

# Potential Impacts of Deepwater Horizon Oil Spill on Sea Turtles

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## Introduction

Sea turtles have been swimming the oceans for more than 100 million years. They have persisted through natural predators, climatic changes and even the mass dinosaur extinction. They have proven to be important ecologically, economically and culturally both in the United States and abroad. Nonetheless, modern day human activities are killing sea turtles at a faster rate than many populations can sustain.

In fact, each of the sea turtle species found in U.S. waters is listed as either “threatened” or “endangered” under the Endangered Species Act (ESA) – which means they may be driven to extinction in the foreseeable future. Five of the world’s seven species of sea turtles inhabit the Gulf of Mexico for some portion of their lives: green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp’s ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and loggerhead (*Caretta caretta*).

A variety of human actions including commercial fishing, coastal development, and direct harvest have led to the decline of sea turtle populations and the need for ESA listings. Sea turtle protection measures have resulted in increased numbers for some sea turtle populations. For other populations, however, the outlook is increasingly grim. Each of the five sea turtle species that can be found in the Gulf of Mexico are now at risk of significant harm from the Deepwater Horizon oil spill.

Species	Population Status Under Endangered Species Act
Green	Endangered (Florida & Mexico's Pacific coast breeding colonies); Threatened (all other areas)
Hawksbill	Endangered
Kemp’s Ridley	Endangered
Leatherback	Endangered
Loggerhead	Threatened

**Table 1.** U.S. Sea Turtle Populations Status

## Turtles Face a Wide Variety of Threats from the Spill

As of June 9, 32 oiled sea turtles have been found in the Gulf of Mexico.<sup>1</sup> More than 320 sea turtles have been found dead or injured since the spill began April 20.<sup>2</sup> While scientists have not yet determined the cause of death for many of these turtles, this number is higher than usual.

While some sea turtles that are dead or injured are found by search crews or wash up on the beach "strand," many others will not. This is because currents often carry the carcasses out to sea or carcasses can sink or be eaten by predators. In the coming months, we can expect to continue seeing elevated levels of sea turtle standings and also to discover oiled turtles at sea. In addition, there are at least three other ways to assess the impact of the oil spill on Gulf sea turtles.

First, there could be reduced nesting due to injuries to mature females or nesting beaches being covered in oil. Nest monitoring programs should be able to report any emerging trends as the season progresses.

Second, if oil washes up on the beach after the nests are already laid; hatching success rates will be likely impacted. This will become apparent through nest monitoring programs once the nests start to hatch, approximately two months after the eggs are laid.

Finally, when the hatchlings join the rest of the population out at sea, they will face direct oil exposure, contaminated prey and oil impacts on their habitat. It is difficult to estimate how long it will take for these types of impacts to show up in the population. If adult females are killed, nesting numbers could start to decline almost immediately. Kemp's ridley sea turtles do not reach sexual maturity until they are 7-15 years old so the impacts of large numbers of hatchlings being lost to the oil spill could take a decade or more to begin to influence nesting numbers. For loggerhead and green sea turtles, which don't reach maturity to some time after 20 years of age, it could take even longer to see impacts.

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<sup>1</sup>Deepwater Horizon Response. Consolidated Fish and Wildlife Collection Report. June 8, 2010. [http://www.deepwaterhorizonresponse.com/posted/2931/FWNnumbers\\_Web\\_8June\\_final.600867.pdf](http://www.deepwaterhorizonresponse.com/posted/2931/FWNnumbers_Web_8June_final.600867.pdf)  
<sup>2</sup> Deepwater Horizon Response. Consolidated Fish and Wildlife Collection Report. June 8, 2010.

## Oil Related Injuries

Sea turtles can suffer both internal and external injuries from contact with oil or chemical dispersants. Sea turtles are vulnerable to the effects of oil at all life stages—eggs, post-hatchlings, juveniles, and adults.<sup>3</sup> They are especially at risk because they do not avoid oiled waters according to studies.<sup>4</sup>

Depending on the circumstances of the oil spill, sea turtles could become coated in oil or inhale volatile chemicals when they surface to breathe, swallow oil or contaminated prey, swim through oil, or come in contact with it on their nesting beaches. This contact with oil is dangerous to sea turtles in a variety of ways:

- Oil or dispersants on the sea turtle's skin and body can cause skin irritation, chemical burns, and infections.<sup>5</sup> Oil exposure for just 4 days can cause sea turtles' skin to continually fall off in sheets. This condition persists even after they are removed and treated from the exposure.<sup>6</sup>
- Inhalation of volatile petroleum compounds or dispersants can damage the respiratory tract and lead to diseases such as pneumonia.<sup>7</sup>
- Ingesting oil or dispersants may cause injury to the gastrointestinal tract, which may affect the animals' ability to absorb or digest foods.<sup>8</sup> Turtles of all life stages exposed to tarballs have been found with tar blocking their digestive systems leading to toxic exposure and "floating syndrome" where gas prevents the turtle from diving and therefore feeding. This can lead to starvation.<sup>9</sup>
- Chemicals that are inhaled or ingested may damage liver, kidney, and brain function, cause anemia and immune suppression, or lead to reproductive failure or death.<sup>10</sup>
- Oil on developing sea turtle nests has been shown to increase egg mortality and lead to potential deformities in the hatchlings that do survive.<sup>11</sup> Viscous, weathered oil on beaches is an additional obstacle hatchlings must overcome to reach the water safely before predators end their chances of survival.<sup>12</sup>

