

Systematic list of birds observed Stanford Oceanographic
Expedition 17; Galápagos Islands and vicinity, 22 February
- 23 March 1968.

Alan Baldrige
Hopkins Marine Station

Galápagos penguin Spheniscus mendiculus. This endemic species was seen only on Islas Isabela and Fernandina. A maximum of 5 at Pta. Espinosa, Fernandina on 4 March. On Isabela 10 at Caleta Black 7 March and 8-10 Caleta Tagus on the same day. The large number of 150 was counted on and around the three small islets in Bahia Elizabeth 8-9 March. At least 25% were in juvenile plumage and many adults appeared to be molting. Two abandoned clutches of 2 eggs were found in small caves on the middle of the three islets. In another hole a single abandoned egg was seen. What appeared to be a molting adult was seen at the end of a ten-foot tunnel on the same islet but whether this bird had eggs or young could not be determined. If the estimate for the total population of 1500 birds (Lévêque, 1963) is accurate, then the Bahia Elizabeth area is of major importance to this species. Fifty were at Noah's Cove (3 miles east of Pta. Moreno) 10 March and 6 at Iguana Cove the following day.

Hawaiian petrel Pterodroma phaeopygia. Three to four birds were seen close to the ship off Wreck Bay, San Christobal 19 March.

Audubon's shearwater Puffinus lherminieri. Abundant throughout the Archipelago but not seen at sea to the east. Small parties of courting birds repeatedly visited the cliffs of Genovesa and 2 birds were seen in inaccessible crevices in the cliffs of Bahia Darwin on 29 February.

Galápagos storm petrel Oceanodroma tethys. This species was first seen on 22 Feb. at lat. 83°41'W, long. 2°14'S and became increasingly abundant as we approached the Islands. It was abundant throughout the Archipelago and especially at Genovesa where the spectacular swarming "flight," involving perhaps 5000 birds on occasion, was noted from 0900-1700 hrs each day (Nelson, 1966). No eggs or young could be located although birds were entering fissures in the lava in small numbers. It was a little less numerous in the area west of Isabela.

Harcourt's or Madeiran storm petrel Oceanodroma castro. Not seen about Genovesa but found to be common on the west side of Isabela 6-11 March. It was present, although less numerous, off Islas Plaza, Santa Cruz, 14 March and on 19 March off Wreck Bay, San Christobal.

Elliot's storm petrel Oceanites gracilis. Small numbers seen off the west coast of Isabela with 2-3 Pta. Espinosa, Fernandina, 6 March. One came aboard ship and was caught and examined, Noah's Cove, Isabela 10 March.

Red-billed tropicbird Phaethon aethereus. First seen at lat. 83°41'W, long. 2°14'S on 22 February. The bird was abundant at Genovesa. Birds were seen in crevices and display flighting was in progress, however, no eggs or young were found. Very small numbers were seen about Islas Plaza and Rocas Gordon, Santa Cruz. Three birds seen Isla Onslow, Santa Maria, 17 March.

Brown pelican Pelecanus occidentalis. Present throughout the Archipelago but nowhere especially numerous. Nests with half-grown young at Pta. Espinosa 6 March and Bahia Elizabeth 9 March. Some young at the latter location were ready to fly. Further south at Noah's Cove, Isabela, were nests with all stages from eggs to young ready to fly on 10 March.

Masked or Blue-faced booby Sula dactylatra. Abundant throughout the Islands except on the west side of Isabela. All stages of nesting activity observed on Genovesa. It was not found breeding elsewhere.

Red-footed booby Sula sula. Seen only about Genovesa. Here the brown phase is dominant and makes up 90% of the population. Apparently just starting to lay, for a few eggs were seen, although most of the birds were sitting on empty nests.

Blue-footed booby Sula nebouxii. Abundant throughout most of the Archipelago except Genovesa, where only odd birds were seen. Apparently at the end of the breeding season, for a few young, almost ready to fly, were seen on the largest islet in Bahia Elizabeth, Isabela. No eggs seen.

Flightless cormorant Nannopterum harrisi. This endemic was found only on the west coast of Isabela and nearby Fernandina. 42-43 were counted on Pta. Espinosa, Fernandina, 4-5 March. They did not appear to be breeding. At Caleta Black on Isabela 3 nests with eggs were found 7 March. At Noah's Cove there were 10 birds and 3 nests with eggs on 10 March. At Bahia Elizabeth 9 March about 8 pairs were found including 2 nests with eggs, while nearby fledged young were being fed by parents.

