far from other sources of power, and critical to the future of many people around the globe," said Richard Brown, a senior research scientist at PNNL and the lead author of the Fisheries paper.

"We want to help minimize the risk to fish while making it possible to bring power to schools, hospitals, and areas that desperately need it," added Brown.

Harnessing the power of water flowing downhill to spin turbines is the most convenient energy source in many parts of the world, and it's a clean, renewable source of energy to boot.

In Brazil, several dozen dams are planned along the Amazon, Madeira and Xingu rivers -- an area that teems with more than 5,000 species of fish, and where some of the largest hydropower projects in the world are being built. In southeastern Australia, hydropower devices are planned in the area drained by the Murray-Darling river system. And in Southeast Asia, hundreds of dams and smaller hydro structures are planned in the Lower Mekong River Basin.

The authors say the findings from a collaboration that spans four continents improve our understanding of hydropower and will benefit fish around the globe. New results about species in the Mekong or Amazon regions, for instance, can inform fish-friendly practices in those regions of the United States where barotrauma has not been extensively studied.

To 'Everest' and back in an instant

Dams vary considerably in the challenges they pose to migrating fish, and the challenges are magnified when a fish must pass through more than one dam or hydro structure. At some, mortality is quite high, while at others, such as along the Columbia River, most fish are able to pass over or through a single dam safely, thanks to extensive measures to keep fish safe. Some fish spill harmlessly over the top, while others pass through pipes or other structures designed to route fish around the dam or steer them clear of the energy-producing turbines.

Still, at most dams, the tremendous turbulence of the water can hurt or disorient fish, and the blades of a turbine can strike them. The new study focuses on a third problem, barotrauma -- damage that happens at some dams when a fish experiences a large change in pressure.

Depending on its specific path, a fish traveling through a dam can experience an enormous drop in pressure, similar to the change from sea level to the top of Mt. Everest, in an instant. Just as fast, as the waters swirl, the fish suddenly finds itself back at its normal pressure.

Those sudden changes can have a catastrophic effect on fish, most of which are equipped with an organ known as a swim bladder -- like a balloon -- to maintain buoyancy at a desired depth. When the fish goes deeper and pressures are greater, the swim bladder shrinks; when the fish rises and pressure is reduced, the organ increases in size.

For some fish, the pressure shift means the swim bladder instantly expands four-fold or eight-fold, like an air bag that inflates suddenly. This rapid expansion can result in internal injuries or even death.

Factors at play include the specific path of a fish, the amount of water going through a turbine, the design of the turbine, the depth of water where the fish usually lives, and the physiology of the fish itself.

"To customize a power plant that is the safest for the fish, you must understand the species of fish in that particular river, their physiology, and the depth at which they normally reside, as well as the tremendous forces that the fish can

be subjected to," said Brown.

PNNL scientists have found that trying to keep minimum pressure higher in all areas near the turbine is key for preventing barotrauma. That reduces the amount of pressure change a fish is exposed to and is a crucial component for any turbine that is truly "fish friendly." Preventing those extremely low pressures also protects a turbine from damage, reducing shutdowns and costly repairs.

Lower Mekong River Basin

Brown and PNNL colleague Zhiqun (Daniel) Deng have made several trips to work with scientists in Southeast Asia, where dozens of dams are planned along the Mekong River and its tributaries. The Mekong starts out high in Tibet and travels more than 2,700 miles, touching China, Myanmar, Laos, Thailand, Cambodia, and Vietnam. The team estimates more than 1,200 species of fish make their home in the Mekong, including the giant Mekong catfish and the giant freshwater stingray, as well as the endangered Irrawaddy dolphin.

The scientists estimate that the region's fish account for almost half of the protein in the diet of the people of Laos and nearly 80 percent for the people of Cambodia. Four out of five households in the region rely heavily on fish for food, jobs, or both.

"Many people in Southeast Asia rely on fish both for food and their livelihood; it's a huge issue, crucial in the lives of many people. Hydropower is also a critical resource in the region," said Deng, a PNNL chief scientist and an author of the paper.

"Can we reduce the impact of dams on fish, to create a sustainable hydropower system and ensure the food supply and livelihoods of people in these regions? Can others learn from our experiences in the Pacific Northwest? This is why we do research in the laboratory -- to make an impact in the real world, on people's lives," added Deng.

The same team of scientists just published a paper in the *Journal of Renewable and Sustainable Energy*, focusing broadly on creating sustainable hydro in the Lower Mekong River Basin. The paper discusses the potential for hydropower sources in the region (30 gigawatts), migratory patterns of its fish, the importance of fish-friendly technology, and further studies needed to understand hydro's impact on fish of the Mekong.

Story Source:

The above story is based on materials provided by DOE/Pacific Northwest National Laboratory. The original article was written by Tom Rickey.

Journal Reference:

1. Richard S. Brown, Alison H. Colotelo, Brett D. Pflugrath, Craig A. Boys, Lee J. Baumgartner, Z. Daniel Deng, Luiz G. M. Silva, Colin J. Brauner, Martin Mallen-Cooper, Oudom Phonekhampeng, Garry Thorncraft, Douangkham Singhanouvong. Understanding Barotrauma in Fish Passing Hydro Structures: A Global Strategy for Sustainable Development of Water Resources. *Fisheries*, 2014; 39 (3): 108 DOI: 10.1080/03632415.2014.883570



They don't have gaping maws or fearsome talons. But don't be fooled. These sponges — though they look like fuzzy twigs — are killers.

Four new species of carnivorous sponges that prey on shrimp-like amphipods and other small animals were discovered in deep waters off the Pacific coast of North America, scientists announced.

Most sponges are filter feeders. They use specialized cells called choanocytes, which have tiny, beating tails that help pull in bacteria and single-celled organisms from the surrounding water. But carnivorous sponges lack these water-moving cells. Instead, they've developed a different strategy to snare food.

A close-up view of *Asbestopluma monticola*, one of four new species of carnivorous sponges discovered off the West Coast of North America.



PLEASE NOTE:- The visit to Wholesale Tropicals is not now on the 15th of April but now is on the 22nd of April



The boldest black-lined rainbowfish are those that are born in the wild. Also more fearless are those that analyze

information with both sides of their brains. This is the conclusion of Australian researchers Culum Brown and Anne-Laurence Bibost from Macquarie University, in a study published in Springer's journal *Behavioral Ecology and Sociobiology*.

The preference to analyze and react to information with either the left or right hemisphere of the brain is called cerebral lateralization, and is widespread among vertebrates. Lateralization is seen in the preference of humans or parrots to use one hand or claw over the other or to always turn to the same side when moving around objects.

The researchers first tested wild rainbowfish against captive rainbowfish. They then used a modified version of the mirror test to find out if a fish showed a lateral preference to view itself with either its left or right eye.

Levels of boldness were tested by timing how long it took a fish to emerge from a safe hiding place. Non-lateralized fish that did not analyze information in a specific brain hemisphere were significantly bolder than both left- and right-lateralized fish. This suggests that fear is heightened when primarily processed by a single hemisphere, making lateralized fish less bold.

Previous studies have shown that complex tasks are more difficult to perform when information processing is shared between two brain hemispheres. It therefore boils down to a question of speed.

A non-lateralized fish in a potentially life-threatening situation must first draw information from both hemispheres, and compare and integrate it before it can make a decision. Strongly lateralized fish, on the other hand, can act more quickly because they only draw on information from a single hemisphere. If non-lateralized fish process fear-related stimuli comparatively slowly or inefficiently, it may be that the moderating effect of fear is somewhat lessened in comparison to strongly lateralized fish.

The researchers think this may result in a reduced level of fear generally, or perhaps the decision to explore is already made before the moderating effect of fear comes into play. Either scenario would adequately explain their observation that non-lateralized fish are bolder than lateralized fish.

The researchers were not surprised that wild fish were significantly bolder than captive-reared fish, as previous work they had done showed that populations that are hunted by predators were braver than those from low-predation areas. "The similarities between personality and laterality are certainly intriguing and hint at a single underlying function or mechanism," says Brown. "We suggest that these aspects of personality traits are actually caused by variation in laterality."

Journal Reference:

1. Culum Brown, Anne-Laurence Bibost. Laterality is linked to personality in the black-lined rainbowfish, *Melanotaenia nigrans*. *Behavioral Ecology and Sociobiology*, 2014; DOI: 10.1007/s00265-014-1712-0



A blind fish found in the pools of pitch-black Mexican caves uses high frequency waves it generates with its mouth in order to navigate, a group of Israeli researchers has found, in much the same way that bats use sound waves to do so.

In a study conducted by Tel Aviv University researchers and published last month in the *Journal of Experimental Biology*, the team observed a previously unknown mechanism by which *Astyanax fasciatus*, known colloquially as the Mexican blind cavefish, uses suction waves to create vibrations in the water around it and then measures its distance to nearby objects by detecting changes to water pressure on its skin.

Scientists had previously been aware of the fish's pressure sensitivity — it is enabled by a system of organs known as lateral lines which exist in all fish, allowing them to feel nearby movements in the water – but the ability to actively generate such movement as a method of “seeing” in the dark is a new discovery.

The team, which included Roi Holzman, Shimrit Perkol-Finkel and Gregory Zilman, conducted experiments in which they observed the mouth movements of *A. fasciatus* specimens, noting that the fish made much more frequent movements when around new objects than when swimming in familiar territory. They also noted that the suction action increased dramatically the closer the fish came to solid objects, perhaps not unlike the way car proximity sensors beep at increasingly smaller intervals when parking in reverse.

The researchers described the technique as being somewhat similar to echolocation: the technique used by bats and several other animals including dolphins to gauge their distance to objects by emitting sound waves and measuring how long they take to bounce back. Unlike echolocation, the fish does not measure time but the subtle ways in which water pressure changes as a result of the suction movement.

Holzman told Live Science that while the newly discovered mechanism has so far only been observed in the Mexican blind cavefish, it could very well exist in other fish.

“It’s a mechanism made out of ancient material, and it just makes sense that other fish would have it,” Holzman said. “We haven’t tested it yet, but I’d really like to.”

Read more: Israelis find how eyeless fish navigates | The Times of Israel <http://www.timesofisrael.com/israelis-find-how-eyeless-fish-navigates/#ixzz2ybUiB1CK>

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This item was published in the Times of Israel



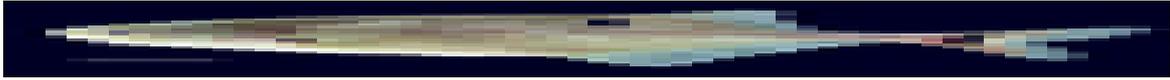
IF it were not for his boat, you would think this fisherman was sitting on a landfill site.

The fisherman in the picture, called Herman, told Channel 4's Unreported World, which goes out on Friday 11th April. I don't catch fish any more ...they're floating on the surface... I'm sure everyone knows the result of dumping rubbish like this. There are rules, but nobody is enforcing them.'Locals say textile factories illegally dump chemicals into the river at night and some nearby village wells contain four times the recommended safe levels of mercury.

There are claims some high street brands could be partly to blame for the torrent of pollution. Greenpeace reported last year that one of the largest textile arms on the Citarum - PT Gistex - has had a 'business relationship' with Gap, H&M and Adidas.

The charity found the manufacturer's waste water contained high doses of several toxic substances. Found in the Daily Mail 11th April 2014





Petrocephalus boboto and *Petrocephalus arnegardi*, two new species of weakly electric fish, have been described from the Congo River.

Petrocephalus boboto from Yangambi, Congo River, Democratic Republic of Congo. Scale bar – 1 cm. Image credit: Lavoué S, Sullivan JP.

Petrocephalus are African weakly fishes of the family Mormyridae that produce pulses of only a few hundred millivolts from an organ made of modified muscle cells in front of their tail.

Receptor cells on the fishes' skin detect distortions to the electric field created by nearby objects in the water. In this way, they are able to electrolocate through their complex aquatic environment at night. Their short electric pulses, too weak to be sensed by touch, are also used to communicate the sender's species identity and gender to other electric fishes.

