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Stenella frontalis.

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Stenella frontalis (G. Cuvier, 1829)

Atlantic Spotted Dolphin

Delphinus frontalis G. Cuvier, 1829:288. Type locality "aux îles du Cap Vert" (West Africa).
Delphinus froenatus F. Cuvier, 1836:155, pl. 10, fig. 10. Type locality "à trente lieues au sud des îles du Cap Vert" (West Africa).
Delphinus doris Gray, 1846:39, pl. 20. Type locality not given.
Delphinus plagiodon Cope, 1866:296. Type locality not given.
Stenella frontalis Fraser, 1950:61. First use of current name combination.

CONTEXT AND CONTENT. Order Cetacea, suborder Odontoceti, family Delphinidae, subfamily Delphininae (LeDuc et al. 1999). Genus *Stenella* contains 5 species (Rice 1998). No subspecies are recognized (Rice 1998; but see "Remarks").

DIAGNOSIS. The Atlantic spotted dolphin (Fig. 1) is distinct from the pantropical spotted dolphin *S. attenuata* in external color. The unspotted calf has a weakly defined cape, a flipper stripe terminating variably between end of gape and eye, and a uniformly colored peduncle (Perrin et al. 1987) as opposed to a strongly defined cape passing high over eye, a flipper stripe terminating anteriorly at the angle of gape, and a peduncle divided into dark upper and light lower portions in *S. attenuata*. Background of dark ventral spots is white rather than gray as in *S. attenuata*. A spinal blaze, which is absent in *S. attenuata*, sweeps up and back, its apex below the dorsal fin. It varies in length, width, and intensity and may be nearly obscured by light dorsal spots in mature individuals in some areas but is usually at least faintly visible in dorsal view. The combination of blaze and dorsal spotting is diagnostic. Eye stripe is typically broad and complex as in *Tursiops*, as opposed to relatively narrow (1–2 cm) and simple as in *S. attenuata* (Perrin 1997). Blowhole stripe is also relatively broad, encompassing ca. one-third the width of head at the level of end of gape.

Stenella frontalis is heavier bodied than *S. attenuata*; adults of the same length weigh 10–30 kg more. Compared with *S. attenuata*, flippers, flukes, and dorsal fin are proportionately larger. In external size and shape, it is intermediate between *S. attenuata* and *Tursiops* (especially *T. aduncus*), showing many similarities to the latter in configuration of rostrum, melon, flippers, and dorsal fin. *S. frontalis* differs from the similarly sized and shaped *Delphinus capensis*, *D. delphis*, *Sotalia fluviatilis*, *Sousa chinensis*, *S. plumbea*, *S. teuszii*, *Stenella clymene*, *S. coeruleoalba*, *S. longirostris*, *Tursiops aduncus*, and *T. truncatus* in ground color pattern (shades of gray, spinal blaze, no stripes) and in having light dorsal spots.

Skull (Fig. 2) can be confused with that of *S. attenuata*, with which it overlaps in every character (Perrin et al. 1987). In some geographic areas, such as the Caribbean, skulls of the 2 species appear nearly identical. Both have a relatively long and narrow, relatively thick rostrum with no palatal grooves, a large number of small slender teeth (30–42 in *S. frontalis* and 35–48 in *S. attenuata*), medially convergent premaxillae, medium-sized rounded temporal fossae, and arcuate rami (Heyning and Perrin 1994; Perrin et al. 1981, 1987). However, rostrum of *S. frontalis* is on average broader distally, prenarial triangle is shorter, and teeth are larger and less numerous. In large specimens tip of mandible usually curves upward, but in small specimens it may be straight, as in *S. attenuata*. Individual skulls can be identified as *S. frontalis* or *S. attenuata* on a maximum-likelihood basis, with stepwise discriminant classification functions incorporating 4 measurements and a tooth count: width of rostrum at three-fourths length, width of rostrum at one-half length divided by postorbital width, width of prenarial triangle at 60 mm divided by postorbital width, and highest rostral tooth count (Perrin et al. 1987). Respective coefficients and constants for the variables are: (*S. frontalis*) 0.0317, 1.8991, −0.363, 12.7033, −500.8247; (*S. attenuata*) −0.0984, 1.7263, 0.0158, 14.0818, −494.2775. To use, add the products of variables and coefficients to the constants and classify as *S. frontalis* or *S. attenuata* depending on which classification function has the higher value. Large skulls of *S. frontalis* from some regions are similar to small skulls of *Tursiops* but can be separated from them on the basis of tooth count (>30 in each row in *S. frontalis*). Palatal grooves present in *S. clymene*, *S. longirostris*, *Delphinus*, *Lagenodelphis hosei*, and some specimens of *S. coeruleoalba* are lacking in *S. frontalis*. It also differs from these species in not possessing a distally flattened and broadened rostrum and sigmoid rami (Perrin et al. 1981). Vertebral count (67–72) does not overlap that of *S. attenuata* (74–84).

