

## **BOTTLENOSE DOLPHIN (*Tursiops truncatus truncatus*): Gulf of Mexico Western Coastal Stock**

### **STOCK DEFINITION AND GEOGRAPHIC RANGE**

Bottlenose dolphins inhabit coastal waters throughout the northern Gulf of Mexico (i.e., U.S. Gulf of Mexico) (Mullin *et al.* 1990). Northern Gulf of Mexico coastal waters have been divided for management purposes into 3 bottlenose dolphin stocks: eastern, northern and western. As a working hypothesis, it is assumed that the dolphins occupying habitats with dissimilar climatic, coastal and/or oceanographic characteristics might be restricted in their movements between habitats, and thus constitute separate stocks. Coastal waters are defined as those from shore, barrier islands or presumed outer bay boundaries to the 20m isobath (Figure 1). The Western Coastal bottlenose dolphin stock area extends from the Mississippi River Delta to the Texas-Mexico border. This region is characterized by an arid to temperate climate, sand beaches in southern Texas, extensive coastal marshes in northern Texas and Louisiana, and low to high levels of freshwater input.

The Western Coastal Stock is trans-boundary with Mexico; however, there is no information available for abundance estimation, nor for estimating fishery-related mortality in Mexican waters.

Portions of the coastal stocks may co-occur with the northern Gulf of Mexico Continental Shelf Stock and bay, sound and estuary stocks. The seaward boundary for coastal stocks, the 20m isobath, generally corresponds to survey strata (Scott 1990; Blaylock and Hoggard 1994; Fulling *et al.* 2003), and thus represents a management boundary rather than an ecological boundary. Both “coastal” and “offshore” ecotypes of bottlenose dolphins (Hersh and Duffield 1990) occur in the Gulf of Mexico (Vollmer

2009), and both could potentially occur in coastal waters. The offshore and coastal ecotypes are genetically distinct using both mitochondrial and nuclear markers (Hoelzel *et al.* 1998; Rosel *et al.* 2009). In the northwestern Atlantic Ocean, Torres *et al.* (2003) found a statistically significant break in the distribution of the ecotypes at 34km from shore. The offshore ecotype was found exclusively seaward of 34km and in waters deeper than 34 m. Within 7.5 km of shore, all animals were of the coastal ecotype. The distance of the 20-m isobath ranges from 4 to 90 km from shore in the northern Gulf. Because the continental shelf is much wider in the Gulf, results from the Atlantic may not apply.

Research on coastal stocks is limited. Fazioli *et al.* (2006) conducted photo-identification surveys of coastal waters off Tampa Bay, Sarasota Bay and Lemon Bay, Florida, over 14 months. They found coastal waters were inhabited by both ‘inshore’ and ‘Gulf’ dolphins but that the 2 types used coastal waters differently. Dolphins from the inshore communities were observed occasionally in Gulf near-shore waters adjacent to their inshore range, whereas ‘Gulf’ dolphins were found primarily in open Gulf of Mexico waters with some displaying seasonal variations in their use of the study area. The ‘Gulf’ dolphins did not show a preference for waters near passes as was seen for ‘inshore’ dolphins, but moved throughout the study area and made greater use of waters offshore of waters used by ‘inshore’ dolphins. During winter months abundance of ‘Gulf’ groups decreased while abundance for ‘inshore’ groups increased. These findings support an earlier report by Irvine *et al.* (1981) of increased use of pass and coastal waters by

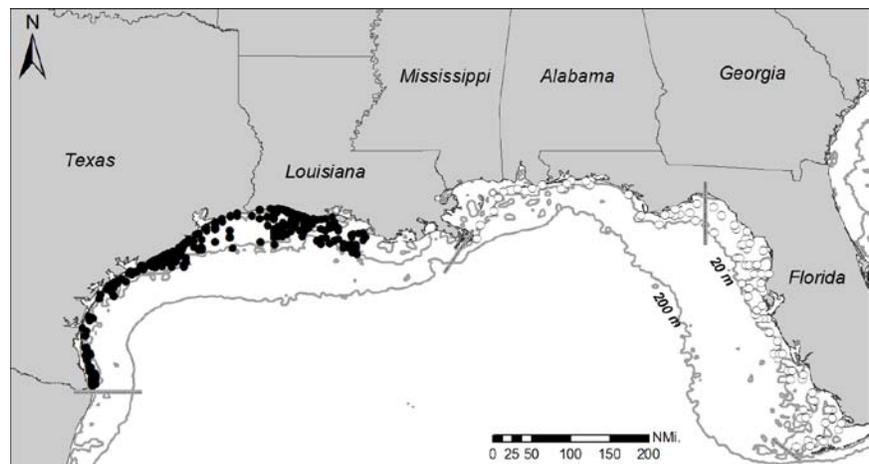


Figure 1. Locations (circles) of bottlenose dolphin groups sighted in coastal waters during aerial surveys conducted in the Western Coastal Stock area in 1992 and 1996, and in the Northern Coastal Stock and Eastern Coastal Stock areas in 2007. Dark circles indicate groups within the boundaries of the Western Coastal Stock. The 20 and 200-m isobaths are shown.

