

Soundings



American Cetacean Society – Monterey Bay Chapter
P.O. Box HE, Pacific Grove, CA 93950

JUNE 2022

**VIRTUAL MONTHLY MEETING
THURSDAY, JUNE 30 AT 7:00 PM
PRESENTER: DR. CHRIS LOWE**

**TITLE: THE RECOVERY OF WHITE SHARKS OFF CALIFORNIA AND
WHAT THAT MEANS TO COASTAL COMMUNITIES**



Dr. Chris Lowe has been studying sharks, rays, and bony fishes for over 30 years, focusing on their behavior, physiology, and ecology. For the last 15 years, Dr. Lowe and his students have been studying juvenile white sharks off the coast of southern California. Using a wide array of technology, they have found that white sharks use southern California beaches seasonally as nursery habitat for their young. This brings juvenile white sharks in close proximity to beach goers. Dr. Lowe and his students use a wide array of technologies and educational methods to help lifeguards and the public understand the mysterious lives of sharks and just how much of a threat they may actually pose.



Next month: Our next meeting will be on Thursday, July 28 at 7 PM, with a presentation on whale evolution by Dr. Annalisa Berta. Please save the date and join us! More information is available on our website, acsmmb.org.

INSIDE THIS ISSUE

CALENDAR	2
BOOK RECOMMENDATIONS....	2
WHALE FACES REVEAL HOW THE WORLD'S BIGGEST ANIMALS EVOLVED.....	2
BIDEN ADMINISTRATION REQUIRED TO RELEASE LONG- OVERDUE POPULATION REPORTS FOR MANATEES, SEA OTTERS AND WALRUSES	3
WHALES ONCE WALKED ALONG THE COASTS OF NORTH AMERICA.....	4
DEATH OF LAST RIVER DOLPHIN IN LAOS RINGS ALARM BELLS FOR MEKONG POPULATION.....	6
SIGHTINGS	7
MEMBERSHIP	8

CALENDAR

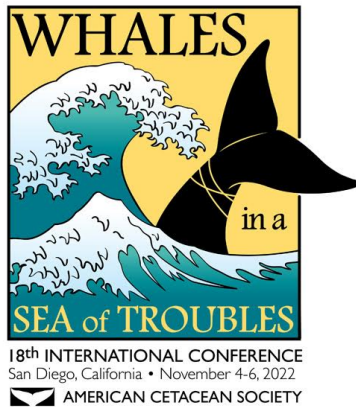
Jun. 28: ACSSF Speaker Series presents a talk by Scott Benson: "Welcome Back, Leatherbacks." 7 - 8:30 PM.

Aug. 1-5: 24th Biennial Conference on the Biology of Marine Mammals in Palm Beach, FL. This conference will be the first fully hybrid, live-virtual conference of the Society of Marine Mammalogy.

Fall 2022 (dates TBA):
10th California Islands Symposium at the Ventura Beach Marriott in Ventura, CA

Nov. 2-5: Annual meeting of the Society of Vertebrate Paleontology in Toronto, Ontario, Canada.

Nov. 4-6: ACS International Conference at the Kona Kai Resort in San Diego: Whales: In a Sea of Troubles.



BOOK RECOMMENDATIONS

Alfred Russel Wallace: The Journey of a Lifetime, by Denise Carrington-Smith. 2022 Storixus Media and Publishing.

A Tidal Odyssey: Ed Ricketts and the Making of Between Pacific Tides, by Richard Astro and Donald Kohrs. 2021 Oregon State University Press.

The Rise and Reign of the Mammals: A New History from the Shadow of the Dinosaurs to Us, by Steve Brusatte. 2022 Mariner Books.

The Biology of Sharks and Rays, Illustrated Edition, by A. Peter Klimley. 2013 University of Chicago Press.

WHALE FACES REVEAL HOW THE WORLD'S BIGGEST ANIMALS EVOLVED

by Josh Davis

May 9, 2022 — Whales are some of the most extreme mammals alive on the planet. But how they evolved from furry, four-legged critters to giants of the ocean has not been fully understood.

Now, with the help of the most comprehensive set of whale skulls scans ever produced, which spans

DONOR APPRECIATION

Thank you to our donors! Over the past six months, we have received donations from the following:

Dave & Judy Zaches
Sherri Garner StMartin

Frances Mitchell
Harvey Williams
Thomas Kieckhefer
Marianne Agnew
Shirley Stihler
Katlyn Taylor

*Thank you for your support of
ACS Monterey Bay!
Chapter!*

their entire 50 million years of evolution, researchers have been able to pinpoint the key moments of their life on Earth.