GENERAL CHARACTERS. The Atlantic spotted dolphin is a small and moderately slender dolphin; length of 79 cranially adult specimens ranged from 166 to 229 cm (Perrin et al. 1987), the largest being a female from Panama and the smallest a 166-cm male from the Azores and a 167-cm female from off West Africa. Maximum recorded mass among 37 adult specimens was 143 kg. The relationship between mass (W; in kg) and body length (L; in cm) based on 14 males is $\log W = -5.1598 + 3.1087 \log L$ (Perrin et al. 1994a). Ranges of other external measurements for cranially adult specimens of both sexes follow (in cm; *n* in parentheses—Perrin et al. 1987): tip of upper jaw to apex of melon, 9–14 (60); tip of upper jaw to end of gape, 20–28 (58); tip of upper jaw to umbilical scar, 81–105 (49); tip of upper jaw to tip of dorsal fin, 104–137 (62); girth at axilla, 82–117 (47); anterior length of flipper, 26–37 (57); width of flipper, 9–14 (59); span of flukes, 35–66 (64); width of fluke, 9–14 (52); height of dorsal fin, 16–25 (66).

The Atlantic spotted dolphin varies geographically in size and degree of spotting (Perrin et al. 1987). In some areas, such as the east coast of the United States and the coast of West Africa, some individuals are so heavily spotted as to appear almost white at a distance, with nearly all the details of the underlying basic pattern obscured. In other areas, for example, north of Cape Hatteras on the east coast of the United States and far offshore in the pelagic western North Atlantic, adults are relatively small and may bear only a very few small and dark ventral spots, usually in the gular region. Some specimens from the Azores have fairly well-developed dorsal spotting but few or no ventral spots. The largest body size is exhibited by animals inhabiting the continental shelf of North America (U.S. east coast, Gulf of Mexico, and Central America),

FIG. 1. Adult *Stenella frontalis*. Photograph courtesy of R. L. Pitman and U.S. National Marine Fisheries Service.

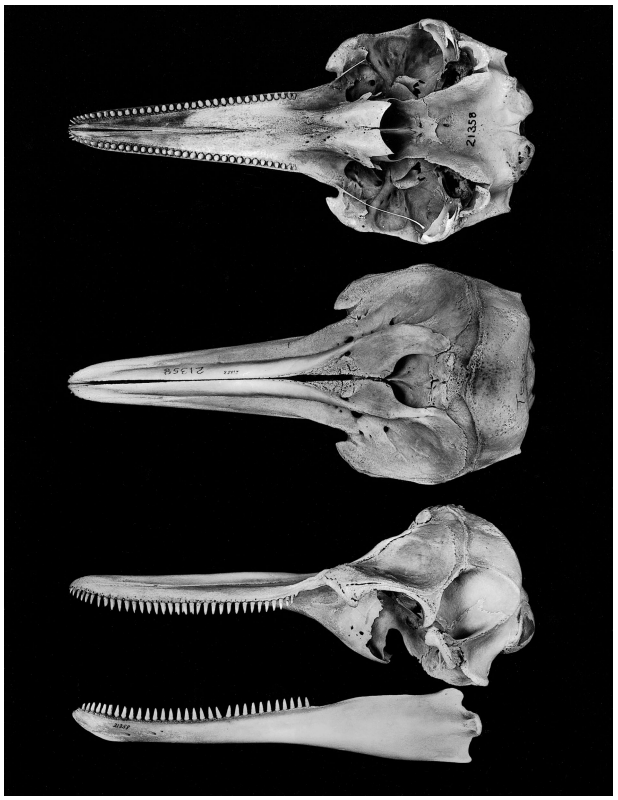

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Stenella frontalis* from the Texas coast in the Gulf of Mexico (cranially mature; sex and body length unknown; Texas Cooperative Wildlife Collection No. 21358, Texas A&M University, Galveston). Greatest length of skull is 423 mm.