Sarasota Bay dolphins in winter. Seasonal movements of identified individuals and abundance indices suggest that part of the ‘Gulf’ dolphin community moves out of the study area during winter, but their destination is unknown. Sellas *et al.* (2005) examined population subdivision among Sarasota Bay, Tampa Bay, Charlotte Harbor, and the coastal Gulf of Mexico (1-12km offshore) from just outside Tampa Bay to the south end of Lemon Bay, and found evidence of significant population structure among all areas on the basis of both mitochondrial DNA control region sequence data and 9 nuclear microsatellite loci. The Sellas *et al.* (2005) findings support the separate identification of bay, sound and estuary stocks from those occurring in adjacent Gulf coastal waters, as suggested by Wells (1986).

Off Galveston, Texas, Beier (2001) reported an open population of individual dolphins in coastal waters, but several individual dolphins had been sighted previously by other researchers over a 10-year period. Some coastal animals may move relatively long distances alongshore. Two bottlenose dolphins previously seen in the South Padre Island area in Texas were seen in Matagorda Bay, 285km north, in May 1992 and May 1993 (Lynn and Würsig 2002).

## **POPULATION SIZE**

Population size estimates for this stock are greater than 8 years old and therefore the current population size for the stock is considered unknown (Wade and Angliss 1997).

## **Abundance estimates**

The most recent estimates of abundance were derived using distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) with sighting data collected during aerial line-transect surveys conducted during autumn from 1992-1994 (Blaylock and Hoggard 1994; NMFS unpublished data). Systematic sampling transects, placed randomly with respect to the bottlenose dolphin distribution, extended orthogonally from shore out to approximately 9 km past the 18-m isobath. Approximately 5% of the total survey area was visually searched. The bottlenose dolphin abundance estimate for the Western Coastal Stock based on the 1992 survey was 3,499 (CV=0.21).

## **Minimum Population Estimate**

The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normally distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distribution as specified by Wade and Angliss (1997). The best estimate of abundance for the Western Coastal Stock of bottlenose dolphins is unknown. Therefore, the minimum population estimate for the northern Gulf of Mexico Western Coastal Stock is unknown.

## **Current Population Trend**

There are insufficient data to determine population trends for this stock.

## **CURRENT AND MAXIMUM NET PRODUCTIVITY RATES**

Current and maximum net productivity rates are not known for this stock. The maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive life history (Barlow *et al.* 1995).

## **POTENTIAL BIOLOGICAL REMOVAL**

Potential Biological Removal (PBR) is the product of minimum population size, one-half the maximum productivity rate and a recovery factor (Wade and Angliss 1997). The minimum population size is unknown. The maximum productivity rate is 0.04, the default value for cetaceans. The recovery factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5 because the stock is of unknown status. PBR for the northern Gulf of Mexico Western Coastal Stock of bottlenose dolphins is undetermined.

## **ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY**

The total annual human-caused mortality and serious injury of the Western Coastal Stock of bottlenose dolphins during 2006–2010 is unknown.

## **Fisheries Information**

The commercial fisheries which potentially could interact with the Western Coastal Stock in the northern Gulf of

Mexico are the shrimp trawl, blue crab trap/pot, stone crab trap/pot, menhaden purse seine, gillnet, shark bottom longline, and Atlantic Ocean commercial passenger fishing vessel (hook and line) fisheries (Appendix III).

### **Hook and Line Fisheries**

During 2010 there was 1 mortality in Texas for which hook and line gear entanglement was documented. The mortality was included in the stranding database (NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 16 November 2011) and is included in the stranding totals presented in Table 1.

### **Shrimp Trawl Fishery**

A voluntary observer program for the shrimp trawl fishery began in 1992 and became mandatory in 2007. Four bottlenose dolphin mortalities were observed in the shrimp trawl fishery during 2003, 2007, 2008 and 2010. The 2010 mortality occurred off the Louisiana coast and likely belonged to the Western Coastal Stock. The 2008 mortality occurred off the Texas coast and could have belonged to the Western Coastal Stock or Continental Shelf Stock. The 2007 mortality occurred off the Louisiana coast and could have belonged to the Western Coastal Stock or a bay, sound and estuary stock (Mobile Bay, Bonsecour Bay Stock or Mississippi Sound, Lake Borgne, Bay Boudreau Stock). During 2009, 1 bottlenose dolphin was released alive presumably with no serious injury after becoming entangled in the lazy line of a shrimp trawl. This animal could have belonged to the Continental Shelf Stock or the Western Coastal Stock. In 2008, a dolphin carcass was caught on the tickler chain of a shrimp trawl; however, the animal's carcass was severely decomposed and may have been captured in this state. It is likely the unidentified carcass belonged to the bottlenose dolphin Western Coastal Stock or Continental Shelf Stock, or possibly to the Atlantic spotted dolphin stock.

### **Blue and Stone Crab Trap/Pot Fisheries**

Bottlenose dolphins have been reported stranded with polypropylene rope around their flukes (NMFS 1991; McFee and Brooks, Jr. 1998; NMFS unpublished data), indicating the possibility of entanglement with crab pot lines. In 2008, a dolphin likely belonging to the Western Coastal Stock was disentangled from crab trap gear in Texas by a concerned citizen and swam away with no reported injuries (NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 16 November 2011). Since there is no systematic observer program, it is not possible to estimate the total number of interactions or mortalities associated with crab traps/pots.

