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The traditional view of mating behavior is that one sex (commonly male) is competitive and the other (commonly female) choosy. The operational sex ratio of humpback whales on the winter reproductive grounds is skewed towards males, resulting in male-male competition for proximity to females. However, because males face non-trivial mating costs and females appear to vary in reproductive potential, males should exhibit mate discrimination. We tested this by using identification photographs of humpback whales collected in the Hawaiian Islands between 1976 and 1995, and 100 scan samples collected from shore in 1998. Analyses confirmed that reproductive potential for the following winter was greater for females without a calf than for females with a calf in any given season ($p<0.005$), and showed that (1) females without a calf were less likely to be found alone ($p<0.001$) and more likely to be found in large pods (4 or more adults) ($p<0.001$) than were females with a calf, (2) individual females tended to be found in larger pods in the years during which they had no calf than in the years during which they had a calf ($p<0.001$), (3) there was a seasonal increase in the probability of females with a calf being escorted by one or more males ($p<0.005$), and (4) head lunges occurred more commonly in all-adult pods than in pods containing a calf ($p<0.015$). We conclude that male humpback whales associate preferentially with females with high reproductive potential, that the attractiveness of individual females varies with their status (with a calf vs. without a calf), that males become progressively less choosy over the course of the reproductive season as females without a calf become increasingly rare on the winter grounds, and that males may expend more energy in competition over females without a calf than females with a calf.

Anatomy and Physiology of Bilateral Sonar Signal Generation in the Bottlenose Dolphin

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This study produced the first unequivocal evidence that bottlenose dolphins possess bilateral sonar signal generators. Anatomic and physiologic data was collected from three bottlenose dolphins during a target discrimination task that required echolocation. Simultaneous recording of internal nasal cavity pressure, nasal tissue motion, and acoustic pressure, provided a unique window on the process of sonar signal generation. Small catheters (2mm OD) measured pneumatic pressure changes at the same depth within each bony nasal passage. High-speed video endoscopy (200 frames/sec) revealed tissue motion at the phonic lips in both (left and right) nasal passages while two hydrophones measured acoustic pressure outside the animal's head. These records clearly demonstrate that acoustic pulses can be generated at the phonic lips on the left and right sides, independently or simultaneously. All three dolphins displayed a bimodal distribution of peak frequencies, with a low peak between 25kHz and 59kHz, and a high peak of between 100kHz and 112kHz. Comparing peak frequency with activity at the phonic lips suggests that each generator has a distinctive acoustic fingerprint that is, in part, related to bilateral anatomic asymmetry. In addition, classification of click spectra suggests a facile ability to switch between generators and/or adjust the energy content within frequency spectra, as revealed by the high degree of spectral variation between clicks within and between click trains. Air pressure in the bony nasal passages rises and falls together, even if the activity patterns at the two pairs of phonic lips are different. The volume of air used to generate each click is small, in contrast to the large volume required for generating whistles. Discovering multiple sonar sources in a dolphin's head should cause us to reinterpret previous findings and reevaluate physiologic limits on pulse repetition rate, signal bandwidth, frequency composition, and projection-beam geometry. Sponsor: Office of Naval Research.

The Relative Abundance of Simpatric Populations of *Pontoporia blainvillei* and *Sotalia fluviatilis guianensis* in the Babitonga Bay, South Coast of Brazil