On a 2010 field trip to the Congo River of Democratic Republic of the Congo, ichthyologists Dr Sébastien Lavoué from the Taiwan Institute of Oceanography and Dr John Sullivan from Cornell University captured a single individual of the genus *Petrocephalus* not quite like any they had seen before.

Petrocephalus arnegardi from Odzala-Kokua National Park, Congo River, Republic of the Congo. Scale bar – 1 cm. Image credit: Lavoué S, Sullivan JP.

As they had for hundreds of other *Petrocephalus* specimens collected in Central Africa since the late 1990s, they placed the small, silvery fish in a small basin with water from the river and recorded its electric organ discharge (EOD) with an oscilloscope, humanely euthanized it, took its photo, procured a tissue sample for DNA analysis, tagged it and preserved it in formaldehyde.

Back in their laboratory, the scientists sequenced the gene cytochrome b from the specimen. Comparing this sequence to those from other *Petrocephalus* specimens and careful examination of the fish's morphology and its EOD helped him determine that it belonged to an undescribed species.

They named this species *Petrocephalus boboto* – the word 'boboto' means peace and fellowship in the Lingala language spoken along the Congo River.

"We named this hard-to-find *Petrocephalus* species 'boboto' in the hopes that solutions for peace – though elusive like this fish – can be found in eastern D.R. Congo and the other troubled areas of Central Africa," said Dr Sullivan, who is the senior author of the paper appearing in the journal *ZooKeys*.

The ichthyologists discovered the other new *Petrocephalus* species in the Congo River basin.

They named it *Petrocephalus arnegardi* for Dr Matthew Arnegard, a scientist with the Fred Hutchinson Cancer

Research Center in Seattle, Washington.

Lavoué S, Sullivan JP. 2014. *Petrocephalus boboto* and *Petrocephalus arnegardi*, two new species of African electric fish (Osteoglossomorpha, Mormyridae) from the Congo River basin. *ZooKeys* 400: 43–65; doi: 10.3897/zookeys.400.6743



An extremely rare oarfish has been captured on camera in the shallow waters of the Gulf of California.

Shedd Aquarium kayakers filmed this 4-m-long Giant oarfish in the Gulf of California. Image credit: John G. Shedd Aquarium.

Oarfish are large, greatly elongated fish found in all temperate to tropical oceans.

They are members of the Regalecidae family, which contains four species: *Regalecus glesne*, *Regalecus russelii*, *Regalecus kinoi* and *Agrostichthys parkeri*.

The first species, commonly known as the Giant oarfish, is the longest bony fish alive.

It can reach a length of 11 meters and weigh as much as 270 kg.

The Giant oarfish can live at great depths – up to 1,000 meters, but occasionally cast up on beaches.

In 2014, kayakers affiliated with the Chicago's John G. Shedd Aquarium filmed two Giant oarfish in the shallow waters of the Gulf of California. They say one of the fish was more than 4 meters long.



First saltwater farmed tilapia

Published: 08 April, 2014

“Color varying with population,” Dr McCormack wrote in a [paper published in the journal Zookeys](#). “First chelipeds very dark, black to black-blue with bright blue highlights along propodal, carpal and meral lateral edges, light blue tint ventrally with articulations dull to bright red. Cephalon dark black-brown dorsally, lightening laterally, many with blue highlight on lateral surface. Thorax and abdomen light brown, green, tan or steel blue, usually with small, light cream or red speckles. Body clear to cream ventrally. Juveniles light blue.”

Gramastacus lacus is found in lowland ephemeral habitats surrounding coastal lakes and lagoons from Wamberal Lagoon, north along the coastal strip to Wallis Lake.

Being dependent on regular natural flooding and drying cycles, only lowland, swampy areas are suitable for this crayfish species.

Each crayfish digs a small rounded cross-section burrow up to 1 m deep into the water table to survive the drying cycle. Some areas are riddled with these small burrows as they are a very prolific species and can occur in very high numbers in small habitat areas.

Now, being found and officially described, Gramastacus lacus must be considered in any further developments and hopefully future habitat loss will be reduced.

McCormack RB. 2014. The eastern swamp crayfish *Gramastacus lacus* sp. n. (Decapoda, Parastacidae) a new species of freshwater crayfish from coastal New South Wales, Australia. *ZooKeys* 398: 53–67; doi: 10.3897/zookeys.398.7



Farmed salmon should be sterilised to prevent them breeding with wild fish and introducing genetic weaknesses, experts have urged.

New research shows that while salmon bred in captivity for food consumption are genetically different from their wild relatives, they are just as fertile, potentially damaging wild populations if they escape and breed with them.

Millions of salmon escape from fish farms each year, and can get into wild spawning populations where they can reproduce and introduce negative genetic traits.

Recently-escaped salmon are not as good at reproducing as wild fish, but the new research shows that their sperm and eggs are as potent as those of wild salmon.

If farmed salmon can revive their spawning behaviour by a period in the wild, they could breed with wild populations, the researchers said.

Lead researcher Professor Matt Gage, from the University of East Anglia's school of biological sciences, said: "Around 95% of all salmon in existence are farmed, and domestication has made them very different to wild populations, each of which is locally adapted to its own river system.

"Farmed salmon grow very fast, are aggressive, and not as clever as wild salmon when it comes to dealing with predators.

"These domestic traits are good for producing fish for the table, but not for the stability of wild populations.

"The problem is that farmed salmon can escape each year in their millions, getting into wild spawning populations, where they can then reproduce and erode wild gene pools."

Researchers used a series of in-vitro fertilisation tests in conditions which mimicked spawning in the wild. All tests on sperm and eggs showed the farmed salmon were as fertile as wild salmon, identifying a clear threat that they could breed with wild populations.

Prof Gage said: "Some Norwegian rivers have recorded big numbers of farmed fish present – as much as 50%. Both anglers and conservationists are worried by farmed fish escapees which could disrupt locally-adapted traits like timing of return, adult body size and disease resistance.

"Salmon farming is a huge business in the UK, Norway and beyond, and while it does reduce the pressure on wild fish stocks, it can also create its own environmental pressures through genetic disruption."

He said a viable solution was to induce a condition called "triploidy", by pressure-treating salmon eggs just after fertilisation, so the fish grows as normal but with both sex chromosomes, which makes most of them infertile.

The process, normal for farming rainbow trout, has not been embraced by the industry because of fears the triploid fish do not perform as well in farms as normal fish, eroding profits, he said.

From the Guardian



YOU MIGHT THINK twice before attempting to clear a blocked drain after this.

A water authority in England was sent to investigate some unusual smells emanating from sewers in Coventry.

Investigators from **Severn Trent Water** found that the drains had become blocked due to a local resident flushing a variety of fish down the loo – including piranhas.

“You wouldn’t think a fish of this size would fit down a toilet, but this is just one example of amazing things we find blocking the sewers,” Matt Final and Jay Slater of Severn Trent said.

They noted that other unusual objects had previously been found in the sewers, such as “piles of pants”.

However, this kind of problem is costing the authority as much as €12,000,000 a year.

“Remember toilet roll is meant to break down when it gets wet so it washes easily through the system,” customer operations manager Sue Fulford said.

“That’s not the case with things like sanitary products, cleansing wipes or in this case large tropical fish which can get stuck in smaller drains.”

Severn Trent are advising customers to “get yourself a bin in the bathroom and use that rather than the toilet” for items such as nappies, wipes, pants, and piranhas. From the [Journal.ie](#).

The illustrated fish is certainly not a piranha looks a bit like a tilapia to me!



Fish farms reach for the sky

FISH farms are taking to the sky in Hong Kong where space is at a premium. Several small business fish farmers are breeding stock in high rise building and in special plastic tanks which holds up to 70,000 tons of salt water.

Grouper, a popular fish in China, is one of the main species and is supplied to local restaurants. This unusual method of aquaculture carries the term 'vertical fish farms' and it is expanding.

One such fish farm, highlighted in a BBC documentary report, is called Oceanthix, which employs six people.

Managing director, Lloyd Moskalik, says it takes between 10 and 13 months to get his grouper up to the right weight. His fish can sell for around 100 Hong Kong dollars (£60 sterling) a kilo.

He is also advising the Singapore and South Korean government on his technique.



What Saltwater Fishes to Avoid at Your Local Fish Store And Why

by Bob Fennel www.fishchanel.com

New hobbyists are often dismayed to find that many of the organisms offered for sale in our interest are poorly suited to captive conditions. In fact; there are several that are not known to have eaten aquarium foods. . . ever. Other species get too large, are too mean, aren't even tropical!!!

So why are these errant fishes (and more) actually proffered at fish stores? The simplest answer is "because they sell"; but as usual, there is a more involved, total answer. There's a "founder" (or flounder) effect that is a type of social inertia in the trade, where fishes that have been caught for decades just continue to be captured, sold through the chain of custody: collector, wholesaler, perhaps jobber, transhipper, retailer and etailers, to the end user, you and I, the aquarist. To some extent, these animals are more common/numerous, easier to catch, and may well ship well and live for a while.

Here I'll make up some general categories, elaborate on what they mean, and cite some species in each that show up very regularly for sale in the trade.

Bad Species: Poor Capture, Transport, or Adaptability Record:One outright contraindicated behavior to avoid in livestock selection is death itself; some species, for whatever unknown reasons, don't generally live through the rigors of collection, holding and shipping. This list of "poor survival fishes" is quite long. Some too-often seen:

Size Matters: Both Too Big and Too Small: There is an optimal range of better to best sizes for each species of fish. Too little ones can't take the rigors of capture, non-feeding. Too large ones also ship poorly, rubbing themselves raw often, and adapt poorly to captive conditions. In-between is the "sweet spot" for each.

Does the Species Eat Captive Foods?Know that a species historical feeding record has little to do with the fact that it is being offered in the trade. There are organisms that have scarcely known to have eaten anything in captivity. Some examples are coral and other specialized-feeding Butterflyfishes (Chaetodon reticulatus, Webbed Butterflyfish;

Chaetodon ornatissimus, the Ornate; and the Exquisite, Chaetodon austriacus among many others). Beware of these and other "miscellaneous" Butterflyfishes. Other species include the Pinnatus Batfish, *Platax pinnatus* (now aquacultured and a bit hardier for it) and Moorish idols, *Zanclus canescens*. More than 95% of these die within a month of wild-collection. These two fishes rarely take food in captivity; most dying mysteriously.

Toxic Life: There is a surprisingly large number of venomous, otherwise toxic fish species in the world; some are sold as pets.

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Most boxfishes and trunkfishes (Family Ostraciidae) (Cowfish, *Lactoria cornuta*, right) and Soapfishes can release toxic materials into the water should they "become upset." One must choose tankmates carefully with these fishes. Other fishes have venom and the means to inject it: Including Plotosid catfishes (*Plotosus lineatus*),

Of course you are aware that Scorpionfishes and their kin are venomous. I still endorse the sale of Scorpaenids such as lionfish and stonefish but one should always have their eyes open when arms, hands are in their tanks.

Too Big Boys (and Girls):Some fishes sold as juveniles are oh-so cute! But, a few of them are real tank busters.

A fave example is the Clown Coris Wrasse. So delightful when small. But should yours live, it might grow into a two foot long female and then become a three foot male! Oh boy!

Chilly Willy:A woeful mention of coldwater life placed in tropical aquarium waters. Yes; there are non-warm water species sold in the trade that won't live at high temperature.

Blue banded gobies.

Catalina Gobies (*Lythrypnus dalli*), Leopard Sharks (*Triakis semifasciatus*) as well as cool/coldwater snails, algae, anemones are all coldwater species. Let the buyer beware!

So are the folks in the pet fish industry a bunch of charlatans; heartlessly selling livestock that they know full-well is not likely to fare in our captive systems? I think not. Many are simply ignorant of how touchy some of the life they sell is; passing on what seems to be hearty specimens to willing consumers. The better stores and etailers DO their best to inform would-be purchasers of issues they may well face with given species, geographical varieties, and size ranges of marine fishes. Quite a few shops eschew carrying "doomed species" period.