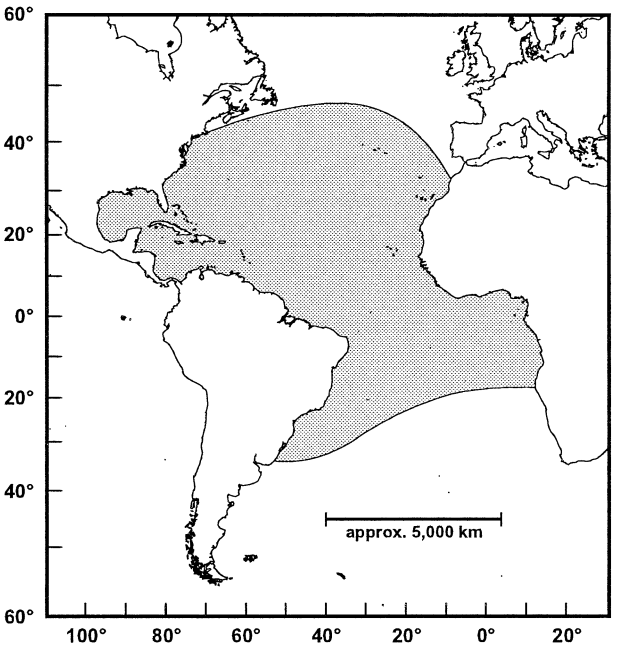

FIG. 3. Distribution of *Stenella frontalis* modified from Jefferson et al. (1993).

averaging ca. 200–210 cm in body length, and the smallest, ca. 20–30 cm shorter, by those around oceanic islands such as the Azores and on the high seas in the western North Atlantic. Animals from the offshore Caribbean are intermediate in size and degree of spotting between continental and oceanic forms. A sample of 27 presumed adult males from Mauritania averaged 195 cm in body length (range, 178–219—Nieri et al. 1999).

Skull (Fig. 2) has a long, narrow rostrum well set off from cranium and tapering to a relatively sharp and deep tip; distal teeth are not splayed as in some delphinines. Premaxillae and maxillae begin to fuse distally near sexual maturation, and in an older adult the fusion may extend over several centimeters. Premaxillae may also fuse medially in adults. Palate is flat at midlength. Pterygoid hamuli are usually in contact medially. The anteriormost 2 teeth in each row are very small and may be buried in bone. Ramus is arcuate, and symphysis is relatively long. Condylobasal length ranged from 356 to 461 cm in 103 cranially adult (premaxillae distally fused to maxillae) specimens (Perrin et al. 1987); the largest was from a 205-cm physically immature (not all vertebral epiphyses fused to centra) male from South Carolina that was also likely sexually immature (testes were not examined, but degree of spotting suggested immaturity). Ranges of tooth counts and measurements (in mm) for specimens from throughout the range (Nieri et al. 1999; Perrin et al. 1987) are: upper teeth, 32–42 per row (114); lower teeth, 30–40 per row (109); length of rostrum, 194–274 (105); width of rostrum at base, 76–107 (108); width of rostrum at one-half length, 44–63 (105); width of rostrum at three-fourths length, 30–50 (105); preorbital width, 146–188 (106); postorbital width, 165–210 (107); zygomatic width, 164–210 (107); greatest width of premaxillae, 65–87 (106); parietal width, 130–171 (107); length of temporal fossa, 57–89 (107); height of temporal fossa, 45–72 (107); length of ramus, 292–399 (97); tooth diameter (mid–lower row, transverse), 3.2–5.3 (68); and width of prenarial triangle at 60 mm, 0.6–9.9 (93). Vertebral formula (n = 32–52 specimens) is 7 C, 13–15 T, 15–20 L, 28–35 Ca, total 67–72.