In connection with the food habits of this species an individual at Pta. Espinosa was seen to swallow an octopus Cephalopoda 10-12 inches across the tentacles on 5 March. At Noah's Cove on 10 March one was seen to swallow a Moray eel Muraedinae nearly 2 feet long (also witnessed by Dr. Dunson).

Magnificent frigatebird Fregata magnificens; Great frigatebird Fregata minor. Common throughout the Islands although no consistent attempt was made to separate the species. Frigatebirds were found breeding only on Genovesa, where they were abundant. Nest building and courtship display were in full swing and a few fresh eggs were found. At the same time a considerable number of large and ready-to-fly young were also present.

Great blue heron Ardea herodias. Odd birds were seen at the following locations:- 2 Bahia Academy, Santa Cruz, 25 Feb.; 1 on shore of Santa Cruz near Islas Plaza 10 March; 1 Pta. Espinosa, Fernandina 5 March.

Egret Herodias egretta. A single bird at Bahia Academy 24 Feb. was the sole record.

Yellow-crowned night heron Nyctanassa violacea. Was found on all islands visited with the exception of Santa Maria. Although usually found on the shore, an adult was seen at the crater lake of Genovesa on 3 March and an immature bird in the thick scrub of the southerly Islas Plaza 13 March, where it was apparently hunting food.

Galápagos heron Butorides sundevalli. Like the last species this endemic bird was found on all islands visited with the sole exception of Santa Maria.

American flamingo Phoenicopterus ruber. This species was found only at the salt lagoon near Post Office Bay, Santa Maria, where 21 birds on 16 March increased to 24 the next day. No breeding activity observed. Members of the present expedition found no Artemia or other abundant crustaceans in the lagoon and one must presume that the birds were feeding on algae. Gifford (1913) states that "Specimens were taken (on Santa Maria) with the gullet full of what appeared to be reddish mud." This species has also been recorded from the shallow lagoons at Bahia Conway, Santa Cruz (Lévêque, 1963) but could not be found there on 27 February.

Galápagos pintail Poecilonetta bahamensis. This endemic was located in only three areas. Fifteen in the crater lake of Genovesa on 3 March; 1 pair in the crater lake at Caleta Tagus, Isabela on 7 March; 25 on the salt lagoon near Post Office Bay, Santa Maria on 16 March. Many of these birds were in pairs, but no breeding activity was observed.

Galápagos hawk Buteo galapagoensis. This endemic hawk was seen only on Fernandina and Isabela. A pair of adults was at Pta. Espinosa 5-6 March. Their empty nest was located on a low lava cliff inland from the point. It was a huge structure and apparently an ancestral site. Its location matched the description of Amadon (1965). These birds frequently visited the tip of the point, where large numbers of Marine iguanas Amblyrhynchus and Lava lizards Tropidurus were present. No kill was observed.

At Caleta Tagus on Isabela a bird was observed from the ship on the morning of 7 March. At 1900 hrs the same or another hawk was seen by Dunson to swoop down on a marine iguana Amblyrhynchus. A few moments later we came upon the bird and examined the dying iguana. It was 31 inches in length and weighed 3.75 lbs. The weight of the hawk is not available at the time of writing but is almost certainly less than that of the prey.

Galápagos rail Creciscus spilonotus. One bird seen and heard in the highlands of Santa Cruz near the eastern boundary of the Tortoise Reserve, 26 February.

Common gallinule Gallinula chloropus. Six birds, all adults, on three different pools in a marshy area inland from Noah's Cove mangroves, Isabela, 10 March.

Frazar's oystercatcher Haematopus galapagensis. This species proved to be rather uncommon considering the abundance of rocky shore habitat available. Birds were seen as follows:- Bahia Conway, Santa Cruz, 1 pair with a single half-grown chick; coast of Santa Cruz opposite Islas Plaza, 1 pair; Pta. Espinosa, Fernandina, 2 pairs.

Semi-palmated plover Charadrius semipalmatus. Small numbers seen on Fernandina, Genovesa, Isabela, Santa Cruz and Santa Maria. Maximum of 10 on Santa Cruz near Islas Plaza 14 March. A single bird at the crater lake of Genovesa 3 March.