From the largest animal that has ever lived to those which dive to three kilometers beneath the surface in search of their prey, whales are some of the most extraordinary mammals that have ever evolved.

But while the general evolution of whales over the past 50 million years is well recorded in the fossil record, the intricacies of how and why the group of marine mammals diverged and spread to dominate the oceans has been harder to elucidate.

A new study has been looking at the skulls of extinct and living whales to try and piece this together. By 3D scanning the skulls of some 201 species of whale spanning their entire evolutionary history, the researchers have been able to pinpoint the key moments in the evolution of whales and get a glimpse at what ecological factors were influencing these marine behemoths.

Dr. Ellen Coombs, a Postdoctoral Fellow at the Smithsonian's National Museum of Natural History, completed this research whilst at the Museum.

'We've gathered the most expansive cranial data set for whales which exists on the planet,' explains Ellen. 'The main thing we were looking at was what was happening to the rates of evolution, so where are you seeing peaks and troughs in the speed of evolution, throughout their history.'

'But not only did we look at what was happening to the rates of evolution and the change in skull shape, but we were also looking at what might have affected that.'

The team found that there were three main bursts of evolution for whales. The first occurred when the mammals initially made the transition from land to water, the second when the two main groups of whales diverged from each other, while a third is seen when toothed whales refined their echolocation and diversified.

The results have been published in *Current Biology*.

Taking the plunge



Pakicetus is one of the early ancestors of modern whales, and lived in the wetlands of the Tethys Sea. Credit: ©The Trustees of the Natural History Museum, London.

Wherever they live in the world, whales and dolphins are the dominant predators. They can be found swimming in the depths of the oceans, along rocky coastlines, and even up estuaries and into the planet's major river systems.

Known more formally as cetaceans, the group contains whales, dolphins and porpoises, but cetaceans as a whole can be split into two main groups. One of these is the mysticetes, or big baleen whales such as the blue whale, while the other is the odontocetes, or toothed whales such as dolphins and sperm whales.

All of these are descended from a land-living ancestor around 50-55 million years ago, but the spark for this transition to water is thought to have been the asteroid which killed the dinosaurs 66 million years ago.

While the impact devastated the land, it also had a significant effect on the marine environment, as it finished off the large marine reptiles, such as plesiosaurs, which were dominating the oceans.

'This means there was plenty of empty ocean, which starts to get populated by mammals about 50 million years ago,' explains Ellen. 'Within eight million years, the ancestors of whales go from being fully terrestrial, such as the four-legged Pakicetus, which lived around the edge of the Tethys Sea, to fully aquatic.'

'This is super quick in evolutionary terms.'

It was this rapid transition which caused the first - and largest - boost in evolution for the whales, as the move to water caused some significant changes to their skull shape.

'What you are seeing are changes in the position of the nasals, or nose, from the tip of the snout up to the top of the head as the animals are becoming more aquatic,' says Ellen. This was also associated with other major changes in the body of the early whales, namely the near-complete loss of their hind limbs.

The big split

For about 10 million years the early whales rapidly spread right around the world and into all the vacant American Cetacean Society – Monterey Bay

marine environments, before another big wave of evolution rippled through the group.

This is when the two main groups of modern whales (the neocetes) split, as the baleen and the toothed whales start to do their own very separate, very different things.

'The second really interesting rise in the rates of evolution occurs about 39 million years ago,' explains Ellen. 'The big baleen whales don't have baleen at this point as they are still toothed, but they start to go down their own functional pathway, very different to the echolocating toothed whales.'

'It is really interesting because when baleen then evolves about 27 million years ago and the mysticetes start to mass filter feed, within a few million years their rates of evolution and the changes in their skull come to standstill.'

'We think that is just because they got really good at filter feeding and the shape of their skulls hasn't had to change much since.'

When it comes to the toothed whales, however, Ellen and her team think that it was the evolution of echolocation which really drove the high levels of change in their skulls.

Echolocation meant that the toothed whales suddenly had a huge advantage, as they no longer needed to actually see their food to find it. This meant they could feed on pretty much any prey, and so the whales were able to enter all available niches in the aquatic world.

