

## Lissodelphis peronii.

By Michael W. Newcomer, Thomas A. Jefferson, and  
Robert L. Brownell, Jr.

Published 27 December 1996 by the American Society of Mammalogists

### *Lissodelphis peronii* (Lacépède, 1804)

#### Southern Right Whale Dolphin

*Delphinus leucoramphus* Péron (manuscript), *vide* Lacépède, 1804: 316. Lacépède changed Péron's name *leucoramphus* to *peronii*.

*Delphinus Peronii* Lacépède, 1804:316. Type locality south of Van Diemen's Land (Tasmania), about 44°S, 141°E.

*D[elphinus] bicolor* Gray, 1846:36. Type locality 46°48'S, 142°W (S. Pacific).

*Prodelphinus leucoramphus* Van Beneden and Gervais, 1880: 605. Misspelling of *D. leucoramphus* Lacépède, 1804.

*Delphinapterus lessonii* Philippi, 1893:17. (Based on *D. peronii* of Lesson and Garnot, 1826). No type locality designated.

*Lissodelphis peronii* Palmer, 1899:24. First use of current name combination.

*Prodelphinus Gervaisi* Trouessart, 1898:1036. (Based on *P. leucoramphus* of Van Beneden and Gervais, 1880). No type locality designated.

**CONTEXT AND CONTENT.** Order Cetacea, Suborder Odontoceti, Family Delphinidae. The subfamily Lissodelphininae has been proposed for this genus (Fraser and Purves, 1960), but it has not been universally accepted (Kasuya, 1973). There are two species in the genus: *Lissodelphis peronii* (southern right whale dolphin) and *L. borealis* (northern right whale dolphin). *Lissodelphis peronii* currently contains no subspecies.

**DIAGNOSIS.** *Lissodelphis peronii* is the only finless black-and-white cetacean in the Southern Hemisphere. It can be distinguished easily from its congener, *Lissodelphis borealis* (northern right whale dolphin), by color pattern differences. Southern right whale dolphins are black above and white below (Fig. 1). The distinct border runs from midway along the side of the tail stock, forward to its highest point at mid-body, then dips to its lowest point just above the flipper insertion, rising upward between the eye and the gape, finally meeting with the opposite border in a point on the melon about midway between the snout tip and the blowhole. The flippers are usually white, except for a variable black band on the posterior border of both dorsal and ventral surfaces. The flukes are gray on the upper surface and white, with a thin black trailing edge, on the lower surface (Baker, 1981).

The body shape of the genus *Lissodelphis* is unique. True (1889) noted external differences of size, reporting that the girth of *L. peronii* was greater than that of *L. borealis*. This difference in girth can be seen by comparing photographs of *L. peronii* (Fraser, 1955; Brownell, 1974: plate 9) with those of *L. borealis* (Leatherwood et al., 1972; Perrin, 1991). In these same photographs, the flipper of *L. peronii* appears to be proportionally larger than that of *L. borealis*.

One specimen had the following vertebral formula: 7C, 14T, 32L, 30+1 Ca, with a chevron bone count of 19 (Malm, 1871). The atlas and axis are fused. There are 13 pairs of vertebral ribs (five of which are two-headed and one floating) and eight sternal ribs (Baker, 1981).

**GENERAL CHARACTERS.** The skull is slender, with a narrow, tapering rostrum that ends in a pointed tip (Fig. 2). The maximum known condylobasal length (CBL) is 441 mm (Baker, 1981; Jefferson et al., 1994). Width of rostrum at base ranges from about 26 to 33% of CBL (Baker, 1981). The rostrum is long, and represents about 53–57% of CBL, and the rostral maxillae and premaxillae are fully separated along their entire length (Baker, 1981). The bones of the skull are thin and light (True, 1889). The

mandibles are long, with a short symphysis. There are 37–50 slender, pointed teeth in each tooth row (Jefferson et al., 1994; Van Waerebeek, 1993). The tympanoperiotic bones of *L. peronii* are illustrated in Fig. 3.

These animals are extremely slender and dorso-ventrally compressed (Fig. 1). There is no hint of a dorsal fin or ridge. There is a short beak, which is set off from the melon by a shallow crease. The mouthline is straight. The flippers are slender and recurved, and are located about one-fourth of the way from the snout tip to the flukes. The small flukes are slightly concave on the rear border, with a moderately deep notch (Baker, 1981).

Maximum known length and mass is 2.97 m and 116 kg (Jefferson et al., 1994; Van Waerebeek et al., 1991), but few specimens have been examined, and they probably grow somewhat larger. Males may grow larger than females (the longest measured female was 2.28 m—Baker, 1981).

