



for a living planet®

*the Turtle Thief, the Fishermen  
and the Saint*

a report on the  
consumption of  
sea turtles during lent

*2006*

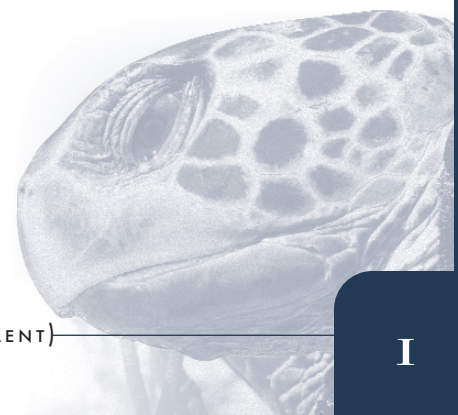
written & compiled by:  
wallace J. nichols and  
jennifer L. palmer



## table of contents

---

I. EXECUTIVE SUMMARY .....	2
II. FOOD, FEASTS, COMMUNION AND CONSERVATION .....	3
III. STATUS OF THE WORLD'S SEA TURTLES AND THEIR USE AS FOOD .....	4
IV. A CASE STUDY: SEA TURTLE HUNTS OF PACIFIC MEXICO .....	5
V. THE CULTURAL CONTEXT OF SEA TURTLE FEASTS .....	8
VI. THE TURTLE THIEF, THE FISHERMEN AND THE SAINT: AN ESSAY.....	9
VII. POPE BENEDICT XVI .....	14
VIII. ACKNOWLEDGEMENTS .....	14
IX. LITERATURE CITED .....	14



## I. EXECUTIVE SUMMARY

---

In conservation, it is rare when a single statement could help save thousands of endangered animals around the world, especially when that statement comes from a single iconic figure.

Pope Benedict XVI has a unique opportunity to greatly advance ocean protection and the recovery of endangered animals. *An official declaration from the Vatican, broadcast to the more than 1 billion Catholics worldwide, stating that sea turtle flesh is red meat and inappropriate food during this religious time, could help assuage this tradition and allow sea turtle populations to recover.*

For centuries, sea turtles have been used as feast food throughout Latin America during Catholic celebrations such as Easter and Christmas. During Semana Santa, or the Lenten season, traditional Catholic rules prohibit the consumption of ‘meat’; yet allow food such as ‘fish’ and other types of seafood to be eaten. Although sea turtles do live in the sea, they are not fish, invertebrates or crustaceans, but are actually reptiles related to tortoises, lizards, and even dinosaurs. The tradition of serving sea turtle during Lent is largely due to the fact that the Catholic Church asks its members to abstain from eating meat during the days prior to Easter. However, sea turtles are incor-

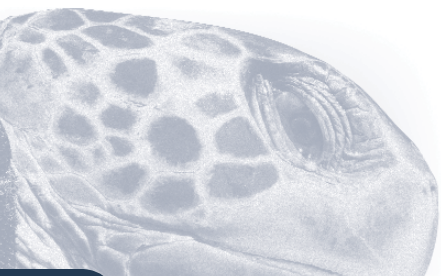
rectly considered ‘non-meat’ food, as sea turtle meat is red and sea turtles are not fish.

Sea turtles have been swimming the ocean for millions of years, but are now facing a real threat of extinction. Currently, six of the seven species of sea turtles are either endangered or critically endangered, and for some populations there are so few that their status is simply unknown. These species are slow growing and long lived, thus making populations extremely vulnerable to massive declines. It is estimated that along the Pacific coast of Mexico as many as 10,000 endangered green, loggerhead, and olive ridley sea turtles are taken for feast food each year during Catholic religious holidays. Other species, such as the leatherback, are also at risk as sea turtle eggs are collected in massive quantities throughout Latin America. In the eastern Pacific Ocean the recovery of green turtle populations has been thwarted in part by this traditional, but yet illegal, use of sea turtle meat. For many populations of sea turtles, each and every individual makes a difference for their survival. Sea turtles are indicators of our ocean’s health and we depend upon the ocean for our own existence. Thus, if these ancient navigators vanish during our lifetime, our future is likely just as bleak.

---

“POPE BENEDICT XVI HAS A UNIQUE OPPORTUNITY TO GREATLY ADVANCE THE PROTECTION OF THE OCEANS AND ENDANGERED ANIMALS WITH A SINGLE STATEMENT.”

---



## II. food, feasts, communion and conservation

---

A feast, traditional or religious, is a time to bring together family and friends. It's a time to celebrate, a time to embrace, a time of rejoicing. Food is the cornerstone of such gatherings, yet 'feast food' is more than calories, vitamins and nutrients. It is emotional. It is family. It is tradition. Feast food is power and it is often an immovable symbol of community (Campbell 2005). "Food is a bearer of significance as well as the material object of consumption" (Atkins and Bowler 2001).

However, when a feast linked to spiritual or social celebration includes motivation to buy, sell, or consume endangered species, conservation becomes far more than just a matter of science and policy (Chakraborty 1992, Nabhan 2003, Smith et al. 2003).

One of the most important celebrations in the Catholic religion is Lent, an Easter holiday, which restricts certain types of food, yet allows the consumption of special "non-meat" feast food including sea turtles, which are endangered. For Catholics in the 7th century, Lent meant no meat, eggs, milk, butter nor cheese for forty days. Lord Byron, in his poem "Beppo", described it this way:

*And thus they bid farewell to carnal dishes,  
And solid meats, and highly spiced ragouts,  
To live for forty days on ill-dress'd fishes,  
Because they have no sauces to their stews.*

Traditionally, the original church rule during Lent has long been "no meat"—so fish, mollusks, and crab have always been permitted because they are "cold blooded". Throughout Catholic history, cold-blooded turtles and frogs were also added to this list. Snails, raised at convents and monasteries as food for Lent, were later allowed, as were iguanas and alligators. Newborn rabbits, dugongs and manatees (marine mammals) and capybara (an aquatic rodent) were included in the list of permitted fare. However, creative interpretation of the Lenten dietary rules reached a new level with 11th-century aristocratic monks at the St. Gall monastery in Switzerland. These epicures included shipping in exotic seafood for Lent (i.e. whales), declaring beavers cold blooded, and specially reclassifying ducks, geese, partridges, and pheasants as "feathered fish" for the duration of the Lenten season.

Such is the case in modern times, as in many parts of the world sea turtles as well as fresh water turtles, tortoises, iguanas and even capybara (a large aquatic rodent) are presently hunted, sold and eaten during the Easter or Lenten season, when "meat" is prohibited but "fish" is allowed. The tradition stems from a widespread and historically rooted interpretation

that turtles are "fish" (Delgado and Nichols 2005).

Easter Week (Semana Santa) and other religious holidays are the peak seasons for sea turtle hunting in many parts of Latin America and other parts of the world (Garcia-Martinez and Nichols 2000, Macys and Wallace 2003). The tradition of serving sea turtle for Easter is largely due to the fact that the Catholic Church asks its members to abstain from eating meat during this holy week. Sea turtles are incorrectly considered appropriate "non-meat" food, or "fish". However, sea turtle meat is red, and in fact sea turtles are reptiles, not fish. A clarification of this matter by authorities of the Catholic Church would greatly influence this culinary custom, help draw needed attention to the problem, and aid in the recovery of sea turtle populations (Felger et al. 2005).

For this reason the help of the Vatican is needed to reach the more than 1 billion Catholics worldwide with a simple message: save endangered sea turtles.

An official statement from the Vatican, declaring that sea turtle flesh is meat, thus is inappropriate food during this religious time, could help assuage this tradition and allow the turtle populations to recover.