The toothed whales were suddenly able to dive down to inky depths on the hunt for squid, or swim up murky rivers in the pursuit of fish.

'What we really need to find in the fossil record is an Eocene odontocete whale that can echolocate,' says Ellen. 'Because we think that the earliest odontocetes could echolocate, or at least had very basic echolocation, and they took this innovation and ran with it.'

Extremely wonky whales

Finally, it was this ability to echolocate which led to the third spurt of evolution.

While the baleen whales evolved to become the largest animals ever to live, employing a strategy so successful their skulls have changed little since, the toothed whales were still innovating and refining their echolocation.

'About 10-18 million years ago the toothed whales, particularly the sperm whales, had some really strange changes going on in their skulls,' explains Ellen. 'We start to see high levels of shape change throughout toothed whale diversification as their echolocation is becoming more sophisticated, and alongside that we start to get a lot of weird changes in their skull.'

'The whales really started to diversify in what they were eating and their body size changed as well.'

Most animals have symmetrical skulls, but one of the main changes in the skulls of echolocating whales is a highly asymmetrical or wonky skull. It is thought

that this is to make space for the echolocating organ known as the 'melon'. This asymmetry is taken to the extreme in sperm whales.

The study is helping to tell the full story of whale evolution, covering not only the entire history of the animals but also their geographic spread around the world as the researchers included a lot of new material in the analysis from the southern hemisphere.

While the diet and ecology of the animals was found to be a major influence on their evolution, the next step for Ellen is to look at the abiotic factors such as climate. It is hoped that by looking at how this has impacted their development in the past it might give some clue as to how the changing environment will influence them in the future.

<https://www.nhm.ac.uk/discover/news/2022/may/whale-faces-reveal-how-the-worlds-biggest-animals-evolved.html>

BIDEN ADMINISTRATION REQUIRED TO RELEASE LONG-OVERDUE POPULATION REPORTS FOR MANATEES, SEA OTTERS AND WALRUSES

by Scott Artis

May 16, 2022 — In response to a lawsuit filed by the Center for Biological Diversity and Turtle Island Restoration Network, the Biden administration today agreed to release long-overdue population reports for manatees in Florida and Puerto Rico and sea otters and walruses in Alaska, as required by the Marine Mammal Protection Act.

“This is a good first step. We can’t protect these amazing and desperately imperiled marine mammals without knowing how many exist in the wild,” said Emily Jeffers, an attorney at the Center. “These documents will help us understand the threats facing manatees, otters and walruses, but they’re also important for setting limits on activities that can harm them. This will help support strong federal action to shield these animals from pollution, climate change and other hazards that are getting more and more deadly.”

A record number of manatees — more than 1,100 — died in 2021, with many of these deaths attributable primarily to the pollution of their habitat, which is killing the seagrass they eat. This represents a loss of more than 10% of the Florida manatee population.

Pacific walruses depend on Arctic sea ice for their essential life functions, and federal officials have found that climate change will destroy that sea-ice habitat and cause a substantial population decline.

“The plight of these species highlights the problems with outdated stock assessments,” said Scott Artis, managing director of Turtle Island Restoration Network. “Good management requires good information, and assuring a current, science-based

population analyses is critical to the protection of marine mammals so they can survive and recover.”

The lawsuit, filed against the Department of the Interior and U.S. Fish and Wildlife Service, asked for updates to expired stock assessments for two stocks of polar bears, Pacific walruses, three stocks of northern sea otters in Alaska, the southern sea otter stock in California and two stocks of West Indian manatees around Florida and Puerto Rico.

After the lawsuit was filed in February 2021, the Fish and Wildlife Service published stock assessments for polar bears and southern sea otters, revealing that the Beaufort Sea polar bear population had plummeted to only 780 individuals.

Today’s legal agreement ensures more accurate population estimates for manatees, Alaskan sea otters and walruses. The new assessments must be completed by specific dates in 2022 and 2023, starting with assessments of the manatee populations in Florida and Puerto Rico that are due by July 29, 2022.

Under the Marine Mammal Protection Act, the Fish and Wildlife Service is required to prepare stock assessment reports for all marine mammals under its jurisdiction, including sea otters, walruses and manatees. Despite this clear directive, the agency had not updated stock assessments for years, and some haven’t been updated in more than a decade.

Accurate stock assessments are essential to the management of marine mammal populations and must be based on the best scientific information available.