Newborn calves have a muted color pattern of gray tones, as do many small cetaceans (Cruickshank and Brown, 1981; Jefferson et al., 1994). At around one year of age they attain the adult black-and-white color pattern (Cruickshank and Brown, 1981).

Several color variants of the southern right whale dolphin have been noted, including all-black (Jefferson et al., 1994) and all-white (Brown, 1973) individuals, those with more extensive light (Cruickshank and Brown, 1981; Rose and Payne, 1991) and dark (Baker, 1981, 1990) back and flank areas, and one with a white spot on the melon (Cruickshank and Brown, 1981). Lillie (1915) sighted individuals with pure white flukes, both above and below, in the Tasman Sea and southeast of New Zealand. In addition, there seems to be a great deal of individual variation in the amount of light and dark shading on the flukes and flippers (Aguayo-L., 1975; Baker, 1981; Cruickshank and Brown, 1981; Fraser, 1955; Lillie, 1915).

**DISTRIBUTION.** This species appears to be distributed in a circumpolar pattern in subantarctic regions, generally between



FIG. 1. Southern right whale dolphins off southern Africa. Photograph by P. E. Malan, courtesy of S. Leatherwood.

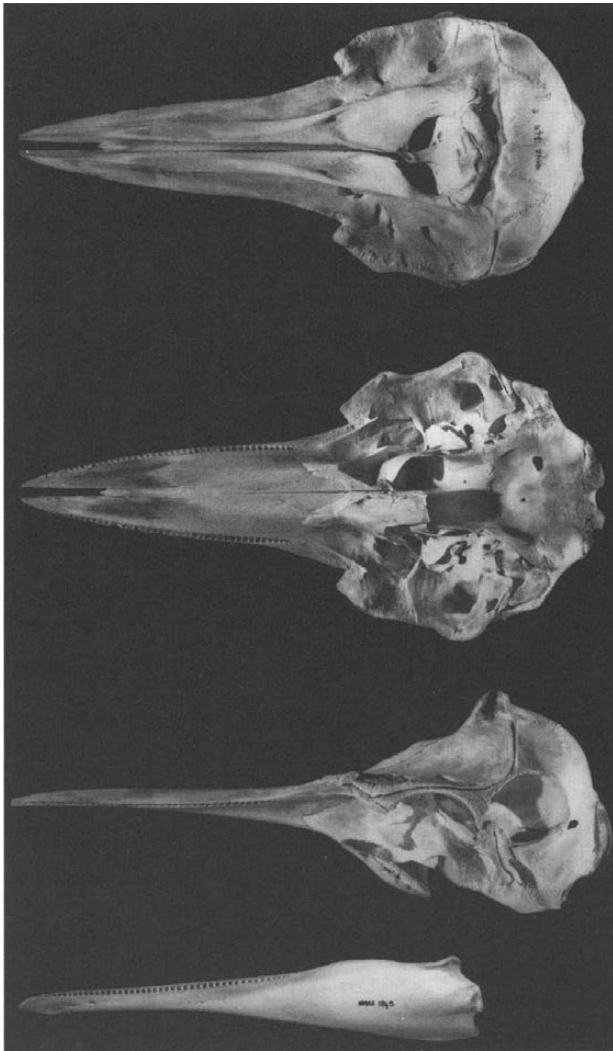


FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Lissodelphis peronii* (female, National Museum of New Zealand 1845). Greatest length of cranium is 45.5 cm. Photographs by Anton van Helden.

the Subtropical and Antarctic Convergences (Gaskin, 1968). These oceanographic features are variable from year to year, and the distribution generally reflects this. Cruickshank and Brown (1981) presented a map of records known at that time, including several previously unpublished whaling logbook records. Most oceanic records are between 35°S and 62°S (Fig. 4), extending north and south of the boundaries of the Subtropical and Antarctic Convergences (Cruickshank and Brown, 1981; Kasamatsu et al., 1988). The range generally extends farther north along the west coasts of