American golden plover Pluvialis dominica. A single bird in company with 4 black-bellied plovers Squatarola squatarola on the shore of Santa Cruz opposite Islas Plaza 14 March. Lévêque, Bowman and Billeb (1966) do not list this species in their account of migrants in the Galápagos. The golden brown coloration, lack of white on upper tail coverts and lack of black on axillaries, together with a distinctive call clearly separated it from its neighbors. It occurs widely in the central Pacific islands as well as in South America during migration (Peterson, 1961) and its presence in the Galápagos is to be expected.

Black-bellied plover Squatarola squatarola. Small numbers seen on Fernandina, Genovesa, Isabela and Santa Cruz, with a maximum of 4 birds on Santa Cruz shore opposite Islas Plaza on 14 March.

Ruddy turnstone Arenaria interpres. One of the most numerous and widespread shorebirds and seen on all islands, with a maximum of 20 at the crater lake of Genovesa 3 March and the same number on Santa Cruz shore opposite Islas Plaza on 14 March.

Whimbrel Numenius phaeopus. Small numbers seen on all islands, with a maximum of 65 at an evening roost on the salt-lagoon near Post Office Bay, Santa Maria, on 17 March. Lévêque, Bowman and Billeb (1966) record large numbers there.

Spotted sandpiper Actitis macularia. Single birds were seen on several islands with a maximum of 2 at the salt-lagoon near Post Office Bay on 17 March.

Wandering tattler Heteroscelus incanum. One of the most numerous and widespread shorebirds and seen on all islands visited as well as the somewhat unlikely location of the crater lake on Genovesa, where 2 were seen on 3 March.

Willet Catoptrophorus semipalmatus. A single bird at the salt-lagoon near Post Office Bay 16-17 March. Lévêque, Bowman and Billeb (1966) list it as "rare."

Lesser yellowlegs Totanus flavipes. A single bird on the salt-lagoon near Post Office Bay 16-17 March. Lévêque, Bowman and Billeb (1966) list it as "rare."

AB-5

Least sandpiper Eriolia minutilla. A single bird on the salt-lagoon near Post Office Bay on 17 March.

Stilt sandpiper Micropalama himantopus. A single bird in company with a lesser yellowlegs Totanus flavipes on the salt-lagoon near Post Office Bay 16-17 March. Lévêque, Bowman and Billeb (1966) list it as "rare" and cite only two records.

Semi-palmated sandpiper Ereunetes pusillus. A small flock of 4 birds on the salt-lagoon near Post Office Bay 17 March. Lévêque, Bowman and Billeb (1966) list it as "rare."

Western sandpiper Ereunetes mauri. Six birds were seen on the salt-lagoon near Post Office Bay on 16 March and 4 there the following day.

Sanderling Crocethia alba. This species was seen in small numbers on several islands, with a maximum of 10 birds on Santa Cruz shore opposite Islas Plaza on 14 March.

Black-necked stilt Himantopus mexicanus. Seen in small numbers in the following locations:- Bahia Conway, Santa Cruz 2-3 pairs on 27 Feb.; Santa Cruz shore near Islas Plaza a single bird on 14 March; Post Office Bay salt-lagoon, Santa Maria 10 birds 16-17 March. No nesting behavior noted.

Wilson's phalarope Steganopus tricolor. Two birds were seen on the salt-lagoon near Post Office Bay 16 March. Lévêque, Bowman and Billeb (1966) list this species as "rare."

Northern Phalarope Lobipes lobatus. Found to be common among the Islands, especially between San Cristobal and Santa Cruz and again off the north coast of the latter Island. Both are areas of turbulence and strong currents. Eight-five birds were feeding on the crater lake at Caleta Tagus on 7 March.

Away from the Islands a huge concentration of circa 1000 birds was associated with a "red tide" at 2°35'S, 82°1'W on 21 Feb., presumably attracted by the zooplankton predators feeding on the tide.

Swallow-tailed gull Creagrus furcatus. First seen at lat. 1°58'S, long. 84°51'W, with small numbers thereafter as we approached the Islands. In the Galápagos they were abundant only on Genovesa and Islas Plaza. Elsewhere only odd individuals seen. All stages of nesting from eggs through half-grown young to fledged juveniles seen on both Genovesa and Islas Plaza. Noted leaving both places at dusk to feed, when most other species were returning to roost.