The stock assessment reports serve to protect marine mammals by analyzing threats and setting sustainable levels of human-caused serious injury and mortality to marine mammals. They also guide management actions for commercial fisheries, oil and gas activities, military activities, coastal development, and other activities that may harm marine mammals.

<https://seaturtles.org/biden-administration-required-to-release-long-overdue-population-reports-for-manatees-sea-otters-and-walruses/>

WHALES ONCE WALKED ALONG THE COASTS OF NORTH AMERICA

by Riley Black

Jan. 3, 2022 — In 1973, amateur paleontologist Peter Harmatuk found a strange tooth in the rock of a stone quarry near Castle Hayne, North Carolina. At the time, the tooth’s identity wasn’t clear beyond “mammal.” But just last year, George Mason University paleontologist Mark Uhen and colleague Mauricio Peredo published a more refined interpretation. The tooth appears to have belonged to a group of strange, long-snouted whales called remingtonocetids. Picture a large otter with a comically-long snout and you have a general idea of what these mammals looked like, creatures that were able to ply the waves as well as walk along sandy beaches. Perhaps that seems strange. Whales are most

familiar to us as creatures of the sea, propelling themselves through the water with their paired flukes. Somehow, however, seal-like whales had made it to the shores of ancient North America from southern Asia.

“Remingtonocetids are thought to be coastal animals,” Uhen says, more like modern seals and sea lions. Instead of swimming straight across the ancient Atlantic, then, they may have gradually expanded their range from their place of origin near ancient Pakistan and India through Eurasia, eventually crossing a much shorter distance to northern North America, possibly in what’s now Canada, and then moving south.

Tracing the route these whales took may be difficult. Rocks of the relevant age, Uhen says, aren’t found north of New Jersey. Clues about the coastal route the otter-like whale took may have been lost due to quirks of geology. But that doesn’t mean the trail has gone entirely cold. “Undoubtedly there are more middle Eocene, semi-aquatic whales to be discovered and described in North America,” Uhen says. The fossils are relatively rare, and hard to find, but they are there. The rock formation that the new tooth came from, for example, has also yielded the remains of a protocetid—or proto whale—named *Crenatocetus* and fully-aquatic whales named *Pachycetus* and *Cynthiacetus*, all of which have been named since 1990.

Thanks to such finds, paleontologists have been able to outline the ancestry of today’s leviathans in greater detail, and there’s more to the story than the origin of humpbacks and bowheads. Researchers are continuing to turn up strange new species of early whales, often in unexpected places. Many early whales were not as closely bound to the land as previously thought, and finds like the remingtonocetid from North Carolina are demonstrating how a diverse array of amphibious whales were able to spread around the world.

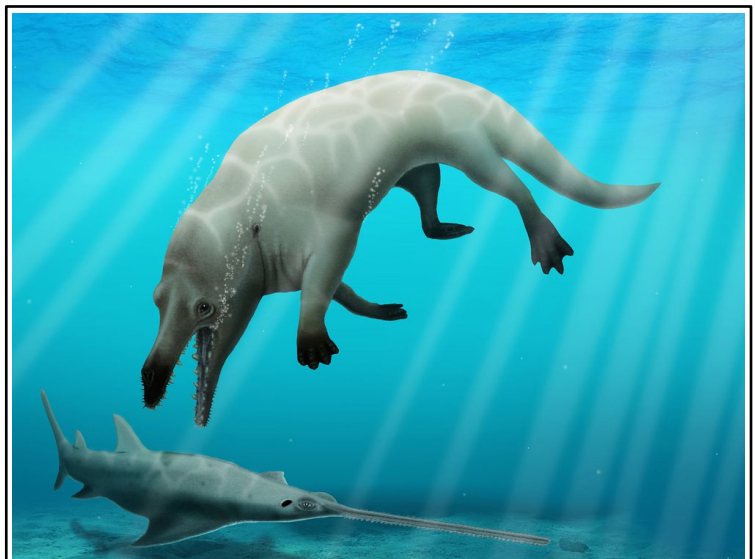
Ever since the mid-19th century, paleontologists and anatomists have been fascinated with the puzzle of how whales went from living on land to spending their whole lives in the sea. The relevant fossils to explain the transition seemed elusive and experts could really only guess as to how whales originated. That changed in the 1970s.