As consumers, it is up to each of us to arm ourselves with knowledge, and either avoid these poor choices, or at least be aware of their inherent challenge. It is ultimately up to you to cast your votes with your money in buying or leaving what you consider of value and not. Do be aware that your actions in turn strongly influence what will go on to be caught and cultured. Choose well.

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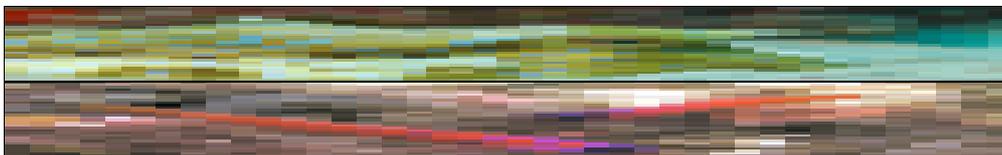
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In the largest regional study of its type to date, marine ecologist Michelle Staudinger and colleagues offer better understanding of the feeding ecologies of two very rare sperm whale species in waters off the southeast U.S. coast, adding baseline data they say are important as climate change, fishing and pollution alters the animals' environment and food sources.

PHOTO :- Researchers analyzed stomach contents collected by the marine mammal stranding network from 22 pygmy and nine dwarf sperm whales found dead on the mid-Atlantic coast between 1998 and 2011.

Understanding what resources support populations of these incredibly rare animals is important to conservation," Staudinger, adjunct assistant professor in environmental conservation at the University of Massachusetts Amherst, says of the pygmy and dwarf sperm whales she studied. "If there are changes in the environment or their prey, we can now hope to better anticipate the potential impacts. There had been quite a knowledge gap about these animals, but this work gives us an idea of their ecological niche and requirements in the current environment."

For the investigation, which used two complementary methods to characterize whale foraging ecology, Staudinger and

colleagues at the University of North Carolina Wilmington (UNC) analyzed stomach contents collected by the marine mammal stranding network from 22 pygmy and nine dwarf sperm whales found dead on the mid-Atlantic coast between 1998 and 2011. Study results appear in the April issue of *Marine Mammal Science*.

These whales in the genus *Kogia* feed almost entirely on beaked squid, cephalopods whose bodies are digested in whale stomachs except for the hard beaks made of chitin, a fingernail-like substance. Staudinger explains, "All deceased stranded marine mammals are necropsied, and scientists save and evaluate the stomach contents. So the stranding network had a stockpile of stomachs collected over 13 years from two of the most commonly stranded whales along the southeast and mid-Atlantic coast."

She adds, "Here I have to confess that I have a kind of unusual ability I learned in earlier research: I can identify cephalopod species by their beaks, a characteristic similar to birds. So when I heard about this study, I jumped at the chance to study these whales."

Some cephalopod species she couldn't recognize from her own reference samples, the marine ecologist noted, "so I went to the Smithsonian Institution's collection, where there are hundreds of species in collections of whalers and fishermen dating back to the 1800s."

Specifically, Staudinger and colleagues hoped to identify differences, if any, in ecological niches occupied by pygmy and dwarf sperm whales. These smaller cousins of the sperm whale were once thought to be a single species until modern analyses showed they are genetically distinct.

Beak analysis from cephalopod remains showed the diet of pygmy sperm whales to be more diverse than that of the dwarf species, the researchers report, and prey sizes were slightly larger for the pygmy than for the dwarf, but not statistically significantly so.

In the second analysis, they evaluated ratios of carbon and nitrogen isotopes in whale muscle samples, an indicator providing information on which habitats the whales were feeding in. That is, the eco-zone (e.g., mesopelagic and bathypelagic) and approximate depths where whales were feeding and whether their diets contained prey high on the food chain such as fish, or lower such as small crustaceans. Staudinger says, "As far as we know this the first time the isotopic signatures have been published for dwarf sperm whales."

She adds that isotopic tracer data suggest these two rare species, while not exactly the same, showed no significant differences in foraging parameters. "We found the ecologic niche of the two species is very similar in U.S. Atlantic waters, which is consistent with other global studies," Staudinger summarizes. "The pygmy sperm whale consumes a greater diversity and size of prey, which means they may be diving deeper than dwarf sperm whales to feed, this makes sense because pygmy sperm whales grow to larger sizes than dwarf sperm whales, however, this could also be an artifact of small sample sizes."

This is important information, Staudinger says, because if these two species show no evidence of resource partitioning there are likely enough food resources to support both their populations in the region. Though if resources shifted or became limiting, pygmy sperm whales would likely have an advantage over dwarf sperm whales as they show evidence of being able to exploit a wider range of food resources and habitats.

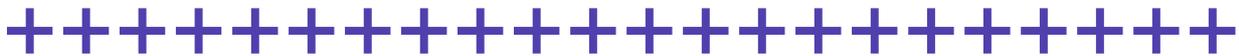
In the future, Staudinger plans to expand her expertise in deep-sea squid ecology through additional studies of marine mammals with UNC Wilmington, and a new investigation of cephalopod biodiversity on the Bear Seamount in the North Atlantic with the Smithsonian Institution, and the National Marine Fisheries Service National Systematics Laboratory.

Story Source:

The above story is based on materials provided by University of Massachusetts at Amherst. Note: Materials may be edited for content and length.

Journal Reference:

1. Michelle D. Staudinger, Ryan J. McAlarney, William A. McLellan, D. Ann Pabst. Foraging ecology and niche overlap in pygmy (*Kogia breviceps*) and dwarf (*Kogia sima*) sperm whales from waters of the U.S. mid-Atlantic coast. *Marine Mammal Science*, 2014; 30 (2): 626 DOI: 10.1111/mms.12064



A fisherman and his sons return from a good day of fishing for tambaqui, one of the Amazon's most high-value fish species dependent on the floodplains.

Scientists from Virginia Tech, the Woods Hole Research Center, and the University of California, Santa Barbara, funded by NASA, are collaborating with Brazilian scientists to explore the ecosystem consequences of the extreme droughts of 2005 and 2010 and the extreme flood of 2009.

"The research fills an important gap in our understanding of the vulnerability of tropical river-forest systems to changes in climate and land cover," said the project's leader, Leandro Castello, assistant professor of fish and wildlife conservation in Virginia Tech's College of Natural Resources and Environment.

The huge study area encompasses 1.7 million square miles, the equivalent of half of the continental United States.

In addition to historical records and ground observations, the researchers will use newly available Earth System Data Records from NASA -- satellite images of the Amazon and its tributaries over the complete high- and low-water cycles.

NASA is funding the study with a \$1.53 million grant shared among the three institutions.

"Amazon floodplains and river channels -- maintained by seasonal floods -- promote nutrient cycling and high biological production, and support diverse biological communities as well as human populations with one of the highest per capita rates of fish consumption," said Castello.

The researchers will look at how the natural seasonality of river levels influences aquatic and terrestrial grasses, fisheries, and forest productivity in the floodplains, and how extreme events such as floods and droughts may disturb this cycle.

"We are confident that deforestation and climate change will, in the future, lead to more frequent and severe floods and droughts," said Michael Coe, a senior scientist at the Woods Hole Research Center. "It is important that we understand how the Amazon River and ecosystem services such as fisheries are affected so that we can devise mitigation strategies."

Amazonian grasses, sometimes called macrophytes, convert atmospheric carbon to plant biomass, which is then processed by aquatic microorganisms upon decomposition.

"Terrestrial grasses grow during the short window when water levels are low, sequestering some carbon, and then die when the floods arrive, releasing the carbon into the aquatic system," said Thiago Silva, an assistant professor of geography at São Paulo State University in Rio Claro, Brazil. "They are followed by aquatic grasses that need to grow extremely fast to surpass the rising floods and then die off during the receding-water period."

"Although most of the macrophyte carbon is released back to the atmosphere in the same form that it is assimilated, carbon dioxide, some of it is actually exported to the ocean as dissolved carbon or released to the atmosphere as methane, a gas that has a warming potential 20 times larger than carbon dioxide," said John Melack, a professor at the University of California, Santa Barbara.

Researchers will measure plant growth and gas exchange, and use photographs from the field and satellites.

Two other Amazon resources -- fisheries and forests -- are important to the livelihood of the people of the region.

"We will combine water level, fishing effort, and fish life-history traits to understand the impact of droughts and floods on fishery yields," said Castello, whose specialty is Amazon fisheries. "Floods in the Amazon are almost a blessing because in some years they can almost double the amount of fish in the river that is available for fishermen and society."

The fishery data include approximately 90,000 annual interview records of fisheries activities on the number of fishers, time spent fishing, characteristics of fishing boats and gear used, and weight of the catch for 40 species. The hydrological data include daily water level measurements recorded in the Madeira, Purus, and Amazonas-Solimões rivers.

The researchers will examine the potential impact of future climate scenarios on the extent and productivity of floodplain forests -- those enriched by rising waters, called whitewater river forests, and nutrient-poor blackwater river forests.

For example, extreme droughts may reduce productivity due to water stress and increases in the frequency and severity of forest fires. Prolonged periods of inundation, on the other hand, may decrease productivity or increase mortality due to water-logging stress.

"We will evaluate these responses for the first time at a regional scale using remotely sensed indicators of vegetation condition and fire-induced tree mortality to measure the response of floodplain forests to inter-annual flood variability and extreme climate events," said Marcia Macedo, a research associate at the Woods Hole Research Center.

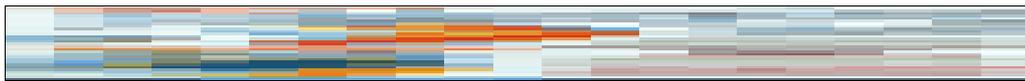
Researchers will measure tree litter dry weight, depth of flooding, tree height and diameter, and stand density. They will also use photographs and satellite images.

Previous research has focused on Amazon upland forests and the potential impacts of deforestation, fire, and drought. The research team will compare new greenhouse gas simulations to previous simulations.

"Our research informs large river ecology globally because natural flowing rivers like the Amazon are rare these days, and most research to date, being done in North America and Europe, has focused on degraded systems," Castello said.

Story Source:

The above story is based on materials provided by Virginia Tech (Virginia Polytechnic Institute and State University).



Not long now for the only fish show this year in Essex or East London- you wont want to miss it!





The sea otter population of Prince William Sound, Alaska took 25 years to recover after the Exxon Valdez oil tanker disgorged more than 10 million gallons of crude oil onto the Alaskan coast on March 25, 1989.

Thousands of otters likely died immediately as they soaked in sludge. For the next two decades, a filthy oil residue poisoned otters as they fed, slowing the recovery process.

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In 2013, though, approximately 4,277 sea otters (*Enhydra lutris*) swam in western Prince William Sound, up from 2,054 in 1993, according to a recent U.S. Geological Survey (USGS) report. Even Knight Island, one of the most heavily polluted areas in 1989, had recovered to pre-spill otter occupancy levels. The otters now abound at near the maximum number the region can support sustainably.

The Other Side of Otters

“Although recovery timelines varied widely among species, our work shows that recovery of species vulnerable to long-term effects of oil spills can take decades,” said lead author and USGS biologist Brenda Ballachey, in a press release. “For sea otters, we began to see signs of recovery in the years leading up to 2009, two decades after the spill, and the most recent results from 2011 to 2013 are consistent with recovery as defined by the Exxon Valdez Oil Spill Trustee Council.”

Prince William Sound sea otters live normal life spans now, too. In a healthy ecosystem, the oldest and youngest otters die more frequently than adult animals in the prime of life, from two to eight years old. However, between 1989 and 2008, biologists counted an abnormally high number of adult otter corpses washed up on the beach, compared to the numbers from before the spill. However, in the three most recent counts, otters death rates seemed to be returning to a normal range of ages.

