

STENO BREDANENSIS IN THE MEDITERRANEAN SEA

Steno bredanensis (Cuvier 1828),¹ the rough-toothed dolphin, has generally been considered to be only an occasional visitor to the Mediterranean Sea (*cf.* Walker 1964) and not a consistent component of the Mediterranean fauna (Duguy and Robineau 1973, 1982, Duguy and Cyrus 1973, Duguy 1978, 1983, Duguy *et al.* 1983, Cagnolaro *et al.* 1983). Five specimens have been positively identified from these waters. The skull of an adult from the Gulf of Marseille is in the museum of that city in France (Robineau 1975, Duguy and Cyrus 1976). A second skull from the Tyrrhenian Sea is in the Museum of Florence, Italy (Giglioli 1880, van Beneden 1889, Damiani 1903). The skull of a third specimen, collected near Haifa, Israel, is now at the British Museum, London (Marchessaux and Duguy 1979). A fourth specimen captured near Toulon, France, in 1926 was not preserved (Robineau 1975), but the record is unmistakably of *S. bredanensis* (Neuville 1927, 1928). The fifth specimen was caught in 1970 in the Gulf of Aigues-Mortes, south of France (Granier

¹ Note by William E. Schevill—This is an abridged summary of the somewhat confused nomenclatural history of *Steno bredanensis* (G. Cuvier in Lesson 1828). As early as 1812, Baron G. Cuvier was aware of the species because of a few skulls in the Museum of Paris, noted without names in the second paragraph on p. 10, *Annales du Muséum d'Histoire Naturelle*, Vol. 19. In 1817, Desmarest discussed this report under the name "*Delphinus rostratus* Cuvier" on pp. 160-161 in the *Nouveau Dictionnaire d'Histoire Naturelle*, Vol. 9.

Then in 1823, in an inadvertently ironic passage, Cuvier renamed *Delphinus geoffrensis* Blainville in Desmarest 1817 (now *Inia*) as *D. frontatus* ("pour éviter toute équivoque") after including the same few skulls of 1812 and 1917 on p. 278 (and on p. 296 and pl. 21, figs. 7 and 8) in *Recherches sur les ossemens fossiles*, 2nd edition, Vol. 5, part 1. During the printing of this work, J. G. S. van Breda ("finding myself by chance in Paris") called Cuvier's attention to the fact that these skulls belonged to a conspicuously non-frontate species very different from Blainville's *geoffrensis* (Cuvier's *frontatus*), and Baron Cuvier gratefully acknowledged this correction (1823, *op. cit.*, p. 400) and later distinguished the species as *Delphinus bredanensis*. This was then published by Lesson in 1828 as "*Delphinus bredanensis* Cuv.," p. 206, *Histoire Naturelle . . . des mammifères et des oiseaux* (Complément des Oeuvres de Buffon, Vol. 1).

In 1829, appropriately using Cuvier's new name of 1828, van Breda published his figures of the whole animal and its skull, in *Nieuwe Verhandelingen, Klasse 1, Deel 2*, pp. 235-238, K. Instituut van Wetenschappen, Letterkunde, en schoone Kunsten. Since then, various authors have proposed new names for forms allied to this species, including Lesson in 1836, H. Schlegel in 1841, Gray in 1846 (including it in his new genus *Steno*), Peters in 1876, and de Miranda-Ribeiro in 1936, although none of these appears to be more than a synonym of *bredanensis* G. Cuvier.

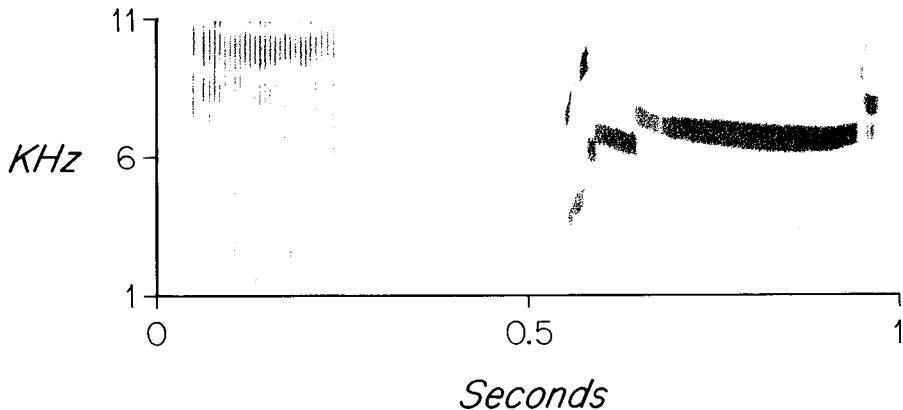


Figure 1. Representative click series and whistle sequence by *Steno*; both appear to have been produced by one dolphin. The analyzing filter bandwidth (resolution) of the spectrogram was 600 Hz.