Franklin's gull Larus pipixcan. This species observed only on Isabela, where 6 birds were seen at Noah's Cove (3 miles east of Pta. Moreno) 10 March. Adult and immature plumages represented.

Dusky gull Larus fuliginosus. This endemic seen in small numbers on Fernandina, Genovesa, Isabela and Santa Cruz, with a maximum of 20 feeding on fish remains at Genovesa 29 Feb. and about the same number Bahia Elizabeth 9 March. Further evidence of the scavenging nature of this species was provided by 2 birds investigating a newly-dead Galápagos sea lion pup Zalophus on Islas Plaza 15 March.

Brown noddy Anous stolidus. This species was observed in small numbers throughout the Islands, with a notable concentration of circa 750 birds associated with Audubon's shearwaters Puffinus lherminieri at a dense fish school near Rocas Gordon, Santa Cruz on 14 March. The only evidence of nesting was the presence of 3 pairs of birds and the discovery of 2 clutches of eggs, on the middle of the three islets in Bahia Elizabeth, Isabela 9 March.

Galápagos dove Nesopelia galapagoensis. This endemic species was observed on three islands as follows:- Santa Cruz, a single bird at the Tortoise Reserve 26 Feb.; a maximum of 5-6 birds at Genovesa 29 Feb.; (8 birds killed by local fishermen for food were found drying on the beach in Bahia Darwin on 28 Feb.); Fernandina, 2 birds at Pta. Espinosa 6 March.

Barn owl Tyto alba. A single bird seen in the dusk of 26 Feb. near Bella Vista, Santa Cruz.

Galápagos short-eared owl Asio galapagensis. This endemic bird was seen only on Genovesa and Santa Cruz. A single bird in the Tortoise Reserve on Santa Cruz 26 Feb. and at least 6 birds in the storm petrel "flight" area of Genovesa on 2 March. The roosting sites in the latter location were covered with the bones of hundreds of small petrels Oceanodroma.

Galápagos flycatcher Myiarchus magnirostris. This endemic found on all of the islands visited from sea level upwards.

Vermillion flycatcher Pyrocephalus nanus. This bird was found to be numerous in the higher regions of Santa Cruz on 26 Feb. and likewise on Santa Maria in the hills above Black Beach 18 March. In both cases the territorial song-flights of the males attracted attention.

Mockingbird Nesomimus parvulus. This endemic was encountered on all of the islands visited. No mockingbirds were seen on Santa Maria, where they are now considered extinct (Swarth, 1931).

Galápagos martin Progne modesta. This endemic form was seen only on Isabela, where a single bird was seen on one of the islets in Bahia Elizabeth 9 March. A party of 6 at Noah's Cove 10 March.

Yellow warbler Dendroica petechia. Common on all islands visited, especially in those areas where mangroves present.

Galápagos finches Geospizinae. No attempt was made to observe this endemic group intensively. There are so many problems in field identification that considerable time is required merely to familiarize oneself with them. This would not have been time well spent in the present expedition. The best place for observation of this group proved to be the area around Darwin Station at Bahia Academy, Santa Cruz.

I was especially interested to observe their association with the marine iguana Amblyrhynchus (see Amadon 1967). In the afternoon of 4 March Dunson and I watched 2 finches, presumed to be the small ground finch Geospiza fuliginosa grooming iguanas out on the exposed rocks at the tip of Pta. Espinosa, Fernandina. They were observed to carefully pick over the iguana from head to tail.

As far as is known this association has not been recorded between the finches and the land iguana Conolophus, although Darwin (1882) makes a somewhat cryptic remark on association in describing one of the "thick-billed finches 'hopping with the utmost indifference ...on the back of the reptile'".

It was of great interest to observe such an association on the more southerly of the Islas Plaza. This island is known for its dense concentration of land iguanas (Lévêque, 1963). Some 10 hrs of observations on the iguanas was carried out 13-15 March. At 0845 hrs on 15 March I saw a male finch, thought to be the Cactus ground finch Geospiza scandens, approach a large iguana, one of 6 sunning themselves on rocks in a clearing in the Opuntia. The finch approached the head, examined both sides, hopped onto the dorsal surface, moved anteriorly, then hopped off and examined the area behind the right foreleg. The iguana, which meanwhile had been prostrate on its rock, raised itself high on all four legs and arched its back. At this the finch moved beneath and was clearly seen to remove two ticks, one from the base of the right foreleg, the other from the lower abdomen. The finch emerged and flew off, the iguana once more prostrating itself. Despite a prolonged watch the activity was not seen to be repeated.