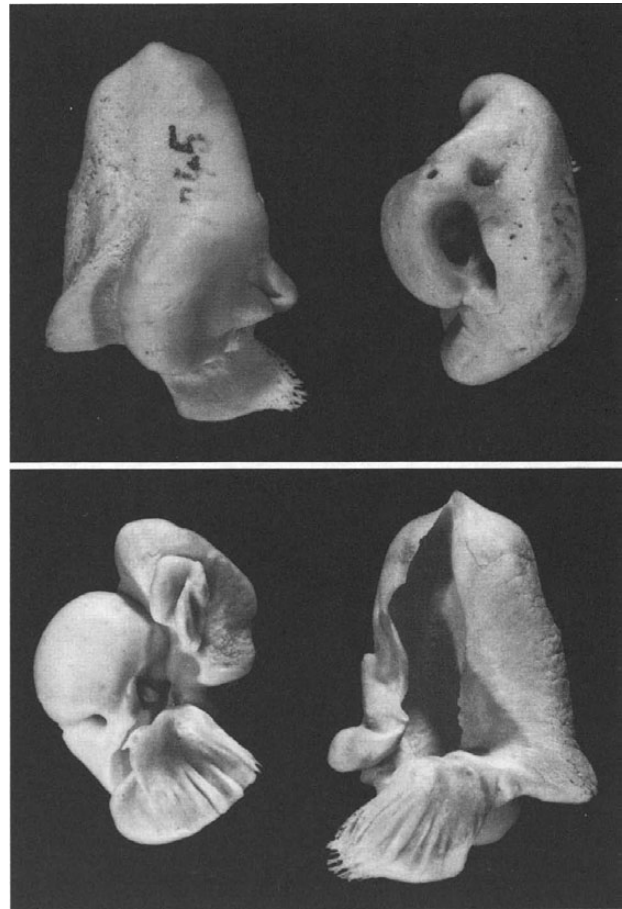


FIG. 3. Tympanoperiotic bones of *Lissodelphis peronii* (National Museum of New Zealand 1845). Top photo: ventral view of left bulla (left) and dorsal view of right periotic (right). Bottom photo: ventral view of right periotic (left) and dorsal view of left bulla (right). Photographs by Anton van Helden.

continents due to colder currents such as the Humboldt (also called the Peru Coastal) and Benguela (Brown, 1982; Van Waerebeek et al., 1991).

Northern records are from 23°S off the west coast of southern Africa (Brown, 1982) and 12°30'S off the west coast of South America (Van Waerebeek et al., 1991). Southern records are from about 63–64°S (Brownell, 1974; Jefferson et al., 1994). Interestingly, there appear to be no records from the southeast coast of southern Africa, despite extensive research effort there (Ross, 1984). This is probably due to the warm water influence of the Agulhas Current. A resident population of *L. peronii* may be associated with the Luderitz upwelling cell off the west coast of Namibia (Findlay, 1989; Findlay et al., 1992).

A report of the southern right whale dolphin at St. Helena

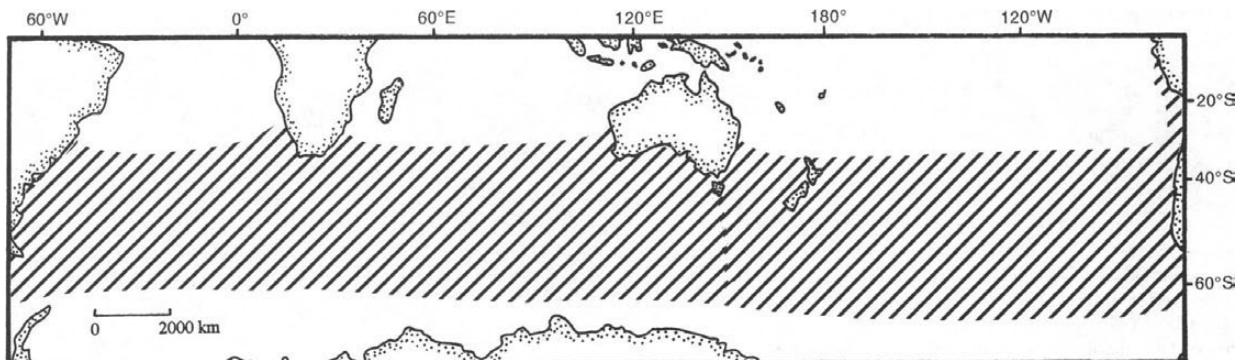


FIG. 4. Geographic distribution of the southern right whale dolphin.

(16°00'S, 5°45'W) was questioned by Perrin (1985) because this island is located in tropical waters. Klinowska (1991) erroneously stated that Leatherwood and Reeves (1983) reported *L. peronii* "off New Guinea." Earlier, Quoy and Gaimard (1824) had reported some supposed specimens of "*Delphinus peronii*" in the South Pacific, around 2°S, near New Guinea. Based on this sighting, Hershkovitz (1966) included New Guinea in the range of this species. However, we do not accept Quoy and Gaimard's sighting, because: (1) they saw and illustrated the dolphins from a distance, (2) no specimens were collected, (3) the inadequacy of older sight records has been demonstrated (Fraser, 1966), and (4) there are no confirmed records of *L. peronii* from any tropical waters in the Southern Hemisphere.