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3 Shigenaka, G. et al. 2003. Oil and Sea Turtles, biology, planning and response. NOAA publication. Available at: [http://response.restoration.noaa.gov/book\\_shelf/35\\_turtle\\_complete.pdf](http://response.restoration.noaa.gov/book_shelf/35_turtle_complete.pdf)

4 Shigenaka, G. et al. 2003.

5 National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA's Oil Spill Response. Effects of Oil on Marine Mammals and Sea Turtles. [http://response.restoration.noaa.gov/book\\_shelf/1887\\_Marine-Mammals-Sea-Turtles-fact-sheet.pdf](http://response.restoration.noaa.gov/book_shelf/1887_Marine-Mammals-Sea-Turtles-fact-sheet.pdf)

6 Shigenaka, G. et al. 2003.

7 National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA's Oil Spill Response. Effects of Oil on Marine Mammals and Sea Turtles.

8 National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA's Oil Spill Response. Effects of Oil on Marine Mammals and Sea Turtles.

9 Shigenaka, G. et al. 2003.

10 National Oceanic and Atmospheric Administration, U.S. Department of Commerce. NOAA's Oil Spill Response. Effects of Oil on Marine Mammals and Sea Turtles.

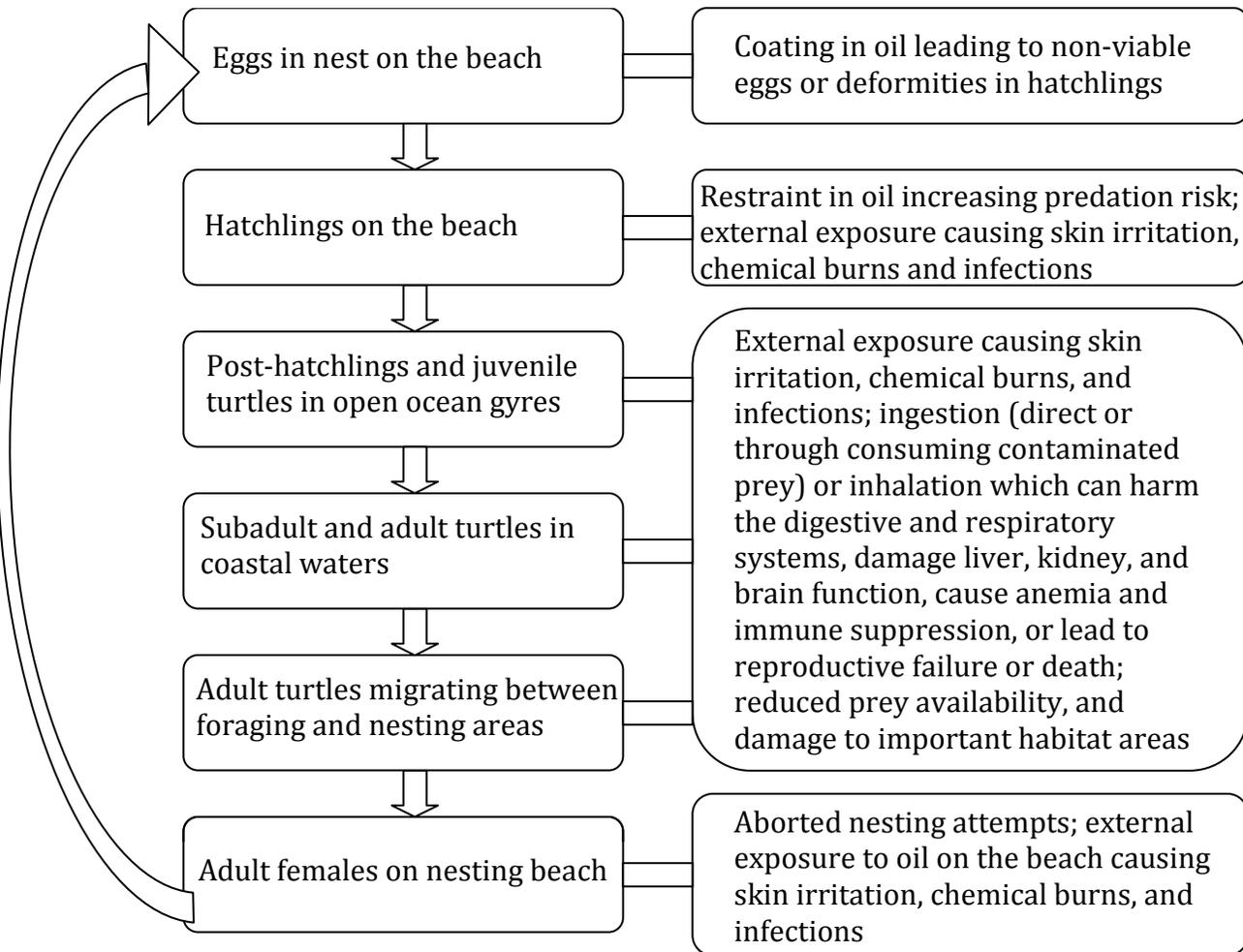
11 Shigenaka, G. et al. 2003.