LITERATURE CITED

- Amadon, D. 1965. Notes on the Galapagos hawk. Oiseau 35 no. special: 9-21.
- Amadon, D. 1967. Galapagos finches grooming marine iguanas. Condor 69: 311.
- Darwin, C. 1882. A Naturalist's voyage: journal of researches into the natural history and geology of the countries visited during the voyage of H.M.S. 'Beagle' round the world... London J. Murray. 519 pp.

- Gifford, E. W. 1913. Birds of the Galapagos Islands, with observations on the birds of Cocos and Clipperton Islands. Proc. Calif. Acad. Sci. Ser. 4. Vol. II pt. 1.
- Lévêque, R. 1963. Le statut actuel des vertébrés rares et menacés de l'Archipel des Galapagos. Terre et la Vie 1963 no. 4: 397-430.
- Lévêque, R., R. I. Bowman, and S. L. Billeb. 1966. Migrants in the Galapagos area. Condor 68(1): 81-101.
- Nelson, J. B. 1966. Flighting behaviour of Galapagos storm petrels. Ibis 108: 430-432.
- Peterson, R. T. 1961. Field guide to Western birds. Boston, Houghton Mifflin. 366 pp.
- Swarth, H. S. 1931. The avifauna of the Galápagos Islands. Occ. Pap. XVIII Calif. Acad. Sci.

Observations on the Galápagos fur seal *Arctocephalus australis galapagoensis* Heller, 1904.

The overexploitation and rapid decline of this species has been well documented (Townsend, 1934 and Scheffer, 1958). Its re-discovery and slow increase are discussed by Barning (1933) and Lévêque (1963). Viable populations in areas suitable for observation now exist on Isla San Salvador and Genovesa.

The visit of Te Vega to Bahia Darwin on Genovesa from 29 Feb. to 3 March permitted observations on a group of *Arctocephalus* inhabiting the foot of the cliffs just inside the east arm of the Bay. Observations were carried out throughout the daylight hours and one night was spent in the area.

Summary of Observations

- 1) A total of some 55 animals was counted. Of these 30 were in the study area and close attention was given to half that number. All age groups appeared to be represented, except small pups.
- 2) The habitat contrasts markedly with that of the Galapagos sea lion *Zalophus californianus wollebaeki*. The fur seal is confined to areas where extensive caves and fissures are available at the foot of cliffs. The animals may disappear from sight completely in some of these holes.
- 3) Temperature regulation is closely associated with choice of habitat. In the study area the caves were cool (28°-29°C), moist and completely shaded from direct sunlight.

- 4) No evidence of territorialism or other breeding activity was observed, indicating that the breeding season must be at some other time of the year. The extremely sparse literature is not helpful in this respect. Bonner (1958) in his account of the Southern fur seal Arctocephalus australis, Zimmerman, in South Georgia, indicates December. Rand (1967) in his extensive study of the Cape fur seal Arctocephalus pusillus indicates October-November. R. I. Bowman (personal communication) believes the Galápagos fur seal breeds in the cool season (July-September).
- 5) The animals proved extraordinarily silent for pinnipeds. Non-breeding aggregations of California sea lions Zalophus californianus and Steller sea lion Eumetopias jubata vocalize extensively. The relative silence of the present species rendered it impossible to obtain recordings of vocalization.
- 6) The daily routine of the animals was observed including the time spent sleeping on exposed rocks or in caves, the periods of swimming or sleeping whilst afloat, and their departure from the area for feeding purposes and following that, their return. Feeding apparently takes place at night, for the animals depart at sunset, returning around sunrise (checks of the area after dark revealed no fur seals to be present). This nocturnal feeding behavior is in marked contrast to the diurnal feeding of the Galápagos sea lion (Eibl-Eibesfeldt, 1955; Orr, 1967).
- 7) Observations on interspecific relationships.