Ongoing adult otter death may have occurred because, after the spill, the surviving otters suffered from near-constant exposure to toxic chemicals as the animals foraged for mussels and other shellfish in the crude-soaked sand and gravel beds of the Sound. USGS scientists found genetic signs in the otters bodies indicating that they experiences chronic long-term exposure to oil residues, compared to otters from other areas.

Although the biologists still observed these genetic warning signs in 2012, the levels had dropped significantly since 2008.

Photo: Sea otter, *Enhydra lutris*, mother with nursing pup in the Morro Bay harbor.

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Small changes in a population may lead to dramatic consequences, like the disappearance of the migratory route of a species. A study carried out in collaboration with the SISSA has created a model of the behaviour of a group of individuals on the move (like a school of fish, a herd of sheep or a flock of birds, etc.) which, by changing a few simple parameters, reproduces the collective behaviour patterns observed in the wild. The model shows that small quantitative changes in the number of knowledgeable individuals and availability of food can lead to radical qualitative changes in the group's behaviour.

Until the '50s, bluefin tuna fishing was a thriving industry in Norway, second only to sardine fishing. Every year, bluefin tuna used to migrate from the eastern Mediterranean up to the Norwegian coasts. Suddenly, however, over no more than 4-5 years, the tuna never went back to Norway. In an attempt to solve this problem, Giancarlo De Luca from SISSA (the International School for Advanced Studies of Trieste) together with an international team of researchers (from the Centre for Theoretical Physics -- ICTP -- of Trieste and the Technical University of Denmark) started to devise a model based on an "adaptive stochastic network." The physicists wanted to simulate, simplifying it, the collective behaviour of animal groups. Their findings, published in the journal *Interface*, show that the number of "informed individuals" in a group, sociality and the strength of the decision of the informed individuals are "critical" variables, such that even minimal fluctuations in these variables can result in catastrophic changes to the system.

"We started out by taking inspiration from the phenomenon that affected the bluefin tuna, but in actual fact we then developed a general model that can be applied to many situations of groups "on the move," explains De Luca.

The collective behaviour of a group can be treated as an "emerging property," that is, the result of the self-organization of each individual's behaviour. "The majority of individuals in a group may not possess adequate knowledge, for example, about where to find rich feeding grounds" explains De Luca. "However, for the group to function, it is enough

that only a minority of individuals possess that information. The others, the ones who don't, will obey simple social rules, for example by following their neighbours."

The tendency to comply with the norm, the number of knowledgeable individuals and the determination with which they follow their preferred route (which the researchers interpreted as being directly related to the appeal, or abundance, of the resource) are critical variables. "When the number of informed individuals falls below a certain level, or the strength of their determination to go in a certain direction falls below a certain threshold, the migratory pathway disappears abruptly."

"In our networks the individuals are "points," with interconnections that form and disappear in the course of the process, following some established rules. It's a simple and general way to model the system which has the advantage of being able to be solved analytically," comments De Luca.

So what ever happened to the Norwegian tuna? "Based on our results we formulated some hypotheses which will, however, have to be tested experimentally," says De Luca. In the '50s Norway experienced a reduction in biomass and in the quantity of herrings, the main prey of tuna, which might have played a role in their disappearance. "This is consistent with our model, but there's more to the story. In a short time the herring population returned to normal levels, whereas the tuna never came back. Why?"

One hypothesis is that, although the overall number of Mediterranean tuna has not changed, what has changed is the composition of the population: "The most desirable tuna specimens for the fishing industry are the larger, older individuals, which are presumably also those with the greater amount of knowledge, in other words the knowledgeable elders." concludes De Luca.

Another curious fact: what happens if there are too many knowledgeable elders? "Too many know-alls are useless," jokes De Luca. "In fact, above a certain number of informed individuals, the group performance does not improve so much as to justify the "cost" of their training. The best cost-benefit ratio is obtained by keeping the number of informed individuals above a certain level, provided they remain a minority of the whole population."

Story Source:

The above story is based on materials provided by International School of Advanced Studies (SISSA). Note: Materials may be edited for content and length.

Journal Reference:

1. G. De Luca, P. Mariani, B. R. MacKenzie, M. Marsili. Fishing out collective memory of migratory schools. Journal of The Royal Society Interface, 2014; 11 (95): 20140043 DOI: 10.1098/rsif.2014.0043

2. =====



A disgraced German bishop who resigned on Wednesday after building costs at his new headquarters spiraled to at least €31 million, spent €213,000 on a fish tank. On Thursday he passed some of the blame onto his deputy.

The [108-page report](#) into extortionate spending at the Bishop of Limburg's headquarters was published by the leadership of Germany's Catholic Church on Wednesday.

Franz-Peter Tebartz-van Elst handed in his resignation to Pope Francis the same day. He had been suspended in October after details of his spending emerged.

Despite unrelenting media attention and being summoned to answer to Pope Francis in Rome last October, he only officially offered a statement on Thursday.

In it, Tebartz-van Elst admitted his handling of the role was “in many respects a disorderly, unfocused and primarily a personally-driven management position”.

Yet he then claimed that the reported total costs were inaccurate.

He argued that his out of control spending was a result of other construction projects he had seen go wrong.

As soon as it began, he felt he needed to “observe the quality and the durability of the entire project”. His spending choices should have been overseen by his deputy, Vicar General Franz Kaspar, but he maintained they were not.

"As I am not an authority in the area of church management, as my qualification is in pastoral theory, I have to relinquish the responsibility to Dr Kaspar who was [according to the report into the spending] 'the only person with an overarching view of the seat's assets'."

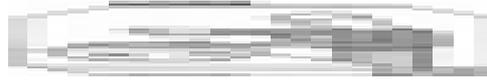
The Limburg diocese in central Germany said on Thursday it was looking towards a new beginning.

But it added filling Tebartz-van Elst's position would not be easy, due to a lack of suitable candidates in the Catholic Church.

Below are some of the most lavish aspects of the bishop's spending.

Fish tank: A tank for ornamental fish with a depth of two metres cost €213,000.





Crude oil from the 2010 Deepwater Horizon disaster causes severe

defects in the developing hearts of bluefin and yellowfin tunas, according to a new study by a team of NOAA and academic scientists.

The findings, published in the Proceedings of the National Academy of Sciences on the 25th anniversary of the Exxon Valdez oil spill, show how the largest marine oil spill in United States history may have affected tunas and other species that spawned in oiled offshore habitats in the northern Gulf of Mexico.

This image shows a normal yellowfin tuna larva not long after hatching (top), and a larva exposed to Deepwater Horizon crude oil during embryonic development (bottom). The oil-exposed larva shows a suite of morphological abnormalities including fluid accumulation from heart failure and poor growth of fins and eyes.

Atlantic bluefin tuna, yellowfin tuna, and other large predatory fish spawn in the northern Gulf during the spring and summer months, a time that coincided with the Deepwater Horizon spill in 2010. These fish produce buoyant embryos that float near the ocean surface, potentially in harm's way as crude oil from the damaged wellhead rose from the seafloor to form large surface slicks.

The new study shows that crude oil exposures adversely affect heart development in the two species of tuna and an amberjack species by slowing the heartbeat or causing an uncoordinated rhythm, which can ultimately lead to heart failure.

"We know from the 1989 Exxon Valdez spill in Prince William Sound that recently spawned fish are especially vulnerable to crude oil toxicity," said Nat Scholz, Ph.D., leader of the ecotoxicology program at NOAA's Northwest Fisheries Science Center in Seattle. "That spill taught us to pay close attention to the formation and function of the heart."

"The timing and location of the spill raised immediate concerns for bluefin tuna," said Barbara Block, Ph.D., a study coauthor and professor of biology at Stanford University. "This spill occurred in prime bluefin spawning habitats, and the new evidence indicates a compromising effect of oil on the physiology and morphology of bluefin embryos and larvae."

Recent studies are increasingly painting a more detailed picture of how oil-derived polycyclic aromatic hydrocarbons (PAHs) act on the heart. Earlier this year, the Stanford-NOAA team showed in a related paper published in *Science* (Brette et al. 343: 772) that Deepwater Horizon crude oil samples block excitation-contraction coupling--vital processes for normal beat-to-beat contraction and pacing of the heart--in individual heart muscle cells isolated from juvenile bluefin and yellowfin tuna.

"We now have a better understanding why crude oil is toxic, and it doesn't bode well for bluefin or yellowfin embryos floating in oiled habitats," said Block. "At the level of a single heart muscle cell, we've found that petroleum acts like a pharmacological drug by blocking key processes that are critical for cardiac cell excitability."

This mechanism explains why the team observed a range of cardiac effects in the developing hearts of intact embryos in the present study. "We directly monitored the beating hearts of living fish embryos exposed to crude oil," said Dr. John Incardona, NOAA research toxicologist and the study's lead author. "The tiny offspring of tunas and other Gulf species are translucent, and we can use digital microscopy to watch the heart develop."

The major difficulty facing the researchers was access to live animals. Tunas are difficult to raise in captivity and few facilities exist worldwide with spawning fish. In the open ocean, fragile fish embryos and larvae are mixed with many other types of plankton, and they usually don't survive the rough conditions in a net towed near the surface. This made it close to impossible to assess developmental cardiotoxicity in samples collected near the Deepwater Horizon surface oil slicks.

To work around this challenge, the international team brought the oil to the fish. Samples of crude oil were collected from the damaged riser pipe and surface skimmers. The samples were then transported to the only land-based hatcheries in the world capable of spawning tunas in captivity.

This approach allowed the scientists to design environmentally relevant crude oil exposures for bluefin tuna and yellowfin tuna at marine research facilities in Australia and Panama, respectively. Luke Gardner, an Australian native post-doctoral associate from Stanford University and co-author on the PNAS paper, was vital in helping the team investigate the bluefin.

"It is challenging to maintain bluefin in culture and we were privileged to have successfully tested the crude oil in Australian facilities, the only on-land hatchery that has bluefin tuna in culture. This gave us access to tuna embryos and allowed us to study the developmental toxicity of oil," said Gardner. The pioneering effort to develop new testing methods was also led by Martin Grosell, Ph.D., at the University of Miami.

The new research adds to a growing list of fish that are affected by crude oil. "This fits the pattern," said Incardona. "The tunas and the amberjack exposed to Deepwater Horizon crude oil were impacted in much the same way that herring were deformed by the Alaska North Slope crude oil spilled in Prince William Sound during the Exxon Valdez accident."

Crude oil is a complex mixture of chemicals, some of which are known to be toxic to marine animals. Past research has focused in particular on PAHs, which can also be found in coal tar, creosote, air pollution and stormwater runoff from land. In the aftermath of an oil spill, PAHs can persist for many years in marine habitats and cause a variety of adverse environmental effects.

Developmental abnormalities were evident in bluefin and yellowfin tunas at very low concentrations, in the range of approximately one to 15 parts per billion total PAHs. These levels are below the measured PAH concentrations in many samples collected from the upper water column of the northern Gulf during the active Deepwater Horizon spill phase.

Severely affected fish with heart failure and deformed jaws are likely to have died soon after hatching. However, the NOAA team has shown in previous work that fish surviving transient crude oil exposures with only mild effects on the still-forming heart have permanent changes in heart shape that reduce swimming performance later in life.

"This creates a potential for delayed mortality," said Incardona. "Swimming is everything for these species."

The nature of the injury was very similar for all three pelagic predators, and similar also to the response of other marine fish previously exposed to crude oil from other geologic sources. Given this consistency, the authors suggest there may

have been cardiac-related impacts on swordfish, marlin, mackerel, and other Gulf species. "If they spawned in proximity to oil, we'd expect these types of effects," said Incardona.

Story Source:

The above story is based on materials provided by National Oceanic and Atmospheric Administration. Note: Materials may be edited for content and length.

Journal Reference:

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Caviar without killing the Sturgeon.

Caviar was once the food of kings and czars — and for a sturgeon, it meant death.

But a new technique of massaging the ripe eggs from a female sturgeon — without killing or even cutting the fish open — could make caviar more abundant, more affordable, and more accessible to all.