12 Shigenaka, G. et al. 2003.

In addition to injuries from direct contact with the oil or from consuming contaminated prey, oil spills can also be harmful to sea turtles by destroying important sea turtle habitat areas and reducing available prey.<sup>13</sup> Some important sea turtle habitats that can be impacted by oil include sargassum sea weed mats, sea grass beds and coral reefs. Declines in sea grass, as well as invertebrates and sponge populations, as a result of oil exposure reduce the available food supply to sea turtles.<sup>14</sup>

### Stages of the Sea Turtle Life Cycle

### Primary Oil Related Threats



**Figure 1.** Oils Spill Related Threats to Sea Turtles at Various Life Stages<sup>15</sup>

<sup>13</sup> Shigenaka, G. et al. 2003.

<sup>14</sup> Shigenaka, G. et al. 2003.

<sup>15</sup> Oil spill threats summarized from Shigenaka, G. et al. 2003 and NOAA, U.S. Department of Commerce. NOAA's Oil Spill Response. Effects of Oil on Marine Mammals and Sea Turtles.

## Specific Concerns for Gulf Sea Turtle Species

The five species of sea turtles found in the Gulf of Mexico vary in distribution, life history, and behavior but they have one important thing in common. All five could be put in harm's way by the Deepwater Horizon oil spill. The spill comes at an especially inopportune time, sea turtle nesting season. Additional information on nesting locations, nesting seasons, hatchling incubation times, and ages to maturity for Gulf sea turtle species can be found in Table 2.

### Sea Turtles of the Gulf of Mexico

Species	Nesting Locations in Gulf	Female Nesting Season	Hatchling Emergence	Age at Maturity
Green ( <i>Chelonia mydas</i> )	limited numbers on Padre Island, TX; significant nesting on Gulf coast of Mexico	depends on location but generally June-Sept. with peak June-July	~2 months after nesting; Aug -Nov	20-50 years
Hawksbill ( <i>Eretmochelys imbricata</i> )	Yucatan Peninsula, MX near Ciudad del Carmen, Campeche, and very northern end of the peninsula near El Cuyo; some nests also recorded in Bahia Honda State Park, FL	varies with locality but generally between April and November	~60 days; June-Jan	unknown, upwards of 30 years
Kemp's Ridley ( <i>Lepidochelys kempi</i> )	95% of nesting occurs in the areas of Rancho Nuevo, Tepehuajes, and Barra del Tordo in Tamaulipas, Mexico; some nesting has also been noted in Veracruz, MX, Texas, Alabama and the Gulf coast of Florida; rare nesting in NC, SC, Gulf and Atlantic coast of FL	May-July	50-60 days after nesting; late June to Sept	7-15 years
Leatherback ( <i>Dermochelys coriacea</i> )	some nesting in Florida; also some in TX and Gulf coast of Mexico	March to July	60-65 days after nesting; May to September	6-10 years
Loggerhead ( <i>Caretta caretta</i> )	nesting concentrated from NC to SW Florida but some nesting does occur in AL, TX, Gulf coast of FL, eastern coast of the Yucatan, & northern Cuba; nesting has been recorded on Chandeleur Islands of LA	early April-September	about two months after nesting; late June-mid November	20-30 years

**Table 2.** Reproductive Characteristics of Gulf of Mexico Sea Turtles<sup>16</sup>

<sup>16</sup> Sources for information in table: U.S. Fish & Wildlife Service, National Marine Fisheries Service, the Southeast Fisheries Science Center, the Status of the World's Sea Turtles (SWOT) project and Dow et al. (2007). Sea Turtle Nesting in the Wider Caribbean Region. WIDECAST Technical Report No. 6.