Two additional extralimital reports of this species also are erroneous. Based on the color pattern of three dolphins collected off Japan, Ogawa (1937) and Tobayama et al. (1969) identified them as southern right whale dolphins. These are now known to be northern right whale dolphins with uncommonly-occurring color patterns (Leatherwood and Walker, 1979). There is no fossil record for this species.

**FORM AND FUNCTION.** Almost nothing is known about the anatomy and physiology of southern right whale dolphins. Baker (1981) found a row of five or six hair follicles on each side of the beak and reported a blubber layer thickness of 0.8–1.0 cm for a single specimen.

**ONTOGENY AND REPRODUCTION.** Five pregnant female *L. peronii* from 77 that stranded in November 1988 had near-term fetuses (Cawthorn, 1990), and one stranded in April 1988 had a 1.02 m near-term fetus (Jefferson et al., 1994). An intact 0.86-m neonate, possibly premature, was recovered from the stomach of a Patagonian toothfish (*Dissotichus eleginoides*) on 14 October 1983 (Van Waerebeek et al., 1991), and a complete 0.87-m fetus was found in the gut of a sleeping shark (*Somniosus cf. pacificus*) in November 1990 (Crovetto et al., 1992). Females 2.18 and 2.28 m in length and a male 2.51 m in length were sexually mature (Baker, 1981; Van Waerebeek et al., 1991).

**ECOLOGY.** Southern right whale dolphins reportedly associate with at least five other species of small cetaceans (Jefferson et al., 1994). Like their northern congener, they are found most often in association with pilot whales (*Globicephala* sp.) and dolphins including *Lagenorhynchus* (Cruickshank and Brown, 1981). Large schools of *L. peronii* are almost exclusively monospecific, but may be joined by smaller numbers of other species for only brief periods of time (Rose and Payne, 1991).

There are two published reports of predation on southern right whale dolphins. The gut of a 3.6-m sleeping shark contained a 0.87-m fetus, and a 0.86-m neonate was recovered from the stomach of a 1.7-m Patagonian toothfish (Crovetto et al., 1992; Van Waerebeek et al., 1991).

The food of *Lissodelphis peronii* consists primarily of squids and fishes. Squid prey includes the following families: Ommastrephidae, Gonatidae, Mastigoteuthidae, and Cranchiidae (Jefferson et al., 1994). The following fish families were represented: Bathylagidae, Photichthyidae, Myctophidae, Merlucciidae, Engraulididae, Atherinidae, and Carangidae (Baker, 1981; Goodall and Galeazzi, 1985; Jefferson et al., 1994; Torres-N. and Aguayo-L., 1979). Remains of decapod crustaceans were found in the stomach contents of at least one specimen (Van Waerebeek et al., 1991).

Internal parasites of southern right whale dolphins include *Nasitrema* sp. in the air sinuses, *Stenurus* sp. in the lungs, *Anisakis simplex* and unidentified trematodes in the stomach, *Strobil-ocephalus triangularis* in the colon, *Tetrabothrius forsteri* in the intestine, *Orthosplanchnus antarcticus* and *Delphinicola tenuis* in the liver, and *Phyllobothrium* sp. in the blubber (Baker, 1981; Fernandez, 1987; Van Waerebeek et al., 1991).

Southern right whale dolphins are primarily oceanic, deep water animals (Baker, 1981; Cruickshank and Brown, 1981; Miyazaki and Kato, 1988), occurring in cold to temperate waters of 1 to 20°C (Cruickshank and Brown, 1981; Kasamatsu et al., 1988). However, they also occur close to shore, where deep water approaches the coast or where continental shelf waters are highly productive (Rose and Payne, 1991; Van Waerebeek et al., 1991). Sea surface salinities associated with *L. peronii* sightings off southwestern Africa ranged between 34.8 and 35.2 ppt (summer) and 34.2 and 35.2 ppt (winter; Findlay, 1989).

Migratory movements of *L. peronii* are unknown. They appear

to be present year-round in a localized area of high productivity off southwestern Africa and Namibia (Findlay, 1989; Findlay et al., 1992; Rose and Payne, 1991). Off the Chilean coast between 25° and 40°S they are also present throughout the year, but part of the population may undertake a northward migration during the austral winter and spring, when cool coastal upwelling and the coastal component of the cold Humboldt (Fiords) Current are strongest (Van Waerebeek et al., 1991). *Lissodelphis peronii* may be one of the more common cetaceans off southwestern South America (Van Waerebeek et al., 1991). There have been no population estimates, nor have separate stocks been differentiated.

