Environmental Conservation Issues: Grassroots Efforts in Mexico

Grupo Tortuguero and Baja California's Sea Turtles

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SEA TURTLE NATURAL HISTORY

Like all turtles, sea turtles are cold-blooded, egg-laying, air-breathing reptiles. All but one species has a hard shell composed of scales or *scutes*. They belong to the order Testudines and present day species are divided into two families, Cheloniidae (six species) and Dermochelyidae (one species). Of the seven extant species, five are almost cosmopolitan in their range while the Flatback (*Natator depressus*) is limited to northern coastal waters of Australia and the Kemp's Ridley (*Lepidochelys kempii*) is restricted to the Atlantic & Caribbean waters of the Americas.

Sea turtles have lived on Earth for at least 200 million years. The most intact fossilized remains of the world's largest sea turtle species, *Archelon ischyros* (pronounced Ar-key-lon is-key-ros), was found in South Dakota in the 1970's and was dated at 74 million years old. It measures 15 feet long from beak to tail, and 16.5 feet across from flipper to flipper. The live animal probably weighed about 4,500 pounds and the species may have lived to about one hundred years old. This, and other specimens discovered date from the Cretaceous Period (75-65 mya) when the Midwest region was covered by a shallow sea. The basic design of the smaller present day species has changed little from that of their ancient ancestors, though, like *Archelon*, they probably had a leathery carapace.

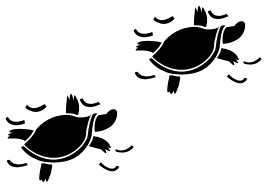
Sea turtles, once they hatch and make their way to the ocean, will never set flipper on land again, except in the case of mature females who will come ashore every two to four years to dig from 4 to 7 nests per season. The number of eggs laid (70-180) and the incubation period (52-65 days) depends on the species and nest temperature. Nest temperature also plays a role in the determination of gender, with temperatures above 30º C (86ºF) producing females, while those below 28º C (82º F) will produce males. Nests must also have ample moisture and air for proper egg development and hatchling survival.

Young turtles spend many years in open ocean waters, floating within seaweed and debris rafts, evading predators while feeding and growing. Once they have reached an adequate size to be less of a tasty morsel for predators such as sea birds and larger fish, they will make their way towards the coast to feed, remaining either well offshore or venturing closer in to shallow waters. Most are opportunistic omnivores and will eat according to available food sources. Some species of sea turtles prefer crustaceans (crabs, shrimp), mollusks (snails, squid, octopus) or jelly fish. The Hawksbill finds sponges a delicacy while sea grass and algae is more to the Green's liking.

EASTERN PACIFIC SEA TURTLES

Five species of sea turtle occur in high concentrations off of the Baja California peninsula in either the Pacific Ocean or the Gulf of California (see chart below). This concentration constitutes a large portion of the respective species' regional population. This area is a major feeding ground for all five species as well as a minor nesting area for three (Green, Olive Ridley and Leatherback). Turtles feeding in the Baja California region will spend most of their lives there except for when they migrate elsewhere to breed. The principal nesting area for the Olive Ridley population is the west coast of mainland Mexico from the states of Sinaloa south to Costa Rica. When mature, they will migrate

Common Name (US)	Nombre Común (México)	Scientific Name
Green/Black	Tortuga prieta, Tortuga negra	*Chelonia mydas*
Hawksbill	Carey	*Eretmocheyls imbricata*
Leatherback	Tortuga laúd	*Dermocheyls coriacea*
Loggerhead	Tortuga amarilla, Tortuga cabezón	*Caretta caretta*
Olive Ridley	Tortuga golfina	*Lepidocheyls olivacea*



between June and November to the breeding grounds where they will mate and the females will go ashore to nest. Ridleys participate in mass nesting events called *arribadas* (the "arrival").