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Pontoporia blainvillei and *Sotalia fluviatilis guianensis* are coastal species of little cetaceans with restrict distribution in Southeastern South Atlantic Ocean. The event of simpatrics populations that resid in the Babitonga Bay has been documented since 1996. Considering intence antropic pressure that the area has been suffering, the knowledge of these populations is important and fundamental for monitoring and conservation in future. Studies of population density has been started in October 2000 utilizing a boat with 5,5m length with a 40 Hp motor. The study area compreends the estuary of Babitonga Bay with 160 Km², sub divided in 5 sectors of different sizes, considering the fisionomic differences between the sectors. The study has been utilized line transect method with two observers, with each one covering on angle of 90° since the prow of the boat and another person writing. The data obtained until now correspond to the period of November 2000 to May 2001, in a total of 26 days of effort and 37,7 hours of sample, covering 335,2 Km. Were founded 10 groups of *P. blainvillei* with size varying from 1 to 10 individuals, with the media of 4 individuals per group. The groups of *S. f. guianensis* varyed from 1 to 22 individuals, with the media of 4 individuals per group, totalizing 52 groups. Sighting rates were higher for *S. f. guianensis* (1,5 group/10 km) than for *P. blainvillei* (0,3 groups/ 10 km) covered. The sector with lowest sighting rates compreend the acess chanel of the bay, however the central area of the bay were founded the highest incidance of both species. The Babitonga Bay represents an important refuge for both species and their permanence should be monitored. This study has preliminary data that will be analised using the DISTANCE computer program for an higher data confidence.

Comparative Analysis of Marine Mammal Utilization in the Southeastern Caribbean

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Although some recent progress has been made in better understanding marine mammal utilization in the southeastern Caribbean, no comparative analysis has been carried out to see how such practices originated, developed, and finally impacted the marine mammal populations in that region. We conducted field and archival studies for Venezuela, Trinidad and Tobago, Grenada, and St. Vincent and the Grenadines. We analyzed records of whaling, dolphin fisheries, and manatee exploitation for those countries, interviewed local fishers, and explored the remains of whaling stations in the area. Our results show that each one of those countries developed a different pattern of marine mammal exploitation when it came to whaling and dolphin fisheries but similar patterns regarding manatee exploitation. In Venezuela there was little whaling, all carried out by Yankee whalers in the nineteenth century; in Trinidad and Tobago whaling was essentially an activity promoted by local elites that did not survive into this century. Whaling in Grenada was introduced and developed by Norwegians in the 1920's. Yankee whalers did have a great influence on whaling practices in St. Vincent and the Grenadines since the 1830's. Dolphin fisheries in Venezuela have been intense and carried out by local fishers with some influence from Far-east fishers; this activity is restricted to accidental catches in Trinidad and Tobago and is nonexistent in Grenada. Dolphin fisheries have been a well-organized operation in St. Vincent and the Grenadines since the 1920's. Most local populations of manatees in this part of the Caribbean were depleted during colonial times. We conclude that marine mammal utilization in these four neighboring countries developed differently due to historical, political, social, and economic circumstances.

Reproductive Energetics of Adult Male Northern Elephant Seals

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The energetics of breeding was investigated in 21 adult male northern elephant seals associated with three adjacent harems at Año Nuevo, CA. Mass and body composition were measured in January and again in March. Body composition was determined from water isotope dilution. Water flux

Comparative Analysis of Marine Mammal Utilization in the Southeastern Caribbean

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Abstract

Although some recent progress has been made in better understanding marine mammal utilization in the southeastern Caribbean, no comparative analysis has been carried out to see how such practices originated, developed, and impacted the marine mammal populations in that region. We conducted field and archival studies for Venezuela, Trinidad and Tobago, Grenada, and St. Vincent and the Grenadines. We analyzed records of whaling, dolphin fisheries, and manatee exploitation for those countries, interviewed local fishers, and explored the remains of whaling stations. Our results show that each of these countries developed a different pattern of marine mammal exploitation when it came to whaling and dolphin fisheries but similar patterns regarding manatees (Table 1). In Venezuela there was little whaling, all carried out by Yankee whalers in the nineteenth century. In Trinidad and Tobago whaling was essentially an activity promoted by local elites that did not survive into this century. Whaling in Grenada was introduced and developed by Norwegians in the 1920's. Yankee whalers did have a great influence on whaling practices in St. Vincent and the Grenadines, starting in the 1830's. Dolphin fisheries in Venezuela have been intense and carried out by local fishers with some influence from far-east fishers. This activity is restricted to accidental catches in Trinidad and Tobago, and is nonexistent in Grenada. Dolphin fisheries have been a well-organized operation in St. Vincent and the Grenadines since the 1920's. Most local populations of manatees in these four countries were depleted during colonial times. Total catches for each country can be seen in Figures 1-4. These numbers correspond with the time periods of activity shown in Table 1. We conclude that marine mammal utilization in these groups of islands developed differently due to historical, political, social, and economic circumstances.