### **Menhaden Purse Seine Fishery**

There are no recent observer program data for the Gulf of Mexico menhaden purse seine fishery but incidental mortality of bottlenose dolphins has been reported for this fishery (Reynolds 1985). Through the Marine Mammal Authorization Program, there have been 11 self-reported incidental takes (all mortalities) of bottlenose dolphins in northern Gulf of Mexico coastal and estuarine waters by the menhaden purse seine fishery. These takes likely affected the following stocks: Western Coastal Stock; Northern Coastal Stock; Mississippi Sound, Lake Borgne, Bay Boudreau Stock; Mississippi River Delta Stock; and Barataria Bay Estuarine System Stock. Two takes of single bottlenose dolphins were reported in Louisiana waters during 2005 (both likely belonged to the Western Coastal Stock; 1 of the animals may have been dead prior to capture). Three takes were reported in 2000, 2 of which were for single dolphins (1 bottlenose, 1 unidentified) in Louisiana waters (likely belonged to Western Coastal Stock and either Mississippi River Delta Stock or Northern Coastal Stock), and the third was for 3 bottlenose dolphins in a single purse seine in Mississippi waters (likely belonged to Mississippi Sound, Lake Borgne, Bay Boudreau Stock). The menhaden purse seine fishery was observed to take 9 bottlenose dolphins (3 fatally) between 1992 and 1995 (NMFS unpublished data). During that period, there were 1,366 sets observed out of 26,097 total sets, which if extrapolated for all years suggests that as many as 172 bottlenose dolphins could have been taken in this fishery with up to 57 animals killed. Without an observer program it is not possible to obtain statistically reliable information for this fishery on the number of sets annually, the incidental take and mortality rates, and the communities from which bottlenose dolphins are being taken.

### **Gillnet Fishery**

No marine mammal mortalities associated with gillnet fisheries have been reported for the Western Coastal Stock, but stranding data suggest that gillnet and marine mammal interaction does occur, causing mortality and serious injury. Four research-related gillnet mortalities occurred between 2003 and 2007 in Texas and Louisiana. Additionally, in 2008, 1 dolphin was entangled in a fisheries research gillnet in Texas. All of these animals likely

belonged to bay, sound and estuary stocks.

### **Shark Bottom Longline Fishery**

The shark bottom longline fishery has been observed since 1994, and no interactions have been reported for the Western Coastal Stock. However, 3 interactions with bottlenose dolphins were recorded during 1999, 2002 and 2003 (Burgess and Morgan 2003a,b) which likely involved animals from the Eastern Coastal and Continental Shelf Stocks. No interactions with any bottlenose dolphin stock were observed during 2004-2010 (Hale and Carlson 2007; Hale *et al.* 2007; Richards 2007; Hale *et al.* 2009; 2010; 2011).

### **Strandings**

A total of 566 bottlenose dolphins were found stranded in Western Coastal Stock waters of the northern Gulf of Mexico from 2006 through 2010 (Table 1; NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 16 November 2011). Evidence of human interactions (e.g., gear entanglement, mutilation, gunshot wounds) was detected for 20 of these stranded dolphins. For 3 of the dolphins from 2010, visible, external oil was present on the animals. Bottlenose dolphins are known to become entangled in, or ingest recreational and commercial fishing gear (Wells and Scott 1994; Gorzelany 1998; Wells *et al.* 1998; Wells *et al.* 2008), and some are struck by vessels (Wells and Scott 1997; Wells *et al.* 2008).

There are a number of difficulties associated with the interpretation of stranding data. It is possible that some or all of the stranded dolphins may have been from a nearby bay, sound and estuary stock; however, the proportion of stranded dolphins belonging to another stock cannot be determined because of the difficulty of determining from where the stranded carcass originated. Stranding data probably underestimate the extent of human-related mortality and serious injury because not all of the dolphins which die or are seriously injured due to human interactions wash ashore, nor will all of those that do wash ashore necessarily show signs of fishery-interaction or other human interactions. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of human interaction, and the condition of the carcass if badly decomposed can inhibit the interpretation of cause of death.

Since 1990, there have been 12 bottlenose dolphin die-offs or Unusual Mortality Events (UMEs) in the northern Gulf of Mexico, and 6 of these have occurred within the boundaries of the Western Coastal Stock and may have affected the stock. 1) From January through May 1990, a total of 367 bottlenose dolphins stranded in the northern Gulf of Mexico. Overall this represented a two-fold increase in the prior maximum recorded strandings for the same period, but in some locations (i.e., Alabama) strandings were 10 times the average number. The cause of the 1990 mortality event could not be determined (Hansen 1992). 2) In March and April 1992, 111 bottlenose dolphins stranded in Texas, about 9 times the average number. The cause of this event was not determined, but carbamates were a suspected cause. 3) In 1993-1994 an UME of bottlenose dolphins likely caused by morbillivirus started in the Florida Panhandle and spread west with most of the mortalities occurring in Texas (Lipscomb 1993; Lipscomb *et al.* 1994). From February through April 1994, 220 bottlenose dolphins were found dead on Texas beaches, of which 67 occurred in a single 10-day period. 4) During February and March of 2007 an event was declared for northeast Texas and western Louisiana involving 66 bottlenose dolphins. Decomposition prevented conclusive analyses on most carcasses. 5) During February and March of 2008 an additional event was declared in Texas involving 113 bottlenose dolphin strandings. Most of the animals recovered were in a decomposed state. The event has been closed, however, the investigation is ongoing. 6) An UME was declared for cetaceans in the northern Gulf of Mexico beginning 1 February 2010; and, as of early 2012, the event is still ongoing. It includes cetaceans that stranded prior to the Deepwater Horizon oil spill (see "Habitat Issues" below), during the spill, and after. During 2010, 41 animals from this stock were considered to be part of the UME.