## **Kemp's ridleys:**

Kemp's ridleys, the smallest sea turtles in the world, are named after Richard M. Kemp, a fisherman from Key West, Fla., who first submitted the species for identification in 1906.<sup>17</sup> Most Kemp's ridley nesting occurs at Rancho Nuevo in Tamaulipas, Mexico, just south of the Texas border on the Gulf of Mexico.<sup>18</sup> Occasional nesting also occurs in other parts Mexico, Texas, Alabama and Florida.<sup>19</sup> Tracking studies have shown that in the United States, adult female Kemp's ridleys that nest along the Texas coast typically migrate eastward along the Louisiana coastline towards the Mississippi River Delta, where they may forage for months.<sup>20</sup> Kemp's ridleys feed opportunistically, taking advantage of whatever food is easily available including crabs, jellyfish, snails, and fish.<sup>21</sup>

The nesting of endangered Kemp's ridley sea turtles is exponentially increasing, which has been taken as a good sign for the population as a whole. The 2010 nesting season for Kemp's ridley sea turtles started just after the Deepwater Horizon spill.

Females could be impacted by oil during migrations to the nesting beach or between nesting events. Nesting beaches could be already covered in oil when females approach them to nest, or oil could wash up on to beaches where nests have previously been laid. If the turtles do nest successfully, in a few short weeks, the Gulf will have vulnerable hatchling sea turtles that could be swimming into areas with oil.

In addition, most Kemp's ridley sea turtles reside year-round in the Gulf of Mexico. The mouth of the Mississippi river, an area being impacted by the spill, is an important foraging area for Endangered Kemp's ridley sea turtles.

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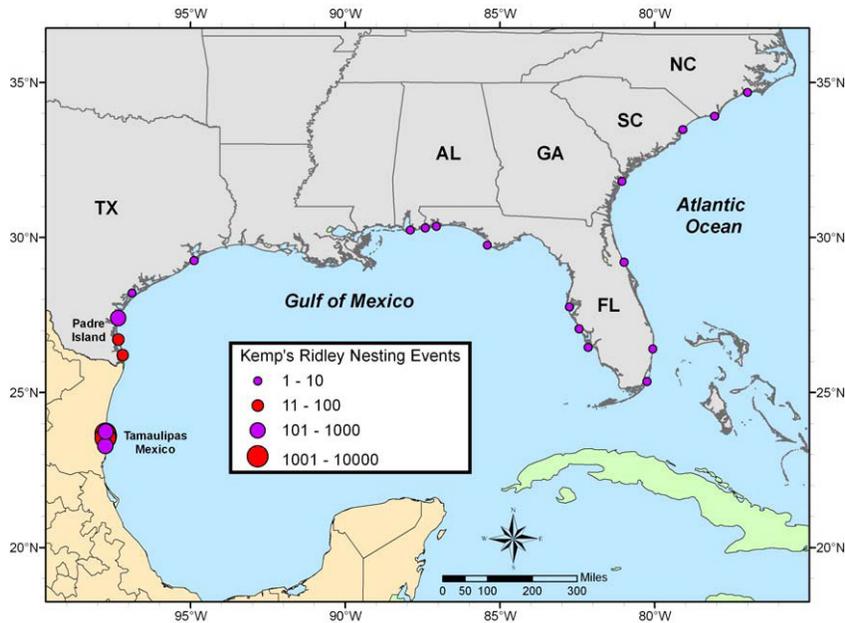
17 National Marine Fisheries Service. 2008. Kemp's ridley turtle (*Lepidochelys kempii*). <http://www.nmfs.noaa.gov/pr/species/turtles/kempstridley.htm>

18 National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2007. Kemp's ridley sea turtle (*Lepidochelys kempii*) 5-year review: Summary and evaluation. 8pp.

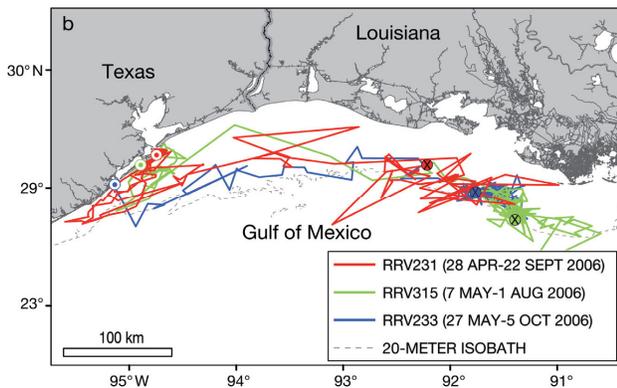
19 Complete graphic from National Marine Fisheries Service, U.S. Fish and Wildlife Service, and SEMARNAT. 2010. Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*), Second Revision. National Marine Fisheries Service. Silver Spring, Maryland.

20 Texas A&M University at Galveston Sea Turtle and Fisheries Ecology Research Lab. 2008. Satellite tracking TAMUG Kemp's ridley nesters 2007-2008: Caillie (RRV255). Data obtained from [seaturtle.org](http://www.seaturtle.org) 8/18/08. [http://www.seaturtle.org/tracking/index.shtml?tag\\_id=75421](http://www.seaturtle.org/tracking/index.shtml?tag_id=75421).