Best of all, says Angela Köhler, the German scientist who has spent nine years developing the new production system, "no-kill caviar" — also being called "cruelty-free caviar" and "correct caviar" by the people marketing it — could help reduce demand for black market caviar and save endangered wild sturgeon from being hunted to extinction.

The idea is to turn the caviar farming industry into something more akin to the commercial production of poultry, eggs or milk. The new method, being practiced at a small farm in Loxstedt, Germany, called **Vivace GmbH**, involves first viewing a sturgeon's eggs by ultrasound. If they are deemed ready, a signaling protein is administered to the sturgeon several days before the egg harvest.

This, Köhler says, "induces labor" and releases the eggs from a membranous sack in the belly cavity. At that point, the eggs can be pumped from the belly with gentle massaging. Köhler says the process can be repeated every 15 months or so throughout a sturgeon's lifetime, which may last decades.

The method is considered by some an improvement over so-called "C-section caviar" production, which requires making a small incision in the female fish to access her eggs. The operation allows the producer to harvest the roe without using any chemicals to induce egg-laying. But C-sections subject a sturgeon to the risk of fatal infection and can damage the fish's ovaries, reducing future roe yields.

"[The Vivace method] will make caviar production more financially reasonable," Köhler says. "It doesn't make much sense to take a fish that needs seven or eight years to mature and then, when it has its first eggs, kill it."

The Vivace farm in Loxstedt produced only about 1,100 pounds of caviar last year, Köhler says. If demand grows, output could eventually rise to 10 tons per year.

That's still just a tiny fraction of current global output. But if enough other caviar farms adopt her method — which would involve paying money for proprietary information about the process — Köhler says caviar farming could become a relatively cheap endeavor. Supply could increase as prices dive. In the end, low-priced no-kill caviar could undercut the market for illegally produced wild sturgeon caviar.

But some skeptics doubt that no-kill caviar will catch on.

Geno Evans, owner of **Anastasia Gold Caviar**, in Pierson, Fla., has tried making caviar without killing his fish. He wasn't impressed. In order to massage the roe from the fish's body cavity, he explains, you have to wait until a sturgeon is nearly ready to lay her eggs. For Evans, this resulted in overly oily, soft caviar.

"[The eggs] were mushy," he tells *The Salt*. "It was gross. It wasn't caviar."

Köhler's method addresses this texture issue by rinsing the tender, overripe roe immediately in a calcium-water solution. This makes the oil-rich pearls durable enough to undergo salting and curing without breaking.

It also improves the texture, according to Deborah Keane, owner of the **California Caviar Company**, in Sausalito, Calif., currently the only American importer of Vivace no-kill caviar.

"You get what chefs call the 'Caspian pop' — a very firm snap in your mouth as you bite each egg," says Keane.

Wesley Holton, the executive chef of **Rose. Rabbit. Lie.** in Las Vegas, is among several American chefs using the product. He says Vivace caviar tastes about the same as traditional caviar, but withstands heat better. (The traditional stuff tends to wilt when cooked.)

The *Salt* sampled the Vivace caviar alongside more traditional styles at Keane's tasting room. The traditional caviar from *Acipenser baerii*, the Siberian sturgeon, was creamy and buttery, with a pronounced flavor of brine, sardines and smoked salmon.

A similar product made from the eggs of *A. transmontanus*, the white sturgeon of Western North America, was also buttery smooth, with a salty flavor and an interesting finish of pond water and river fish.

The Vivace *A. baerii* caviar was entirely different. The tiny black eggs did not melt in the mouth but, rather, popped. Flavor was faint and subdued, with quiet hints of salt marsh and catfish. It was not our favorite of the three.

And then there's the question of price.

For now, an ounce of Vivace will run you \$125 to \$135 in Keane's shop, compared to \$105 an ounce for conventional caviar of the same species. A custom-packed jar of Vivace "golden caviar," taken from albino fish, will fetch up to \$800 per ounce.

But Keane argues that if more farms adopt the Vivace method, no-kill caviar could eventually become "an everyday indulgence," bringing costs down to \$20 or \$30 per ounce.



State seizes koi from Harpswell womanA warden and biologists from the Department of Inland Fisheries and Wildlife also took Georgette Curran's squirrel and blue jay.

Georgette Curran lost her koi on Monday when a warden and biologists with the Maine Department of Inland Fisheries and Wildlife seized them as well as a 6-year-old squirrel and a 14-year-old blue jay.

PET KOI: Ulysses swims atop Spottie in the indoor aquarium that held koi at the Harpswell home of Georgette Curran.

Photo courtesy of Georgette Curran

Curran, 66, of Harpswell, lost her bid to keep her koi — ornamental pond fish — when the Maine Supreme Judicial Court last month refused to overturn a lower court ruling that denied her a permit to keep the koi. She'd asked to be allowed to keep her fish permanently, and let them be in an outside pond in the summer. She'd been allowed to keep them indoors pending the appeal.

"It's insane that 49 states — the rest of the world — allows koi 'cause they're a tropical trade fish," she said. "Maine has common carp laws and they're lumping them in. They're a subspecies. They wouldn't take over our native waters 'cause they wouldn't survive."

For years Curran has bucked the system, trying to move koi to a list of allowed aquarium trade fish in the state, and she is collecting signatures to try to get state regulations changed.

In the court battle, she sought permission to keep the brightly colored fish permanently and to have them in an outdoor

pond in the warmer weather.

Curran was distraught on Monday, her voice hoarse. "I've been crying so much," she said.

She said she went to view her basement pond when they left. "I just cried," she said. "There's water everywhere, Everything is torn up. My beautiful Lemon (a koi) wasn't there to greet me."

She said she had applied for a permit to keep her blue jay, Jayne.

"She went through West Nile virus and lived through it with the help of my vet at the time," Curran said. "And she had a crippled leg. She was spoiled rotten."

"At least they let me say goodbye," Curran said.

She was given a summons charging her with illegal possession of koi and has a hearing June 17 in West Bath District Court.

Mark Latti, a spokesman for the state fisheries and wildlife department, said Sgt. Jason Luce of the Maine Warden Service served the warrant to remove the fish and took the other two animals as well.

"It was illegal possession of captive wildlife," Latti said. He said there were no charges at this point involving the bird and squirrel.

Latti said a total of 47 live koi and five dead ones were removed from Curran's home. Curran said she had frozen the five fish after they died.

Curran's permit to keep the fish while the court case was pending restricted her to 40 koi.

"Right now we'll try to find a home for the koi," Latti said on Monday afternoon. "Ideally we'd move the koi to a state that allows koi, but we have concerns about disease and parasites. Two potentially had some type of disease, and we will continue to monitor to see if others have that. If they're disease-free then they'll be moved out of state."

He said the state will look for a suitable home for the other two animals as well, since they would not survive in the wild.

Latti said Curran "violated several provisions in the conditional permit, including putting these fish outside and having more than 40, which she wasn't able to explain and possibly was breeding them."

He said Curran's permit to keep the koi had expired. Curran was first denied a permit to keep them in April 2012, but got the restricted permit in July 2012 while the court appeal was pending.

"The court affirmed that we weren't being overly restrictive and that they did pose a threat to the state's waters," Latti said. "They're a nonnative fish. They're invasive just like milfoil, and once they're in a waterway, you can't get them out."

Latti said the original tip about Curran keeping koi came in through the department's Operation Game Thief tipline.

Curran still has 24 Chihuahuas and three Doberman pinschers. She said the officers seized some of the dogs' medication.



RIO VISTA -- Desperate to save chinook salmon from the drought, wildlife managers have begun an unprecedented rescue convoy to truck more than 30 million hatchlings to safer waters in the Sacramento River. State and federal fishery agencies are hauling the fish downstream from five Central Valley hatcheries to prevent them from perishing in low, overheated rivers or streams, or getting lost in the low-water Delta.

Just 2 inches long at six months old, the silvery smolts are still weak swimmers that need strong river flows to wash them into San Francisco Bay and the Pacific Ocean. Drought has cut into those flows.

On Tuesday, three tanker trucks hauled 450,000 baby salmon from the Coleman National Fishery Hatchery near Red Bluff for release into the Sacramento River at Rio Vista. The fish will be hauled to four sites, two on the Delta and two in San Francisco Bay.

It was the first full day of a 10-week relief effort that is the largest fish trucking operation California has ever seen.

"This is a Herculean effort to try to stave off a fishery disaster in 2016 when these fish are expected to return to the rivers," said Stafford Lehr, fisheries branch chief of the state Department of Fish and Wildlife. "We want to jump-start these young fish past the trouble spots and give them a better chance to survive."

The fish convoys are the biggest of many state and federal efforts around California this year to protect salmon, steelhead, trout and other fish imperiled by low flows in rivers, streams and creeks.

In a hatchery near Keswick Dam on the upper Sacramento River, equipment to cool water has been expanded to protect winter-run chinook salmon from the hotter weather ahead.

Crews on parts of the Upper Sacramento are manually netting some fish stranded in ponds and walking them short distances and dropping them in the main river stem.

Biologists are watching fish runs on several rivers closely to decide if government should intervene and start rearing them in hatcheries.

"The trucking operation is about helping hatchery fish, but we are very carefully watching the condition of wild fish," said Howard Brown, a National Marine Fisheries biologist. "It is a difficult year and there are many competing needs for water."

Hundreds of salmon smolts died this winter due to lack of water in the Pajaro River, which empties into the ocean near Watsonville.

"We're really worried about what the summer's going to look like" for Central Coast coho, said Jon Ambrose, a biologist with the National Marine Fisheries Service.

The Central Valley salmon runs are the largest contributors to California's \$1.4 billion a year salmon fishing industry.

The trucking operations, biologists believe, will dramatically improve the hatchery salmon's survival rate.

The state has done some salmon trucking in previous years, but this is the first year that the federal Coleman hatchery and the four state hatcheries in the Central Valley have shipped all their young salmon by truck into the Delta.

In normal years, all the Coleman hatchery fish and some of the state's hatchlings would be released into the nearby river to swim out toward the ocean. This approach makes the salmon familiar with the scent and cues from local water and improves their odds of finding their way back to spawn as adults.

The fish trucked out to Rio Vista may have a hard time finding their way back in three years.

"Their GPS system has been thrown out of kilter" by the move, said Lehr.

But the big move, which is costing more than \$800,000, may be the best shot at survival of these baby salmon from the Central Valley, biologists said.

On their arrival in Rio Vista, the smolts were piped and splashed into large holding pens for an hour's adjustment period before their release into the Sacramento River and the start of their journey to the San Francisco Bay and the ocean.



Members of the Cell Biology in Environmental Toxicology group have discovered evidence of "feminization" of male fish in the estuaries of Gernika, Arriluze, Santurtzi, Plentzia, Ondarroa, Deba and Pasaia. The first cases (2007-2008) were detected in Urdaibai, and the most recent data confirm that they are also taking place in other estuaries. Pollutants acting as estrogens are responsible for this phenomenon which, among other changes, is causing ovocytes -- immature ova -- to appear in male fish.

The UPV/EHU's Cell Biology in Environmental Toxicology group has conducted research using thick-lipped grey mullet and has analysed specimens in six zones: Arriluze and Gernika in 2007 and 2008, and since then, Santurtzi, Plentzia, Ondarroa, Deba and Pasaia. The acquisition of feminine features by male fish has been detected, to a greater or lesser extent, in all the estuaries, not only in the characteristics of the gonads of the specimens analysed but also in various

molecular markers. According to Miren P. Cajaraville, director of the research group, the results show that "endocrine disruption is a phenomenon that has spread all over our estuaries, which means that, as has been detected in other countries, we have a problem with pollutants."

Some of the emerging pollutants detected are in fact responsible for the "feminization" of male fish on the Basque coast and belong to the group of endocrine disrupting chemicals. Chemically, they are very different from each other, but they all have similar effects: due to their interaction with hormones, they destroy the hormone balance and can lead to the feminization or masculinization of the organism. As they are pollutants that have appeared recently, little is known as yet about their effects on the environment and on ecosystems. According to Cajaraville, "our discoveries are significant, because they enable us to know how far these pollutants have spread in our estuaries and rivers and what effects they have; that way, we will be able to adopt methods to prevent them reaching our waters, like legal regulations governing their use."