The discovery of a roughly 55-million-year-old whale called *Pakicetus* helped center paleontologists’ focus on Pakistan, India and Egypt, and soon there was a veritable flood of early whale species. Even this year, Mansoura University Vertebrate Paleontology Center paleontologist Abdullah Gohar and colleagues named a new early whale, *Phiomicetus anubis*, from Egypt. The ancient menagerie doesn’t represent a straight line of land-dwelling mammals becoming more and more at home in the water. Different species of early whales overlapped in time and space, Gohar says, pointing out *Phiomicetus* as but one example.

The whale lived alongside another otter-like whale called *Rayanistes*, and, Gohar speculates, the sharp-toothed *Phiomicetus* may have targeted the calves of its relative. Early whale species did not appear one after the other, but represented an entire family that proliferated around the water’s edge before whales became entirely at home in the sea.

The prehistoric coastlines of North America play a role in the story, too. During the 19th century, Black slaves discovered large bones in the fields of the South. These fossils were later named and described by paleontologists in the U.S. and England, although researchers did not always immediately know what they were looking at. Naturalist Richard Harlan, for example, thought some of these bones belonged to an enormous seagoing lizard and named them *Basilosaurus*—meaning “king lizard”—before anatomist Richard Owen recognized that the creature was a mammal and likely a fossil whale. And it was big. The largest specimens represent animals about 66 feet long, the largest mammal that had ever lived until modern whale families began to evolve. And *Basilosaurus* wasn’t alone. Paleontologists are now realizing that there was a greater diversity of early whales in North America than they previously expected.

Millions of years ago, whales also walked along the shores of ancient Georgia. If you were to visit the beaches of what would one day become the Peach State about 40 million years ago, you might spot a strange mammal waddling along the shore or lurking in an estuary like a big, hairy crocodile. Paleontologists know this animal as *Georgiacetus*, one of several early whales whose fossils have helped experts explore how whales went from



A restoration of the extinct whale *Phiomicetus*, named by paleontologists earlier this year, preying upon a sawfish. Credit: Robert W. Boessenecker via Wikimedia under CC BY-SA 4.0

amphibious mammals to the blubbery beasts we know today.

Like the newly-named *Phiomictetus*, Gohar says, the creature belonged to an ancient group of protocetids that represent a turning point in whale evolution. Named in 1998, *Georgiacetus* resembles other early whales found in northern Africa, Asia, and, as a recent find elucidated, South America. The whale was more amphibious and retained functional hind limbs that would have allowed the mammal to stand on land. The fact that *Georgiacetus* turned up in the rocks of North America indicates that whales were capable of swimming across entire oceans, like the ancient Atlantic, even before they became fully adapted to life at sea. “Protocetids are regarded as the first cetaceans who conquered the oceans,” Gohar says.

By land or by sea, early whales moved between continents and were a larger part of Earth’s ancient ecology than paleontologists previously expected. Digging up new information about early whales isn’t just about adding new species to the growing list of fossil species. The fact that early whales keep turning up in unexpected places indicates that some were probably more adept in the water than previously recognized. By sea or by coast, whales started to move further and further afield very quickly after their origin, their lives deeply connected to the water. Long before the evolution of blowholes or blubber, whales were at home in the seas. It’s unclear where the next tantalizing find will turn up, but, given the surprising discoveries of the past three decades, fossil whales will surely keep making waves.

<https://www.smithsonianmag.com/science-nature/whales-once-walked-along-the-coasts-of-north-america-180979027>

DEATH OF LAST RIVER DOLPHIN IN LAOS RINGS ALARM BELLS FOR MEKONG POPULATION

by Carolyn Cowan

Apr. 14, 2022 — Known only by his identity code, ID#35 was the last individual of a doomed subpopulation of freshwater Irrawaddy dolphins (*Orcaella brevirostris*). He was the sole occupant of a deep pool in the Mekong River that spans the border between Cambodia and Laos, and fought for several weeks against lacerations to his tail from entanglement in illegal fishing gear. He had been struggling to swim, let alone to feed himself.

Mortally wounded, ID#35 died as many of his kin before him. Yet there was a deeper significance to the moment his pale and bloated body washed up on a riverbank in mid-February 2022: his death confirmed that the Irrawaddy dolphin is extinct in Laos.