Geographic variation in skull size and shape is marked and parallels that in body size described above (Perrin et al. 1987). Skulls from the oceanic western North Atlantic and the Azores closely resemble those from the coast to the west in shape but are smaller, in correlation with smaller body size and reduced spotting. Western North Atlantic coastal and Gulf of Mexico skulls are on average larger than Caribbean skulls in all dimensions except width of the prenarial triangle. The 2 series differ most in proportionate width of rostrum, dimensions of temporal fossa, and tooth widths. Caribbean animals on average have a more slender rostrum, smaller temporal fossa, and smaller teeth when compared with continental coastal dolphins. Skulls from Africa are similar to those from the U.S. east and Gulf coasts in size and shape (Nieri et al. 1999). Number of teeth has significant geographical variation; range of the series means is 3 or 4 teeth in each jaw or 12–16 overall. Tooth counts are lowest in western North Atlantic coastal specimens and those from the Azores and highest in midtropical Atlantic specimens. The western North Atlantic coastal form is also larger than the oceanic and Caribbean forms in all postcranial skeletal dimensions.

DISTRIBUTION. *Stenella frontalis* is endemic to the tropical and warm-temperate Atlantic, from ca. 45°N to ca. 35°S in the west, and to the coast of Africa from Mauritania south to at least Gabon in the east (Fig. 3; Jefferson et al. 1993, 1997; Nieri et al. 1999; Perrin et al. 1994a; Van Waerebeek et al. 2000). It is common in the western North Atlantic (Perrin et al. 1994a) and the Gulf of Mexico (Jefferson and Schiro 1997) and may also be common along the tropical Atlantic coast of Africa (Nieri et al. 1999). After the bottlenose dolphin *T. truncatus*, it is the commonest small cetacean stranded in Puerto Rico and the Virgin Islands (Mignucci-Giannoni et al. 1999) and occurs elsewhere in the northern Caribbean (Jefferson and Lynn 1994; Roden and Mullin 2000), the Lesser Antilles (Caldwell et al. 1971; Perrin et al. 1987), Mexico (Aurioles Gamboa 1993), Venezuela (Agudo et al. 1994; Romero et al. 2001), and Colombia (Vidal 1990). It may be the most common small cetacean off southern Brazil (Zerbini and Kotas 1998). It is recorded from the midtropical Atlantic (off Brazil far from any land and possibly off the island of St. Helena—Perrin et al. 1987) and from the Cape Verde Islands (Hazevoet and Wenzel 2000), the island of Madeira (Freitas et al. 1998), the Azores (Martin 1988; Viallelle 1997), and the Canary Islands (Martin et al. 1992). G. Cuvier's *D. dubius* 1812 (of uncertain specific identity but based on skulls of spotted dolphins *S. frontalis*, *S. attenuata*, or both) was described as from European waters (Perrin et al. 1987), and a skull in the British Museum collected in 1948 is labeled "coast of Europe," but no reliable contemporary records of *S. frontalis* exist

from north of Madeira in the eastern Atlantic. A reported sighting record from the western Mediterranean (Di Natale 1983) remains unconfirmed (the observation was made by untrained observers, no photographs were taken, and the description is too general to allow confident assignment to species). Recent reference to occurrence in Chinese waters (Li 1997) was in error; the name was used in the older Asian literature to refer to the pantropical spotted dolphin, *S. attenuata* (Perrin et al. 1987).

FOSSIL RECORD. No fossils of this species are known. The family Delphinidae dates back to the late Miocene in Europe and North America (Barnes et al. 1985).