Despite the fact that they are new pollutants in terms of their effects, the "sources" of endocrine disrupting chemicals can be found in everyday products: plasticisers, pesticides, contraceptive pills, fragrances and detergents, among other things.

Some reach the waters after managing to get through the cleaning systems in wastewater treatment plants, and others as a result of industrial or farming activities. So, as far as the Urdaibai Biosphere Reserve is concerned, for example, "our main hypothesis," says Cajaraville, "is that they come from the water treatment plant. It was the first place we studied, and continues to be, by far, responsible for the highest percentage of recently appearing pollutants."

In any case, the UPV/EHU's research group found evidence of feminization in male thick-lipped grey mullet in all the estuaries analysed: in three out of the six estuaries (Gernika, Pasaia and Deba) appeared intersex fish, in other words, specimens whose testicles contained immature ova (depending on the area studied, the percentage ranged between 12% and 64%). What is more, all the estuaries have tested positive as far as the two main molecular indicators are concerned: most of the male fish (between 60% and 91%) had vitellogenin (a protein that, in principle, is only expressed in females) in the liver; in the brain, there were considerable levels of the gene expression that encodes Aromatase Cyp19a1b, a protein involved in oestrogen synthesising. Its expression in the male brain is a clear symptom of feminization.

Apart from measuring the feminization indicators in male fish populations, the research team also carried out a chemical analysis of the sampling areas: "All the time we worked in collaboration with analytical chemistry teams, and we characterised each spot from the chemical and biological points of view," stressed Cajaraville. During the 2007/2008 campaign they had the collaboration of the chemical team of the Institute of Environmental Diagnosis and Water Studies of the CSIC (Spanish National Scientific Research Council); later they were assisted by the UPV/EHU's department of Analytical Chemistry. According to Cajaraville, this is a "highly significant fact, since apart from demonstrating that there are clear biological indicators of fish feminization, in each of the places studied we have measured which pollutants have appeared recently and their respective concentrations, and we have confirmed the correlation existing between the presence of the pollutants and the feminization phenomenon." The pollutants were measured in the bile of the fish, and the said correlation has shown, according to Cajaraville, that it is the pollutants that are responsible for the feminization of the male fish.

The results of the research have been published in two papers, one in the journal of Science of the Total Environment and the other in the journal of Marine Environmental Research.

Story Source:

The above story is based on materials provided by Elhuyar Fundazioa. Note: Materials may be edited for content and length.

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Encouraging lion onto Caribbean menus

Published: 28 March, 2014

A NEW project is underway to encourage Caribbean fishermen to include the deadly lionfish as part of their daily catch in an attempt to protect the world's second-largest coral reef.

The Belize Barrier Reef Reserve World Heritage Site is 116,148 hectares and comprises seven marine protected areas. The second largest barrier reef system in the world, it is Belize's number one tourist spot and crucial to the country's fishing industry.

However, the barrier's diverse ecosystem is under serious threat from the invasive lionfish, a native of the Indian and Pacific oceans that was introduced to the Florida waters in the 1990s.

There is a growing concern that the predominance of the fish poses a serious threat to the very existence of indigenous fish species, including the grouper and spiny lobster.

This is the background to the Lionfish Project, organised by the Environmental Conservation Organisation (ECOMAR) and the National Corla Reef Monitoring Network.

The project involves partnerships with government organisations, civil society, private sector, artisanal fishermen and tour guides.

So far over 15,000 lionfishes have been removed from the reef and twelve workshops have been conducted in coastal

communities throughout Belize.

One of the most successful initiatives has been the issue of lionfish hunter cards to 62 tour guides and fishermen on the island.

The cards allow the holder to spear while diving, as long as they catch only lionfish. The locals have been encouraged to process the fish and sell them in restaurants.

Whilst lionfish are poisonous whilst alive, they are not harmful when eaten. Markets are now being developed to export the fish, which have a similar price to grouper.

Although the lionfish contain venom, they are not poisonous when eaten, so the fish are processed and sold at restaurants as a tasty meal. Markets are currently being developed for export, and prices for lionfish are comparable to grouper.



Illegal Dolphins in EU, owners refuse DNA check!

The animal protection organization ProWal and the Whale-and Dolphinprotection-Forum (WDSF) are looking for evidence in the dolphinarium in Constanta, town in the EU country Rumania, of their illegal import of dolphins from Taiji/Japan.

None of the 30 dolphinariums in the EU answered when asked about the DNA analysis of the dolphins held in captivity in zoos and pleasure parks, which would have no doubt given insight into the origin of the dolphins. The Washington Species Protection Act (CITES) forbids the import of dolphins for commercial use.

Last September ProWal inspected the dolphinarium in Constanta, Rumania, after the organization was told that dolphins were held there, which came from the brutal drive-hunts in Taiji. ProWal found only two of the original three dolphins, which were bought for Euros 500.000 from a zoo in Peking under the pretense that these were captivity-bred dolphins. He was told that one dolphin had died. The Rumanian dolphinarium owner, furthermore, maintained that these dolphins were second generation. This, however, could time wise not be possible, the dolphin-protection organization replied, since the only successful breeding of a dolphin happened as proven in 2003 and this dolphin calf did not survive.

The dolphin protectors, furthermore, pointed out that there was no documentation of any successful breeding in the second generation ever in Peking. To the contrary, China, Russia and the Ukraine belong to the group of the largest buyers of dolphins caught in the wild from Japan.

The Rumanian government in Bucarest also refused to hand over documentation regarding DNA analysis and so did the dolphinarium owner in Constanta. Juergen Ortmueller, CEO of the WDSF: "We are missing here transparency from all the dolphinariums in Europe, which are hiding behind their own creation the EEP, so that nobody from the outside can find out what is going on."

A financial investor from Suceava in Rumania by the name of Popescu, contacted ProWal last fall asking for support to construct a new private dolphin pool, because he stumbled onto our website by searching the internet and was under the impression the ProWal is an organization supporting dolphinariums. After the dolphins had been imported from China, Russia or the Ukraine, the private dolphin tank was going to be opened to the public and bring a nice income. The procuring of import documents would not be a problem he explains. Since none of the named countries has any success in breeding to show, WDSF and ProWal assume that all the dolphins will come from Japan via the other countries into Rumania.

Furthermore, ProWal and WDSF found through their research that the EU is supporting the construction of a dolphinarium in Rumania by dipping into a building fund to the tune of 900.000 Euros and has also footed a major part of the construction cost of 11.5 million Euros of a dolphinarium in the Lithuanian town of Kleipeda.

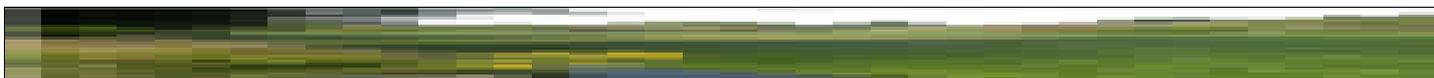
ProWal and the WDSF demand from the EU to immediately stop the support for the construction of the dolphinariums in Rumania and Lithuania. Furthermore, a ban without exception should be implemented in the EU since there is a great lack of transparency regarding the origin of the animals in the existing dolphinariums and there is no control over this.



Aquatic Plants Ban starts in April in UK!

Five invasive pond plants commonly sold in the Aquatic trade will be banned from sale by DEFRA- these are listed as Water Fern(?), Pennywort, Australian swamp stonecrop, and water primrose. Apparently retailers who are non-compliant will face a fine of £5,000 and/or prison. Retailers are also being urged to advise customers on management and disposal of these plants already in ponds.

We are not sure what Water fern is actually but wonder whether it is Azolla or Salvinia?





Conservation group's report criticizes wasteful discarding of fish; many species off R.I. coast. We thought the habit of discarding fish was just an European problem!

March 20, 2014

OCEANA

An Oceana map shows three of the "dirtiest fisheries" off the Rhode Island coast. The data is compiled from the 2014 NMFS National Bycatch Report.

BY RICHARD SALIT

So much seafood is inadvertently caught and tossed overboard for dead that the persistent practice is a serious threat to efforts to restore depleted U.S. fish populations, including numerous species off Rhode Island, according to a report released on Thursday.

In "Wasted Catch," the Washington-based environmental group *Oceana* asserts that 17 percent to 22 percent of U.S. fishermen's catch is discarded, amounting to 2-billion pounds every year.

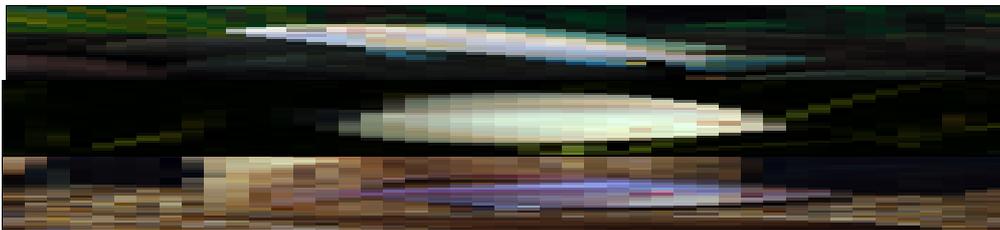
"Bycatch, or the catch of non-target fish and ocean wildlife, is one of the largest threats to maintaining healthy fish populations and marine ecosystems around the world," the report states.

Among what it calls the nation's "nine dirty fisheries" are three off Rhode Island. They include Northeast bottom trawling (groundfish, whiting), mid-Atlantic bottom trawling (scup, flounder, sea bass), and New England/mid-Atlantic gillnetters (monkfish, groundfish, skates). In trawling, nets are towed through the water while gillnets are set and anchored.

Rhode Island fisheries regulators acknowledge that bycatch continues to be a problem. It's a particularly difficult one to resolve, but some progress has been made, they say.

"It's an issue we grapple with — how to turn discarded fish into landed fish so they are not wasted," said Mark Gibson, deputy chief of marine fisheries, who represents the state on the New England Fishery Management Council.

Oceana calls for stricter bycatch limits, improved bycatch reporting, incentives for fishermen to reduce bycatch, promotion of more selective fishing gear, and expansion of a program that puts observers on board fishing vessels.



TOP TEN FISHKEEPING MISTAKES

How many Aquarists can say they've never made a mistake in their fishkeeping experiences, but in reality, of course all of us have made mistakes during our time in this hobby. If only we knew then what we know now. As with so many things in life, it's whether we learn from our mistakes that will determine how successful we will be. Granted, the mistakes we all make can be frustrating, as is evident in the statistics and studies showing that a large percentage of hobbyists quit soon after beginning — some even within a month.

If you are a newcomer to this wonderful hobby, try not to be discouraged — and most of all, do not give up. I promise that no matter how frustrating or difficult fishkeeping may seem at the moment, if you learn from your mistakes, you will truly find this hobby rewarding.

On the other hand, there's another philosophy we can apply here: Learn from the mistakes of others. With this in mind, I've created a list of 10 of the more common mistakes made in the hobby (in no particular order). Learn from this list and avoid these mistakes before you even come close to making them. We'll cover the first five this month and the last five in the next issue.

Whether you are new to fishkeeping or have been at it for many years, overfeeding the fish is typically among the hardest mistakes to avoid. Many would say that feeding their fish is the most enjoyable part of this hobby because it is our way of interacting with them.

Overfeeding Your Fish Our fish would have us believe they are starving to death the way they endlessly beg for more food. Overfeeding our fish, however, is a serious concern and a mistake we definitely want to avoid. It can be directly harmful both to the health of the fish and the quality of the water they live in, which will also negatively affect their health. The effect that overfeeding has on the quality of the water in your aquarium may not be obvious. All that uneaten

food or additional waste produced from overfeeding will be broken down into ammonia and nitrite, both of which are extremely toxic to fish. As uneaten food decays, it can also cause a variety of other problems, including cloudy water, algae blooms — even low pH and oxygen levels in your tank.