Issues of inequality and poverty often underlie environmental problems. However, in this case large numbers of people are not consuming sea turtles out of necessity during Lent. Many coastal and urban consumers of sea turtles have other more affordable, accessible, and legal ways to nourish themselves. The sea can sustain us if the right decisions are made, if resources are managed properly and if the most vulnerable species, such as endangered sea turtles, are allowed to recover.

The Vatican has a special opportunity to contribute considerable conservation gains simply by clarifying that sea turtles are not fish and that their flesh is meat. Such a pronouncement could significantly assist the recovery of several vulnerable sea turtle populations.

On July 8, 2002, a letter signed by 63 conservation and spiritual leaders from 13 countries was sent to Pope John Paul II at the Vatican, asking his assistance in protecting endangered sea turtles (Nichols et al. 2003). To date, the Vatican has responded with only a short communication that the original letter was received. This global campaign to save sea turtles should continue until a clarification is made.

### III. status of the world's sea turtles and their use as food

With the exception of the Arctic Ocean, sea turtles are found in all the world's oceans, and some species even make transoceanic migrations. Six of the world's seven species of sea turtles are endangered or critically endangered. The leatherback, kemp's ridley, and hawksbill turtles are listed as 'critically endangered'—meaning the species is facing an extremely high risk of extinction in the wild in the immediate future, with a population reduction of at least 80% over the last 10 years or three generations. Olive ridley, loggerhead, and green turtle's status is only slightly better, as they are listed as 'endangered'—meaning a population reduction of at least 50% over the last 10 years. There is insufficient information available to assess the status of the flatback turtle (Baillie et al., 2004).

With seven species in total, the leatherback is the largest, measuring six to seven feet (2 m) in length and three to five feet (1 to 1.5 m) in width, with a weight up to 1300 pounds (600 kg). Most other species are smaller, such as greens, loggerheads, and olive ridleys, being two to four feet in length (~0.5 to 1 m) and proportionally less wide. Sea turtles are slow growing, long lived species, often times not reaching maturity until 25 years of age and surviving to be over 80 years old.

Historically, coastal peoples have gathered turtle eggs and hunted sea turtles for their meat for thousands of years. The most commonly eaten sea turtle meat comes from the green sea turtle; however, loggerheads, ridleys, and occasionally hawksbills and leatherbacks are also consumed by humans in various regions.

Currently, the only legal use of marine turtles in the Western Hemisphere is in Cuba, Costa Rica (e.g. eggs in Ostional) and the British Caribbean Island states such as Cayman Islands, British Virgin Islands, Turks and Caicos and Montserrat. Use of turtle meat is illegal in all of the countries along the Pacific coast of the Americas and strict laws, steep fines and even jail penalties protect turtles. However, the ritual of eating turtle meat during holiday celebrations still represents one of the main threats to sea turtle survival and a significant barrier to the recovery of some populations. For example, in Pacific Mexico, during Semana Santa, the Holy Week preceding Easter, thousands of inland residents journey to coastal communities in search of sea turtles and other seafood. During this week, as many as 5,000 turtles are consumed in this region alone and much of the conservation gains made during the year are negated (Felger et al. 2005).



*Turtles are caught in entanglement nets and sold alive.*

Gaining accurate information on the scope and magnitude of illegal sea turtle hunting in Latin America can be exceedingly difficult and even dangerous. TRAFFIC's report, "Swimming Against the Tide", reviewed the exploitation, trade and management of marine turtles in 11 northern Caribbean countries and territories (Fleming 2001). It revealed that sea turtle meat and eggs are consumed by communities throughout the region. Additionally, products are made from the turtles, including oil, cartilage, skin and shell—providing everything from basic sustenance to luxury items. While estimating the annual hunt of sea turtle in all of Latin America is a daunting task, specific information does exist for some regions. For example, estimates include as many as 50,000 turtles killed for their meat each year in Mexico (Cantu, pers. comm., Nichols 2003a, Koch et al. 2006) and more than 10,000 in Nicaragua (Lagueux 1998, Campbell and Lagueux 2005). Moderate levels of sea turtle hunting for human consumption has also been documented in Belize, Columbia, Costa Rica, El Salvador, Ecuador, Guatemala, Honduras, Nicaragua, Panama, Peru, and Venezuela, although the tradition of eating sea turtle during Lent is strongest along the Pacific coast of Mexico (Opay 1998, Chacón 2000, Nichols 2003a, Alava et al. 2005, Ordonez-Espinosa et al 2005, Troeng, pers. comm.).

The use of sea turtles varies greatly throughout Latin America as well as within countries (see Table 1, page 7). For example, while sea turtle eggs are collected and eaten on Costa Rica's Pacific coast, their meat is less commonly consumed. But on the Caribbean coast of Costa Rica, green turtles are hunted for their meat and their eggs are collected as well (Arauz, pers. comm.).

## IV. A case study: sea turtle hunts of pacific mexico

Some of the best and most relevant information on the use of sea turtles comes from the Pacific coast of Mexico (**Figure 1**). Although sea turtle meat is consumed year round, there are strong peaks during Lent (*Felger et al. 2005*).

The importance of the northwest Mexican coast for sea turtles is primarily in its value as a rich and diverse nursery and feeding area. Five of the world's seven sea turtle species forage and grow to maturity in this region, then return to the beaches where they hatched. Nesting beaches for sea turtles feeding in waters of northwest Mexico are often located thousands of miles away. For example, green turtles along the coast of the Baja California peninsula nest more than 1,000 miles south in the Mexican state of Michoacan. Loggerhead turtles foraging in northwest Mexican waters hatch on Japanese beaches, some 6,000 miles away, and make transoceanic migrations that include developmental areas along the Mexican coast (**Figures 2 and 3**). Sea turtle migrations connect the entire ocean (*Nichols 2003b*).



**Figure 1 — Map of Northwest Mexico**

However, the ocean is far from safe for these animals. Legal prohibitions intended to control human actions such as predation, consumption, and fisheries by-catch of sea turtles, as well as pollution and destruction of their habitats, have been ineffective. Despite the 1990 ban on killing sea turtles and collecting their eggs, and despite penalties that include prison sen-

tences as long as twelve years for doing so (*Código Penal Federal de México 1996*), the illegal hunting of sea turtles and gathering of their eggs continues (*Koch et al. 2006*). Recently, PROFEPA [Mexican environmental enforcement agency] Deputy Minister Francisco Gines warned: '[W]e cannot do anything against illegal [sea turtle] trafficking on our own. We need the population's help to completely stop the consumption of eggs and meat' (*Rutler 2004*).

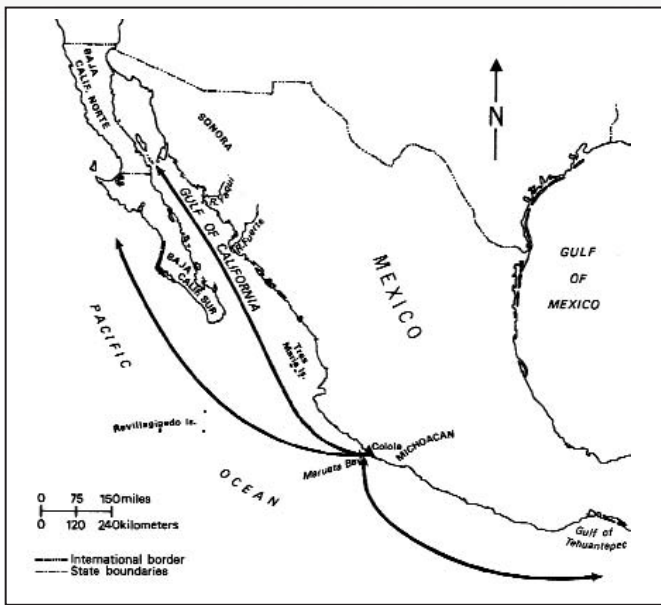
Collecting accurate information on the scope and magnitude of black market activities can be exceedingly difficult and even dangerous. In northwest Mexico, the connection between illegal markets and drug traffickers has hindered both reporting of such mortality and enforcement action—deemed too dangerous to risk the lives of enforcement agents. However, if we are to develop accurate, effective conservation strategies, it is critical that a workable estimate of all sources of sea turtle mortality be made.

