CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Meeting of the Nomenclature Committee
Geneva (Switzerland), 19 August 2003, 18h00

TAXONOMIC STATUS AND DISTRIBUTION OF THE INDO-PACIFIC BOTTLENOSE DOLPHIN, TURSIOPS ADUNCUS (EHRENBERG, 1833)

This document has been prepared by Robert L. Brownell, Jr., William F. Perrin, Randall R. Reeves, and James G. Mead.

Southwest Fisheries Science Center, National Marine Fisheries Service, 1352 Lighthouse Ave., Pacific Grove, California, U.S.A. 93950 (RLB), Southwest Fisheries Science Center, National Marine Fisheries Service, 8604 La Jolla Shores Drive, La Jolla, California, U.S.A. 92037 (WFP), 27 Chandler Lane, Hudson, Québec, JOP 1HO, Canada (RRR), Division of Mammals, NHB 390 MRC 108, Smithsonian Institution, Washington, D.C. 20560, U.S.A. (JGM).

Abstract

At the present time CITES recognizes only one species of bottlenose dolphin, *Tursiops truncatus*. Until exceptions are proposed and agreed upon, scientific names used by CITES follow those used in Wilson and Reeder (1993). In this document, we summarize new information and data on another species of bottlenose dolphin, the Indo-Pacific bottlenose, *T. aduncus*. The Indo-Pacific bottlenose can be distinguished from common bottlenose dolphins using genetic, osteological and external morphology data. The geographic distribution of the Indo-Pacific bottlenose dolphin is reviewed and compared with the distribution of the common bottlenose dolphin that is adjacent or overlapping in much of the same region. Also we review the conservation status of Indo-Pacific bottlenose dolphin and raise concerns about the exploitation from small, resident populations of this species.

Introduction

Bottlenose dolphins (genus Tursiops) occur worldwide in tropical and warm-temperate waters, and include both coastal and pelagic populations (Mead and Brownell 1993, Rice 1998). However, because of their cosmopolitan distribution and variable external and osteological characters, many species and subspecies were described over 100 years ago (True, 1889). The lack of large samples, except for *T. truncatus* (Montagu, 1821) originally described from the eastern North Atlantic Ocean, has resulted in over a century of taxonomic confusion (True 1889, Mead and Brownell 1993). Therefore, until recently just the single species *T. truncatus* has been recognized in the scientific literature and by CITES, which follows the scientific names used in Wilson and Reeder (1993) unless a case is made to follow some other classification.

Ross (1977) presented evidence for the existence of two species, *T. truncatus* and *T. aduncus* from South Africa but Ross and Cockroft (1990), after examining specimens from Australia, concluded that specimens from the two locations should be assigned to a single species, *T. truncatus*. However, during the late 1990s, Wang and colleagues (Wang et al. 1999, Wang et al. 2000a,b) showed that the Indo-Pacific bottlenose can be distinguished from the common bottlenose dolphin using genetic, osteological and external morphology data.

Discussion

Taxonomic status - Differences between *T. truncatus* and *T. aduncus* are briefly summarized below: (1) External Morphology-- In stranded or captive specimens, the rostrum length as a proportion of the length

from the tip of the snout to the eye (taken perpendicular to the longitudinal axis of the body) is greater in *T. aduncus*. Ventral pigmentation may also be useful in discriminating the two species. Ventral spotting appears to be common in most *T. aduncus* throughout their range (Wang et al. 2000b); (2) Osteological-- Wang et al. (2000a) used cluster and principal components analyses to show clear osteological separation between these two species using four characters. The number of vertebrae in the two species are also non-overlapping at least in Chinese waters where the two species are sympatric (Wang et al. (2000a); (2) Genetic-- All recent analyses of mitochondrial DNA sequences (mt DNA) support the above characters in distinguishing the two forms as separate species (Curry and Smith 1997, Wang et al. 1999, Moller and Beheregaray 2001). Hoelzel et al. 1998, also using mt DNA, found genetic separation between the two forms, except for one specimen from South Africa. Based on the cytochrome b gene, *Tursiops aduncus* may not even belong in the genus Tursiops (LeDuc et al. 1999).