21 Witzell, W.M., Schimdt, J.R. 2005. Diet of immature Kemp's ridley turtles (*Lepidochelys kempii*) from Gullivan Bay, Ten Thousand Islands, Southwest Florida. *Bulletin of Marine Science* 77(2):191-199.



**Figure 2.** Major nesting beaches in the State of Tamaulipas, Mexico, and proportion of total nests documented for each beach in 2007 (Source: J. Pena, GPZ), and location of nests recorded in U.S. (Source: Padre Island National Seashore, FWS, Florida Marine Research Institute, Georgia Department of Natural Resources, South Carolina Department of Natural Resources, and North Carolina Wildlife Resources Commission).<sup>22</sup>



**Figure 3.** Satellite tracking data showing the migration of Kemp's ridley sea turtles tagged on their Texas nesting beach to the region of the Deepwater Horizon oil spill during 2006.<sup>23</sup>

<sup>22</sup> Complete graphic from National Marine Fisheries Service, U.S. Fish and Wildlife Service, and SEMARNAT. 2010. Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*), Second Revision. National Marine Fisheries Service. Silver Spring, Maryland.

<sup>23</sup> Seney EE, Landry AM Jr (2008) Movements of Kemp's ridley sea turtles nesting on the upper Texas coast: implications for management. *Endang Spec Res* 4:73-84

## Loggerheads:

Loggerhead sea turtles at various developmental stages and in numerous locations could be harmed by this oil spill. Loggerheads call a wide range of temperate and tropical habitats in the Atlantic, Pacific and Indian oceans home. In the United States, loggerheads nest on beaches along the Atlantic Ocean and Gulf of Mexico from Texas to North Carolina. The beaches of southern Florida host the second largest loggerhead nesting colonies in the world and account for more than 90 percent of their nesting in the United States.<sup>24</sup> However, Data show that loggerhead nesting subpopulations in the North Atlantic are declining and that the single greatest manmade threat to this population is the risk of being killed as bycatch in commercial and artisanal fisheries.<sup>25</sup>

Loggerhead sea turtles are currently proposed by the federal government for uplisting to “endangered” from “threatened” under the Endangered Species Act. The Gulf of Mexico, especially the west coast of Florida is an important habitat area for these animals. Loggerheads nest from Breton National Wildlife Refuge in southeast Louisiana, east along the Gulf coast of Florida to the Keys.<sup>26</sup> Nesting has also been recorded along the Texas coast and in Mexico.

Loggerheads can be found year-round in a variety of areas in the Gulf of Mexico. The shallow waters off the west coast of Florida are a very important loggerhead foraging area.<sup>27</sup> This is illustrated by the fact that loggerhead sea turtles have commonly been caught in this area by fishing gear (Figure 4). Loggerheads nesting along the west coast of Florida have even been documented migrating to the direct area of the Deep Horizon oil spill<sup>28</sup> Even some loggerheads that nest along the Atlantic coast of Florida make their way to foraging grounds in the Gulf of Mexico (Figure 5).<sup>29</sup>

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24 National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2008. Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (*Caretta caretta*), Second Revision. National Marine Fisheries Service, Silver Spring, MD. 5 pp.

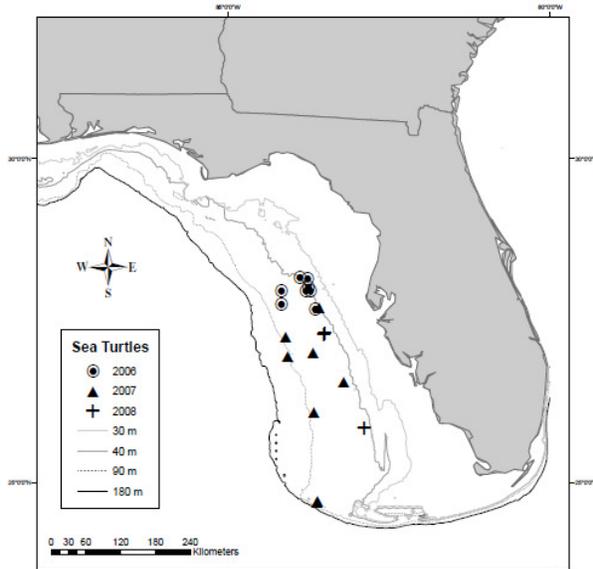
25 National Marine Fisheries Service, Office of Protected Resources and U.S. Fish and Wildlife Service; Southeast Region. 2007. Loggerhead Sea Turtle (*Caretta caretta*) 5-Year Review: Summary and evaluation. 36 pp.

26 Brost, B. 2007. Loggerhead nesting in Florida: Personal communication. In SWOT Report—State of the World's Sea Turtles, vol. 2 (2007).|Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Marine Turtle Program. Loggerhead Nesting in Florida. [http://research.myfwc.com/features/view\\_article.asp?id=11812](http://research.myfwc.com/features/view_article.asp?id=11812) ; Reynolds, M., Share the Beach. 2007. Loggerhead nesting in Alabama. In SWOT Report—State of the World's Sea Turtles, vol. 2 (2007).|Reynolds, Mike. Share the Beach. 2005. Alabama Sea Turtle Nesting Report. In The State of the World's Sea Turtles Report, vol. 2 (2007).; Shaver, D. 2008. Personal communication. In SWOT - State of the World's Sea Turtles - vol. 4. 2009.