Current research on sea turtle mortality is based on extensive interviews, observations, and tagging studies. These data were collected and extrapolated from many sources including: a) hundreds of interviews with fishermen and residents of dozens of coastal communities, b) direct observations of sea turtle hunting, c) isolated and anecdotal reports of turtle hunting, d) extensive mark-recapture studies, and e) satellite tracking (**Table 1**).

Researchers from various universities and agencies indicate that the consumption of sea turtles in northwest Mexico is as high as 35,000 turtles annually (*Delgado and Nichols 2005*). This estimate is backed by studies from the Universidad Autonoma de Baja California Sur (La Paz, BCS), Centro para Estudios Costeros (San Carlos, BCS), CIBNOR (La Paz, BCS), ProPeninsula, Defenders of Wildlife, Wildcoast, University of Florida, University of Arizona, Centro Regional Pesquera (Ensenada, Baja California), Greenpeace, Mexico (Mexico City), Fundacion para la Conservacion de los Picudos (La Paz, BCS), and Amigos del Mar de Cortez (San Carlos, Sonora).

It was conservatively estimated that 1 or 2 sea turtles per week, on average, were consumed in each coastal community of northwest Mexico (*Nichols 2003b, Koch et al. 2006*). Given this estimate, for a region with more than 300 coastal communities, 15,600 to 31,200 turtles would be consumed annually. With peak holidays such as Easter (Semana Santa) and Christmas, the additional black market trade to urban areas is thought to exceed 10,000 turtles annually, adding even more to the total of sea turtles taken each year.

Turtles are principally hunted using nets, longlines, or harpoons. Some are kept alive in pens and transported in large trucks, pick-ups, or in trunks of cars. There are two types of markets for sea turtles: the local market and the export market. In the first case, the turtle is consumed in the capture area or a nearby community or city as a family or festive meal. In the export market, the turtle is captured and sent from the capture areas to cities such as Tijuana, Ensenada, Mexicali, and in some cases to U.S. border cities such as San Diego and Tucson. In these cities, the turtle is sold to restaurants where it is prepared and sold as turtle soup. During holiday times, such as Easter Week, it is common to find sea turtle fillets for sale in all of these cities.



**Figure 2 — Migration of green turtles from Colola, Michoacan, Mexico nesting beaches (Alvarado and Figueroa 1992).**

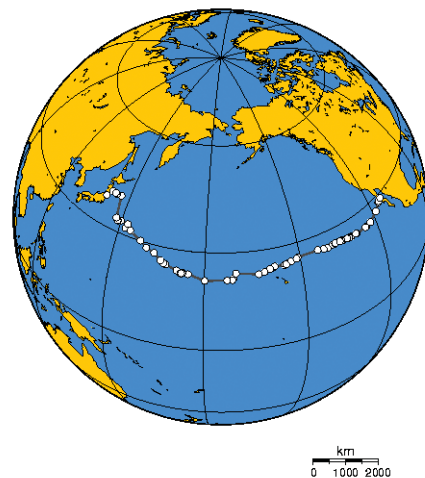
Supporting these estimates are the following facts (Table 1) and first-hand reports from northwest Mexico (Nichols 2003a, pers. comm. to WJN, 2000-2003). Anecdotal information and personal observations of the enormity of this problem are common and provide a vivid account of the sea turtle poaching issue, as well as the difficulty in estimating the extent of the problem.

“Charo, who lives in front of the Palacio Municipal in Santa Rosalia (Calle Plaza # 10) is from an established family in the town and is in the business of shipping live sea turtles in luggage aboard the bus which regularly visits on its way to Ensenada. Charo knows the bus line drivers and has their tacit consent. When the luggage arrives in Ensenada, it is claimed by someone who sells the turtle meat for 300 pesos/kilo [~\$14/lb.] to restaurants or other buyers.”

“A guy in PROFEPA [Mexican environmental enforcement agency] knew one of the owners of a shrimp fleet and asked him to investigate. He found out that many shrimp boats take the TED [Turtle Exclusion Device] off once they are at sea and capture sea turtles to sell them in the black market of sea turtle meat in northern Mexico. They do this especially when shrimp capture is low. He also found out that in fact a shrimp boat dumped the sea turtles when he got into trouble with bad weather and had to seek refuge inside the lagoon. But this is not documented at all.”

“...when a fisherman sees a sea turtle [he] tries to catch it somehow, even [though] they know it’s forbidden to catch [sea turtles]. The problem is that enforcers are never around because of the lack of money to move around. Lately (1999) fishermen have found shrimp at Bahia Sebastian Vizcaino, the word has spread and every year more are coming this way. I’m almost sure that the dead sea turtles found at Laguna Ojo de Liebre were from a ship who decided to throw [them] overboard [to avoid port enforcement officers].”

It’s very difficult to place a figure on the precise number of sea turtles hunted and eaten during Lent. However, based on the available research and reports of similar seasonal activities from around Latin America and the world, the global total of sea turtles consumed during Lent likely reaches tens of thousands annually. Specifically, in the case of the endangered Eastern Pacific green turtle (*Chelonia mydas*) and North Pacific loggerhead turtle (*Caretta caretta*) the seasonal turtle hunts to meet the demand during Lent represent substantial barriers to population recovery. Eastern Pacific green turtle, widely consumed in Latin American countries, has declined more than 95% in the past decade (Alvarado et al. 2001).



**Figure 3 — Migration of a loggerhead turtle from Baja California to Japan determined through satellite telemetry (Nichols 2003b)**

**Table 1 — Population of Catholics, sea turtle status and turtle use in eastern Pacific countries.**

Country	United States	Mexico	Guatemala	El Salvador	Nicaragua	Costa Rica	Panama	Colombia	Ecuador	Peru	Chile
Catholic population	64, 621,000	123,393,000	10,304,000	5,436,000	5,212,000	3,763,000	1,799,000	38,406,000	11,749,000	28,160,000	1,021,000
	Status										
LEATHERBACK (Dermochelys coriacea)	CR	NA	eggs	eggs	eggs	eggs	eggs	eggs	eggs	NA	NA
HAWKSBILL (Eretmochelys imbricata)	CR	NA	meat/eggs	eggs	eggs	eggs	eggs	eggs	eggs	NA	NA
EAST PACIFIC GREEN TURTLE (Chelonia mydas)	E	meat	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat	meat
OLIVE RIDLEY (Lepidochelys olivacea)	E	meat	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat/eggs	meat	meat
LOGGERHEAD (Caretta caretta)	E	meat	meat	NA	NA	NA	NA	NA	NA	meat	meat

**CR = Critically Endangered E = Endangered D = Data Deficient NA = Not Available**



Sea turtles are typically butchered alive, their hearts beating for as long as 20 minutes after slaughter.



Sea turtle meat is commonly eaten as soup, steaks or tacos.