Cetacean specialists have documented the loss of the dolphins from the Chheu Teal transboundary pool

for years. In 1993, there were 17 individuals living in the pool. By 2009, the subpopulation had dwindled to seven; three years later to six; and by 2018, only three remained. In 2021, photo identification surveys led by Cambodia’s Fisheries Administration and WWF confirmed that ID#35 was all alone.

The species, found in both freshwater and marine environments in South and Southeast Asia, is considered globally endangered. However, the freshwater populations that inhabit the Irrawaddy in Myanmar, the Mahakam in Indonesian Borneo, and Cambodia’s stretch of the Mekong are critically endangered, each with fewer than 100 remaining individuals.

With the loss of the Mekong’s Chheu Teal subpopulation, the river’s fewer than 90 surviving dolphins now exclusively occur downstream in Cambodia, where they face the same range of threats that wiped out the transboundary group.

A slow and inexorable extinction

While injuries sustained through entanglement in fishing nets directly led to the death of the last transboundary dolphin, according to local media reports, conservationists say there were many factors that contributed to the subpopulation’s decline.

“The numbers in the [transboundary] pool have plummeted over the last few years, due to multiple threats,” Lan Mercado, Asia-Pacific director of WWF, said in a February 2022 statement, “including hydro-power dam construction causing disruptions to river flow and reduced fish abundance, drowning in gill-nets, and the use of damaging fishing practices such as electrofishing and overfishing.”

Of the numerous threats to dolphins in the Mekong, gill nets — vertical netting that hangs across a stretch of water — pose the greatest risk and underly the majority of accidental drownings and entanglement injuries, according to Somany Phay, deputy director of Cambodia’s fisheries conservation department and the government liaison at WWF-Cambodia.

In 2012, Cambodia established a ban on gill nets within a dolphin protection zone that spans their 180-kilometer (110-mile) core habitat and is patrolled by a team of 72 river guards. Phay said the country also established agreements with Laos on the protection and management of the Chheu Teal deep-water pool at both provincial and national levels, including gill-net bans.

However, a lack of commitment and coordination on these agreements enabled illegal fishing to continue, particularly within Lao waters, according to a 2022 report from the Cambodia Fisheries Administration, the IUCN Cetacean Specialist Group and WWF. The loss of the transboundary subpopulation ultimately came down to a “lack of participation of Lao’s authority and fishermen” in eliminating the use of gill nets and other illegal fishing practices, the report said.

The challenges of enforcing fishing regulations across national borders were brought into sharp focus during the last few weeks of ID#35's life. Authorities and fishers had observed netting wrapped around the dolphin's tail fluke weeks before his death, according to local media reports. However, it was unclear whether this was a result of illegal fishing in Cambodia or Laos, or which country was responsible for the animal's rescue and rehabilitation. Due to the ambiguity, neither country mounted a dedicated rescue.

"There are seven river guards patrolling the Cambodia side of the pool," Phay told Mongabay. "But [because] part of the pool is in Laos, Cambodian officials have no authority to go inside Lao territory to confiscate gill nets and eliminate illegal fishing practices."

Phay added that levels of illegal fishing in the Chheu Teal pool had ramped up since the completion of the Don Sahong hydropower dam in Laos, which began operating in 2020. Located less than 2 km (1.2 mi) north of the Cambodia-Laos border, the dam blocks one of the Mekong's main channels where fishers once congregated, he said. As a result, fishers have been displaced further into the dolphin's deep-pool habitat.

Wider implications

For people living near the Chheu Teal transboundary pool, the loss of the dolphins translates to a permanent loss of potential ecotourism revenues. In particular, the cetaceans once underpinned tourism-related livelihoods and businesses in Champassak province in southern Laos.

Twenty years ago, tourists could kayak to the transboundary pool to observe the dolphins "surfacing all around," Inthy Deuansavanh, director of Green Discovery Laos, an ecotourism company that used to operate river dolphin tours, told Mongabay.

But with dolphin numbers in decline and sightings diminishing, Deuansavanh was forced to discontinue the tours five years ago, with knock-on consequences for the local community.

"We had to stop the kayaking activities there, which meant that the local people who were working as guides lost their jobs," Deuansavanh said. "At that time, the dolphins were the main attraction of the area ... boats, platforms, viewing points and restaurants, all owned and operated by local people, benefited from the business."