In the early 1990's, a connection between Loggerhead turtles off the Pacific coast of the peninsula and those in the waters of Japan and the South China Sea was scientifically established. After an ID tag from a dead Loggerhead that had been marked off Baja California was recovered by a fisherman in Japan, scientists set out to confirm a long-held theory of a connection. In 1996 Grupo Tortuguero researcher J. Nichols was the first to successfully track a mature female Loggerhead named *Adelita* by satellite as she traveled almost directly from Baja to Japan. Since then, several other mature female turtles have been tracked and this data, along with DNA evidence, has proved that Loggerheads born on the beaches of Japan (as well as other Asian countries) migrate about 5,600 miles across the Pacific to spend their adolescence along the Baja California peninsula and then as adults return to remain in their natal waters where they will mate and nest.

TURTLES AND HUMAN INTERACTION

Sea turtles have historically been an important source of protein in coastal populations world wide. Many indigenous cultures have revered sea turtles and include them in their religious ceremonies. Sea turtles continue to play a central role in the culture of the Comcaac Nation (the Seri) of Sonora, Mexico and the tribe has become an active participant in the sea turtle conservation movement. A traditional Turtle Island story of the Onondaga tribe (New York state) tells of the Earth being supported on Turtle's back (see: http://www.turtleisland.org/front/article3.htm). In Baja California, sea turtle images appear in 1000 to 1500 year old rock paintings found on cliffs and cave walls in remote canyons throughout the southern peninsula, indicating that these peoples were familiar with the animals and that turtles must have held some significance within their culture to have been depicted in their art. Mexicans have long believed that turtle meat and blood have medicinal properties and that the eggs have aphrodisiacal effects. These traditions and myths persist to this day in many areas and present a great obstacle to sea turtle conservation.

ENDANGERED SPECIES

Currently all seven species are recognized by the IUCN (International Union for Conservation of Nature and Natural Resources) as either data deficient (Flatback), vulnerable (Olive Ridley), endangered (Green), or critically endangered (Leatherback, Loggerhead & Kemp's Ridley). They are protected worldwide by the *Convention on the International Trade of Endangered Species of Wild Fauna and Flora* (CITES). All species were placed on the CITES endangered list between 1975 and 1977 except for the Flatback of Australia (1981). Mexico's sea turtles are specifically protected within Mexico by federal decree (*NOM-059-ECOL-2001*) and the *Carta Nacional Pesquera* of 2004, although enforcement continues to be problematic. In spite of all these protections, illegal, unsustainable consumption continues in Mexico as well as worldwide. In northwest Mexico and the southwest United States alone, at least 30,000 turtles are slaughtered and sold on the black market annually mostly during Easter, Christmas and other important religious holidays, where the eating of the meat is not considered to break the Lenten rules. National holidays as well as political and social events are also times of increased turtle consumption and even officials working on environmental issues have been known to procure a turtle meal for their honored guests.

Poaching for personal or commercial consumption is not the only factor contributing to the sea turtles' plight. Incidental by-catch is another major cause of turtle mortality, killing untold thousands yearly. They drown after they are scooped up in gill nets lacking turtle exclusion devices or snagged on long lines designed to catch large fish such as swordfish or tuna. They are injured by boat propellers or drowned when they become entangled in old nets and fishing lines. Chemical contaminants (such as PCB's or the heavy metals cadmium and lead) weaken individuals and may affect long term fertility. They choke on plastic bags (commonly mistaken for jellyfish). Even the eggs are not safe once they are laid. Poachers can easily decimate a season's crop on an entire beach in some areas, as can wild and feral predators (coyotes, raccoons, wild pigs, feral dogs) that raid or otherwise disturb the carefully constructed nests.

Last but not least, the loss of pristine nesting habitat is reducing the rate of repopulation of the species as beaches are consumed for tourism or industrial projects. Coastal development brings with it invasive dune plant species that make nest digging difficult. Off-road vehicles run rampant, compacting the sand and suffocating eggs. Nocturnal lighting from hotels, homes and streets can confuse the hatchlings' ability to navigate safely and quickly toward the ocean. And it can be only assumed that global climate change will further contribute to this loss of habitat if, as projected, a substantial sea rise occurs.