**Table 2 — Chronology of recent illegal sea turtle use in northwest Mexico.**

Year	Location	Event	Source
1993	El Caparrito Beach, Guerrero Negro; Ensenada; El Sauzal de Rodriguez, BCS Mexico	19 green turtles, illegally captured at El Caparrito Beach in Guerrero Negro, BCS, were confiscated by Mexican Federal Highway Police from an illegal market in Ensenada, BC. The market value was estimated at US\$ 7,000 US. The turtles were released 10-12 miles off El Sauzal de Rodriguez (North of Ensenada).	Resendiz and Hernandez 1993
1996	Baja California Sur, Mexico	The army detained two people with 10 live black sea turtles in Baja California Sur.	El Universal, 10 February 1996
1996	Santo Domingo and La Paz, BCS, Mexico	During the four months of the sea turtle season, up to 30 turtles per day could be captured in the coastal town of Santo Domingo, BCS. Illegal fisherman called "guateros" said they had to bribe government authorities in La Paz to be able to poach. One of the PROFEPA inspectors confessed that since they receive salaries of 2,000 pesos (US \$ 200) per month and must collect their salary in La Paz, a trip that costs them 500 pesos (US \$ 50), they have no choice but to participate in the illegal transactions.	La Reforma, 19 August 1997
1997	San Ignacio Lagoon, BCS, Mexico	In March 1997, 10,000 pounds of green turtle meat were reported to leave the San Ignacio Lagoon, BCS area each week.	N. Labudde, unpublished report, March 1997
1997	La Paz and Los Cabos, BCS, Mexico	Prices of sea turtle meat: at the beach (US\$ 1 per kg), La Paz (US\$ 5 per kg), Los Cabos (US\$ 6 per kg).	La Reforma, 19 August 1997
1997	Ojo de Liebre Lagoon, BCS, Mexico	In December 1997, at least 97 black sea turtles died in Ojo de Liebre Lagoon, BCS Mexican wildlife agents examined several hypotheses for this mass mortality. The leading hypothesis is that the stranding was caused by the jettisoning of turtles, caught for the holiday market, by shrimp trawlers. The trawlers were forced unexpectedly to enter the port due to foul weather.	Exportadora de Sal, S.A. 1998. Analisis tecnico-cientifico del documento "Mortandad de tortugas marinas en la Laguna Ojo de Liebre, BCS". Grupo Tecnico de Exportadora de Sal, S.A. de C.V., Guerrero Negro, BCS. 27 pp.
1997-2000	Baja California Sur, Mexico	Ten green turtles were satellite tracked in Baja California waters; two, and possibly a third, of those turtles were eaten in less than one year, representing one of the highest mortality rates recorded globally.	Hays et al. 2003
1999	Sinaloa, Mexico	Municipal Police in Sinaloa found 4 butchered sea turtles in a clandestine slaughterhouse.	La Jornada, 15 June, 1999
1999	Baja California Sur, Mexico	The Federal Judicial Police and Army seized 250 kg of black sea turtle meat in August 1999.	La Jornada, 16 August, 1999
2000	Baja California Sur, Mexico	Estimated 4,160 – 9,600 sea turtles hunted illegally for the black market each year in Baja California, based on an estimate of 10 fishing camps and detailed information from Laguna San Ignacio.	Cantú and Sánchez 1999
2001	Baja California Sur, Mexico	Local sea turtle consumption in the Bahía Magdalena region is estimated at a minimum of 564 sea turtles per year, based on counts of carapaces from dumps and fish camps in 1999.	Gardner and Nichols 2001
2001	Ensenada and Bahía de los Angeles, BCS, Mexico	Mexican federal agents confiscated 500 sea turtles in Ensenada, BC, all from Bahía de los Angeles, BC.	Nichols 2003a
2001	Baja California Sur, Mexico	In all fishing camps surveyed, sea turtles were hunted. However, in some regions the tradition is stronger: Laguna San Ignacio, Santa Rosalia, San Bruno, San Lucas and others. In these places turtle hunting is common and the sale of turtle is open. One only needs to ask for a turtle and a live animal is brought from the areas where turtles are tied.	Zuniga-Arce 2001
2001	Isla El Coyote, BCS, Mexico	Fishermen from Isla El Coyote, BCS report that boats from the state of Sinaloa capture and transport approximately 25 turtles per boat each week to mainland markets in Mazatlan, Culiacan, and Los Mochis, Sinaloa.	Zuniga-Arce 2001
2002	San Ignacio Lagoon, BCS, Mexico	One convicted poacher, Francisco Fisher of San Ignacio, BCS, admitted on videotape to catching and selling more than 100 metric tons of green turtles during his 8 years as a poacher. That equates to 5,000 turtles, or 625 turtles per year.	C. Mayoral, pers. comm., 2002
2003	Baja California Sur, Mexico	Sea turtle meat is commonly served at meetings of fish, politicians, and drug dealers.	El Universal, 24 August 1997; M. Villalejos, personal communication, Loreto, BCS, February 2002
2003	Baja California Sur, Mexico	Consumption of immature and young adult sea turtles predominates. Most of the turtles consumed in northwest Mexico are in the immature size range.	Nichols 2003b
2003	Baja California Sur, Mexico	Corruption and conflict of interest make enforcement of sea turtle protection laws difficult. For example, federal wildlife agents are often threatened when enforcing the laws. Bribes	Nichols, W.J. and J.A. Seminoff, Unpublished data; Seminoff et al. 2003
2003	Baja California Sur, Mexico	Flipper tagging of sea turtles, and subsequent tag returns indicate that a minimum of 10-25% of study turtles are captured by fishermen within a year.	Nichols 2003a
2003	Baja California Sur, Mexico	In urban areas one kilogram (approximately 2.2 pounds) of turtle varies in price from 300 to 400 Mexican pesos for meat (approximately US \$ 15 to US \$ 20 per pound), whole turtles cost from 50 to 100 pesos/kg (US \$ 2.50-5.00 per pound). A serving of sea turtle in restaurants is sold for approximately US \$20 in urban areas. A large sea turtle can render up to 100 restaurant servings (US \$2,000).	Nichols 2003a
2006	Baja California Sur, Mexico	Average sea turtle consumption in the Bahía Magdalena region is estimated at a minimum of 342 sea turtles per year, based on counts of carapaces from dumps and fish camps	Koch et al. 2006

## v. The cultural context of sea turtle feasts

---

When compared with green turtle populations of the Atlantic, Caribbean and Indian Ocean regions, the turtle populations of northwest Mexico were spared until relatively recent times—due primarily to the harsh climate, small human population, and remoteness of the peninsula. The long tradition of turtle hunting and consumption runs from indigenous peoples, such as the Seri Indians, through current inhabitants of the region. Given the wealth of traditional history and connection, the green turtle may be the most important animal in northwest Mexico.

However, following the expanded markets of the 20th century, human population growth, and commercial fisheries development, sea turtle numbers have dwindled (Felger et al. 2005). In addition to the obvious economic incentives of the fishery, sea turtles are also culturally important in the region, with their use dating to pre-Colombian times. Turtles were regularly consumed locally in a variety of forms, prompting reference to the green turtle as the “black steer” due to its importance as “the chief source of meat in that barren peninsula” (Caldwell and Caldwell 1962).

The expanded significance of sea turtles as a valued nutritional resource and cultural object resulted in an increased economic significance for these animals. Through the mid-1900s many families in northwest Mexico relied on sea turtles to earn a living and worked in some way in the procurement and distribution of these animals (O'Donnell 1974).

Certainly turtle meat was—and still is for some—an important source of protein. Consumption of turtle meat was equated with good health, physical vitality and stamina, virility, and festive celebrations. Sea turtle blood and oil were thought to have medicinal qualities and were prescribed to cure ailments such as anemia and bronchitis. One would be hard-pressed to locate a native of the region who has not been raised on sea turtle meat and once cured by turtle remedies. These traditions have not abated, and most coastal inhabitants still include sea turtle meat as a regular, if not frequent, part of their diet and culture.

