BOTTLENOSE DOLPHIN (*Tursiops truncatus*): Northern Gulf of Mexico Oceanic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Thirty-eight stocks have been provisionally identified for Gulf of Mexico bottlenose dolphins (Waring *et al.* 2001). Gulf of Mexico inshore habitat has been separated into 33 bay, sound and estuarine stocks. Three northern Gulf of Mexico coastal stocks include nearshore waters from the shore to the 20 m isobath. The continental shelf stock encompasses waters from 20 to 200 m deep. The Gulf of Mexico oceanic stock encompasses the waters from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ; Figure 1).

Both "coastal/nearshore" and "offshore" ecotypes of bottlenose dolphins (Hersh and Duffield 1990) occur in the Gulf of Mexico (LeDuc and Curry 1998). The offshore and nearshore ecotypes are genetically distinct using both mitochondrial and nuclear markers (Hoelzel *et al.* 1998). In the northwestern Atlantic, Torres *et al.* (2003) found a statistically significant break in the distribution of the ecotypes at 34 km from shore. The offshore ecotype was found exclusively seaward of 34 km and in waters deeper than 34 m. Within 7.5 km of shore, all animals were of the coastal ecotype. If the distribution of ecotypes found by Torres *et al.* (2003) is similar in the northern Gulf of Mexico, the oceanic stock consists of the offshore ecoptype.

Based on research currently being conducted on bottlenose dolphins in the Gulf of Mexico, as well as the western North Atlantic Ocean, the structure of these stocks is uncertain, but appears to be complex. The multi-disciplinary research programs conducted over the last two decades (e.g., Wells 1994) are beginning to shed light on stock structures of bottlenose dolphins, though additional analyses are needed before stock structures can be elaborated on in the Gulf of Mexico. As research is completed, it may be necessary to revise all the stocks of bottlenose dolphins in the Gulf of Mexico.

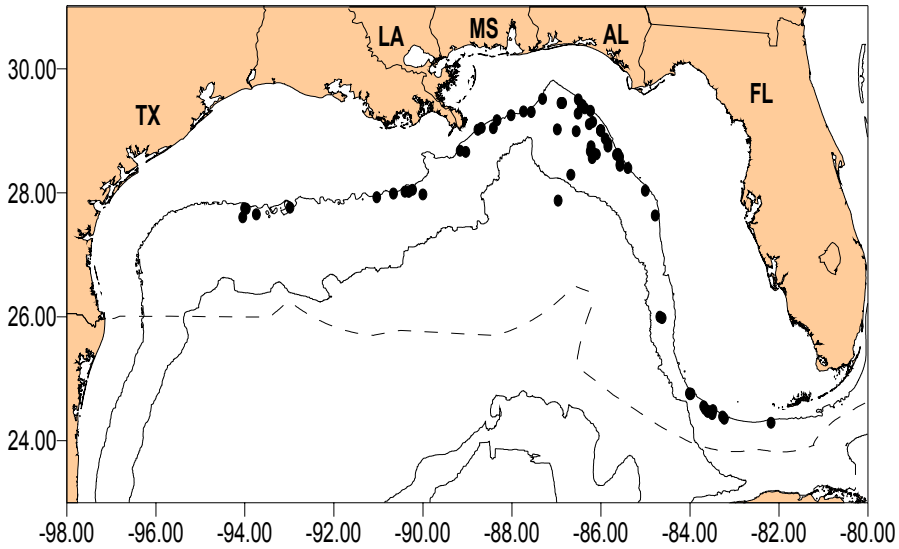

Figure 1. Distribution of bottlenose dolphin sightings from SEFSC shipboard surveys during spring 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 200 m and 2000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 2001) and the computer program DISTANCE (Thomas *et al.* 1998) to sighting data. Surveys were conducted during April/May from 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordon Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in review). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for bottlenose dolphins in oceanic waters, pooled from 1996 to 2001, is 2,239 (CV=0.41) (Mullin and Fulling in review), which is the best available abundance estimate for this species in the oceanic Gulf of Mexico.

Minimum Population Estimate

The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). The best estimate of abundance for bottlenose dolphins is 2,239 (CV=0.41) taken from Mullin and Fulling (in review). The minimum population estimate for the northern Gulf of Mexico oceanic stock is 1,607 bottlenose dolphins.

Current Population Trend

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

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum productivity rates are unknown for this stock. For purposes of this assessment, the maximum 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 level (PBR) is the product of minimum population size, one-half the maximum productivity rate, and a recovery factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 1,607 (CV=0.41). 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. PBR for the Gulf of Mexico oceanic bottlenose dolphin is 16.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Annual human-caused mortality and serious injury is unknown for this stock.

Fisheries Information

The level of past or current, direct, human-caused mortality of bottlenose dolphins in the Gulf of Mexico is unknown; however, interactions between bottlenose dolphins and fisheries have been observed in the Gulf of Mexico. There have been no reports of incidental mortality or injury associated with the shrimp trawl fishery in this area. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S.Gulf of Mexico. There were no reports of mortality or serious injury tobottlenose dolphins in the Gulf of Mexico from 1997 to 2002. Fishery interactions have previously been reported to occur between bottlenose dolphins and the longline swordfish/tuna fishery in the Gulf of Mexico (SEFSC unpublished logbook data), with annual fishery-related mortality and serious injury to bottlenose dolphins estimated to be 2.8 per year (CV=0.74) during 1992-1993. This could include bottlenose dolphins from the continental shelf and oceanic stocks. However, there has been no recent mortality of a bottlenose dolphin in this fishery (Yeung 1999; Yeung 2001).

A trawl fishery for butterfish was monitored by NMFS observers for a short period in the 1980's with no records of incidental take of marine mammals (Burn and Scott 1988; NMFS unpublished data), although an experimental set by NMFS resulted in the death of two bottlenose dolphins (Burn and Scott 1988). There are no other data available with regard to this fishery.

Other Mortality

The use of explosives to remove oil rigs in the portions of the continental shelf in the western Gulf of Mexico has the potential to cause serious injury or mortality to marine mammals. These activities have been closely monitored by NMFS observers since 1987 (Gitschlag and Herczeg 1994). There have been no reports of either serious injury or mortality to bottlenose dolphins in the oceanic Gulf of Mexico (NMFS unpublished data).

STATUS OF STOCK

The status of bottlenose dolphins, relative to OSP, in the U.S. Gulf of Mexico oceanic waters is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less that 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because annual fishery-related mortality and serious injury has not exceeded PBR.

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