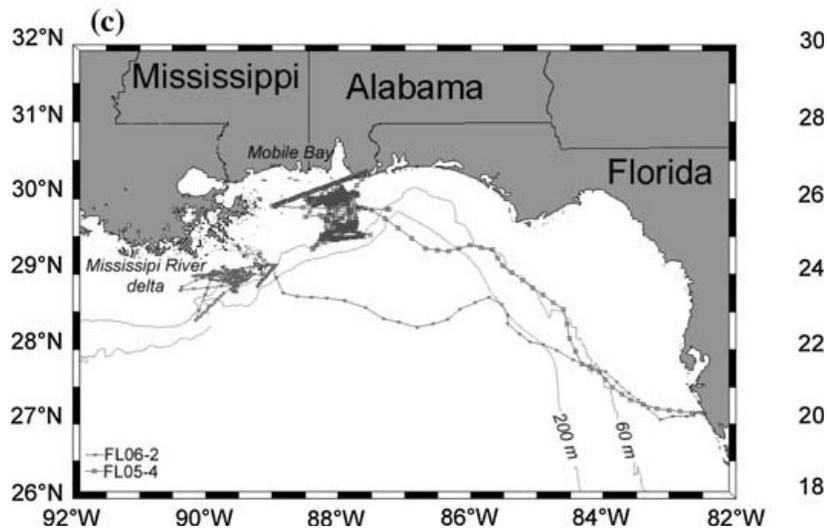
27 Girard, C., A. D. Tucker, and B. Calmettes. 2009. Post-nesting migrations of loggerhead sea turtles in the Gulf of Mexico: dispersal in highly dynamic conditions. *Marine Biology* 156: 1827-1839.

28 Girard, C., A. D. Tucker, and B. Calmettes. 2009

29 Two examples of this can be viewed on the Caribbean Conservation Corporation's website at [http://www.cccturtle.org/satellitetrackingmap.php?page=satflg\\_lumiere](http://www.cccturtle.org/satellitetrackingmap.php?page=satflg_lumiere) and [http://www.cccturtle.org/satellitetrackingmap.php?page=satfl-cape\\_hokie](http://www.cccturtle.org/satellitetrackingmap.php?page=satfl-cape_hokie)



**Figure 4.** Sea turtle take locations by year in the Gulf of Mexico observed in bottom longline reef fish sets.<sup>30</sup>



**Figure 5.** Satellite tracking data showing the migration of 2 loggerhead sea turtles tagged in Sarasota County, Florida to the region of the Deepwater Horizon oil spill.<sup>31</sup>

30 National Marine Fisheries Service, Southeast Fisheries Science Center. 2009 Estimated Takes of Sea Turtles in the Bottom Longline Portion of the Gulf of Mexico Reef Fish Fishery July 2006 through December 2008 Based on Observer Data. NMFS Southeast Fisheries Science Center Contribution PRD-08/09-07

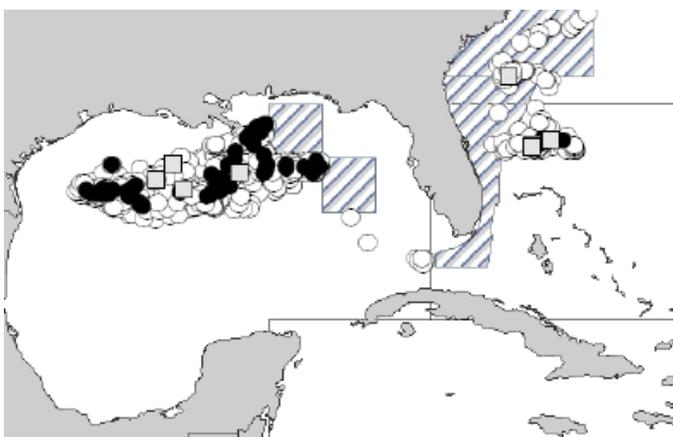
31 Girard, C., A. D. Tucker, and B. Calmettes. 2009.

## Leatherbacks:

Leatherbacks are the largest sea turtles in existence. Leatherbacks can grow up to 6.5 feet in and weigh up to 2,000 pounds.<sup>32</sup> Most leatherback nesting in the United States occurs in Puerto Rico, the U.S. Virgin Islands, and Florida, but they can be found swimming as far north as the Canadian waters of the Gulf of Maine.<sup>33</sup>

Of all sea turtles, leatherbacks spend the most time in the open ocean. Their bodies are built for diving into cold waters to depths of as much as 3,200 feet to find their jellyfish prey.<sup>34</sup> Leatherbacks can be found in the Gulf of Mexico following blooms of jellyfish, their main prey.<sup>35</sup> Leatherbacks are more than twice as abundant in the Gulf during the summer months than they are during the winter.<sup>36</sup>

Figure 6 shows the locations in the Gulf of Mexico where leatherback sea turtles were caught in pelagic longline fishing gear, thus demonstrating that leatherback sea turtles are commonly found in the area of the Deepwater Horizon spill.



