



Facts: Leatherback Sea Turtles

Imminent Extinction

- Leatherback sea turtles have been around for more than 100 million years – since the Cretaceous Period (when dinosaurs roamed).
- However, they are now listed as Critically Endangered and the Pacific population is estimated to be extinct by 2015 (all seven species of sea turtle are threatened or endangered).
- There are less than 50,000 leatherback sea turtles left in the Pacific and Atlantic Oceans.
- In the 1980s, more than 90,000 nesting female leatherbacks were in the Pacific, today there are less than 3,000.

Leatherback Life History and Biology

- Leatherbacks can be found throughout the world's oceans foraging in frigid sub-polar waters and nesting (like the other six species of sea turtle) in the tropics, sub-tropics and southern temperate climatic zones. Six of the seven species of sea turtle nest in North America.
- A sexually mature female leatherback returns to the beach where she was hatched to breed and nest every two to three years. She could lay as many as seven nests in a season and lay 65-85 eggs each time and then disappear into open-ocean until she is ready to breed again.
- Female leatherbacks have been known to swim entire ocean basins (13,000 km one way in the Pacific) to reach their nesting beach, the same location where she was hatched.
- The hatchlings, small enough to fit in the palm of the hand, must brave predators both on land and at sea, and typically swim non-stop for 36 hours using only nutrients stored in their underbelly. Those who survive are often never seen again until they return as first-time mothers. These are called the “lost years,” because up to now, scientists didn't know for sure how long it took for them to become sexually mature or where they went for nursery grounds.
- Fully grown leatherbacks weigh 250-550 kg (550-1250 lbs) and measure 135-170 cm SCL (straight carapace length) with the largest weighing more than 900 kg (about the size of a Volkswagen Beetle®).
- Leatherbacks are oceanic-pelagic animals (they live off the continental shelf in the water column). They are programmed to swim continuously in open water and have no concept of boundaries or barriers, unlike the other six species of sea turtle, which forage along coastlines or in the reefs.
- Leatherbacks are the deepest diving of the sea turtles, reaching depths greater than 1,000 m.

- Leatherbacks are gelatinivores, eating solely jellyfish or ctenophores (gelatinous zooplankton), a low-calorie diet.
- Leatherbacks are the only species of sea turtle with a “soft” shell, which is primarily black with white patches. Each leatherback turtle has a unique pink spot on its head (above the pineal gland), which expands as it grows.

Why are they going extinct?

- Fisheries by-catch is the number one cause of death for adult leatherbacks in the wild, due to drift-nets, gill-nets, pound-nets, trawlers and shrimp fisheries as well as long-line fishery entanglement and foul hooking.
- Nesting beach habitat is lost to tourism and resorts.
- Light pollution from beachfront homes or cities causes disorientation of hatchlings and adults.
- In the wild, one in 1,000 hatchlings makes it to adulthood due to a combination of natural causes and human activities.
- Humans can help by reducing consumption of shrimp and pelagic fish as well as recycling and preventing pollution/litter.

UBC Rearing Project

- The UBC project marks the first time in history where more than one leatherback has been successfully raised in captivity, providing crucial comparative data for scientific research and conservation.
- T. Todd Jones and Mervin Hastings brought back the critically endangered leatherback hatchlings from Tortola, British Virgin Islands where Mervin works for the Department of Conservation and Fisheries.
- The UBC leatherback project raised 10 animals for over a year. The oldest turtle reached 42 kg and 76 cm CCL (curved carapace length) at two-years and two-months of age, making it the second largest and second longest-lived leatherback ever raised in captivity from hatching.
- Researchers around the world have attempted to raise leatherbacks in captivity since 1936. Only two other researchers have been able to maintain a single leatherback for more than a year. The UBC project marks the first time *multiple animals* were maintained for more than one year.
- In 1988, Vincent Bels, a researcher with the Muséum National d'Histoire Naturelle in France raised a single leatherback for 1,200 days reaching a mass of 49.5 kg, this leatherback was the largest and longest-lived leatherback ever maintained in captivity from hatching.

- The leatherbacks at UBC are custom-fitted with a soft harness made of rubber hose, which is attached to the top of the pool. This technique, pioneered by UBC PhD candidate T. Todd Jones, allows the animals to swim freely, changing directions, without bumping into the side or bottom of the tanks.
- Without the tethered harness, the leatherbacks would swim continuously (as they do in the wild) into the side or bottom of the tank, causing injury.
- Jones and colleague Mervin Hastings have developed a special squid “Jello” recipe to replicate what leatherbacks eat in the wild: jellyfish. The recipe consists of: human grade squid, gelatin and reptile vitamins blended and set into jelly strips.
- Leatherbacks are fed three times a day until satiation and record is kept of their diet and growth.

Research and Data

- Based on Jones’s research, a female leatherback requires 3.3 million kilojoules of energy, or more than 800 million calories, to reach sexual maturity.
- As a result, Jones estimates that with abundant food sources, female leatherbacks could reach first time nesting size (sexual maturity) in as little as seven years and mean nesting size as early as 13 years post-hatching, compared to 15-30 years for other hard-shell sea turtles. With their quicker time to maturity leatherbacks are poised to make a comeback from the brink of extinction (in the Pacific) but only if we act now to reduce fisheries by-catch and offset the effects of climatic change.
- According to Jones, leatherbacks spend more than 38 per cent of their total energy budget on osmoregulation and a combined 25 per cent for processes such as digestion, thermoregulation and locomotion. This leaves 37 per cent of daily total energy for somatic (body tissue) and reproductive (gonadal) growth.
- With increasing human pressures (harvesting, by-catch and habitat loss), coupled with climatic change due to global warming, leatherbacks are witnessing a reduction in resource availability. This causes them to spend more energy on locomotion (to find food) and thermoregulation (more time spent in colder waters foraging). This reduces energy to somatic and reproductive growth thus lowering the reproductive output of these animals – and lengthens the time it takes for female leatherbacks to reach sexual maturity.

About T. Todd Jones

- T. Todd Jones is a native to the East coast, where he grew up fishing, diving and surfing in Florida, which bred an early interest in the marine sciences.

- Upon graduating West Orange High School in Central Florida, Jones went on to receive his B.Sc. and M.Sc. in the Dept. of Biological Sciences at Florida Atlantic University (FAU) in Boca Raton, FL.
- Jones began raising leatherback turtles in the mid-1990s under the mentorship of Drs. Mike Salmon and Jeanette Wyneken at FAU learning and perfecting the rearing protocols before going on to raise them in Playa Grande, Costa Rica in 2000.
- In 2002 Jones came to the Department of Zoology, University of British Columbia, to begin his PhD under the mentorship of Dr. David R. Jones CM, FRSC.
- At UBC, Jones, along with colleague Mervin Hastings, began raising leatherbacks in the summer of 2004, this project has now become the most successful leatherback rearing project to date.
- Jones’s research has earned him the Archie Carr Biology Award, named after the father of sea turtle conservation, at the 27th Annual Symposium on the Conservation and Biology of Sea Turtles, February 22-28, 2007 in South Carolina. Jones was honoured by both scientists and sea turtle conservationists for his groundbreaking research on the physiology and behaviour of leatherbacks, which could inform better conservation policies. This is the second time Jones has won this award, first receiving it in 2002 in Miami for his research on leatherback sea turtles.



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