

## **PYGMY SPERM WHALE (*Kogia breviceps*): Western North Atlantic Stock**

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

The dwarf sperm whale (*Kogia breviceps*) and the pygmy sperm whale (*K. simus*) appear to be distributed worldwide in temperate to tropical waters (Caldwell and Caldwell 1989). Sightings of these animals in the northern Gulf of Mexico occur primarily along the continental shelf edge and over the deeper waters off the continental shelf (Mullin *et al.* 1991; Southeast Fisheries Science Center unpublished data). Recent analyses of hemoglobin, morphometric and dietary data from Florida strandings of both species (Barros *et al.* 1998) suggests that habitat partitioning may exist between the two species, *K. simus* occupies more offshore and oceanic waters, whereas *K. breviceps* inhabits more mid-shelf waters. Interestingly, a recent analysis of South Africa stranding data indicates that in that region *K. simus* is the nearshore species (Plön *et al.* 1998). Pygmy sperm whales and dwarf sperm whales are difficult to distinguish and sightings of either species are often categorized as *Kogia* sp. There is no information on stock differentiation for the Atlantic population.

### **POPULATION SIZE**

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data collected during a 1992 winter, visual sampling, line-transect vessel survey of the U.S. Atlantic Exclusive Economic Zone (EEZ) waters between Miami, Florida, and Cape Hatteras, North Carolina. Abundance was estimated for both species combined because the majority of sightings were not identified to species, and both species are known to occur in the area. The estimated abundance of dwarf sperm whales and pygmy sperm whales combined for the 1992 surveys was 420 animals (coefficient of variation, CV = 0.60) (Hansen *et al.* 1994). Pygmy sperm whale abundance alone cannot be estimated due to uncertainty of species identification of sightings.

### **Minimum Population Estimate**

A best and minimum population size could not be estimated because of the uncertainty in species identification.

### **Current Population Trend**

No information was available to evaluate trends in population size.

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

Current and maximum net productivity rates are not known for this stock. For purposes of this assessment, 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 (MMPA Sec. 3. 16 U.S.C. 1362; 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 this stock is of unknown status. PBR for the western North Atlantic pygmy sperm whale was unknown because the minimum population estimate cannot be estimated.

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

#### **Fishery Information**

The level of past or current, direct, human-caused mortality of pygmy sperm whales in the U.S. Atlantic EEZ is unknown. Available information indicates there is likely little, if any, fisheries interaction with pygmy sperm whales in the U.S. Atlantic EEZ.

There were no documented strandings of pygmy sperm whales along the U.S. Atlantic coast during 1987-present which were classified as likely caused by fishery interactions. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured may wash ashore, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interaction.

Data on current incidental takes in U.S. fisheries are available from several sources. In 1986, NMFS established a mandatory self-reporting fishery information system for large pelagic fisheries. The Northeast Fisheries Science Center (NEFSC) Sea Sampling Observer Program initiated in 1989, and since that year several fisheries have been covered by the program. In late 1992 and in 1993, the SEFSC provided observer coverage of pelagic longline vessels fishing off the Grand Banks (Tail of the Banks) and currently provides observer coverage of vessels fishing south of Cape Hatteras. There have been no observed mortalities or serious injuries by NMFS Sea Samplers in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, New England multispecies sink gillnet, mid-Atlantic coastal sink gillnet, and North Atlantic bottom trawl fisheries.

### **Other Mortality**

At least 174 (includes one unidentified in 1996 that was assigned by the SAR author to this species, because the pygmy sperm whales account for the majority of identified *Kogia* stranding) pygmy sperm whale strandings were documented along the U.S. Atlantic coast between Cape Hatteras, North Carolina, and Miami, Florida, during 1987-1996 (NMFS, unpubl. data). Two of the stranded animals had plastic, or a plastic bag or bags in their stomachs, and one additional animal had possible propeller cuts on its flukes.

### **STATUS OF STOCK**

The status of this stock relative to OSP in the U.S. Atlantic EEZ is unknown. This species is not listed as endangered or threatened under the Endangered Species Act. There is insufficient information with which to assess population trends. Because there are no observed mortalities or serious injuries between 1992 and 1996, total fishery-related mortality and serious injury for this stock is considered insignificant and approaching zero mortality and serious injury rate

### **REFERENCES**

- 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. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-6, 73 pp.
- Barros, N.B., D.A. Duffield, P.H. Ostrom, D.K. Odell and V.R. Cornish. 1998. Near-shore vs. off-shore ecotype differentiation of *Kogia breviceps* and *K. simus* based on hemoglobin, morphometric and dietary analyses. The World Marine Mammal Conference, 20-24 January 1998, Monaco (Abstract).
- 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.
- Caldwell, D. K. and M. C. Caldwell 1989. Pygmy sperm whale *Kogia breviceps* (de Blainville 1838): dwarf sperm whale *Kogia simus* Owen, 1866. Pages 235-260. In: S. H. Ridgway and R. Harrison, Handbook of marine mammals, Vol. 4: river dolphins and the larger toothed whales. *Academic Press*, San Diego.
- Hansen, L. J., K. D. Mullin and C. L. Roden. 1994. Preliminary estimates of cetacean abundance in the northern Gulf of Mexico from vessel surveys. Southeast Fisheries Science Center, Miami Laboratory, Contribution No. MIA-93/94-58.
- 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, Colorado, 72 pp.
- Mullin, K., W. Hoggard, C. Roden, R. Lohofener, C. Rogers and B. Taggart. 1991. Cetaceans on the upper continental slope in the north-central Gulf of Mexico. OCS Study/MMS 91-0027. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Regional Office, New Orleans, Louisiana, 108 pp.

- Plön, S.E.E., R.W. Harris, P.M. Illgner and V.G.C. Cockcroft. 1998. Analysis of pygmy *Kogia breviceps* and dwarf *Kogia simus* sperm whale strandings along the South African coastline using a geographic information system. The World Marine Mammal Conference, 20-24 January 1998, Monaco (Abstract).
- Wade P.R., and R.P. Angliss. 1997. Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop April 3-5, 1996, Seattle, Washington. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-12, 93 pp.