1970–1972). In addition, Collet (1984) mentions “about ten” other specimens caught between 1950 and 1960 in the Mediterranean for the Laboratoire de Physiologie Acoustique in France. Also, probable sightings of this species have been reported from the Ionian Sea (Di Natale and Mangano 1981, Cagnolaro *et al.* 1983) and from the Sicily Channel (Cagnolaro *et al.* 1983).

To add considerably to this record, we report here observations of a large aggregation totalling approximately 160 animals in eight groups of about 20 *Steno* each. These sightings were made during a cruise for the Woods Hole Oceanographic Institution in the Sicily Channel in water about 500 m deep, approximately 170 km southeast of Cape Passero (Sicily) and 130 km southeast of Malta (35°28'26"N, 15°53'04"E). On 4 September 1985, at 0950 h, the dolphins approached our vessel as it moved at 13 km/h. The *Steno* remained in the area for nearly 1.5 h. The abundance of animals permitted many repeated observations, opportunities for photography, and confidence in the identifications. In spite of occasional white caps on the surface of the sea (25 to 30 km/h winds), sighting conditions were excellent.

This species was identified by the head profile, with its reduced melon sloping gently back from a long and slender rostrum, without a sharp transverse demarcation between forehead (melon) and rostrum. Other characters included the white forward portion of the lower jaw and (often) the tip of the rostrum, but with the rear portion of the rostrum dark; the dark colored area on top of the head and around the eyes; the distinctive dark, narrow cape high on the sides of the body, dipping laterally on each side below the dorsal fin, and often ending sharply just behind the fin; the distinct light band below the cape; the dark, often blotchy back; and the tall, dark, slightly falcate, broad-based dorsal fin. A variety of sizes were observed including adults of 2–2.5 m and many cow-calf pairs. Calves were perhaps 1.3 m long and apparently not neonates.

A few *Steno* broke away from their groups and moved to ride the pressure wave on the bow of the ship, travelling at speeds up to 16 km/h. Bow-riding

animals moved relatively straight ahead, with less veering from side to side and less turning on their sides than we have observed in other delphinids riding the bow wave of this same vessel. The dolphins also occasionally leaped clear of the water; otherwise, their surface activity consisted mostly of slow movements, with individuals usually remaining in discrete sub-groups containing a variety of sizes. When the boat was stopped to set an array of hydrophones, some of the *Steno* approached and remained nearby; a few dived down to rub against a deep hydrophone at a 70-m depth, and they overloaded it with click sounds. Diving capability previously demonstrated for *Steno* was to approximately 30 m (Norris *et al.* 1965).

Good recordings of underwater *Steno* vocalizations were made with a four-hydrophone array (Watkins and Schevill 1972). Both broad-spectrum clicks and whistles at frequencies of 3–12 kHz were produced apparently by the same individuals. A representative sequence of these is shown in Figure 1. Click series were often in short bursts of 0.1–0.2 sec duration, and whistle sequences commonly lasted about 0.5 sec; the vocalizations were similar to those reported for other populations (Busnel and Dziedzic 1966, Norris and Evans 1967). The occurrence of most of the *Steno* that we observed in apparent social aggregations is reflected in the constant background of sounds from many individuals at once; they were actively vocalizing during much of the period that they were in range of our listening system.

Based on these data alone, it is not possible to assess whether *S. bredanensis* is a regular Mediterranean species although such an interpretation now seems more likely. This species is apparently not abundant anywhere in the world although a few other large groups have been seen (stated without reference by Leatherwood *et al.* 1983). Our sightings may be indicative of a more stable *Steno* population in the Mediterranean than was previously thought, based on the following points: (1) a relatively large number of animals were observed; (2) the groups of dolphins included a variety of sizes and numerous calves (indicative of a viable population); and (3) they were a considerable distance from Gibraltar (suggesting that this was not just a passing visit from the Atlantic).

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