FORM AND FUNCTION. Vision may be stereoscopic (Caldwell and Caldwell 1972). The accessory diverticulum or "connecting sac" of the naso-frontal sac of the nasal sac complex is more developed on the right than on the left (Schenkkan 1971). Overall, the nasal sac system is very similar to those of *S. attenuata*, *S. coeruleoalba*, *S. longirostris*, and *T. truncatus* (Mead 1975; Schenkkan 1973). Mineralization of ossicles and tympanic bone of the middle ear is very high relative to that in terrestrial mammals and mysticetes, 2.6–2.7 g/cm^3 (Nummela et al. 1999). Milk of *S. frontalis*, like that of other delphinids, is relatively rich in fat and protein and low in lactose compared with that of most terrestrial mammals (Eichelberger et al. 1940). A description of the urogenital tract by Harrison-Matthews (1950) was actually based on *S. attenuata* (Perrin et al. 1987).

ONTOGENY AND REPRODUCTION. The largest recorded fetus was 88 cm long, and the smallest free-swimming animal was 120 cm long (Perrin and Reilly 1984; Perrin et al. 1994a); average length at birth is within this range. Calves are unspotted at birth. In the Bahamas dark ventral spots begin to appear at about the time of weaning (2–3 years of age—Herzing 1997). As sexual maturity approaches, these increase in number and size, and light dorsal spots begin to appear. At ca. 3–4 years of age, the juvenile "speckled" phase (discrete dark ventral spots and a few light dorsal spots) is entered. Typically at age 8 or 9, development of spots accelerates, and some spots begin to merge ("mottled" phase); some females become sexually mature and may conceive and give birth during this young adult phase. The oldest adult phase ("fused," dark and light spots become extensive and coalesce on ventral and dorsal surfaces) is typical of animals >16 years. Development of spotting with age is very much like that in the pantropical spotted dolphin, *S. attenuata*, except that whereas in *S. attenuata* ventral spots merge and fade in adults to yield a slightly mottled or uniform gray underside, in *S. frontalis* they remain distinctly defined. Degree of development of spotting is individually and geographically variable, being greatest in animals of the continental coast (Perrin et al. 1987). The system of stripes on the head (the "bridle," made up of the eye stripe and the blowhole stripe) develops from a single anlage consisting of a band across back of head in fetuses ca. 100 mm long (Perrin 1997).

Seven females measuring 183–213 cm from the U.S. Atlantic and Gulf coasts were sexually mature, and 3 others 186–192 cm long were immature (Perrin et al. 1994a). Six males that were 189–221 cm in length had testes that were 106–1,210 g in mass; of these, 4 (201–221 cm in length) had testes that were 502–1,012 g in mass. Two females of 174 and 183 cm from St. Vincent in the Lesser Antilles were mature, and 3 measuring 168–180 cm were immature. Three males measuring 157–179 cm were immature. A 200-cm female captured off West Africa was pregnant (Cadenat and Lassarat 1959).

Gestation is assumed to last ca. 1 year (Herzing 1997). Litter size is 1. In the Bahamas peak calving periods are early spring and late fall (Herzing 1997). In this population the average calving interval was ca. 3 years (range, 1–5 years). Almost half the pregnant females were still nursing calves, implying that weaning may occur at ca. 2–4 years.

ECOLOGY. The large, heavily spotted form of *S. frontalis* along the Northwest Atlantic and in the Gulf of Mexico inhabits the continental shelf and is usually found inside or near the 100-fathom (185-m) curve (within 250–350 km of the coast and usually at least 8–20 km offshore). It may come into shallow water seasonally, perhaps in pursuit of migratory prey species (Perrin et al. 1994a; Würsig et al. 2000), but it is usually replaced in nearshore waters by the common bottlenose dolphin. Between the 100- and 2,000-m depth contours in the northwestern Gulf of Mexico (Davis et al. 1998), Atlantic spotted dolphins occurred in cooler, shallower waters than did the pantropical spotted dolphin. The bottom-depth gradient was less than for 28 other species. Similar association with low seafloor relief occurs in the Caribbean (Mignucci-Giannoni 1998). Mean depth for 36 sightings during an aerial survey in the north-central Gulf of Mexico was 368 m (standard error, 40.3 m; range, 91–1,152 m—Mullin et al. 1994). A rehabilitated Atlantic spotted dolphin monitored for 24 days by satellite along the continental shelf of Texas spent most of its time at depths of <10 m but consistently dived to or near the seafloor in 30 m of water (Davis et al. 1996). A group was sighted ca. 300 m from shore in the high-oceanic Cape Verde Islands (Reiner et al. 1996). In the Bahamas, Atlantic spotted dolphins spend much time in shallow water (6–12 m) over sand flats (Herzing 1990).