Unchecked human exploitation of sea turtles, the continued systemic denial of the connection between human activity and environmental degradation, and our patent disregard for the health of the environment and all of its unique ecosystems have placed the sea turtle, among many other species, in a tightening, downward spiral. However, there are a growing number of individuals worldwide who have taken up the call to explore and address these issues as they pertain to sea turtles and in doing so, perhaps these efforts will have some rippling effect in the collective consciousness.

CONSERVATION PROJECTS—GRUPO TORTUGUERO (GTC)

In 1999, a small group of international scientists, community activists and local fishermen came together in Loreto, BCS for the first time to form Grupo Tortuguero of the Californias. Their goal was to better understand and address the factors that were leading to the decline in the Eastern Pacific sea turtle populations. A drastic decline had been witnessed in nesting populations worldwide during the 1970's and 1980's. By the mid 1990's marine scientists and environmental groups were becoming ever more alarmed by the continued decline. On one beach alone in Michoacán, the number of nesting females coming ashore during a weekend-long *arribada* had declined from 25,000 in 1970 to less than 500 in 1999 (just 2% of the previous population).

The meeting launched Grupo Tortuguero's conservation work which was begun in a few fishing villages where there was a history of heavy poaching as well as an expressed interest in the project by local people. In the intervening years, the group has brought together fishermen, poachers (now ex-), government officials, scientists, school children, business people and environmental activists to work both within individual communities and on a regionally coordinated basis. The group uses a number of different approaches and works to promote behaviors and social norms that will help to preserve turtles and their environment.

Environmental Education. This is a key component of GTC's work, which uses the sea turtle as a *flagship species*, linking its success to the health of both marine and terrestrial environments as well as to the economic success of the region. Its national and international media campaigns have been innovative and many have addressed the myths surrounding turtles in Mexican society. Its workshops, scientific meetings and environmental festivals have helped to increase participant knowledge about the environment, current environmental challenges, and how individuals and communities can take proactive measures in its stewardship. Information gathered from outside activities will be taken back to a participant's community and may be incorporated there into further activities and workshops, assuring

that information is cycled through the region. Many of these activities are geared toward children and youth, who are seen as future stewards of the area's resources. "*El futuro está en tus manos*" is the motto of EcoAmigos de Mulegé, local non-profit youth group.

Monitoring Program. Since 2001, GTC has managed a scientifically based monitoring program that brings much needed funding to local fisherman, and involves them as active participants in the research and protection of their local resources. Teams conduct a monthly monitoring where, over a 24 hour period, they capture, weigh, photograph, tag and release turtles. They receive a monthly stipend that covers expenses as well as a small salary. A number of the sites included in this project are involved only with the protection of nesting beaches and egg relocation to nearby hatcheries that they maintain and guard. Team members from each community are expected to attend and present their data at the annual monitoring meeting which is held in a different community each August.

In January 2008, its annual meeting was held in Loreto, BCS concurrently with RETOMALA (a network of Latino turtle conservationists) and the 25th Annual Symposium of the International Sea Turtle Society with over 1200 tortugueros in attendance. At that meeting, a very positive action was discussed that marks the success of GTC's conservation program. As a result of his experience with GTC fishermen and scientists from Mexico, the US and Japan, the captain of a major Mexican fishing fleet working off the peninsula's Pacific coast made a landmark decision. He voluntarily retired the fleet's long lines, thereby making a commitment to the protection of at least 700 Loggerheads yearly that would have been killed by his fleet alone within a key turtle feeding hotspot. It is further hoped that local groups will be able to pressure the Mexican government to declare their area a national marine refuge, off limits to further large-scale commercial fishing harmful to turtles.