Table 1. Bottlenose dolphin strandings occurring in Western Coastal Stock waters of the northern Gulf of Mexico from 2006 to 2010, as well as number of strandings for which evidence of human interaction was detected and number of strandings for which it could not be determined (CBD) if there was evidence of human interaction. Data are from the NOAA National Marine Mammal Health and Stranding Response Database (unpublished data, accessed 16 November 2011). Please note human interaction does not necessarily mean the interaction caused the animal's death. Please also note that strandings in coastal waters have been separated by coastal stock and separated from bay, sound and estuary stocks; therefore, the annual totals below will differ from those reported previously. Finally, there were an additional 24 dolphins not included in this or any other table that stranded either in bay, sound and estuary waters or in coastal waters that could not be assigned definitively to a stock due to bad location data. If/when the location data are resolved, the numbers below could increase.

Stock	Category	2006	2007	2008	2009	2010	Total
Western Coastal Stock	Total Stranded	79	112 <sup>a</sup>	152 <sup>b</sup>	92	131 <sup>c</sup>	566
	Human Interaction						
	---Yes	3	5	1	3	7	20
	---No	15	27	29	4	18	93
	---CBD	61	80	122	85	106	453

<sup>a</sup>This total includes 59 animals that were part of the 2007 UME  
<sup>b</sup>This total includes 1 mass stranding event (2 animals in August 2008)  
<sup>c</sup>This total includes 41 strandings that are part of the ongoing UME in the northern Gulf of Mexico

### Other Mortality

As part of its annual coastal dredging program, the Army Corps of Engineers conducts sea turtle relocation trawling during hopper dredging as a protective measure for marine turtles. Five incidents have been documented in the Gulf of Mexico involving bottlenose dolphins and relocation trawling activities. Four of the incidents were mortalities, and 1 occurred during each of the following years: 2003, 2005, 2006, and 2007. It is likely 2 of these animals belonged to the Western Coastal Stock (2005, 2007) and 2 belonged to bay, sound and estuary stocks (2003, 2006). An additional incident occurred during 2006 in which the dolphin became free during net retrieval and was observed swimming away normally. It is likely this animal belonged to a bay, sound and estuary stock. All of the mortalities were included in the stranding database and the 2 most recent are included in the appropriate stranding tables under "Yes" for Human Interaction.

The problem of dolphin depredation of fishing gear is increasing in the Gulf of Mexico. There have been 3 recent cases of fishermen illegally "taking" dolphins due to dolphin depredation of recreational and commercial fishing gear. In 2006 a charter boat fishing captain was charged under the MMPA for shooting at a dolphin that was swimming around his catch in the Gulf of Mexico, off Panama City, Florida. In 2007 a second charter fishing boat captain was fined under the MMPA for shooting at a bottlenose dolphin that was attempting to remove a fish from his line in the Gulf of Mexico, off Orange Beach, Alabama. A commercial fisherman was indicted in November 2008 for throwing pipe bombs at dolphins off Panama City, Florida, and charged in March 2009 for "taking" dolphins with an explosive device.

Feeding or provisioning of wild bottlenose dolphins has been documented in Florida, particularly near Panama City Beach in the Panhandle (Samuels and Bejder 2004) and south of Sarasota Bay (Cunningham-Smith *et al.* 2006; Powell and Wells 2011), and also in Texas near Corpus Christi (Bryant 1994). Feeding wild dolphins is defined under the MMPA as a form of 'take' because it can alter their natural behavior and increase their risk of injury or death. Nevertheless, a high rate of uncontrolled provisioning was observed near Panama City Beach in 1998 (Samuels and Bejder 2004), and provisioning has been observed south of Sarasota Bay since 1990 (Cunningham-Smith *et al.* 2006; Powell and Wells 2011). There are emerging questions regarding potential linkages between provisioning and depredation of recreational fishing gear and associated entanglement and ingestion of gear, which is increasing through much of Florida. During 2006, an estimated 2% of the long-term resident dolphins of Sarasota Bay died from ingestion of recreational fishing gear (Powell and Wells 2011). Swimming with wild bottlenose dolphins has also been documented. Near Panama City Beach, Samuels and Bejder (2004) concluded that dolphins were amenable to swimmers due to provisioning. Swimming with wild dolphins may cause harassment, and harassment is illegal under

the MMPA.

## HABITAT ISSUES

The Deepwater Horizon (DWH) MC252 drilling platform, located approximately 50 miles southeast of the Mississippi River Delta in waters about 1500m deep, exploded on 20 April 2010. The rig sank, and for 87 days millions of barrels of oil and gas were discharged from the wellhead until it was capped on 15 July 2010. During the response effort dispersants were applied extensively at the seafloor and at the sea surface (Lehr *et al.* 2010; OSAT 2010). In-situ burning, or controlled burning of oil at the surface, was also used extensively as a response tool (Lehr *et al.* 2010). The oil, dispersant and burn residue compounds present ecological concerns. The magnitude of this oil spill was unprecedented in U.S. history, causing impacts to wildlife, natural habitats and human communities along coastal areas from western Louisiana to the Florida Panhandle (NOAA 2011). It could be years before the entire scope of damage is ascertained (NOAA 2011).