Known prey includes squids, fishes (including flatfishes, carangids, clupeoids, and hemiramphids), and benthic invertebrates (holothurians—Perrin et al. 1994a; Würsig et al. 2000). Harpooned pelagic animals from St. Vincent had fed on mesopelagic fish and squid. Possible nocturnal feeding on flying fish (Exocoetidae) occurred in the Gulf of Mexico (Richard and Barbeau 1994). Feeding aggregations with flocks of shearwaters (*Puffinus gravis* and *Calonectris diomedea*) occurred in the Azores (Martin 1986). Atlantic spotted dolphins herded small clupeid fish into a dense ball in a coordinated fashion before feeding on them (Fertl and Würsig 1995). They followed shrimp trawlers in the Bay of Campeche, Mexico, and in the northern Gulf of Mexico to feed on discarded bycatch or fish in the trawl (Delgado-Estrella 1997; Fertl and Leatherwood 1997). In the Bahamas they fed on flatfish buried in the sand (Herzing 1996).

Estimates of some annual vital parameters for a population of ca. 100 individually identified animals in the Bahamas are pregnancy rate (for mature females), 0.25; birth rate (for mature females), 0.33; calf mortality rate, 0.24; per capita birth rate, 0.08; fecundity (number of calves surviving 1 year divided by number of mature females), 0.23; recruitment (number of calves surviving 1 year divided by minimum population size), 0.06; and pregnant and lactating rate (for mature females), 0.11 (Herzing 1997).

During 24 days, a satellite-tracked rehabilitated Atlantic spotted dolphin traveled a minimum of 1,711 km at a mean transit speed of 0.8 m/s and a mean minimum daily distance of 72 km (Davis et al. 1996). This dolphin ranged along 300 km of Texas coastline with a mean distance offshore of 52 km. In the Caribbean, seasonal inshore–offshore movements have been inferred (Mignucci-Giannoni 1998).

Predators include sharks (Wood et al. 1970; Perrin et al. 1994a) and killer whales (*Orcinus orca*). In the Bahamas severe but nonfatal shark bites occurred in ca. 10% of the population (Herzing 1997). Endoparasites include the trematodes *Braunina cordiformis*, *Campula palliata*, and *Pholeter gastrophilus*; the nematodes *Anisakis alexandri*, *Halocercus delphini*, and *H. lagenrhynchi*; and an unidentified ciliate and an unidentified larval arthropod (Perrin et al. 1987, 1994a). Ectoparasites and commensals include the rabbit-eared barnacle *Conchoderma auritum*, the pseudostalked barnacle *Xenobalanus globicipitis*, an unidentified cyamid crustacean, and the remora *Remora* (= *Remilegia*) *australis* (Perrin et al. 1987, 1994a).

Livers of stranded Atlantic spotted dolphins from the coast of Florida contained higher levels of tris(4-chlorophenyl) methane and tris(4-chlorophenyl) methanol than blubber of marine mammals in other regions (Watanabe et al. 2000). Other contaminants in order of concentration were polychlorinated biphenyls (PCBs), dichlorodiphenyl-trichloryl-ethanes (DDTs), chlordanes, and hexachlorobenzene and hexachlorocyclohexane isomers.

BEHAVIOR. Segregation often occurs by age and sex (Herzing 1990). Juvenile subgroups may be independent most of the time but are sometimes "tended" by young or old adults of either sex. Seven groups in the northern Gulf of Mexico averaged 20 animals (range, 3–55—Jefferson 1996). Individuals in distress may be supported at the surface by other members of the group (Caldwell and Caldwell 1986). Affiliative contact behaviors in the Bahamas include rubbing, simple contact, petting, and mouth–genital contact (Dudzinski 1998). Atlantic spotted dolphins more often exchanged rubs or pets with individuals of the same sex and age class. Tactile and vocal signals may be concurrent. Association between mother and calf is high during the first 3 years of life of the calf (Herzing

and Brunnick 1997). Juvenile females display strong associations with other females in the same age class. Pregnant females form associations lasting up to at least 2 years with previously unassociated females who have given birth the same year. Strong bonds occur between males (Herzing 1996). Atlantic spotted dolphins may socialize with humans (St. John 1988).