The deeply integrated nutritional, cultural, and economic significance of sea turtles for the peoples of northwestern Mexico is interestingly mirrored by a similar tradition among the Miskito Indians of Nicaragua. Cultural geographer Bernard Nietschmann has nicely stated the pervasiveness of sea turtles in Miskito culture: “Turtling is more than a means to get meat, turtles are more than simply a source of meat, and turtle meat is more than just another meat...turtling and turtles are part of a way of life, not merely a means of livelihood. The activity and the product are not elements that can be simply

lost or substituted without consequent deep change in cultural patterns (Nietschmann 1982:441)”.

This statement is similarly applicable to the significance of these animals for many of the peoples of northwestern Mexico. Likewise in northwest Mexico, a turtle moves from the fisher to the butcher (typically male) to women who prepare the meat. The meat is then shared with kin and friends. When a sea turtle is hunted, it is an event. There is a deep fondness, respect, and curiosity for the turtles—although the process of butchering of turtles appears brutally cruel (Steinbeck 1951).

When turtle meat is shared among families and friends the process is imbued with symbolism—consciously or not. An offer of a turtle feast is considered among the highest honors and displays of trust (Delgado and Nichols 2005).

It should not be surprising that recently enacted laws against killing sea turtles and collecting their eggs would fail to halt the centuries old traditions of consuming turtle meat and eggs. In this light, a Mexican fisherman from Isla Holbox, an island off the Yucatan Peninsula of Mexico, aptly illustrates the cultural conflict between the need to respect local traditions that have existed for hundreds of years and the need to save sea turtle species that have existed for millions of years:

*“Since we were little kids, we’ve had the importance of eating turtles impressed upon us. It’s as if they taught you, as a child, to believe in the Virgin Mary, the Virgin of Guadeloupe, and then from one day to the next they tell you not to believe in her” (Macys and Wallace 2003:623).*

This example, from another part of Mexico, accurately reflects a similar cultural dilemma in northwestern Mexico: human actions are the most direct and significant threats to sea turtle populations. However, carefully understanding and addressing the cultural practices and social pressures associated with consumption and exploitation of these species are necessary if we are to successfully change this destructive course.

While the cultural—as well as economic, social, and ecological—challenges of sea turtle conservation are indeed difficult, the clear need for the protection of these species and the marine environment that they inhabit is immediate and imperative if we hope to preserve both.

The loss of sea turtles represents a threat to far more than a single commercial species. It’s the historic, and even spiritual, connection to these animals that will help harvest the political will needed to recover turtle populations.

## vi. The turtle thief, the fishermen and the saint: an essay



My 1972 International Travelall 4x4 was overloaded, overworked and beginning to overheat under the desert sun. The roof and cargo spaces were packed with research and camping equipment, a limited supply of dry ice, one dog and my nearly expired scientific permits. I was driving fast on the gravel and washboard road between the Pacific fishing village of Punta Abreojos and the main Highway One. It's said that at a certain velocity, bumpiness disappears, peaks and valleys of the washboard blend as tires float, occasionally touching the ground. I had located that threshold speed. My brown truck and I hummed past the creosote bushes.

When my side of the truck felt too low—like a flat—I stuck my head out the window in time to glimpse one of my rear Goodyear AT tires zip by, attached to half an axle. As I slowed, dragging the steel wheel-less brake assemblage through the gravel, the wheel/axle bounded through the desert ahead like a jackrabbit being chased by a coyote. Our dust passed us.

I climbed out of the truck and surveyed the 150-meter trench I'd plowed. The roadtrip-ending reality of this breakdown set in, accentuated by the 100 kilometers of uninhabited desert surrounding me in every direction.

I sent messages out with each passing traveler, mostly fish-

ermen headed to the villages of San Ignacio or Vizcaino for routine supply runs.

"*Todo bien* (everything ok)?" they'd ask.

"*Perfecto* (just fine)," I'd answer, leaning on the disembodied axle. (At this point, it was being used as a pitiful toilet paper holder.)

"Send a big tow truck," was always my parting message.

I'd wave several times, especially if they had children riding in their truck bed,

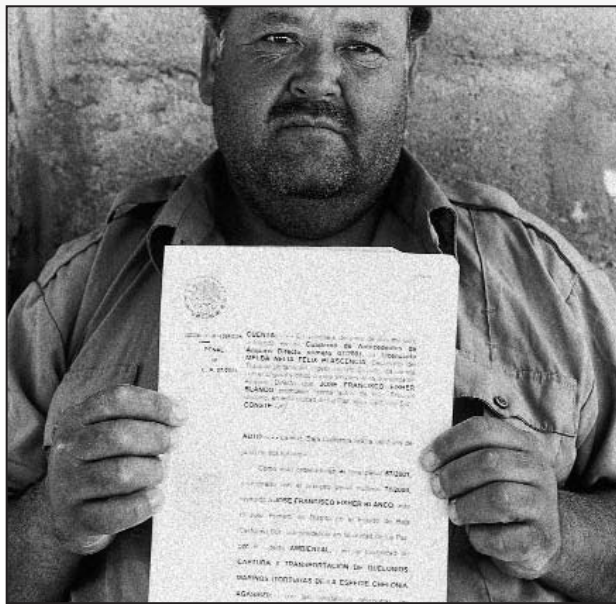
and they'd continue down the road surely enjoying a chuckle at my expense.

Twenty-eight hours later, at 2:00 A.M., one big tow truck piloted by a sleepy man came to my salvage. We hauled the Travelall backward over the washboard to Highway One, then south to the town of San Ignacio to the dirt lot in front of *Gruas Cadena*, the local auto repair shop, where I slept. In the morning, the mechanic and I assessed the damage and decided that parts from a 1975 Ford – ground down – could work. I went for some breakfast with my dog Red.

## THE TURTLE THIEF

At the mechanic's place, a shade structure surrounded by an acre of rusted and oily parts from decades of wrecked trucks like mine, I met Gordo.

Francisco "Gordo" Fisher sat on a bench seat ripped from another deceased truck, drinking a caguama – the oversized thirty-six-ounce bottles of Mexican-brewed Tecate beer. I sat across from him on the edge of a tire. Gordo is a large, unmissable man. He has a fleshy face and gentle eyes. His voice is somewhat high-pitched and he speaks in a non-linear way, bouncing from subject according to an unseen script.



**Francisco "Gordo" Fischer, a former sea turtle poacher, with his arrest papers.**

Talk turned from trucks to fishing, then to sea turtles. Gordo bragged about his prowess in catching them—all sizes—and selling them. According to his own estimate, he caught upwards of 1,000 turtles each year and trafficked them up the peninsula to a buyer on the border who sold them for as much as \$500 each. As Gordo drank, I filled pages in my field notebook with his data. How and where turtles are caught (with long gill nets in the lagoon), how they are smuggled north to Ensenada and Tijuana (over backroads at night), how the frequent military checkpoints are negotiated (walkie-talkies and bribes), how much a single live turtle can sell for (over US\$500), how the turtle-selling business peaks around the Easter holiday and who buys them (influential officials and restaurateurs).

Finally he asked, "Why are you so interested in las caguamas?"

"I study them. I have a permit from your government to

catch and tag them. We are trying to save them."

"I can help you catch many sea turtles," he said.

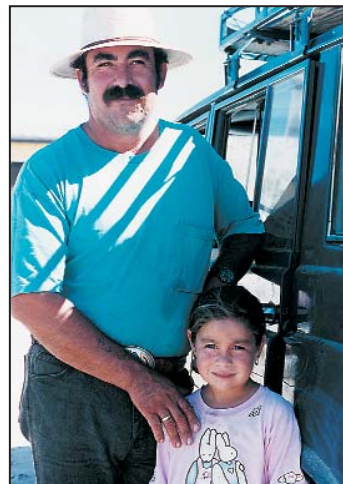
I'm sure you could, I thought.