A substantial number of beaches and wetlands along the Louisiana coast experienced heavy or moderate oiling (OSAT-2 2011). The heaviest oiling in Louisiana occurred west of the Mississippi River on the Mississippi Delta and in Barataria and Terrebonne Bays, and to the east of the river on the Chandeleur Islands. Some heavy to moderate oiling occurred on Alabama and Florida beaches, with the heaviest stretch occurring from Dauphin Island, Alabama, to Gulf Breeze, Florida. Light to trace oil was reported along the majority of Mississippi barrier islands, from Gulf Breeze to Panama City, Florida, and outside of Atchafalaya and Vermilion Bays in western Louisiana (OSAT-2 2011).

Shortly after the oil spill, the Natural Resource Damage Assessment (NRDA) process was initiated under the Oil Pollution Act of 1990. A variety of NRDA research studies are being conducted to determine potential impacts of the spill on marine mammals. These studies have focused on identifying the type, magnitude, severity, length and impact of oil exposure to oceanic, coastal and estuarine marine mammals. The research is ongoing. For coastal and estuarine dolphins, the NOAA-led efforts include: active surveillance to detect stranded animals in remote locations; aerial surveys to document the distribution, abundance, species and exposure of marine mammals and sea turtles relative to oil from DWH spill; assessment of sublethal and chronic health impacts on coastal and estuarine bottlenose dolphins in Barataria Bay, Louisiana, and a reference site in Sarasota Bay, Florida; and assessment of injuries to dolphin stocks in Barataria Bay and Chandeleur Sound, Louisiana, Mississippi Sound, and as a reference site, St. Joseph Bay, Florida.

Coastal dolphins have been observed with tar balls attached to them and seen swimming through oil slicks close to shore and inland bays (NOAA 2010a). The effects of oil exposure on marine mammals depend on a number of factors including the type and mixture of chemicals involved, the amount, frequency and duration of exposure, the route of exposure (inhaled, ingested, absorbed, or external) and biomedical risk factors of the particular animal (Geraci 1990; NOAA 2010b). In general, direct external contact with petroleum compounds or dispersants with skin may cause skin irritation, chemical burns and infections. Inhalation of volatile petroleum compounds or dispersants may irritate or injure the respiratory tract, which could lead to pneumonia or inflammation. Ingestion of petroleum compounds may cause injury to the gastrointestinal tract, which could affect an animal's ability to digest or absorb food. Absorption of petroleum compounds or dispersants may damage kidney, liver and brain function in addition to causing immune suppression and anemia. Long term chronic effects such as lowered reproductive success and decreased survival may occur (Geraci 1990; NOAA 2010b).

The nearshore habitat occupied by the 3 coastal stocks is adjacent to areas of high human population and in some areas, such as Tampa Bay, Florida, Galveston, Texas, and Mobile, Alabama, is highly industrialized. Concentrations of anthropogenic chemicals such PCBs and DDT and its metabolites vary from site to site, and can reach levels of concern for bottlenose dolphin health and reproduction in the southeastern U.S. (Schwacke *et al.* 2002). PCB concentrations in 3 stranded dolphins sampled from the Eastern Coastal Stock area ranged from 16-46µg/g wet weight. Two stranded dolphins from the Northern Coastal Stock area had the highest levels of DDT derivatives of any of the bottlenose dolphin liver samples analyzed in conjunction with a 1990 mortality investigation conducted by NMFS (Varanasi *et al.* 1992). The significance of these findings is unclear, but there is some evidence that increased exposure to anthropogenic compounds may reduce immune function in bottlenose dolphins (Lahvis *et al.* 1995), or impact reproduction through increased first-born calf mortality (Wells *et al.* 2005). Concentrations of chlorinated hydrocarbons and metals were relatively low in most of the bottlenose dolphins examined in conjunction with an anomalous mortality event in Texas bays in 1990; however, some had concentrations at levels of possible toxicological concern (Varanasi *et al.* 1992). Agricultural runoff following periods of high rainfall in 1992 was implicated in a high level of bottlenose dolphin mortalities in Matagorda Bay, which is adjacent to the Western Coastal Stock area (NMFS unpublished data).

The Mississippi River, which drains about two-thirds of the continental U.S., flows into the north-central Gulf of

Mexico and deposits its nutrient load which is linked to the formation of one of the world's largest areas of seasonal hypoxia (Rabalais *et al.* 1999). This area is located in Louisiana coastal waters west of the Mississippi River delta. How it affects bottlenose dolphins is not known.

#### STATUS OF STOCK

The status of the Western Coastal Stock relative to OSP is not known and population trends cannot be determined due to insufficient data. This species is not listed as threatened or endangered under the Endangered Species Act. There are insufficient data to determine population trends for this stock. Total human-caused mortality and serious injury for this stock is not known and there is insufficient information available to determine whether the total fishery-related mortality and serious injury is insignificant and approaching zero mortality and serious injury rate. NMFS considers this stock to be a strategic stock for the following reasons: the stock size is currently unknown and PBR undetermined, and there are documented cases of human-related mortality from a number of sources; there is no systematic monitoring of all fisheries that may take this stock; and an UME of unprecedented size and duration (began 1 February 2010 and is ongoing) has impacted the Western Coastal Stock area.