Although strandings of southern right whale dolphins were reported as uncommon (Baker, 1981; Cruickshank and Brown, 1981), strandings have increased along the beaches of Chile over the last several years, apparently representing animals discarded from fishing nets (Van Waerebeek et al., 1991). There have been reports of mass-strandings (Cawthorn, 1990; Fraser, 1955; Goodall, 1978).

Southern right whale dolphins were taken by nineteenth century whalers, primarily for their meat (Cruickshank and Brown, 1981; Goodall and Galeazzi, 1985; Mitchell, 1975). More recently, small numbers have been taken off Peru and Chile for food or crab bait (Aguayo-L., 1975; Goodall and Cameron, 1980; Torres-N. and Aguayo-L., 1979; Van Waerebeek and Reyes, 1994). A rapidly-developing swordfish (*Xiphias gladius*) driftnet fishery off northern Chile may be taking significant numbers of southern right whale dolphins (Van Waerebeek et al., 1991).

**BEHAVIOR.** Southern right whale dolphins are gregarious, but herd sizes can vary widely. Groups of two to >1,000 animals have been reported. Singles or pods of just a few animals have also been observed, usually associated with other species of small cetaceans (Baker, 1990; Brownell, 1974; Gaskin, 1968).

Herd configurations reported for *L. peronii* are of four basic types: densely packed schools, with no identifiable subgroups; herds of scattered subgroups of various sizes; V-shaped herds; and herds in "chorus line" formation (Cruickshank and Brown, 1981). These arrangements conform to those reported for *L. borealis* by Leatherwood and Walker (1979). Slow-moving herds surface at a shallow angle, exposing little of the head and body. Fast-moving schools may demonstrate one of two surfacing modes: (1) swimming just below the surface, rapidly surfacing to breathe, then resubmerging, or (2) swimming rapidly at the surface, performing low-angle leaps with much surface disturbance. Other surface behavior includes fluke slaps and breaches (landing on the belly or sides). Individuals may dive for periods of 10 to 75 seconds, but entire herds have dived for up to 6.5 minutes (Cruickshank and Brown, 1981). Submergence times while bow-riding have ranged between 10 and 14 seconds (Rose and Payne, 1991).

The reaction of southern right whale dolphins to vessels is variable. Although they will ride a ship's bow wave, at other times they actively avoid ships, and their behavior does not appear to be dependent upon the presence of other species (Cruickshank and Brown, 1981). Although fast swimmers, there have been few direct speed measurements at sea. Cruickshank and Brown (1981) and Rose and Payne (1991) reported *L. peronii* swimming at speeds of 22 km/h.

An unusual behavior pattern for *L. peronii* was reported off southern Africa by Rose and Payne (1991). In a loose herd, one dolphin began jumping out of the water, circling the entire aggregation. The school then exploded outward, with the dolphins swimming directly away from the center in all directions. This was observed on two occasions, but has not been reported elsewhere.

The behavior of young southern right whale dolphins is apparently indistinguishable from that of adults (Cruickshank and Brown, 1981; Gaskin, 1972). However, bow-riding juveniles were noted to surface more frequently than adults (Rose and Payne, 1991).

**REMARKS.** The genus name, *Lissodelphis*, derives from the Greek *liso* for "smooth" and *delphis* for "dolphin." The specific epithet *peronii* is from F. Péron, the French naturalist who observed these dolphins on 11 January 1802, south of Tasmania (Leatherwood and Reeves, 1983). Common names include whitebellied right whale dolphin, southern right whale porpoise, mealy-mouthed porpoise, *tunina* (= *tonina*) *sin aleta* (Spanish), *delfin* (= *delphin*) *liso austral* (Spanish), *minami semi-iruka* (Japanese), *dauphin de Peron* (French), *dauphin aptère austral* (French), *yuzhnyi kitovidnyi*

*delfin* (Russian), *südlichen Glattdelphins* (German), and *zuidelijke gladde dolfin* (Dutch). To be correct grammatically, the common name should probably be hyphenated as right-whale dolphin (Jones et al., 1991; D. W. Rice, pers. comm.).

Philippi (1900) described a new species of dolphin, *Tursio? chiloënsis*, based on a skull from Ancud, Chiloe Island, Chile. Various authors have listed this species as a junior synonym of *L. peronii* (Donoso-Barros, 1975; Hershkovitz, 1966; Sielfeld, 1983; Tamayo and Frassinetti, 1980), whereas Cabrera (1960) placed it in the synonymy of *Cephalorhynchus eutropia*. Goodall (1986), however, has shown clearly that *T. chiloënsis* is a junior synonym of *Lagenorhynchus australis*.