We headed to the lagoon. Me thinking: This guy can help me make up lost time. He thinking: Sea turtle permits! This guy is my new business partner!

With Gordo as my guide, we made the rounds to all the fish camps. A sea turtle biologist accompanied by a sea turtle thief, asking sea turtle eaters to help them find endangered, federally-protected sea turtles.

## THE FISHERMEN

The first time I pulled into Punta Abreojos, the small coastal village just north of San Ignacio Lagoon, I was struck by the clean dirt roads, relatively free of the garbage found in most places, and the neat homes lining those roads. What hit me next was the hospitality. In the fishing cooperative office, I explained to Antonio Valenzuela that I was there to study sea turtles. He sat beneath a clock shaped like the Baja California peninsula, inlaid with abalone shell—this is abalone and lobster territory. He left his office for a moment, and then called to me from the hall.



**Fisherman Martin Arce and his daughter Adelita.**

"This is Cesar. He will help you with your turtle project. Good luck."

We shook hands and Antonio disappeared back into his office.

Cesar Mayoral Rouseau is a young man, about my age. He catches lobster half the year and fish the other half. Like me, he's curious about the natural world, and shares his enthusiasm with his son Gustavo and daughter Xiomara. In another time and place Cesar could have been the biologist visiting my fishing village. At his house, he led me through his yard to a small shed that would later become my temporary lab and bunkhouse. He showed me his fighting roosters, which he treats like little kings. We drank sweet coffee and made plans to leave early in the morning to check the fish traps. Once we'd reached the day's fish quota, we could look for sea turtles.

In the morning, twelve miles from the coast on a glassy sea, we hoisted baited traps from the bottom with a winch. Each trap held between three and thirty cabrilla and a few tilefish. The small fish went back into the ocean while the larger ones fell to the bottom of the panga. By noon the panga was loaded and the sun, directly overhead, was hot. We could now look for turtles.

The first sea turtle we came across was a small olive ridley. I enthusiastically jumped from the panga onto the basking animal, a technique we call “turtle rodeo.” El Perico, Cesar’s fishing partner, shouted “¡Pato al agua!” (Like a duck to water!) and Cesar circled the boat back to where I swam with the small animal. The turtle, hardly larger than my two hands, was tangled in a mesh bag by its front flipper.

“That turtle wouldn’t have lived much longer like that,” Cesar observed as he pointed out the mesh beginning to cut into the flesh around the flipper.

We gave the turtle a routine check-up, tagged and measured it, and promptly returned it to sea. As enthused as we were to find this little olive ridley, we were in search of loggerhead turtles.

In another boat my colleagues guided by Isidro Arce, the fishing cooperative’s deputized chief of enforcement, also searched for turtles. Our project is a study of loggerhead turtle migration had proven that these turtles make a transpacific migration from Baja California to their home beaches in Japan. A turtle named Adelita (after the daughter of fisherman Martin Arce) had been tracked for 368 days from Santa Rosaliita, a small town in northern Mexico, to Sendai, a port in northern Japan, 12,000 kilometers to the west. Tragically, she was caught in a squid net.



*Baja California fishermen learning sea turtle monitoring techniques.*

That day we would put another satellite transmitter on another loggerhead turtle. We called this turtle Xiomara, after Cesar’s daughter.

When it came time for release, Xiomara—the turtle—was accompanied to the water’s edge by Xiomara—the little girl. The turtle made her way through the wash with almost the whole town on the beach to see her off. A row of pickup trucks lined the beach and headlights lit the place like a stadium.

Over the next nine months we tracked this turtle’s path. By October 1997, three months after her release, Xiomara was offshore of San Juanico, not too far to the north. In December, she’d pass close to Isla Magdalena, having moved several hundred miles to the south. Then she moved 500 miles out into the Pacific Ocean before we lost her signal in June 1998. Today Xiomara’s track through the eastern Pacific Ocean hangs on the walls of classrooms throughout Baja, and fishermen and their children still continue to ask, “How is Xiomara, the turtle?”

Back on land, Isidro Arce derives his authority from his stature, his quiet sternness and from his father who was the first person born in Punta Abreojos. His legacy and leadership in this town are as legitimate as they get. It is no coincidence that he is the man who orchestrated the cooperative’s crack-down on abalone and lobster poaching and overfishing, leading to record catches a few years later.

As a boy, Isidro witnessed sea turtles descend from a super-abundant source of cash and protein to an endangered species, a rarity. As a young man he caught and ate his share of them. He grew up on their meat and was nourished by turtle blood. From time to time he was cured of a cough by turtle oil.

“Any fisherman who knows this ocean has watched the turtles disappear. We all talk about it. But now, we have to do something,” Isidro told me.

Moved by his recent experience with the sea turtle tracking project, Isidro wanted to learn more and to bring turtles back to his coast. In March 2000, he accompanied me to Orlando, Florida to attend an international conference on sea turtle biology and conservation.

“I never knew there were so many people who cared so much about these animals,” Isidro said as we stood among 1,000 scientists in a huge excessively air-conditioned hall. “We have to save Baja’s turtles! We must stop the poachers! We must teach the children!” Isidro exclaimed, driving his fist in the air. Isidro told everyone at the conference about his town, how he loved it, the surf and how he wanted to save the turtles.

In the evening we visited the house of Peter Pritchard, one of the world’s leading turtle experts. The house is filled with

specimens of just about every turtle or tortoise on the planet. On one wall hangs the shell of an Aldabran green turtle, nearly as tall and wide as two men standing side by side. Peter was one of the scientists who considered Baja's green turtles to be unique, a separate species, from other green turtle populations.



***Enforcement of strong laws protecting sea turtles exists but is typically inadequate.***

When asked what he thought of this classic taxonomic debate, Isidro carefully considered the shell on the wall, which was four times the size of a typical Baja green turtle.

“No se, but if we don't do something to save the turtles that are left, it won't matter anyway, will it?”

In April 2000, after returning from the meeting, Isidro and his buddy, Javier Villavicencio, organized an ambush in the desert between San Ignacio Lagoon and Punta Abreojos. With the backing of the military and local wildlife agents, the two fishermen hid in the scrub along the road and waited. They had been tipped off that a poacher would be coming that way that night with a cargo of sea turtles bound for Ensenada. The group squatted in the dark until the headlights of a small pickup truck appeared on the ridge, and then dipped into the wash. At the bottom of the arroyo Javier and Isidro, backed by men with automatic weapons, descended upon the poacher. Seven green turtles filled the truck bed—alive but worse for wear. Driving the truck was one Francisco Fisher, AKA “Gordo.”

Later, wildlife agent Carlos Mayoral, who filed the report on the arrest, told me that when questioned, Gordo admitted to poaching more than 4,000 turtles since 1992. Gordo Fisher was quickly out on bail after only a few days in the Santa Rosalia jail. I saw him recently at Laguna San Ignacio, where he claimed to be fishing for scallops and crabs and making weekly trips to La Paz, a full day's travel each way, to sign his parole papers.

## THE SAINT

The seven turtles in the back of Gordo's truck were probably headed to Ensenada or Tijuana. There, an insatiable demand for sea turtles exists during the Easter holiday, driving a black market that extends the length and width of the peninsula. During Semana Santa, the week prior to Easter, and Lent, the 40 days prior to that, the tradition of abstaining from red meat sends legions of vacationers looking for fresh seafood. Mistakenly, sea turtle meat is considered “fish” and is traditionally prepared during these holiday feasts.