**Figure 6.** Observed pelagic longline fishing effort and sea turtle takes during 2008, with the leatherback sea turtle interactions displayed as black dots.<sup>37</sup>

32 NOAA Fisheries, Office of Protected Resources. Leatherback Turtle. Retrieved 6/4/10 from <http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm>

33 NOAA Fisheries, Office of Protected Resources. Leatherback Turtle. Retrieved 6/4/10 from <http://www.nmfs.noaa.gov/pr/species/turtles/leatherback.htm>

34 Bonin, F., Devaux, B., Dupré, A. 2006. *Turtles of the World*. John Jopkins University Press, Baltimore, MD.

35 e.g. Leary, T.R. 1957. A schooling of leatherback turtles, *Dermochelys coriacea coriacea*, on the Texas coast. *Copeia*. 3: 232.

36 Davis, R.W., Evans, W.E., and Würsig, B., eds. 2000. *Cetaceans, sea turtles and seabirds in the northern Gulf of Mexico: Distribution, abundance and habitat associations. Volume I: Executive Summary*. Prepared by Texas A&M University at Galveston and the National Marine Fisheries Service. U.S. Department of the Interior, Geologic Survey, Biological Resources Division, USGS/BRD/CR-1999-0006 and Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2000-002 27 pp.

37 Garrison, L.P., Stokes, L. and C. Fairfield. 2009. *Estimated Bycatch of Marine Mammals and Sea Turtles in the U.S. Atlantic Pelagic Longline Fleet During 2008*. NOAA Technical Memorandum NOAA NMFS-SEFSC-591: 63p.

## **Greens:**

Green sea turtles are primarily herbivores, feeding chiefly on grasses, plants and other vegetation. In U.S. Atlantic and Gulf of Mexico waters, green turtles are found close to shore from Texas to Massachusetts, as well as in the U.S. Virgin Islands and Puerto Rico. The majority of green sea turtle nesting in the southeastern United States occurs in Florida but some nesting has also be documented on Padre Island National Seashore and South Padre Island in Texas.<sup>38</sup> The inshore waters of south Texas are an important habitat area for juvenile green sea turtles.<sup>39</sup> Important feeding areas along the Gulf coast of Florida include St. Joseph Bay, Cedar Key, Crystal River, Homosassa, Florida Bay and the Florida Keys.<sup>40</sup>

While conservation efforts over the past several decades have helped green sea turtle populations in the Atlantic Ocean and Gulf of Mexico to rebound, this oil spill could change that. Green sea turtles nesting along the gulf coast or feeding in shallow gulf sea grass beds could now be impacted by the oil spill.

Seagrass beds in the Gulf of Mexico, which serve as important habitat for juvenile green sea turtles, could also be impacted. Trapped oil in sediments of sea grass can kill the seagrass, which is a significant component of green turtle diets.<sup>41</sup>

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38 National Park Service. The Green Sea Turtle, Padre Island National Seashore. Retrieved 6/4/10 from <http://www.nps.gov/pais/naturescience/green.htm>

39 National Park Service. The Green Sea Turtle, Padre Island National Seashore. Retrieved 6/4/10 from <http://www.nps.gov/pais/naturescience/green.htm>

40 NOAA Fisheries, Office of Protected Resources. Green Turtle Webpage. Retrieved 5/26/10 from <http://www.nmfs.noaa.gov/pr/species/turtles/green.htm>.

41 Shigenaka, G. et al. 2003.

## Hawksbills:

Hawksbill sea turtles are named for their distinctive beaks that curve sharply at the end. Juvenile hawksbills feed primarily on seagrass and algae, while adults use their strong beaks to eat invertebrates, sponges, oysters, corals and crustaceans such as crabs.<sup>42</sup> By feeding on sponges and other reef species, hawksbills help maintain healthy and balanced coral reef ecosystems.<sup>43</sup>

Hawksbills are not highly migratory and, more than any other sea turtle species prefer to remain closer to shore. In the United States, hawksbills are most commonly found offshore of Texas, Puerto Rico, the U.S. Virgin Islands, and Florida's Atlantic coast. Hawksbill nesting is relatively rare in U.S. waters but has been recorded in areas of Florida such as the Keys as well as in the Virgin Islands and Puerto Rico. Hawksbills may traverse the Gulf of Mexico in route from their nesting beaches in Mexico.<sup>44</sup>

The overall Atlantic hawksbill population has decreased by 80 percent since the early 1900s.<sup>45</sup>

In addition to having all the same oil related issues as other species of sea turtles, oil can also damage coral reefs which are a prime habitat area for hawksbill sea turtles. Direct contact with oil can lead to coral death or have sublethal effects, such as reduced photosynthesis, growth, or reproduction, as well as reduced larval development and viability.<sup>46</sup> Loss of coral reef, and the sponges associated with it, would lead to a reduction of food and shelter for hawksbill sea turtles.