Van Waerebeek (1993) re-identified a skull in the Tasmanian Museum as a specimen of *Lissodelphis peronii*. This specimen previously was referred to as both *Lagenorhynchus obscurus* and *L. cruciger* by Pearson (1936) and Guiler (1978), respectively.

Thanks to L. Osegueda and K. Sekiguchi for assistance in obtaining references and to A. Baker and K. Van Waerebeek for comments on an earlier version of the manuscript. Special thanks to A. Baker and A. van Helden for providing photographs of the skull and tympanoperiotic bones, and to S. Leatherwood for providing the full-body photograph (previously published in Cruickshank and Brown, 1981).

#### LITERATURE CITED

- AGUAYO-L., A. 1975. Progress report on small cetacean research in Chile. *Journal of the Fisheries Research Board of Canada*, 32:1123-1143.
- BAKER, A. N. 1981. The southern right whale dolphin *Lissodelphis peroni* (Lacépède) in Australasian waters. *National Museum of New Zealand Records*, 2:17-34.
- . 1990. Whales and dolphins of New Zealand and Australia: an identification guide. Victoria University Press, Wellington, New Zealand, 133 pp.
- BROWN, S. G. 1973. Recent sight records of southern right whale dolphins in the Pacific Ocean. *The Marine Observer*, 43:78-80.
- . 1982. Southern right whale dolphins off the South West Africa coast. *The Marine Observer*, 52:33-34.
- BROWNELL, R. L., JR. 1974. Small odontocetes of the Antarctic. Pp. 13-19, in *Antarctic mammals* (S. G. Brown, R. L. Brownell, Jr., A. W. Erickson, R. J. Hofman, G. A. Llano, and N. A. Mackintosh, eds.). *Antarctic Map Folio Series*, 18, American Geographic Society, New York, 19 pp.
- CABRERA, A. 1960 (1961). *Catálogo de los mamíferos de América del Sur. II (Sirenia-Perissodactyl-Artiodactyla-Lagomorpha-Rodentia-Cetacea)*. Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" e Instituto Nacional de Investigación de las Ciencias Naturales, *Ciencias Zoológicas* 4:309-732.
- CAWTHORN, M. W. 1990. New Zealand. Progress report on cetacean research, April 1988 to May 1989. Reports of the International Whaling Commission, 40:202-205.
- CROVETTO, A., J. LAMILLA, AND C. PEQUEÑO. 1992. *Lissodelphis peronii*, Lacépède 1804 (Delphinidae, Cetacea) within the stomach contents of a sleeping shark, *Somniosus cf. pacificus*, Bigelow and Schroeder 1944, in Chilean waters. *Marine Mammal Science*, 8:312-314.
- CRUICKSHANK, R. A., AND S. G. BROWN. 1981. Recent observations and some historical records of southern right-whale dolphins *Lissodelphis peronii*. *Fisheries Bulletin of South Africa*, 15:109-121.
- DONOSO-BARROS, R. 1975. Contribución al conocimiento de los cetáceos vivientes y fósiles del territorio de Chile. *Gayana, Universidad de Concepción, Zoológica*, 36:1-127.
- FERNANDEZ, J. C. 1987. Nuevos registros de parásitos en mamíferos marinos Chilenos. *Parasitología al Día*, 11:120-125.
- FINDLAY, K. P. 1989. The distribution of cetaceans off the coast of South Africa and South West Africa/Namibia. M.Sc. thesis, University of Pretoria, Pretoria, South Africa, 107 pp.
- FINDLAY, K. P., P. B. BEST, G. J. B. ROSS, AND V. G. COCKCROFT. 1992. The distribution of small odontocete cetaceans off the coasts of South Africa and Namibia. *South African Journal of Marine Science*, 12:237-270.
- FRASER, F. C. 1955. The southern right whale dolphin, *Lissodelphis peroni* (Lacépède): external characters and distribution. *Bulletin of the British Museum (Natural History), Zoology Series*, 2:339-346.
- . 1966. Comments on the Delphinoidea. Pp. 7-31, in *Whales, dolphins, and porpoises* (K. S. Norris, ed.). University of California Press, Berkeley, 789 pp.
- FRASER, F. C., AND P. E. PURVES. 1960. Hearing in cetaceans: evolution of the accessory air sacs and the structure and function of the outer and middle ear in recent cetaceans. *Bulletin of the British Museum (Natural History), Zoology Series*, 7:1-140.