In Baja California, sea turtle is emotional food. It's feel-good food. It's power food. Changing the turtle-eating tradition before extinction changes it for us, is a big challenge—a challenge that's beyond the reach of sea turtle migration studies, wildlife management strategies, complex mathematical population models, economic incentives, and law enforcement. We needed to appeal to a higher authority. In conversations with Catholic leaders in Mexico City it was clear that they thoroughly enjoyed eating sea turtles and were unlikely to initiate conservation measures, let alone give up their Easter tradition.

The director of a prominent Catholic charity sarcastically offered: “why don't you ask the Pope to help you with your turtles!”

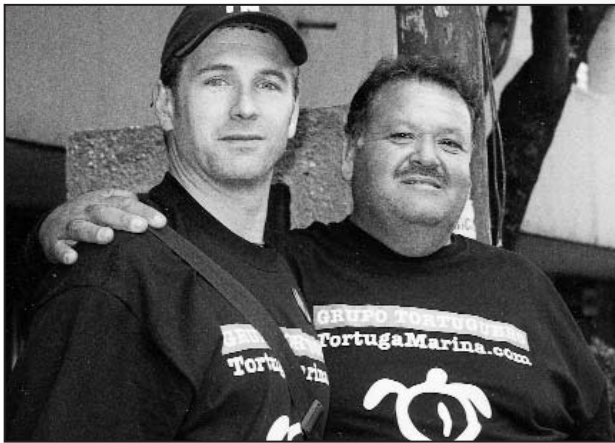
A letter to the Vatican asking the Pope to help us save sea turtles? Yes, that was it. Brilliant. The only way we could get people to stop eating sea turtles during a religious holiday was to get the Pope himself to declare sea turtle consumption a breach of Lenten rules.

In July 2002, the Pope was scheduled to be in Mexico City to canonize Juan Pablo, the Indian saint. Serge Dedina, an American conservationist, fisherman Javier Villavicencio, Rubi Moreno, a folk singer/activist, Fay Crevoshay, an energetic media guru, and I traveled to Mexico City. As the Pope sped around the Plaza de Independencia, Serge and I shouted and waved a plastic sea turtle replica over our heads, pleading with His Holiness to bless the sea turtles and ask the faithful to spare their lives. He never even slowed down. The Pope sped away down Avenida La Reforma, got on his plane and flew back to Rome.

Fortunately, we had a Plan B. Fay knows everyone in the Mexico City media business – she had gone to school with many of them. And she knows how to work the phone. If we couldn't get the Pope to ask his people to save sea turtles in the name of Jesus of Nazareth, we'd have Fay ask her people to help us save sea turtles in the name of ratings.

Fay lined up a full week of TV, radio and newspaper inter-

views. Javier and Rubi told their stories. Serge and I provided academic facts. We all gave our most passionate pleas, imploring listeners, readers, and watchers to skip the turtle dinner. And the hosts of the programs followed with their own passionate messages. Horacio Villalobos, the ambassador of Mexico's most popular MTV-like music video show, asked teens to listen to Shakira and not eat sea turtle. At a news conference, Mexican poet and environmental activist Homero Ardijs asked the newly canonized indigenous saint, Juan Diego, to make his first miracle the salvation of Mexico's sea turtles. The message ran strong on all the major networks, entering some 50 million households.



*The author (WJN) and Francisco Fisher in Mexico City sharing a sea turtle conservation message.*

Back in Baja California, at Bahía de los Angeles, Father Eric Morales, the local priest, helped biologist Antonio Resendiz tag a large male green turtle. The two lifted the turtle to the gunwale and lowered him over the side of their boat. "Padre Morales and Antonio are the only people in town who don't eat sea turtle," I was told by one fisherman. "I hope that starts to change.

Change happens slowly, almost imperceptibly, at first. A fisherman returns a sea turtle to the water instead of hauling it home. A child asks her grandfather not to cook a turtle for a

holiday meal. A poet shares a story in the living room of millions of homes. A turtle connects children in Mexico and Japan. One day the poet may meet the fisherman. They may visit the turtle thief in jail. The Japanese scientist may meet the child. And the tipping point will begin to favor survival. The ocean may begin to resemble itself again.

With some luck, perhaps the blessing of a goddess or the Pope, and the hard work of many brave fishermen willing to initiate a new tradition of conservation and stewardship, we'll see Baja California's sea turtles come back from the edge.

In the Mexican desert, surrealism lurks beneath each rock and serendipity reinvents itself daily. Throughout Latin America, turtle thieves, fishermen and saints are joining forces to save their 100 million-year-old totem animal from extinction.



## POSTSCRIPT

*I originally wrote this article in 2002. In April 2003 after Francisco "Gordo" Fisher was released from jail he joined us in Mexico City on a mass media campaign promoting sea turtle conservation. Mexico's most notorious convicted sea turtle poacher broadcast his message on national television and radio for an entire week. His voice was simple: help us to save sea turtles, a life of poaching isn't worth the cost. Francisco Fisher was my nemesis. Now he's one of my heroes and he's my friend.*

“The loss of sea turtles represents a threat to far more than a single commercial species. It's the historic, and even spiritual, connection to these animals that will help harvest the political will needed to recover turtle populations.”

## VII. POPE BENEDICT XVI

Pope Benedict XVI has a unique opportunity to greatly advance the protection of the oceans and endangered animals with a single statement. Such opportunities are few and far between in the modern world. Background on the Pope suggests that he is a scholar with conservative positions on many issues. As such, arguments related to sea turtle protection should appeal to nature as a foundation of human well-being. ***Will Pope Benedict be the Vatican's first Ocean Champion?***

Pope Benedict XVI (Latin: Benedictus PP. XVI), born Joseph Alois Ratzinger on April 16, 1927 in Marktl am Inn, Bavaria, Germany, is the 265th and reigning pope, the head of the Roman Catholic Church, and sovereign of Vatican City State. He was elected on April 19, 2005 in a papal conclave, celebrated his Papal Inauguration Mass on April 24, 2005, and took pos-

session of his cathedral, the Basilica of St. John Lateran, on May 7, 2005.



One of the best-known theologians since the 1960s and a prolific author, he is viewed as a close conservative ally of his predecessor, Pope John Paul II. He served as a professor at various German universities, and was a theological expert at the Second Vatican Council before becoming Archbishop of Munich and Freising. At the time of his election as Pope, he was Prefect of the Congregation for the Doctrine of the Faith and Dean of the College of Cardinals. During his papacy, Benedict XVI has particularly emphasized what he sees as a need for Europe to return to fundamental Christian values, in response to increasing de-Christianization and secularization in many developed countries, where secular humanism is influential.

## VIII. ACKNOWLEDGEMENTS

The authors would like to thank the following people for their contributions to this report: Randall Arauz, Joanna Alfaro, Jennifer Benway, Jeffrey Brown, Juan Carlos Cantu, Didiher Chacón-Chaverri, Erik Cutter, Astrid Deilmann, Carlos Drews, Alejandro Fallabrino, Jack Frazier, Terri Garland, Brian Hutchinson, Volker Koch, Sarah Otterstrom, Adrian Reuter, Natalia Rossi, Jeffrey Seminoff, Matthew Stafford and Sebastian Troeng.

## IX. LITERATURE CITED

Alava, J.J., J. Alfaro-Shigueto, and P. Opay. 2005. Commerce and use of sea turtles in the southeast Pacific: Peru and Ecuador. *Proceedings of the Nineteenth Annual Symposium on Sea Turtle Biology and Conservation*. NOAA Technical Memorandum NMFS-SEFSC-443.

Alvarado, J., and A. Figueroa, A. 1992. Post-nesting recaptures of black marine turtles (*Chelonia agassizi*) tagged in Michoacan, Mexico. *Biotropica* 24(4): 560-566.