LITERATURE CITED

- Banning, G. H. 1933. Hancock expedition of 1933 to the Galápagos Islands. General report. Bull. Zool. Soc. San Diego, Calif. 10: 1-30.
- Bonner, W. N. 1958. Notes on the Southern fur seal in South Georgia. Proc. Zool. Soc. Lond. 130(2): 241-252.
- Eibl-Eibesfeldt, I. 1955. Ethologische Studien am Galápagos-Seelöwen, Zalophus wollebaeki Sivertsen. Zeit. f. Tierpsych. 12: 286-303.
- Lévêque, R. 1963. Le statut actuel des vertébrés rares et menacés de l'Archipel des Galápagos. Terre et la vie 1963 no. 4: 397-430.
- Orr, R. T. 1967. The Galápagos sea lion. J. mamm. 48(1): 62-69.
- Rand, R. W. 1967. The Cape fur-seal (Arctocephalus pusillus). 3. General behaviour on land and at sea. Investl. Rep. Div. Sea Fish. S. Afr. 60: 1-39.

Scheffer, V. B. 1958. Seals, Sea Lions and Walruses: a review of the Pinnipedia. Stanford, Stanford Univ. Press. 179 pp.

Townsend, C. H. 1934. The Fur Seal of the Galápagos Islands. Zoologica xviii(2): 43-56.

Cetaceans observed on Part 2 of Stanford Oceanographic Expedition 17, Galápagos Islands and vicinity.

Balaenoptera sp. A medium-sized rorqual (30-40 feet) was observed on several occasions in the waters of the Archipelago, usually singly or in pairs. From their irregular movements and long periods beneath the surface all appeared to be actively feeding. While the markedly recurved and rather conspicuous dorsal fin, placed far back, suggested Sei Whale Balaenoptera borealis, there is some reason to believe these animals are Bryde's Whales B. edeni according to Norris (unpublished Field Report of the Galápagos Expedition of the Alpha Helix Nov. 12 - Dec. 4, 1967). B. edeni may replace B. borealis in waters over 20° in the eastern Pacific, as it appears to do in the western Pacific and possibly the Atlantic (Omura, 1966).

All of those observed on the present cruise were within 10 miles of the shore. The largest number of sightings was made between Bahia Iguana and Isla Tortuga off the southeast coast of Isabela where 7-11 individuals were observed. The other records were from the north coast of Fernandina (1 animal) and the south coast of San Christobal (2 animals).

Killer Whale Orcinus orca. A single animal, female or immature from the shape of the dorsal fin, surfaced close to Te Vega while she lay at anchor in Bahia Darwin, Isla Genovesa on Feb. 29. The animal was seen by Dr. Barber who is familiar with this species. Lévêque (1963) lists Galapagos occurrences of this species, including one from Bahia Darwin of 5 animals on Oct. 20, 1961.

Pacific bottlenose dolphin Tursiops sp. This species proved, as expected, to be the most numerous cetacean in Galápagos waters. It was observed throughout the Islands and doubtless even more would have been observed had Te Vega made its inter-island runs in daylight rather than darkness, as was usually the case.

The largest concentration was noted on March 11 on the run from Iguana Cave to Isla Tortuga when 5 schools were seen. Small schools were seen very occasionally on the run between Guayaguil and the Islands and they were also observed in the Guayas delta.

Pilot whale Globicephala sp. This species was not observed about the Islands but a school of 20 was observed in association with Sperm Whales Physeter catodon and Bottlenose dolphins Tursiops on March 22 at 1°53'S 82°33'W, and 10 the following day off the Guayas Delta.

AB-11

Sperm Whale Physeter catodon. Among the Islands the only sighting was of a single large individual breaching on March 11 south of Isla Tortuga, off south coast of Isabela.

Good-sized groups were encountered on both outward and return runs from Guayaguil. On Feb. 22 at 1°58'S 84°51'W at 1700 hrs 12-15 animals included at least one small calf. We made a very close approach in the ship. Likewise on March 22 at 1615 hrs at 1°53'S 82°33'W a group of 12 was very closely approached.

LITERATURE CITED

- Lévêque, R. 1963. Notes sur quatre Cétacés de l'Océan Pacifique (Ecuador et Galapagos). *Mammalia* 27(4): 608-609.
- Omura, H. 1966. Bryde's Whale in the northwest Pacific In Norris, K. S. (ed.) Whales, dolphins and porpoises. Univ. of Calif. Press, Berkeley and Los Angeles. 789 pp.