- GASKIN, D. E. 1968. Distribution of Delphinidae (Cetacea) in relation to sea surface temperatures off eastern and southern New Zealand. *New Zealand Journal of Marine and Freshwater Research*, 2:527-534.
- . 1972. Whales, dolphins and seals, with special reference to the New Zealand region. St. Martin's Press, New York, 200 pp.
- GOODALL, R. N. P. 1978. Report on the small cetaceans stranded on the coasts of Tierra del Fuego. *Scientific Reports of the Whales Research Institute*, 30:197-230.
- . 1986. On the identity of *Tursio chiloënsis* Philippi 1900. *Marine Mammal Science*, 2:230-232.
- GOODALL, R. N. P., AND I. S. CAMERON. 1980. Exploitation of small cetaceans off southern South America. Reports of the International Whaling Commission, 30:445-450.
- GOODALL, R. N. P., AND A. R. GALEAZZI. 1985. A review of the food habits of the small cetaceans of the Antarctic and Sub-Antarctic. Pp. 566-572, in *Antarctic nutrient cycles and food webs* (W. R. Siegfried, P. R. Condy, and R. M. Laws, eds.). Springer-Verlag, Berlin, 700 pp.
- GRAY, J. E. 1846. On the cetaceous animals. Pp. 13-53, in *The zoology of the voyage of H.M.S. Erebus & Terror, under the command of Captain Sir James Clark Ross, R.N., F.R.S., during the years 1839 to 1843, volume 1: Mammalia, Birds* (J. Richardson and J. E. Gray, eds.). 1:13-53 + 37 pls.
- GUILER, E. R. 1978. Whale strandings in Tasmania since 1945 with notes on some seal reports. *Papers and Proceedings of the Royal Society of Tasmania*, 112:189-213.
- HERSHKOVITZ, P. 1966. Catalog of living whales. *Bulletin of the United States National Museum*, 246:1-259.
- JEFFERSON, T. A., M. W. NEWCOMER, S. LEATHERWOOD, AND K. VAN WAEREBEEK. 1994. Right whale dolphins *Lissodelphis borealis* (Peale, 1848) and *Lissodelphis peronii* (Lacépède, 1804). Pp. 335-362, in *Handbook of marine mammals, volume 5: The first book of dolphins* (S. H. Ridgway and R. Harrison, eds.). Academic Press, London, 416 pp.
- JONES, J. K., JR., R. S. HOFFMANN, D. W. RICE, C. JONES, AND M. D. ENGSTROM. 1992. Revised checklist of North American mammals north of Mexico, 1991. *Occasional Papers, The Museum, Texas Tech University*, 146:1-23.
- KASAMATSU, F., D. HEMBREE, G. JOYCE, L. TSUNODA, R. ROWLETT, AND T. NAKANO. 1988. Distribution of cetacean sightings in the Antarctic: results obtained from the IWC/IDCR minke whale assessment cruises, 1978/79 to 1983/84. Reports of the International Whaling Commission, 38:449-487.
- KASUYA, T. 1973. Systematic consideration of recent toothed whales based on the morphology of tympano-periotic bone. *The Scientific Reports of the Whales Research Institute*, 25: 1-103.
- KLINOWSKA, M. 1991. Dolphins, porpoises and whales of the world: the IUCN red data book. International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland, 429 pp.
- LACÉPÈDE, B. G. E. 1804. *Histoire naturelle des cétacées*. Plaisan, Paris, 329 pp.
- LEATHERWOOD, S., AND R. R. REEVES. 1983. *The Sierra Club handbook of whales and dolphins*. Sierra Club Books, San Francisco, 302 pp.
- LEATHERWOOD, S., AND W. A. WALKER. 1979. The northern right whale dolphin *Lissodelphis borealis* Peale in the eastern North Pacific. Pp. 85-141, in *Behavior of marine animals, volume 3: Cetaceans* (H. E. Winn and B. L. Olla, eds.). Plenum Press, New York, 438 pp.
- LEATHERWOOD, S., W. E. EVANS, AND D. W. RICE. 1972. The whales, dolphins, and porpoises of the eastern North Pacific: a guide to their identification in the water. *Naval Undersea Center Technical Paper No. 282*, Naval Undersea Research Development Center, 182 pp.
- LILLIE, D. G. 1915. British Antarctic ("Terra Nova") expedition,