Alvarado-Díaz, J., C. Delgado-Trejo, and I. Suazo-Ortuño. 2001. Evaluation of the Black Turtle Project in Michoacán, México. *Marine Turtle Newsletter* 92:4-7.

Atkins, P., and I. Bowler. 2001. *Food in Society: Economy, Culture, Geography*. Oxford University Press, London.

Baillie, J.E.M., Hilton-Taylor, C. and Stuart, S.N. (eds) 2004. 2004 IUCN Red List of Threatened Species. A Global Species Assessment. IUCN, Gland, Switzerland and Cambridge, UK.

Caldwell, D. K., and M. C. Caldwell. 1962. The black

"steer" of the Gulf of California. *Los Angeles County Museum, Contributions in Science* 61:1-31.

Campbell, H. 2005. A tale of two families: The mutual construction of 'Anglo' and Mexican ethnicities along the US-Mexico border. *Bulletin of Latin American Research* 24 (1): 23-43.

Campbell, C. and C.J. Lagueux. 2005. Survival probability estimates for large juvenile and adult green turtles (*Chelonia mydas*) exposed to an artisanal marine turtle fishery in the western Caribbean. *Herpetologica* 61(2): 91-103.

Cantú, J.C. and M.E. Sánchez. 1999. Trade in sea turtle products in México. Unpublished report. Teyeliz, A.C. Mexico City.

Chacón, D. 2002. Diagnóstico sobre el comercio de las tortugas marinas y sus derivados en el Istmo Centroamericano. National Fish and Wildlife Foundation, IFAW, ANAI and WIDE-CAST. San José, Costa Rica. 247 p.

Chakraborty, D.K. 1992. Turtle Eating Ceremony among the Great Andamese. *Journal of the Anthropological Survey of India* 41:11-17.

Código Penal Federal de México. 1996. Título Vigésimo Quinto, Delitos Contra el Ambiente y la Gestión Ambiental, Capítulo II, De la Biodiversidad, Artículo 420. December 13.

Delgado, S., and W.J. Nichols. 2005. Saving sea turtles from the ground up: Awakening sea turtle conservation in northwestern Mexico. In: Frazier, J. (ed.). *Marine Turtles as Flagship Species*. *Marine Studies* 3(2)/4(1): 89-104.

Felger, R.S., W.J. Nichols, and J. Seminoff. 2005. Sea turtles in northwestern Mexico: conservation, ethnobiology, and desperation. Pages 405-424 In: J-L. Cartron, G. Ceballos, and R.S. Felger (eds.). *Biodiversity, Ecosystems and Conservation in Northwest Mexico*. Oxford University Press, New York.

Fleming, E.H. 2001. *Swimming against the tide: Recent surveys of exploitation, trade, and management of marine turtles in the Northern Caribbean*. TRAFFIC North America, April 2001.

Gardner, S. and W.J. Nichols. 2001. *Assessment of Sea Turtle Mortality Rates in the Bahía Magdalena Region, Baja California Sur, México*. *Chelonian Conservation and Biology*, 2001, 4(1):197-199.

Hays, G.C., A.C. Broderick, B.J. Godley, P. Luschi, and W.J. Nichols. 2003. *Satellite telemetry reveals high levels of fishing induced mortality for marine turtles*. *Marine Ecological Progress Series* 262: 305-309.

Heppell, S. S. 1998. *Application of life-history theory and population analysis to turtle conservation*. *Copeia* 1998:367-375.

Koch, V., W.J. Nichols, H. Peckham, and V. de la Toba. 2006. *Estimates of sea turtle mortality from poaching and bycatch in Bahía Magdalena, Baja California Sur, Mexico*. *Biological Conservation* 128: 327-334.

Lagueux, C.J. 1998. *Marine turtle fishery of Caribbean Nicaragua: human use patterns and harvest trends*. Doctoral Dissertation, University of Florida, Gainesville. 215 pp.

Macys, S. and G.N. Wallace. 2003. *Marine turtle conservation on Holbox Island, Quintana Roo, Mexico: the fishermen's perceptions*. *Chelonian Conservation & Biology* 4: 620-625.

Nabhan, G.P. 2003. *Singing the Turtles to Sea: The Comcaac (Seri) Art and Science of Reptiles*. University of California Press.

Nichols, W.J. 2003a. *Beyond bycatch: Local realities and challenges of implementing sea turtle recovery programs in the Californias*. Unpublished report to the Bellagio Sea Turtle Conference, 17-21 November 2003, Bellagio Conference Center, Bellagio, Italy.

Nichols, W.J. 2003b. *Biology and conservation of sea turtles in Baja California, Mexico*. Doctoral dissertation. Department of Wildlife and Fisheries Sciences, University of Arizona, Tucson.

Nichols, W.J., C. Safina and L. Grossman. 2003. *Divine intervention: Lobbying the Vatican to save sea turtles*. *Marine Turtle Newsletter* 99:29.

Nietschmann, B. 1982. *The cultural context of sea turtle subsistence hunting in the Caribbean and problems caused by commercial exploitation*. In: K.A. Bjorndal (Ed.), *Biology and Conservation of Sea Turtles* (reprinted 1995). Washington, DC: Smithsonian Institution Press. Pp. 439-445.

O'Donnell, J. 1974. *Green turtle fishery in Baja California waters: history and prospect*. Department of Geography. California State University, Northridge, CA. Unpublished thesis. 119 pp.

Opay, P. 1998. *Legal Action Taken To Stop The Hunting Of Green Turtles In Costa Rica*. *Marine Turtle Newsletter* 79:12-16.

Ordonez-Espinosa, C., P.Lahanas, and L Ceballos. 2005. *Causes of mortality in the province of Bocas del Toro, Panama*. *Proceedings of the Nineteenth Annual Symposium on Sea Turtle Biology and Conservation*. NOAA Technical Memorandum NMFS-SEFSC-443.

Resendiz, A., and J.L. Hernandez. 1993. *Black turtles confiscated, released*. *Marine Turtle Newsletter* No. 62.

Rutler, P. 2004. *Mexicans outraged by sea turtle massacre*. Agence France Presse. January 25.

Seminoff, J.A., T.T. Jones, A. Resendiz, W.J. Nichols and M.Y. Chaloupka. 2003. *Monitoring green turtles (Chelonia mydas) at a coastal foraging area in Baja California, Mexico: multiple indices describe population status*. *J. Mar. Biol. Ass. U.K.* 83: 1355-1362.

Smith, E.A., R. Bliege Bird, and D.W. Birdb. 2003. *The benefits of costly signaling: Meriam turtle hunters*. *Behavioral Ecology* Vol. 14 No. 1: 116-126.

Spotila, J.R. 2004. *Sea Turtles: A Complete Guide to Their Biology, Behavior, and Conservation*. Johns Hopkins University Press, Baltimore.

Steinbeck, J. 1951. *The Log from the Sea of Cortez*. Penguin Books, New York.

Zuniga-Arce, F. 2001. *Conservación de la tortuga marina en Baja California Sur, México*. Unpublished report. UABCS, La Paz.

”Throughout Latin America, turtle thieves, fishermen and saints are joining forces to save their 100 million-year-old totem animal from extinction.”



WWF is one of the world's largest and most experienced independent conservation organizations, with almost 5 million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by:

- conserving the world's biological diversity,
- ensuring that the use of renewable resources is sustainable
- promoting the reduction of pollution and wasteful consumption.

#### **WWF Germany**

Rebstöcker Straße 55  
D-60326 Frankfurt am Main

Tel.: +49 69 / 7 91 44 - 0  
Fax: +49 69 / 61 72 21  
E-Mail: [info@wwf.de](mailto:info@wwf.de)  
Internet: [www.wwf.de](http://www.wwf.de)