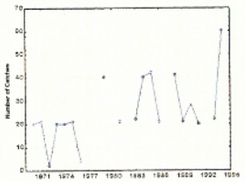

Figure 1. Total recorded marine mammal catches for Venezuela.

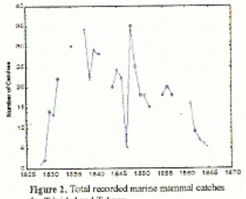

Figure 2. Total recorded marine mammal catches for Trinidad and Tobago.

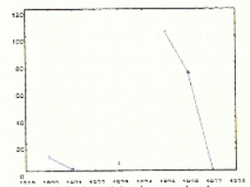

Figure 3. Total recorded marine mammal catches for Grenada.

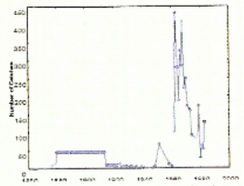

Figure 4. Total recorded marine mammal catches for St. Vincent and the Grenadines.

Whaling station remains, Glover Island, Grenada

Whaling Station, Copper's Hole, Monos Island, Trinidad

Petit Nevis Island Whaling Station, Bequia, Grenadines Source: Price (1985)

Dolphin catch, Venezuela

TABLE 1. Modes of exploitation of marine mammals in the southeastern Caribbean. Information for Venezuela is based on Romero et al. 1997 and Romero et al. 2001; for Trinidad and Tobago this paper; for Grenada based on Romero and Hayford 2001, and for St. Vincent and the Grenadines on Rack 1952, Adams 1971, Adams 1973, and Beck 1986.

	Venezuela	Trinidad and Tobago	Grenada	St. Vincent and the Grenadines
Whaling				
Nature	Locally absent	Intense shore-based	Intense shore-based	Moderate shore-based
Period	n/a	1826-1865	1925-1927	1860's-present
Induced by	n/a	Local planters (elites)	Norwegians	Local fishers
Yankee whaling?	Very marginal 1850's-1870's	Moderate 1820's-1870's	Moderate 1860's-1880's	Moderate 1830's-1880's
Species	Humpbacks	Almost all humpbacks	Almost all humpbacks	Mostly humpbacks, some sperm
Usage	Oil	Oil, meat, whalebone	Oil, meat, manure	Oil, meat
Intensity	Minor	Significant	Significant	Significant
Ecological effects	?	Total depletion	Total depletion	Partial Depletion
Dolphin fisheries				
Nature	Intense	Marginal	Absent	Significant
Period	Mostly 1960's-Present	n/a	n/a	1920's-present
Induced by	Local and Far-east fishers	Local fishers	n/a	Local fishers
Species	Common, Bottlenose		n/a	Pilot, killer, Risso's, *Stenella* spp.
Capture method	Harpooning, nets, guns	Harpooning, nets	n/a	Harpooning, nets
Usage	Meat, oil, artisanal	Meat	n/a	Meat, oil
Ecological effects	Population depletion	No noticeable effects	n/a	?
Manatee exploitation				
Nature	Opportunistic	Opportunistic	Opportunistic	Absent
Period	Pre-Columbian-present	Pre-Columbian-present	Pre-Columbian-18th. century	n/a
Practiced by	Locals	Locals	Locals	n/a
Capture method	Harpooning	Harpooning	Harpooning	n/a
Usage	Meat, oil	Meat, oil	Meat and oil (?)	n/a
Ecological effects	Largely depleted	Largely depleted	Extinction	n/a

Abandoned copper kettles for boiling whale oil, now underwater, Copper's Hole, Monos Island, Trinidad

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