Grupo Tortuguero celebrated its 13th annual meeting in La Paz, BCS in January 2011. At this meeting, scientific papers and monitoring project results were presented. In Puerto López Mateos, for example, it was reported that there was a 60% decrease in the annual number of beached turtles that had been killed in nets. There had also been an increase in the degree of local involvement with nine fishing Co-Ops and a total of 15 organizations involved. Other projects, in Loreto Bay and Laguna San Ignacio, have studied the distribution of turtle populations in those places to determine patterns of use by both humans and turtles. The goal is decrease the impact and mortality of turtles in those areas and help determine if further delimitation of protected or closed areas is warranted. In another community, Punta Abreojos, researchers want to look at the effects of heavy metals on sea turtles, a possible explanation for the apparently stunted size of specimens captured there.

The 14th, and the 16th through 19th annual meetings were held in Mazatlán and hosted by the Acuario Mazatlán. Having gone through a few rough years financially and a reorganization, in January 2018 GTC hosted almost 200 attendees at their 20th anniversary meeting in Loreto, BCS. New acquaintances were made and old friendships rekindled. A variety of research reports were presented as were the yearly results from the monitoring and hatchery projects. In terms of the nesting beaches, there was an increase in the number of hatchlings released during the past season as compared to the previous year. There has been a stable yearly increase in the number of hatchlings released over GTC's 20 years of conservation and the number of nesting females s at Colula and two adjacent beaches in Michoacán had returned this year to pre-1975 numbers. Yearly meetings continue to be a focal point for sharing information and forming and/or strengthening inter-community and international alliances. From the original 45 people who formed GTC in 1999, the yearly meeting has grown. In 2020 attendance at the 20th Annual Meeting in Loreto topped 350. Today GTC is working with 59 communities across the two states of the Baja California peninsula and six other Mexican states as well as collaborating with groups in eight countries. **Viva la Tortuga! ¡Viva la Revolución Tortuguera!**

VOCABULARY/VOCABULARIO

adolescence	la adolescencia	investigate/the research	investigar/la investigación
ban/banned	la veda/en veda	jellyfish	la medusa/malagua
beach	la playa	lay eggs	desovar/poner huevos
black market	el mercado negro	male	el macho
blood sample	la muestra de sangre	maturity	la madurez
boat, a type of small	la panga	migrate	migrar
breed or mate	aparearse	monitoring	el monitoreo
by catch	la pesca incidental	nest	el nido
carapace	el carapacho/el caparazón	nest/the nesting	anidar/la anidación
capture	la captura	net	la red
cholesterol	el colesterol	non-governmental org	organización no gubernamental
conservation program	el programa de conservación	non-profit organization	organización sin fines de lucro
conserve/the conservation	conservar/conservación	ocean	el mar/el océano
consumption	el consumo	patrol/to patrol	la vigilancia/vigilar
crab	el cangrejo	plastron (lower shell)	el plastrón
crustacean	el crustáceo	poacher	el cazador furtivo
decrease	la disminución	poaching	la caza furtiva
discharge (of waste)	la descarga	predator	el depredador
dive	zambullirse	retractable	retráctil/replegable
education campaign	la campaña educativa	satellite transmitter	la trasmisora satelital
egg	el huevo	scute (scales of shell)	el escudo
endangered	en peligro de extinción	sea grass	los pastos marinos
erupt (nest)	brotar	species	la especie
environment	el medioambiente	tag/tagging	la placa/el marcaje
environmental contamination	la contaminación ambiental	TED (Turtle Excluder Device)	TED (Dispositivo Excluidor de Tortugas)
feed/food	alimentar/la alimentación	the arrival = mass nesting	la arribada
female	la hembra	threaten/the threat	amenazar/la amenaza
fisher(man)	el pescador	tissue sample	la muestra de tejido
flipper	la aleta	tourist guide	el guía turística
fossil	el fósil	trade/the trade	comercializar/el comercio
garbage/waste	la basura/los desechos	turtle	tortuga, caguama
gender (also genus)	el género	turtle activist	el tortuguero
heavy metals	los metales pesados	turtle group	el grupo tortuguero
in decline	en declive	virus	el virus
internal parasites	los parásitos internos	young turtle, hatchling	la tortuguita/la cría