Of the 197 observed encounters between Atlantic spotted dolphins and common bottlenose dolphins (*T. truncatus*) in the Bahamas, 60% were affiliative, 34.9% were aggressive, and 4.8% involved foraging (Herzing and Johnson 1997). Behaviors included attempted mating by adult male bottlenose dolphins with juvenile spotted dolphins of both sexes, high-energy bouts of sexual play and aggression (including open-mouth threats, squawks, and head-to-head posturing, and formation of temporary mixed-species male coalitions), mixed foraging, and alloparenting. Group size was largest (mean, 20; range, 10–30) during aggressive encounters.

Narrow-band individual signature whistles (frequency range 5.0–19.8 kHz with maximum energy at 6.7–17.9 kHz) are produced (Caldwell et al. 1973; Wartzok and Ketten 1999). Creaking sounds consisting of broad-band pulses (clicks, 1–8 kHz) are also produced during feeding and exploration of the environment. Upon excitement, burst-pulse squeals and squawks (0.1–8 kHz) are emitted (Caldwell and Caldwell 1971). In a 10-year study of Atlantic spotted dolphins in the Bahamas (Herzing 1996), the signature whistle was the most frequent vocalization in a social context, followed in order by "excitement vocalization" (burst-pulse with overlapping signature whistle at 4–18 kHz, lasting 2–30 s), "genital buzz" (high-repetition–rate clicks at 1.2–2.5 kHz, lasting 6–20 s, and associated with courtship and discipline), "squawk" (broad-band burst-pulse at 0.2–12 kHz, lasting 0.2–1.0 s, and associated with agonistic and sexual-play interactions), "scream" (overlapping frequency-modulated whistles at 5.8–9.4 kHz, lasting 2.5–4.0 s), "bark" (burst-pulse at 0.2–2.0 kHz, lasting 0.5–1.0 s), and "synchronized squawks" (burst-pulse at 0.1–15 kHz, main energy at 0.1–2.2 kHz, lasting 0.9–1.0 s). Squawk, scream, and bark were associated with agonistic interactions. Echolocation click trains at 2.0–6.0 kHz were associated with foraging and feeding. Whistle structures are more similar to those of *S. attenuata* and *S. longirostris* than to those of *T. truncatus* but differ in having relatively more inflection points (Wang 1993).

A satellite-tracked rehabilitated Atlantic spotted dolphin in the shallow northern Gulf of Mexico dove a minimum of 698 times daily over a 24-day period (Davis et al. 1996). The dives were mostly shallow (4–10 m) and of short duration (94% to <30 m and <2 min in duration). The deepest dives were to 40–60 m, and the longest dive was 5–6 min long.

GENETICS. G-band karyotypes are nearly identical to those of *S. attenuata* and *S. longirostris* (Stock 1981). *S. frontalis* is very similar to *S. attenuata* in the amount and distribution of C-band heterochromatin but greatly different from *S. longirostris*. Conspicuous heteromorphism exists between the C-heterochromatin of the homologs of several pairs of chromosomes. In a cladistic phylogenetic analysis based on cytochrome-*b* mitochondrial DNA, *S. frontalis* shares a strongly supported polytomic clade with *S. clymene* and *S. coeruleoalba* (sister taxa), *S. attenuata*, *Delphinus*, and *T. aduncus* (to the exclusion of *T. truncatus*—LeDuc et al. 1999).