#### REFERENCES CITED

- Barlow, J., S.L. Swartz, T.C. Eagle and P.R. Wade. 1995. U.S. marine mammal stock assessments: Guidelines for preparation, background and a summary of the 1995 Assessments. NOAA Tech. Memo. NMFS-OPR-6, 73 pp.
- Beier, A.G. 2001. Occurrence, distribution, and movement patterns of outer coastline bottlenose dolphins off Galveston, Texas. Master's thesis from Texas A&M University. 97 pp.
- Blaylock, R.A. and W. Hoggard. 1994. Preliminary estimates of bottlenose dolphin abundance in southern U.S. Atlantic and Gulf of Mexico continental shelf waters. NOAA Tech. Memo NMFS-SEFSC-356, 10 pp.
- Bryant, L. 1994. Report to Congress on results of feeding wild dolphins: 1989-1994. National Marine Fisheries Service, Office of Protected Resources, 23 pp.
- Buckland, S.T., D.R. Anderson, K.P. Burnham and J.L. Laake. 1993. Distance sampling: Estimating abundance of biological populations. Chapman & Hall, London. 446 pp.
- Burgess, G. and A. Morgan. 2003a. Commercial shark fishery observer program. Renewal of an observer program to monitor the directed commercial shark fishery in the Gulf of Mexico and South Atlantic: 1999 fishing season. Final Report, U.S. National Marine Fisheries Service, Highly Migratory Species Management Division Award NA97FF0041.
- Burgess, G. and A. Morgan. 2003b. Commercial shark fishery observer program. Renewal of an observer program to monitor the directed commercial shark fishery in the Gulf of Mexico and the south Atlantic: 2002(2) and 2003(1) fishing seasons. Final Report, U.S. National Marine Fisheries Service, Highly Migratory Species Management Division Award NA16FM0598.
- Cunningham-Smith, P., D.E. Colbert, R.S. Wells and T. Speakman. 2006. Evaluation of human interactions with a wild bottlenose dolphin (*Tursiops truncatus*) near Sarasota Bay, Florida, and efforts to curtail the interactions. *Aquat. Mamm.* 32(3):346-356.
- Fazioli, K.L., S. Hofmann and R.S. Wells. 2006. Use of Gulf of Mexico coastal waters by distinct assemblages of bottlenose dolphins (*Tursiops truncatus*). *Aquat. Mamm.* 32(2): 212-222.
- Fulling, G.L., K.D. Mullin and C.W. Hubard. 2003. Abundance and distribution of cetaceans in outer continental shelf waters of the U.S. Gulf of Mexico. *Fish. Bull.* 101: 923-932.
- Geraci, J.R. 1990. Physiologic and toxic effects on cetaceans. pp. 167-197 In: J. R. Geraci and D. J. St. Aubin (eds.) *Sea mammals and oil: Confronting the risks*. Academic Press, New York. 259 pp.
- Gorzelany, J.F. 1998. Unusual deaths of two free-ranging Atlantic bottlenose dolphins (*Tursiops truncatus*) related to ingestion of recreational fishing gear. *Mar. Mamm. Sci.* 14(3): 614-617.
- Hale, L.F. and J.K. Carlson. 2007. Characterization of the shark bottom longline fishery: 2005-2006. NOAA Tech. Memo. NMFS-SEFSC-554, 28 pp.
- Hale, L.F., L.D. Hollensead and J.K. Carlson. 2007. Characterization of the shark bottom longline fishery: 2007. NOAA Tech. Memo. NMFS-SEFSC-564, 25 pp.
- Hale, L.F., S.J.B. Gulak and J.K. Carlson. 2009. Characterization of the shark bottom longline fishery, 2008. NOAA Tech. Memo. NMFS-SEFSC-586, 23 pp.
- Hale, L.F., S.J.B. Gulak and J.K. Carlson. 2010. Characterization of the shark bottom longline fishery, 2009. NOAA Tech. Memo. NMFS-SEFSC-596, 25 pp.