Species distribution - T. aduncus is reported throughout much of the temperate and tropical Indian Ocean and western Pacific Ocean. These dolphins are found from Cape Agulhas in southeastern South Africa and along the entire rim of the Indian Ocean, including the Red Sea, Persian Gulf, and the Indo-Malay Archipelago. They also occur in the coastal waters around much of the northern half of Australia. In the western- North Pacific this species occurs around Taiwan; the Ogasawara (Bonin) Islands and Kyushu, Japan. Confirmed records are known from South Africa (Ross 1977, 1984); west and east coasts of Australia (Ross and Cockroft 1990, Connor et al. 2000, Hale et al. 2000); Gulf of Tonkin, Taiwan, Hong Kong, China (Wang et al. 2000a,b); western Kyushu, Japan (Shirakihara et al. 2002). Probable T. aduncus populations are known from coastal areas in the Indo-Pacific region include: Pakistan (Pilleri and Gihr 1974), Persian Gulf (Robineau and Rose 1984), southeastern Asian waters north to the East China Sea (Hammond and Leatherwood 1984), Ogasawara Islands and New Caledonia (C. Garrigue in Hale et al. 2000).

Conservation status - Throughout their range Indo-Pacific bottlenose dolphins appear to have numerous local, resident populations. Some resident populations appear to be relatively small (Amakusa, western Kyushu, Japan just over 200 dolphins -- Shirakihara et al. 2002). The status of these dolphins from Papua New Guinea and eastward is poorly known. Reeves et al. (2003) noted that although this species is not considered endangered, its near-shore distribution makes it vulnerable to direct exploitation (including live-capture and removal), fishery conflicts and environmental degradation. This concern is especially true at the level of small, local, resident individual populations.

Remarks - The Indo-Pacific bottlenose dolphin has recently been given full species status by the IWC, CMS and IUCN (Reeves et al. 2003:47, IWC 2001). Also T. aduncus is recognized as a full species by Mead and Brownell (In press) in the second edition of Wilson and Reeder (In press).

Literature Cited

Connor, R. C., Wells, R. S., Mann, J. and Read, A. J. 2000. The bottlenose dolphin. Pages 91-126, In: Cetacean societies: field studies of dolphins and whales. J. Mann, R. C. Connors, P. L. Tyack, and H. Whitehead (editors), The University of Chicago Press, Chicago.

Curry, B. E., and Smith, J. 1997. Phylogeographic structure of the bottlenose dolphin (Tursiops truncatus): Stock identification and implications for management. Pages 227-247 In: Molecular genetics of marine mammals, A. E. Dizon, S. J. Chivers, W. F. Perrin (eds.), Special Publication No. 3, The Society for Marine Mammalogy, Lawrence, Kansas.

Hale, P. T., Barreto, A. S., and Ross, G. J. B. 2000. Comparative morphology and distribution of the aduncus and truncatus forms of bottlenose dolphin Tursiops in the Indian and western Pacific Oceans. Aquatic Mammals 26(2):101-110.

Hammond, D. D., and Leatherwood, S. 1984. Cetaceans live-captured for Ocean Park, Hong Kong April 1974-February 1983. Report of the International Whaling Commission 34:491-495.

Hoelzel, A.R., Potter, C. W. and Best, P. B. 1998. Genetic differentiation between parapatric 'nearshore' and 'offshore' populations of the bottlenose dolphin. Proceedings of the Royal Society of London B 265:1177-1183.

IWC. 2001. Report of the working group on nomenclature. Journal of Cetacean Research and Management 3 (supplement):363-367.

LeDuc, R. G., Perrin, W. F., and Dizon, A. E. 1999. Phylogenetic relationships among the delphinid cetaceans based on full cytochrome b sequences. Marine Mammal Science 15:619-648.