There are 2 areas of coral reef in Gulf of Mexico that have been named National Marine Sanctuaries; the Flower Garden Banks and Florida Keys National Marine Sanctuaries<sup>47,48</sup> Both of these areas contain hawksbill sea turtles and could be impacted by the oil spill.

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42 Bonin, F., Devaux, B., Dupré, A. 2006. *Turtles of the World*. Johns Hopkins University Press, Baltimore, MD.

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

44 NOAA. 2008. Hawksbill turtle. <http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm>.

45 International Union for Conservation of Nature. 2007. Marine turtle specialist group: 2007 Red List status assessment of the hawksbill turtle (*Eretmochelys imbricate*). 119 pp.

46 NOAA Coral Reef Conservation Program. *Coral Reefs and Oil Spills*. Retrieved 5/26/10

[http://coralreef.noaa.gov/aboutcrp/news/featuredstories/may10/oilspill\\_coral/](http://coralreef.noaa.gov/aboutcrp/news/featuredstories/may10/oilspill_coral/).

47 National Ocean Service, National Ocean and Atmospheric Administration. Hawksbill Turtle, Flower Garden Banks National Marine Sanctuary. Retrieved 6/4/10 from <http://www8.nos.noaa.gov/onms/park/Parks/SpeciesCard.aspx?refID=6&CreatureID=1293&pID=9>

48 National Ocean Service, National Ocean and Atmospheric Administration. Hawksbill Turtle, Florida Keys National Marine Sanctuary. Retrieved 6/4/10 from <http://www8.nos.noaa.gov/onms/park/Parks/SpeciesCard.aspx?refID=6&CreatureID=731&pID=8>

## Conclusion

Sea turtles pose a unique conservation challenge. They spend a small part of their lives on land and the rest in the water, making their populations difficult to quantify. They are slow to reach sexual maturity, which makes it difficult for them to build their population sizes, especially when their numbers are already severely compromised. Human activity, including destructive fishing practices, has decimated sea turtle populations. They are highly migratory, crossing political jurisdictions and numerous threats on their voyage from foraging grounds to nesting beaches and back. After 30 years of protection under the U.S. Endangered Species Act (ESA), all six species of sea turtles that inhabit U.S. waters still remain “endangered” or “threatened” with extinction.

Clearly, too little has been done to protect sea turtles from human-induced threats. Now a significant new threat has emerged, the Deepwater Horizon oil spill. The question is, will we step up to the conservation challenge or simply allow sea turtles to vanish from the world’s oceans.

## Recommendations

*It’s time for rapid action to clean up the spill, help injured wildlife, improve sea turtle management and end the expansion of offshore drilling. Oceana makes the following recommendations:*

### **Stop Offshore Drilling**

It is clear that the risks of offshore drilling greatly outweigh the benefits. Americans can never be fully compensated for the loss of national treasures such as sea turtles, caused by offshore drilling. For populations that are already struggling to rebuild, an oil spill such as the Deepwater Horizon could be the final blow. Many areas where drilling is occurring or being considered, such as the Gulf of Mexico and the Atlantic Ocean, are critical sea turtle habitats. Continuing to drill for oil and gas in these areas will lead to more spills and ultimately could result in extinction for these unique marine animals, and others.

### **Increase Sea Turtle Monitoring**

Fully documenting the toll that this spill has taken on sea turtles will require in-water monitoring of populations, as well as monitoring of nesting and hatching success. It will also require long-term monitoring of population dynamics including hatchling survival to adulthood and long term reproductive success. The National Oceanic and Atmospheric Administration will need to supplement ongoing programs to carry out this monitoring.

### **Improve Sea Turtle Management**

The U.S. Government needs to determine the cumulative impacts of human activities on sea turtles and reduce the number of sea turtles harmed to a level that will allow recovery of sea turtle populations. To allow for sea turtle recovery, we need to reduce bycatch in commercial fisheries, protect critical habitat areas, and prevent future oil spills.



***Oceana campaigns to protect and restore the world's oceans.*** Our team of marine scientists, economists, lawyers and other collaborators are achieving specific changes in the legislation to reduce pollution and prevent the irreversible collapse of fish stocks, protect marine mammals and other forms of marine life. With an international perspective and dedicated to conservation, Oceana has offices in Europe, North America, South America and Central America. Over 300,000 collaborators and cyber activists in 150 countries have already joined Oceana.

For more information, visit [www.oceana.org](http://www.oceana.org).



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