CONSERVATION STATUS. Numbers of Atlantic spotted dolphins off the U.S. east coast from the Gulf of St. Lawrence to Florida were estimated from surveys in 1998 at 52,279 (CV = 0.87—Waring et al. 2000). The population in the western portion of the northern Gulf of Mexico was estimated at 3,213 (CV = 0.44—Waring et al. 2000), but this was considered to be an underestimate. Atlantic spotted dolphins are taken in a small-scale subsistence fishery at St. Vincent in the Lesser Antilles and possibly also at St. Lucia and Dominica (Perrin et al. 1994a). They may be taken incidentally in tuna purse seines off West Africa (Maigret 1994), are captured as bycatch in gillnets and shark driftnets in Mexico, Brazil, Colombia, and Venezuela (Delgado-Estrella 1997; Lodi and Capistrano 1990; Perrin et al. 1994b; Pinedo 1994; Romero et al. 2001; Vidal et al. 1994; Zavala-González et al. 1994; Zerbini and Kotas 1998), and are considered at risk in gillnet fisheries in the Bahamas, Barbados, Costa Rica, Mexico, and Nicaragua (Vidal et al. 1994). A bycatch of at least 37 animals was reported for a period of ca. 1 month in a now-banned purse-seine fishery for mullet (roe) in Mauritania (Nieri et al. 1999). Atlantic spotted dolphins are taken incidentally on the U.S. east coast in the pelagic drift gillnet fishery; total annual take combined with pantropical spotted dolphins (*S. attenuata*) was estimated at 7.8 (CV = 0.01) for 1994–1998 (Waring et al. 2000). Fishery-related take was estimated at 1.5 Atlantic spotted dolphins (both species) annually in the northern Gulf of Mexico. The impact on populations involved in the fisheries in U.S. Atlantic and Gulf of Mexico waters is considered insignificant (Waring et al. 2000).

REMARKS. Taxonomy of the spotted dolphins was confused until a major revision in 1987, and records of the 2 species before that date were confounded, with varying permutations of the names *S. attenuata*, *S. dubia*, *S. froenata*, *S. frontalis*, and *S. plagiodon* in broad and often contradictory use. Reference should be made to the revision (Perrin et al. 1987) for identification of specific records in the literature.

Delphinus pernettensis Desmarest 1817 may have been based on this species but has been suppressed (International Commission of Zoological Nomenclature 1977) following van Bree (1971). Hall (1981) considered this suppression ill-advised and listed *S. pernettensis plagiodon* (Cope) for the western North Atlantic. Hershkovitz (1966) and van Bree (1971) listed the nominal species as authored by Blainville (in Desmarest 1817). However, although Desmarest credited Blainville with the binomial, he was the 1st to publish it (the introduction to the *Nouveau Dictionnaire d'Histoire Naturelle* indicates clearly that it was he who authored the sections on cetaceans and not Blainville, who was responsible for the sections on comparative anatomy). *D. dubius* G. Cuvier 1812 was possibly also based on this species, but Cuvier did not designate a holotype specimen and worked with a series of skulls that may have also included the pantropical spotted dolphin *S. attenuata*; the name is therefore considered a nomen dubium (Herskhovitz 1966; Perrin et al. 1987; Robineau 1990). Perrin et al. (1987) erred in listing *D. froenatus* F. Cuvier as described in 1829; Cuvier used the trivial name *froenatus* in 1829 but did not publish the binomial until 1836. Other common names are (English) Gulf Stream spotted dolphin, spotted porpoise, Cuvier's porpoise, Cuvier's dolphin, bridled dolphin, long-snouted dolphin, gamin fish or speckly gamin fish; (French) dauphine bridé, dauphin tacheté de l'Atlantique; (Spanish) delfín moteado/manchado del Atlántico/endémico, delfín moteado común, ballenero, estenela moteada, prodelfín, tonina, tonina moteada, delfín pardo, delfín de dientes afilados, delfín pintado; (Portuguese) delfim/gofinho pintado do Atlântico; (German) Zügeldelphin, langstirnige Delphin.

Stenella (originally a subgenus—Gray 1866) is the Latin diminutive form of *Steno*, the genus which Gray (1846) erected for his earlier-listed (1843) but undescribed and unfigured species *D. attenuatus*, a nomen nudum. *Steno* is from Greek and means narrow. The species name *frontalis* is from the Latin *frons* meaning forehead, brow, or forepart, evidently referring to the well-defined melon in the species.

L. Ford photographed the skull. Robert L. Pitman contributed the photograph of the live animal. I thank these people, Dagmar Fertl, and an anonymous reviewer for helping to improve the manuscript.

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