Corydoras catfish are bottom dwellers and require sinking foods in order to thrive. Photo by Aaron Norman
When I used to work in a pet store, many beginners would come into the store complaining that their tank was full of small worms. Right away, without even asking any questions, I knew this person was more than likely overfeeding the fish. The little flatworms they saw are known as planaria, and though these worms are generally harmless (and ironically, your fish will even like eating them), they are an indicator that water quality is not optimal and (usually) that the fish are being overfed.

Overstocking Your Aquarium
Another all-too-common mistake is overstocking our aquariums. I am speaking from experience when I say that it can be difficult to resist the urge to add more fish. We've all been there, browsing through fish tanks at our local dealer when we spot something new we just have to have. Impulse buying is a weakness for many of us.

It can also be a little confusing for beginners to appreciate the difference between the local dealer's tanks and their own aquariums. The store has 50 fish in a 10-gallon tank, and they all seem healthy, so why wouldn't that work at home? The fish in store tanks are typically there a relatively short time, the tanks receive large water changes and often are filtered with a centralized systems (which use ultraviolet sterilizers and are designed to handle large bioloads). I'm not going to provide a general rule for stocking the aquarium but will instead encourage you to research the specific needs of the fish you are interested in. Read as much as you can. Find a trustworthy pet store, and talk to experienced fishkeepers.

Overcrowding brings many potential dangers and in most cases is a disaster waiting to happen. The exception worth noting is with certain African cichlids that are intentionally overcrowded to reduce aggression and fighting over territory. It takes an experienced aquarist to accomplish this successfully.

Some of the problems with overcrowding are the same ones that result from overfeeding, such as elevated ammonia and nitrite levels. The increased bioload from having too many fish can overwhelm the filtration system. Increasing the size of the filter cannot overcome excessive stocking densities. Overcrowding creates unnecessary stress on your fish, lowering the effectiveness of their immune system and increasing their susceptibility to diseases.

In addition, with the exception of certain African cichlids, overcrowding will actually increase aggression among some fish, which may result in injury or even death. And the stress from these conditions often also leads to disease issues in the tank.

Mixing Incompatible Fish
Mixing incompatible fish is a big mistake, with potentially deadly results. **Beginners** are often unaware that many fish have very different needs and do not belong in the same tank. Some pet store personnel will explain this, but not all. For example, when a small juvenile becomes larger, it will eat fish that remain smaller, such as neon tetras. And this is by no means our only concern when selecting potential tankmates. We have to be aware of temperament, environmental needs and dietary requirements.

African cichlids and tropical fish such as tetras and platies do not mix. Photo by Al Castro
A common mistake is not learning how large fish will grow, which may result in predation, as noted above, but can also result in a bioload problem as fish become too large for the tank.

Even with similarly sized fish, we need to learn about their temperaments. Some small fish, such as tiger barbs, are fin-nippers and should not be mixed with fish that have long fins. By learning about our fish, we can discover that certain species need to be kept in schools with their own kind. Other fish require large territories, and having a tank that's an appropriate size goes a long way in maintaining a peaceful community. Another concern with certain fish is having too many males in the same tank, which will lead to fighting. Many of these problems can be minimized or eliminated by doing research ahead of time.

Incorrect Water Chemistry Water chemistry also plays a role in our selection of fish. For example, some fish have significantly different pH requirements. Temperature is another concern, as many fish will prefer different ranges. Dietary needs are an important factor in determining which fish are compatible. This is often an issue of differing vegetable and protein intake requirements, which may not be easily resolved. Some fish are shy or even slower, making it difficult for them to get any food in a tank with aggressive eaters.

I caution you not to forget catfish or bottom-feeders that may be in your tank. For example, I had many customers who could just not keep cory cats alive for more than a few weeks. Their water tested fine, and all their other fish were thriving — plus the fact that most cory cats are fairly hardy to begin with. Their Corydoras were actually starving to death, as no food made it to the bottom of the tank where they eat. Once these customers started providing sinking pellets and tablets, their cory cats thrived.

I can't stress enough the importance of having a regular routine of water changes. It can be the difference between being successful and not being in the hobby for long. Regular water changes are the key to maintaining good quality water and thus the well-being of our aquarium inhabitants.

We must recognize that our aquariums are closed systems in which a variety of pollutants will build up fairly quickly — especially if our tanks are overcrowded and the fish overfed. The solution to pollution is filtration (see mistake number five) and dilution. When we do a water change, we replace dirty water with clean water, helping to reduce the build-up of undesirable dissolved substances, some of which filtration cannot remove completely. Other benefits of regular water changes include improved water clarity and reduction of any odors. We also replenish important trace elements and essential minerals.

Filtration is Key You might assume that having a filter eliminates the need for water changes. An **effective filter** will help maintain better water quality. However, filtration only slows down decreasing water quality and will not remove all pollutants.

Human nature being what it is, we often keep putting off water changes until problems arise. Missing an occasional water change is usually not a problem, but maintaining a regular schedule really is vital to the well-being of our fish. By the way, replacing water that has evaporated does not constitute making a water change. When water evaporates from the aquarium, all the "bad stuff" (nitrates and ammonia) stays behind. While filtration helps to remove these to a degree, water changes is the best way to maintain a healthy system. If the hobbyist falls into the trap of just replacing evaporated water, this will eventually lead to water with dangerous levels of toxins. So do regular water changes, and go to your local fish store to see what kinds of products they have to make water changes as easy and effective as possible — and then use them.

Discus are very specialized and require efficient filtration. Photo by Al Castro
How often and how much water you should change depends on several factors, including stocking density, the presence of live plants and what kinds of food are offered. I prefer to replace about 10 percent of the tank volume every week, but others will do closer to 25 percent every other week. With larger changes, it's better if the replacement water is of similar temperature.

Because our tanks are closed systems, regularly changing the water is the most important thing a hobbyist can do to keep a healthy tank.

Filter maintenance is a necessity. Don't be fooled because the water looks crystal clear. Clear water does not mean clean water. Avoiding filter maintenance is just asking for trouble — maybe not right away but sooner than you might wish.

Filtration can be broken down into three categories: mechanical, biological and chemical. Each is important to the quality of the aquarium water. Filters will become clogged and dirty over time, preventing them from functioning properly. The more fish and food, the faster this occurs. Regularly maintaining a filter includes occasionally cleaning tubes, strainers and impellers, which will have the added benefit of increasing the life span of the filter.

The method of cleaning the filter is as important as the frequency. We never want to replace all the filter media at one time, as this would cause the loss of all the beneficial bacteria responsible for biological filtration. Many filters have separate sponges or other media for biological filtration, allowing us to replace filter cartridges without losing most of the bacteria. If your filter has two cartridges, replace only one at a time. By leaving behind used media, we allow the new media to be quickly seeded with the necessary bacteria.

When cleaning any filter media that will be reused, never wash with tap water, as chemicals such as chlorine could potentially kill the bacteria. Instead, rinse in a separate container/bucket with water from the aquarium. Water changes are an excellent time to do this. Empty the dirty water in the yard (the plants will use the nutrients) or down the drain.

Buying the Aquarium and Fish on the Same Day One of the hardest tasks in my days spent in the pet retail business was trying to help new customers understand that it was not in their best interest to buy a new aquarium and fish on the same day. You can probably imagine how difficult this was, especially when anxious children were involved. In fact, more than a few customers would have us catch the fish they wanted, bag them up, and then catch us completely off guard by asking what tank would be best for them.

Buying an aquarium and fish on the same day is simply not the best course of action — you are just asking for trouble and are most likely setting yourself up for failure. This is perhaps one of the biggest reasons that many new hobbyists give up; they have unknowingly made it almost impossible for themselves to succeed.

Bleeding heart tetra. Photo by Aaron Norman Part of the blame can be placed on a few unscrupulous pet stores that just want to make the quick sale. However, ultimately it is up to each individual hobbyist to educate his or herself so that this mistake is not made, and also so the hobbyist understands the reasons for not buying an aquarium and fish on the same day.

A person who wants to buy a tank and fish at the same time is normally new to the hobby. Most likely, this person is not familiar with the necessary equipment for aquariums, nor how to set them up or how they operate. It is best to allow time to become familiar with how the filter, heater, air pumps, lighting system and other equipment works — this way, you can make sure everything is functioning properly, the water parameters are stable and that there are no leaks.

Cycling the Tank The main reason to not buy an aquarium and fish on the same day has to do with tank cycling. Maintaining and starting a healthy aquarium begins with a proper understanding of the nitrogen cycle. This is a natural process that provides biological filtration, with different types of bacteria converting harmful waste into less toxic compounds. The cycle begins with an ammonia spike from fish waste and food. It is then converted into nitrite, which

consumes the ammonia (both ammonia and nitrite are toxic to your fish). Once the nitrite is broken down, nitrate is left. Depending on the system, nitrate can be acceptable in low levels. By performing regular maintenance and water changes as mentioned in part one, nitrate levels will stay under control.

How long it will take your tank to cycle will depend on several factors. Cycling a tank starts with adding a source of ammonia. Traditionally, this is accomplished by starting your tank off with a few very hardy fish and then gradually adding more fish. However, if you really think about it, you are exposing these fish to pollutants and toxins and hoping they survive. More people are starting to use fishless cycling to get their aquariums off to a good start. I would encourage you to look further into fishless cycling as an alternative to the more traditional methods.

At home and work, since I have a lot of aquariums available to me, I run a filter on an established aquarium for a week or two in order to cycle it. It's almost like an instant cycle. If you don't have an extra filter, ask a friend who wouldn't mind to let you run a filter on his or her healthy aquarium. You can also take some of the used filter media or gravel from an established aquarium to get your tank started in the right direction. If you don't have access to another aquarium, there are also some commercially available products that can help speed up the cycle by introducing beneficial bacteria to the aquarium.

However we choose to cycle our aquariums, hobbyists need to be able to track the ammonia, nitrite and nitrate levels in their aquarium to determine how far along they are in the cycle process, so they will know when to add fish. This brings us to the next common mistake many aquarists make.

I remember one customer in particular who was having a hard time keeping his fish alive; however, he refused to believe that testing his water was important and instead accused us of selling sick and dying fish. When I tried to explain the nitrogen cycle and the importance of cycling his aquarium, he told me that he just wanted "to keep a couple of fish in a tank" and didn't want "to become a chemist or scientist."

While this kind of customer is difficult to deal with, his statement reveals a common misconception (or fear) of many new aquarists. Understanding the nitrogen cycle and basic water parameters, and testing for them does not require a large amount of chemistry knowledge. A very basic understanding of what is happening in the water of our fish tanks will go a long way toward us succeeding and therefore enjoying this hobby.

Routine testing is the only accurate way to be certain that our water parameters are within an acceptable range — and this is especially important for beginners. Every hobbyist should own at least a basic aquarium test kit that tests for pH, ammonia, nitrite and nitrate. By testing for the levels of these, we can determine how our tank is cycling. We will know if it is safe to add more fish. Testing our water regularly will help us to diagnose potential problems, such as a high ammonia level, before it is too late.

Take the time to learn not only what you are testing for but also what the results tell you. Fluctuating water conditions are not healthy for your fish, and testing regularly will help you to maintain the proper water conditions. One last tip that you might find helpful is to keep a record of your test results, doing so may help you to identify potential problems or even mistakes we might be making.

Quarantine Quarantine Quarantine Not quarantining new fish before introducing them to your main tank is an all-too-common mistake shared by beginners and advanced hobbyists alike. For beginners who have just invested a considerable amount of money purchasing their first aquarium and who may already be on information overload, the thought of having to purchase an additional tank for use as a quarantine tank might be overwhelming and perhaps not even make any sense. I recall that some customers interpreted the recommendation to use a quarantine tank to mean

that we were selling unhealthy fish.