- Hale, L.F., S.J.B. Gulak A.M. Napier and J. K. Carlson. 2011. Characterization of the shark bottom longline fishery, 2010. NOAA Tech. Memo. NMFS-SEFSC-611, 35 pp.
- Hansen, L.J. (ed.). 1992. Report on investigation of 1990 Gulf of Mexico bottlenose dolphin strandings. NOAA-NMFS-SEFSC Contribution MIA-92/93-21. Available from: NMFS, Southeast Fisheries Science Center, 75 Virginia Beach Dr., Miami, FL 33149.
- Hersh, S.L. and D.A. Duffield. 1990. Distinction between Northwest Atlantic offshore and coastal bottlenose dolphins based on hemoglobin profile and morphometry. pp. 129-139. *In*: S. Leatherwood and R.R. Reeves (eds.) The bottlenose dolphin. Academic Press, San Diego, CA. 653 pp.
- Hoelzel, A.R., C.W. Potter and P.B. Best. 1998. Genetic differentiation between parapatric 'nearshore' and 'offshore' populations of bottlenose dolphins. *Proc. R. Soc. Lond., Ser. B: Biol. Sci.* 265: 1177-1183.
- Irvine, A.B., M.D. Scott, R.S. Wells and J.H. Kaufmann. 1981. Movements and activities of the Atlantic bottlenose dolphin, *Tursiops truncatus*, near Sarasota, Florida. *Fish. Bull. U.S.* 79: 671-688.
- Laake, J.L., S.T. Buckland, D.R. Anderson and K.P. Burnham. 1993. DISTANCE user's guide, V2.0. Colorado Cooperative Fish & Wildlife Research Unit, Colorado State University, Ft. Collins. 72 pp.
- Lahvis, G.P., R.S. Wells, D.W. Kuehl, J.L. Stewart, H.L. Rhinehart and C.S. Via. 1995. Decreased lymphocyte responses in free-ranging bottlenose dolphins (*Tursiops truncatus*) are associated with increased concentrations of PCB's and DDT in peripheral blood. *Environ. Health Perspect.* 103: 67-72.
- Lehr, B., S. Bristol and A. Possolo, eds. 2010. Oil budget calculator: Deepwater Horizon. Technical documentation. Prepared by the Federal Interagency Solutions Group, Oil Budget Calculator Science and Engineering Team for the National Incident Command. Available from: [http://www.restorethegulf.gov/sites/default/files/documents/pdf/OilBudgetCalc\\_Full\\_HQ-Print\\_111110.pdf](http://www.restorethegulf.gov/sites/default/files/documents/pdf/OilBudgetCalc_Full_HQ-Print_111110.pdf)
- Lipscomb, T.P. 1993. Some answers to questions about morbillivirus. pp. 4-5. *In*: R. A. Blaylock, B. Mase and D. K. Odell (eds.) Strandings, Vol. 2, No. 3, SEFSC Miami Laboratory, Miami, Florida, 7 pp.
- Lipscomb, T.P., S. Kennedy, D. Moffet and B.K. Ford. 1994. Morbilliviral disease in an Atlantic bottlenose dolphin (*Tursiops truncatus*) from the Gulf of Mexico. *J. Wildl. Dis.* 30(4): 572-576.
- Lynn, S.K. and B. Würsig. 2002. Summer movement patterns of bottlenose dolphins in a Texas bay. *G. Mex. Sci.* 20(1): 25-37.
- McFee, W.E. and W. Brooks, Jr. 1998. Fact finding meeting of marine mammal entanglement in the crab pot fishery: A summary. U.S. Fish and Wildlife Service unpublished report. Available from: NMFS, Southeast Fisheries Science Center, 75 Virginia Beach Dr., Miami, FL 33149.
- Mullin, K.D., R.R. Lohofener, W. Hoggard, C.L. Roden and C.M. Rogers. 1990. Abundance of bottlenose dolphins, *Tursiops truncatus*, in the coastal Gulf of Mexico. *Northeast Gulf Sci.* 11(2): 113-122.
- NMFS. 1991. Proposed regime to govern the interactions between marine mammals and commercial fishing operations after October 1, 1993. Draft Environmental Impact Statement, June 1991. Available from: NMFS, Southeast Fisheries Science Center, 75 Virginia Beach Dr., Miami, FL 33149.
- NOAA. 2010a. Frequently asked questions about marine mammal rescue and intervention plans in response to the Deepwater Horizon oil spill. Available from: [http://sero.nmfs.noaa.gov/sf/deepwater\\_horizon/20100726\\_FINAL\\_FAQDWH\\_NOAA\\_marine\\_mammal\\_intervention\\_and\\_rescue.pdf](http://sero.nmfs.noaa.gov/sf/deepwater_horizon/20100726_FINAL_FAQDWH_NOAA_marine_mammal_intervention_and_rescue.pdf)
- NOAA. 2010b. Effects of oil on marine mammals and sea turtles. Available from: [http://sero.nmfs.noaa.gov/sf/deepwater\\_horizon/Marine\\_mammals\\_turtles\\_FACT\\_SHEET.pdf](http://sero.nmfs.noaa.gov/sf/deepwater_horizon/Marine_mammals_turtles_FACT_SHEET.pdf).
- NOAA. 2011. Public scoping for preparation of a programmatic environmental impact statement for the Deepwater Horizon BP Oil Spill. Available from: <http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/2011/04/Public-DWH-PEIS-Scoping-Review-Document1.pdf>
- Operational Science Advisory Team (OSAT). 2010. Summary report for sub-sea and sub-surface oil and dispersant detection: Sampling and monitoring. Prepared for P. F. Zukunft, RADM, U.S. Coast Guard, Federal On-Scene Coordinator, Deepwater Horizon MC252, December 17, 2010. Available from: [http://www.restorethegulf.gov/sites/default/files/documents/pdf/OSAT\\_Report\\_FINAL\\_17DEC.pdf](http://www.restorethegulf.gov/sites/default/files/documents/pdf/OSAT_Report_FINAL_17DEC.pdf)
- Operational Science Advisory Team (OSAT-2). 2011. Summary report for fate and effects of remnant oil remaining in the beach environment. Annex B: Spatial oil distribution. Available from: <http://www.restorethegulf.gov/release/2011/03/01/osat-2-fate-and-effects-oil-beaches>
- Powell, J.R. and R.S. Wells. 2011. Recreational fishing depredation and associated behaviors involving common bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay, Florida. *Mar. Mamm. Sci.* 27(1): 111-129.