RESOURCES/RECURSOS

www.grupotortuguero.org *(English and Spanish)*
www.wildcoast.org
www.todostortugueros.org
www.seaturtle.org *International Sea Turtle Society*
www.euroturtle.org
www.seaturtles.org *Turtle Island Restoration Project*
https://www.widecast.org *Wider Caribbean Sea Turtle Conservation Network*

¿En las manos de quién? video— http://www.youtube.com/watch?v=W45Rmkw3tcg
Mi hombre no necesita huevos de tortuga video— http://www.youtube.com/watch?v=YnVN2VgLNZQ
Santo salva las tortugas video— http://www.youtube.com/watch?v=a0J4S6pZY8w
Santo vs. Chupacaguas video— http://www.youtube.com/watch?v=DGJROh2c6CE

Delgado, Stephen and Wallace J. Nichols. *Saving Sea Turtles from the Ground Up: Awakening Sea Turtle Conservation in Northwestern Mexico*. Mast 2005, 3(2) and 4(1): 89-104. available at: https://www.marecentre.nl/mast/documents/Mast-2004p.89-104.pdf

TURTLE FACTS

- **Worldwide species:** 7
- **Weight:** 80 – 880 lb (adult)
- **Size:** 2.5 ft – 9 ft long (adult)
- **Age:** 50 –100+ (?) years
- **Food:** crustaceans, jellyfish, sea grass, algae and sponges (species dependent)
- **Migration:** 5600 miles (Loggerhead)
- **Age of sexual maturity:** 15-30 years old

DATOS SOBRE LAS TORTUGAS MARINAS

- **Especies mundiales:** 7
- **Peso:** de 80 a 880 libras (adulto)
- **Longitud:** de 2.5 a 9 pies (adulto)
- **Edad:** de 50 a 100 (¿o más?) años
- **Alimentos:** los crustáceos, pastos marinos, medusas algas y esponjas (depende de la especie)
- **Migración:** 5600 millas (Tortuga amarilla)
- **Edad de maduración:** entre 15 y 30 años

DID YOU KNOW?

- It is estimated that only one in 1000 turtles survive to reach reproductive age.
- Black market trade results in the death of approximately 30,000 turtles each year in California, and northwest Mexico alone.
- Once they leave the nest and head to sea, male sea turtles will normally never come ashore again in their lifetime.
- Green sea turtles have been known to hold their breath for up to 5 hours.
- Sea turtles are extremely sensitive to the earth's magnetic field and use it to navigate.
- Leatherback turtles can dive up to 3200 ft.

¿SABÍAS QUÉ?

- Se calcula que solamente una entre cada mil tortugas alcanza la madurez.
- El comercio furtivo resulta en la muerte de aproximadamente 30 miles de tortugas cada año sólo en California y el noroeste de México.
- Al brotar del nido y entrar al mar, las tortugas machos generalmente nunca jamás caminarán en la tierra fuera del mar.
- Las tortugas prietas pueden contener su respiración hasta 5 horas.
- Las tortugas marinas son muy sensibles al campo magnético de la tierra y lo utilizan para navigar.
- La tortuga laúd puede zambullirse hasta 3,200 pies de profundidad.

Ick! I don't want to eat turtles or their eggs

- they are contaminated with heavy metals (cadmium, lead…)
- Green turtles have herpes and papillomatosis
- their flesh and eggs are very high in cholesterol
- they have cooties!! (internal parasites)

Me da asco. No quiero comer las tortugas o sus huevos

- son contaminadas por los metales pesados (el cadmio, el plomo…)
- Las tortugas prietas sufren de herpes y papillomatosis
- la carne y huevos contienen altos niveles de colesterol
- ¡Son infestadas por parásitos internos!