Even among seasoned aquarists, you would probably be surprised how many ignore the important task of quarantining. Whether you are a beginner or experienced hobbyist, skipping this important practice is taking a gamble with potentially serious consequences. I learned this the hard way when I was a lot younger. I had a 150-gallon tank that housed about 25 very large beautiful angelfish, all of which I bred. I decided that I wanted to add a little color to the tank, and I purchased about 30 lemon tetras from my local pet store. They looked very healthy, so I went ahead and introduced them to my big display tank without quarantining them. Everything went great for about two weeks, then one morning I awoke to a complete nightmare. Most of my beautiful angels had clamped fins, and they stopped eating. To make a long story short, I ended up losing about 20 of those angels and all 30 of the lemon tetras due to infection. All of this could have been avoided if I simply used a quarantine tank.

Every time we introduce new life into our aquariums, there is the potential risk of introducing different diseases and parasites. Even if fish look healthy in the store or perhaps are quarantined briefly by the store itself, we cannot automatically assume they are disease-free. Some diseases or parasites may not manifest themselves for a couple of weeks or longer.

By isolating newly purchased fish in a quarantine tank for an extended period of time, we can make sure our fish are disease-free. If it turns out they are sick, it will be much easier to treat them in the quarantine tank without any risk to our main tank(s). This way, the main display tank does not have to be treated, eliminating other potential problems, such as killing beneficial bacteria (which many medicines or treatments will do). Medicating a tank can also be expensive if the tank is large, another bonus of treating the smaller quarantine tank. If you maintain a planted or reef tank, you may not even be able to use certain medicines without potentially deadly consequences for plants and invertebrates.

Another added benefit of the quarantine tank is that you allow your new fish time to settle in and regain their complete health. Besides the stressful move from the store to your tank, your fish may have been shipped halfway across the country to get to the store where you purchased them. The quarantine tank allows them to recuperate from all this stress and be in excellent condition for when you introduce them to your main tank.

Choose the Right Size Aquarium Whenever we try something new for the first time, it is usually recommended that we start small and then work our way up to bigger and better. This is usually sound advice, and we can clearly see the logic in it. The question for the new aquarist is whether they can apply the same reasoning to their new hobby.

It would seem to make sense to start with a smaller aquarium, perhaps even one of popular desktop or nano tanks. You may reason that it will be easier to hone your fishkeeping skills on a smaller tank, plus it is more cost-effective to start small. You might decide that once you know what you are doing and have had some success, you will go bigger. At first glance, this might seem very logical, and after all, it works in other aspects of your life. However, let me explain why this might be faulty thinking and share with you some of the common pitfalls with keeping a smaller aquarium.

First of all, let me state that maintaining smaller aquariums is not impossible, nor are you doomed to failure if you start with a small tank. What we need to realize is that smaller aquariums are a lot less forgiving than their larger counterparts. Due to the smaller volume of water, water parameters, such as pH and temperature, can change quickly. Skipping regular maintenance, overfeeding or any of the other mistakes mentioned in this two-part article will only be magnified in a smaller tank. Maintaining a stable environment in smaller aquariums takes discipline and experience — any mistakes made on our part can prove disastrous. With a larger, more forgiving aquarium, such mistakes might not be as detrimental, or at least we allow ourselves time to resolve any potential problems.

For the beginner who may already be inclined to overstock an aquarium, a smaller tank is just asking for trouble. Let's face it: We always want more fish, plus a smaller aquarium limits the types of fish you can keep. Of course, budget may determine how large of an aquarium you may purchase, but I advise against beginning with too small of a tank.

Garage or Yard SalesNo, I didn't just throw this one in to see if you were paying attention. You might be wondering what in the world it is that garage or yard sales have to do with keeping fish. Well, at almost every garage sale I have ever been to, I have seen a fish tank and related equipment for sale. In fact I have gotten some great deals on expensive items, including filters, at a garage sale.

Have you ever wondered why there are so many fish tanks at garage sales? Sometimes, I ask the sellers why they were selling their fish tank; a typical response is that that they couldn't keep any fish alive and finally gave up on the hobby. So, a fish tank at a garage sale can represent one of the biggest mistakes a beginner can make: giving up on this wonderful hobby. Maintaining a successful aquarium is not that difficult, but you may find it hard to succeed if you don't take the time to learn and do research.

Learn Along the WaySo there you have it. These are the last five of the top 10 mistakes that all of us should try to avoid, whether we are beginners or advanced aquarists. Taking the time to learn as much as possible about this hobby (such as reading this magazine regularly) will help you be successful and find all this fishy business rewarding. Don't get too down on yourself if you make any mistakes along the way. We all make them, but learn from them, and don't forget to enjoy your aquarium as you learn!

Paul Demas has kept freshwater and marine aquariums, ponds and reptiles for more than 25 years. He has worked in management in retail pet stores and currently works for Penn-Plax in new product development. In his spare time, he

authors articles on both fish and reptiles. **This article first appeared in**

Fish.com



One of the most serious threats to global biodiversity and the leisure and tourism industries is set to increase with climate change according to new research by Queen's University Belfast.

Researchers at Queen's have found that certain invasive weeds, which have previously been killed off by low winter temperatures, are set to thrive as global temperatures increase.

The team based at Quercus, Northern Ireland's centre for biodiversity and conservation science research, predicts that invasive waterweeds will become more widespread over the next 70 years.

The researchers say that additional management and legislation will be required if we are to stop the spread of these

pest species.

Four species in particular could establish in areas on average 38 per cent larger than previously thought due to projected climatic warming. The water fern, parrot's feather, leafy elodea and the water primrose, are already highly problematic throughout warmer parts of Europe. Invasive species are considered to be one of the most serious threats to global biodiversity, along with climate change, habitat loss and nutrient addition.

The estimated annual cost of invasive species (plants and animals) to the UK economy is £1.8 billion, with £57 million of impact on waterways including boating, angling and waterway management.

Funded by the Northern Ireland Environment Agency (NIEA), the research has been published in the journal *Diversity and Distributions*. It looked at the global distributions of 15 invasive plant species over a 69 year period.

Dr Ruth Kelly, from the School of Biological Sciences at Queen's, who led the study, said: "Traditionally upland areas have been protected by low winter temperatures which kill off these invading weeds. Now these are likely to become increasingly vulnerable to colonisation.

"On the island of Ireland currently about six per cent of the island is unsuitable for these invasive species but we think this will drop to less than one per cent by 2080. This type of research from Queen's is an example of how we are creating a more sustainable future and shows how monitoring the impact climate change is having is important for many reasons. This project will allow the NIEA and other agencies to begin their planning on how to address future issues and ensure our waterways remain a valuable economic and recreational resource."

Dr Kelly added: "It's not all bad news, however, as our most common invasive waterweed, the Canadian pondweed, is likely to become less vigorous perhaps allowing space for restoration of waterways and native plant communities."

Dr Michael Meharg, from the NIEA, said: "Invasive waterweeds can be a major problem in lakes and rivers throughout Britain and Ireland. Such plants are fast growing and often form dense mats of vegetation which may block waterways and cause problems for boating and fishing, and, therefore, to the leisure and tourism industries. Dr Kelly's research is crucial in planning for the future as we know invasive waterweeds will also out-compete native aquatic plants species and alter habitats for insects and fish."

Story Source:

The above story is based on materials provided by [Queen's University, Belfast](#). Note: Materials may be edited for content and length.

Journal Reference:

1. Ruth Kelly, Katie Leach, Alison Cameron, Christine A. Maggs, Neil Reid. Combining global climate and regional landscape models to improve prediction of invasion risk. *Diversity and Distributions*, 2014; DOI:10.1111/ddi.12194

Researchers at Queen's have found that certain invasive weeds, which have previously been killed off by low winter temperatures, are set to thrive as global temperatures increase.

The team based at Quercus, Northern Ireland's centre for biodiversity and conservation science research, predict



The number of dead pigs recovered in the last two weeks from rivers that supply waterThe number of dead pigs recovered in the last two weeks from rivers that supply water to Shanghai has risen to more than 16,000. The number of dead pigs recovered in the last two weeks from rivers that supply water to Shanghai has risen to more than 16,000.

The government in China's financial hub said 10,570 carcasses had been pulled from its Huangpu river. That is in addition to 5,528 pigs plucked from upstream tributaries in the Jiaxing area of Zhejiang province.

Authorities give daily updates, telling the public that tests show Shanghai's water is safe, but no official has given any full explanation about the massive dumping of pig carcasses.

Hog farmers have told state media that the dumping of carcasses is rising because police have started cracking down on the illicit sale of pork products made from dead, diseased pigs.

The state-controlled Southern Weekly newspaper, citing court documents, said three men were sentenced to life in prison in Jiaxing last November for procuring dead pigs to sell their meat. It says the men and their group bought 77,000 dead pigs in a period of more than two years.

Local officials also told Southern Weekly that the city lacked the facilities to dispose properly of dead pigs. Hog farming is a major business in China.

- Dead animals recovered from Gan river in Jiangxi, which supplies drinking water to the provincial capital (picture)

in •



FoxNews) Diners at Downtown Disney's T-REX Café restaurant in Orlando were treated to a wet and wild dining experience when a giant fish tank sprung a leak on Monday afternoon.

While patrons were eating around 4 p.m., something caused a seam in the tank to break apart, and water began

gushing from the new opening, Fox8 WGHP reports.

Diner Kate Wallace told the station that there was a “very loud” sound when the tank ruptured. Although the entire tank did not break, there was still plenty of water.

“We were sitting about 20-feet away,” Wallace said in an e-mail to WGHP. “The people sitting at the table next to it did get wet... I don’t know how they could have avoided it.”

According to Wallace, waiting staff rushed to the tank to save the fish and began clearing guests from the affected area, although the rest of the restaurant remained open while workers cleaned the water.



All fifteen issues of the Southern Livebearers Group Journal are now online at Howard Preston memorial page

<http://howard preston.weebly.com>



The sea anemone is a genetic oddball, with some traits similar to plants and others more closely resembling higher animals.

The sea anemone is an oddball: half-plant and half-animal, at least when it comes to its genetic code, new research suggests.

The sea creature's genes look more like those of animals, but the regulatory code that determines whether those genes are expressed resembles that in plants, according to a study published Tuesday (March 18) in the journal Genome

Research.

What's more, the complicated **network** of gene interactions found in the simple sea anemone resembles that found in widely divergent, more complex animals.

"Since the **sea anemone** shows a complex landscape of gene regulatory elements similar to the fruit fly or other model animals, we believe that this principle of complex gene regulation was already present in the common ancestor of human, fly and sea anemone some 600 million years ago," Michaela Schwaiger, a researcher at the University of Vienna, said in a statement.

The size of an organism's genome doesn't correspond to how simple or complex that creature's body is, so some scientists hypothesized that more complicated links and **networks** between genes made for more sophisticated body plans.

Schwaiger and her colleagues at the University of Vienna analyzed the genome of the sea anemone, not only identifying **genes that code for proteins**, but also assessing snippets of code known as promoters and enhancers, which help turn the volume up or down on gene expression.

The team found the sea anemone's simple anatomy hides a complicated network of gene interactions, similar to those found in higher animals such as fruit flies and humans. That belies the notion that more complex gene networks always correlate with more elaborate body plans, and also suggests the **evolution** of this level of gene regulation happened before sea anemones, fruit flies and humans diverged, about 600 million years ago.

Part plant

The team also found the sea anemone had a second level of regulation that closely resembles one found in plants. Genes are transcribed or copied by a RNA, which is then used as a **recipe** to build proteins. But tiny snippets of genetic material called microRNAs, which bind to the RNA copies, can stop the step of protein assembly.

While plants and animals have microRNAs, they look and act very different, so researchers had assumed they arose independently in the two kingdoms. Schwaiger and her colleagues found the microRNAs in the sea anemone have similarities to those found in both plants and animals.

That suggests these microRNAs probably evolved before plants and animals diverged long ago, and provides an evolutionary link between plant and animal microRNA.

Information from "Nature"



The Southern Livebearers Aquatic Group Journals called the BRACHY BULLETIN from the 1980`s are now uploaded to <http://howardpreston.weebly.com>