- Rabalais, N.N., R.E. Turner and W.J. Wiseman, Jr. 1999. Hypoxia in the northern Gulf of Mexico: Linkage with the Mississippi River. pp. 297-322. *In*: H. Kumpf, K. Steidinger and K. Sherman (eds.) The Gulf of Mexico large marine ecosystem. Blackwell Science, Oxford, UK.
- Reynolds, J.E., III. 1985. Evaluation of the nature and magnitude of interactions between bottlenose dolphins, *Tursiops truncatus*, and fisheries and other human activities in coastal areas of the southeastern United States. National Technical Information Service PB86-162203, Springfield, VA 22161.
- Richards, P.M. 2007. Estimated takes of protected species in the commercial directed shark bottom longline fishery 2003, 2004, and 2005. NMFS SEFSC Contribution PRD-06/07-08, June 2007, 21 pp.
- Rosel, P.E., L. Hansen and A.A. Hohn. 2009. Restricted dispersal in a continuously distributed marine species: Common bottlenose dolphins *Tursiops truncatus* in coastal waters of the western North Atlantic. *Mol. Ecol.* 18: 5030–5045.
- Samuels, A. and L. Bejder. 2004. Chronic interactions between humans and free-ranging bottlenose dolphins near Panama City Beach, Florida, USA. *J. Cetacean Res. Manage.* 6: 69-77.
- Schwacke, L.H., E.O. Voit, L.J. Hansen, R.S. Wells, G.B. Mitchum, A.A. Hohn and P.A. Fair. 2002. Probabilistic risk assessment of reproductive effects of polychlorinated biphenyls on bottlenose dolphins (*Tursiops truncatus*) from the Southeast United States coast. *Environ. Toxicol. Chem.* 21: 2752–2764.
- Scott, G.P. 1990. Management-oriented research on bottlenose dolphins by the Southeast Fisheries Center. pp. 623-639. *In*: S. Leatherwood and R.R. Reeves (eds.) The bottlenose dolphin. Academic Press, San Diego, CA. 653 pp.
- Sellas, A.B., R.S. Wells and P.E. Rosel. 2005. Mitochondrial and nuclear DNA analyses reveal fine scale geographic structure in bottlenose dolphins (*Tursiops truncatus*) in the Gulf of Mexico. *Conserv. Genet.* 6: 715-728.
- Torres, L.G., P.E. Rosel, C. D'Agrosa and A.J. Read. 2003. Improving management of overlapping bottlenose dolphin ecotypes through spatial analysis and genetics. *Mar. Mamm. Sci.* 19(3): 502-514.
- Varanasi, U., K.L. Tilbury, D.W. Brown, M.M. Krahn, C.A. Wigren, R.C. Clark and S.L. Chan. 1992. pp. 56-86. *In*: L. J. Hansen (ed.) Report on investigation of 1990 Gulf of Mexico bottlenose dolphin strandings, Southeast Fisheries Science Center Contribution MIA-92/93-21, 219 pp.
- Vollmer, N.L. 2011. Population structure of common bottlenose dolphins in coastal and offshore waters of the Gulf of Mexico revealed by genetic and environmental analyses. Ph.D. Dissertation from University of Louisiana at Lafayette. 420 pp.
- Wade, P.R. and R.P. Angliss. 1997. Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop April 3-5, Seattle, WA. NOAA Tech. Memo. NMFS-OPR-12, 93 pp.
- Wells, R.S. 1986. Structural aspects of dolphin societies. Ph.D. dissertation from University of California, Santa Cruz. 234 pp.
- Wells, R.S. and M. D. Scott. 1994. Incidence of gear entanglement for resident inshore bottlenose dolphins near Sarasota, Florida. p. 629. *In*: W. F. Perrin, G. P. Donovan and J. Barlow (eds.) Gillnets and cetaceans. Rep. Int. Whal. Commn., Special Issue 15.
- Wells, R.S. and M. D. Scott. 1997. Seasonal incidence of boat strikes on bottlenose dolphins near Sarasota, Florida. *Mar. Mamm. Sci.* 13(3): 475-480.
- Wells, R.S., S. Hofmann and T.L. Moors. 1998. Entanglement and mortality of bottlenose dolphins, *Tursiops truncatus*, in recreational fishing gear in Florida. *Fish. Bull.* 96(3): 647-650.
- Wells, R.S., V. Tornero, A. Borrell, A. Aguilar, T. K. Rowles, H. L. Rhinehart, S. Hofmann, W. M. Jarman, A. A. Hohn and J. C. Sweeney. 2005. Integrating life history and reproductive success data to examine potential relationships with organochlorine compounds for bottlenose dolphins (*Tursiops truncatus*) in Sarasota Bay, Florida. *Sci. Total Environ.* 349: 106-119.
- Wells, R.S., J.B. Allen, S. Hoffman, K. Bassos-Hull, D.A. Fauquier, N.B. Barros, R.E. DeLynn, G. Sutton, V. Socha and M.D. Scott. 2008. Consequences of injuries on survival and reproduction of common bottlenose dolphins (*Tursiops truncatus*) along the west coast of Florida. *Mar. Mamm. Sci.* 24: 774-794.