The subpopulation loss has strengthened the resolve of authorities and conservationists in Cambodia to protect the remaining Irrawaddy dolphins in the river. The latest population estimate in 2020 indicated that just 89 dolphins are left in Cambodia's waters, within a 180-km stretch of river between the Laos border and Kratie province. Like the extinct subpopulation, these last dolphins are largely confined to a series of deep pools, which renders them

vulnerable to genetic isolation and further pool-by-pool extinctions.

Phay said the single most important factor is stopping gill-net use in the dolphin protection zone through public outreach, improving stakeholder cooperation, and increasing the capacity of river guards to enforce fishing bans.

"We need to safeguard all the remaining individual dolphins from suffering the same fate as the transboundary population," Phay said. "We don't want them to go extinct."

<https://news.mongabay.com/2022/04/death-of-last-river-dolphin-in-laos-rings-alarm-bells-for-mekong-population>

SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see <http://www.montereybaywhalewatch.com/slstcurr.htm>

Date	#	Type of Animal(s)
5/21 10 am	18 300 500 100	Humpback Whales Pacific White-sided Dolphins Risso's Dolphins Northern Right Whale Dolphins
5/21 8 am All Day	29 8 5	Humpback Whales Blue Whales Risso's Dolphins
5/20 9 am	21 55	Humpback Whales Risso's Dolphins
5/19 9 am	12 15 6 1	Humpback Whales Risso's Dolphins Harbor Porpoise Mola Mola (Ocean Sunfish)
5/18 9 am	23 25 9	Humpback Whales (including 2 friendly whales) Risso's Dolphins Harbor Porpoise
5/17 9 am	20 300 10 200	Humpback Whales Pacific White-sided Dolphins Risso's Dolphins Northern Right Whale Dolphins
5/16 9 am	26 100	Humpback Whales Risso's Dolphins
5/15 8 am All Day	20 3 2 9	Humpback Whales Blue Whales Fin Whales Risso's Dolphins
5/14 8 am All Day	18 9 4 5 140	Humpback Whales Blue Whales Fin Whales Pacific White-sided Dolphins Risso's Dolphins
5/12 9 am	26 8 26	Humpback Whales Blue Whales Risso's Dolphins

**Membership Application - American Cetacean Society,
Monterey Bay Chapter**

Join or renew online at acsonline.org
Or mail membership form to ACS Monterey Bay,
P.O. Box HE, Pacific Grove, CA 93950



Membership Type: New ___ Renewal ___ Gift ___

Name _____

Address _____

City, State, Zip _____

Phone _____ Email _____

Membership Level _____

Membership Levels and Annual Dues

Lifetime \$1000	Patron \$500	Contributing \$250
Supporting \$85	International \$55	Family \$55
Individual \$45	Student \$35	Teacher \$35
Senior (62 plus) \$35		

Check _____ Mastercard _____ Visa _____ Expiration _____

Card Number _____ Security Code _____

DONATE

The American Cetacean Society is the world's oldest whale conservation organization, established in 1966. Dedicated to research, conservation and education about whales, dolphins and porpoises and their environment, the American Cetacean Society is volunteer-run and consists of 8 chapters within the national organization. As a 501 (c)(3) non-profit organization, donations are welcome and necessary to continue our work. To donate to the Monterey Bay Chapter of ACS, please visit www.acsmb.org or mail payment to ACS MB, PO Box HE, Pacific Grove, CA 93950. For more information about the American Cetacean Society, please visit www.acsonline.org Thank you!

**Monterey Bay Chapter
Officers & Chairs, 2022**

Brian Phan, *President*
 Katlyn Taylor, *Immediate Past President*
 OPEN, *Vice President*
 Katy Castagna, *Treasurer*
 Jennifer Thamer, *Secretary*
 Sally Eastham, *Membership*
 Tony Lorenz, *Programs*
 Emilie Fiala, *Education & Events*
 Humphrey Williams, *Research Grants*
 Debbie Ternullo, *At-Large*
 Diane Glim, *ACS National Secretary*
 Tony Lorenz, Oren Frey, *Editors*

Email: tonylorenz831@gmail.com
soundingsnewsletter@gmail.com

**MONTEREY COUNTY
HOTLINES
for Marine Mammals**

**Strandings / Entanglements /
Distress**
24-hour toll-free
877-767-9425

Harassment
NOAA Enforcement, Monterey
831-853-1964



An Irrawaddy
 dolphin
 photographed in
 the Mekong River
 in Cambodia.
 Credit: © WWF-
 Cambodia / Tan
 Someth.