Mead, J. G., and Brownell, R. L., Jr. 1993. Order Cetacea, Pages 349-364, In: Mammal species of the world: A taxonomic and geographic reference. D. E. Wilson and D. M. Reeder (eds.), Smithsonian Institution, Smithsonian Press, Washington, D.C.

Mead, J. G., and Brownell, R. L., Jr. In press. Order Cetacea, Pages 000-000, In: Mammal species of the world: A taxonomic and geographic reference. D. E. Wilson and D. M. Reeder (eds.), 2nd edition, Smithsonian Institution, Smithsonian Press, Washington, D.C.

Moller, L. M., and Beheregaray, L. B. 2001. Coastal bottlenose dolphins from southeastern Australia are Tursiops aduncus according to sequences of the mitochondrial DNA control region. Marine Mammal Science 17(2):249-263.

Pilleri, G., and Gihr, M. 1974. Contributions to the knowledge of the cetaceans of southwest and monsoon Asia (Persian Gulf, Indus Delta, Malabar, Andaman Sea and Gulf of Siam). Investigations on Cetacea 5:95-150.

Reeves, R. R., Smith, B. D., Crespo, E. A., and Notarbartolo di Sciara, G. (compiliers) 2003. Dolphins, whales and porpoises: 2002-2010 conservation plan for theworld's cetaceans. IUCN/SSC Cetacean Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. Xi + 139pp.

Rice, D. W. 1998. Marine mammals of the world: Systematics and distribution. Special Publication No. 4, The Society for Marine Mammalogy, Lawrence, Kansas.

Robineau, D. and Rose, J. M. 1984. Les cetaces de Djibouti, Bilan des connaissances actuelles sur la faune cetologique de la mer Rouge et du Golfe d'Aden. Bulletin du Museum National d"Histoire Naturelle, Paris 6:219-249.

Ross, G. J. B. 1977. The taxonomy of bottlenosed dolphins Tursiops in South African waters, with notes on their biology. Annals of the Cape Provincial Museums (Natural History) 11:135-194.

Ross, G. J. B. 1984. The smaller cetaceans of the south east coast of southern Africa. Annals of the Cape Provincial Museums (Natural History) 15:173-410.

Ross, G. J. B. and Cockroft, V. G. 1990. Comments on Australian bottlenose dolphins and the taxonomic status of Tursiops aduncus. Pp. 101-128, In: The Bottlenose Dolphin, S. Leatherwood, and R. Reeves (eds.), Academic Press, San Diego, California.

Shirakihara, M., Shirakihara, K., Tomonaga, J., and Takatsuki, M. 2002. A resident population of Indo-Pacific bottlenose dolphins (Tursiops aduncus) in Amakusa, western Kyushu, Japan. Marien Mammal Science 18:30-41.

True, F. W. 1889. A review of the family Delphinidae. Bulletin of the United State National Museum Number 36:1-191 + XLVII plates.

Wang, J. Y., Chou, L.-S., and White, B. N. 1999. Mitochondrial DNA analysis of sympatric morphotypes of the bottlenose dolphins (genus Tursiops) in Chinese waters. Molecular Ecology. 8:1603-1612.

Wang, J. Y., Chou, L.-S., and White, B. N. 2000a. Osteological differences between two sympatric forms of bottlenose dolphins (genus Tursiops) in Chinese waters. Journal of Zoology (London). 252:147-162.

Wang, J. Y., Chou, L.-S., and White, B. N. 2000b. Differences in the external morphology of two sympatric species of bottlenose dolphins (Genus Tursiops) in the waters of China. Journal of Mammalogy. 81(4):1157-1165.

Wilson, D. E., and Reeder, D. M. 1993. Mammal species of the world: A taxonomic and geographic reference. D. E. Wilson and D. M. Reeder (eds.), Smithsonian Institution, Smithsonian Press, Washington, D.C.

Wilson, D. E., and Reeder, D. M. In press. Mammal species of the world: A taxonomic and geographic reference. D. E. Wilson and D. M. Reeder (eds.), 2nd edition, Smithsonian Institution, Smithsonian Press, Washington, D.C.