1910. Cetacea. British Museum (Natural History) Natural History Report, Zoology, 1:85–124.
- MALM, A. W. 1871. Hvaldjur I Sveriger Musser, ar 1869. Kungliga Svenska Vetenskaps-Akademiens Handlingar, Stockholm, 9:1–104 + 6 pls.
- MITCHELL, E. 1975. Report of the meeting on smaller cetaceans, Montreal, April 1–11, 1974. Journal of the Fisheries Research Board of Canada, 32:889–983.
- MIYAZAKI, N., AND H. KATO. 1988. Sighting records of small cetaceans in the Southern Hemisphere. Bulletin of the National Science Museum (Zoology), Tokyo, 14:47–65.
- OGAWA, T. 1937. Studien über die Zahnwale in Japan (9. Mitteilung). Botany and Zoology, 5:591–598.
- PALMER, T. S. 1899. Notes on three genera of dolphins. Proceedings of the Biological Society of Washington, 13:23–24.
- PEARSON, J. 1936. The whales and dolphins of Tasmania. Papers and Proceedings of the Royal Society of Tasmania, 195:163–192.
- PERRIN, W. F. 1985. The former dolphin fishery at St. Helena. Reports of the International Whaling Commission, 35:423–428.
- . 1991. Why are there so many kinds of whales and dolphins? BioScience, 41:460–461.
- PHILIPPI, R. A. 1893. Los delfines de la punta austral de la América del sur. Anales del museo nacional de Chile, primera seccion, zoologia, 6:1–18.
- . 1900. Contribución a la osteología del *Grypotherium domesticum* Roth: un nuevo delfín. Memorias científicas y literarias. Anales de la Universidad Nacional de Chile:105–114.
- QUOY, J. R. C., AND J. P. GAIMARD. 1824. Voyage autour du monde-exécuté sur les corvettes de S. M. l'Uranie et la Physicienne, pendant les années 1817–20-par M. Louis de Freycinet. Zoologie, Tome 4, 712 pp.
- ROSE, B., AND A. I. L. PAYNE. 1991. Occurrence and behavior of the southern right whale dolphin *Lissodelphis peronii* off Namibia. Marine Mammal Science, 7:25–34.
- 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.
- SIELFELD, K. W. 1983. Mamíferos marinos de Chile. Universidad de Chile, Santiago, 199 pp.
- TAMAYO, H. M., AND D. FRASSINETTI C. 1980. Catálogo de los mamíferos fósiles y vivientes de Chile. Boletín del Museo Nacional de Historia Natural, Santiago, Chile, 37:323–399.
- TOBAYAMA, T., S. UCHIDA, AND M. NISHIWAKI. 1969. A white bellied right whale dolphin caught in the waters off Ibaragi, Japan. Journal of the Mammalogical Society of Japan, 4:112–120.
- TORRES-N., D., AND A. AGUAYO-L. 1979. Hábitos alimentarios de *Lissodelphis peronii* (Lacepede, 1804) en Chile central (Cetacea: Delphinidae). Revista de Biología Marina (Chile), 16: 221–224.
- TROUPESSART, E. L. 1898. Catalogus mammalium tam viventium quam fossilium. R. Friedlander & Sohn, Berlin, 1,469 pp.
- TRUE, F. W. 1889. Contributions to the natural history of the cetaceans, a review of the family Delphinidae. Bulletin of the United States National Museum, 36:1–191.
- VAN BENEDEEN, P. J., AND P. GERVAIS. 1880. Ostéographie des cétacés vivants et fossiles comprenant la description et l'icéonographie du squelette et du système dentaire de ces animaux ainsi que des documents relatifs a leur histoire naturelle. Arthus Bertrand, Paris, 634 pp.
- VAN WAEREBEEK, K. 1993. Presumed *Lagenorhynchus* skull at the Tasmanian Museum reidentified as *Lissodelphis peronii*. Australian Mammalogy, 16:41–43.
- VAN WAEREBEEK, K., AND J. C. REYES. 1994. Interactions between small cetaceans and Peruvian fisheries in 1988/89 and analysis of trends. Report of the International Whaling Commission (Special Issue), 15:495–502.
- VAN WAEREBEEK, K., J. CANTO, J. GONZALEZ, J. OPORTO, AND J. L. BRITO. 1991. Southern right whale dolphins, *Lissodelphis peronii* off the Pacific coast of South America. Zeitschrift für Säugetierkunde, 56:284–295.

Editors of this account were ELAINE ANDERSON, KARL F. KOOPMAN, AND DUKE S. ROGERS. Managing editor was ALICIA V. LINZEY.

M. W. NEWCOMER, 22371 HARTMAN DRIVE, LOS ALTOS, CALIFORNIA 94024; T. A. JEFFERSON, OCEAN PARK CONSERVATION FOUNDATION, OCEAN PARK, ABERDEEN, HONG KONG; R. L. BROWNELL, JR., SOUTHWEST FISHERIES SCIENCE CENTER, NOAA, NMFS, P.O. BOX 271, LA JOLLA, CALIFORNIA 92038.