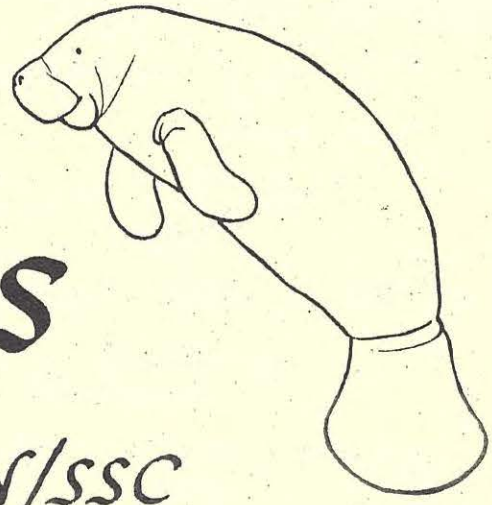

Sirenews

Newsletter of the IUCN/SSC Sirenia Specialist Group

NUMBER 19 APRIL 1993

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SIRENIA WORKSHOP AT ITC 6

A Sirenia Workshop will be held at the Sixth International Theriological Congress in Sydney, Australia, in early July 1993. The date of the workshop is not confirmed but will probably be Wednesday, 7 July. The following titles of spoken papers are provisional, and the program itself is still subject to modification. It will, however, occupy one full afternoon (1330-1730) and be chaired by Dr. John E. Reynolds, III. Each paper will be allotted 20 minutes. The workshop theme is "The interactions between seacows and their food." Attendees are also invited to submit posters, and there will be a poster session scheduled for the morning of 7 July. The following is the tentative program for the workshop.

UNION INTERNATIONALE POUR LA CONSERVATION DE LA NATURE ET DE SES RESSOURCES
INTERNATIONAL UNION FOR CONSERVATION OF NATURE AND NATURAL RESOURCES
Commission de la sauvegarde des espèces—Species Survival Commission

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in April and October and is edited by Daryl P. Domning,
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Spoken Papers:

Janet Lanyon: "Why dugongs are fussy eaters: a nutritional basis for food selection in dugongs"

Cathy Beck: "Food habits of the Florida manatee in estuarine environments"

Lynn Lefebvre, Jane Provancha, Jud Kenworthy, & Cathy Langtimm: "Assessing manatee grazing effects on seagrasses"

Jane Provancha: "Manatees and seagrasses in the northern Banana River, Florida, USA"

Hans de Iongh et al.: "Herbivore-plant interactions between dugongs and seagrass communities in Malaku Province, Indonesia"

Brad Weigle: "Manatee habitat usé in Florida: the role of telemetry and Geographic Information Systems"

Helene Marsh: "Dugongs and seagrasses in Australia: the big picture"

Tony Preen: "The effect of the loss of 1000 km^2 of seagrass on dugongs in Hervey Bay, southern Queensland"

Nina Morissette: "Are dugong habitats safe from anthropogenic impacts in the Great Barrier Reef Marine Park?"

Open discussion led by Galen Rathbun: "Seacows and seagrasses: priorities for unstudied populations and recommendations to the Sirenia Specialist Group"

Several people have expressed interest in a possible field trip to see dugongs in Moreton Bay near Brisbane after the conference. The best way to do this would be to charter an aircraft. The cost would probably be about AUS$100 per person (approximately US$70 per person) for a two-hour flight. The tides are possible, but not ideal, immediately after the workshop, so it may be possible to organize a flight for the afternoon of Monday, 12 July. Alternatively, the tides are better on Tuesday, 20 July, but that would certainly involve people staying around for quite a while after the conference. Anyway, those of you who are interested in participating in such a flight, please contact Tony Preen at the Environmental Studies Unit, James Cook University, Townsville, QLD 4811, Australia (fax no. +61-77-815581).

We are looking forward to seeing as many of you as possible at the conference in Sydney. - **Helene Marsh**

MANATEE WORKSHOP IN JAMAICA

A Regional Workshop on the Status and Management of Manatees in the Wider Caribbean has been tentatively scheduled for September or October of 1993 in Kingston, Jamaica. It will be sponsored by the Caribbean Environment Programme of UNEP. For further information contact the Natural Resources Conservation Authority (NRCA), 53 1/2 Molynes Road, Kingston 10, Jamaica; telephone (1-809) 923-5155; fax (1-809) 923-5070.

NEW GUIDELINES FOR RESEARCH PROPOSALS TO SAVE THE MANATEE CLUB

Save the Manatee Club is interested in receiving proposals for research, the results of which can be used to effect and affect management policy for the recovery of manatee species in the wild.

Effective immediately, the Club will consider proposals for research funding twice a year. In 1993, proposals will be considered in March and July. In 1994 and thereafter, the first round of proposals will be considered no later than November of the previous year. For example, proposals for the first half of 1994 must be received by November 30, 1993. In June of 1994 we will review the second round of proposals for that fiscal year. Requirements for proposals are as follows:

1. Please submit ten (10) copies of your proposal to Judith Vallee, Executive Director, Save the Manatee Club, 500 N. Maitland Ave., Maitland, Florida 32751 USA.

2. Please make sure your proposal addresses the following:
   a. Clearly and concisely state the purpose and need of the proposed research.
   b. State the methodology that will be used.
   c. State the approximate time frame of the research.
   d. State the names of the investigators and cooperating agents and provide a brief statement of their qualifications.
   e. If only partial funding is requested, please include budget for cooperating agent.

3. State how you expect your proposed research to influence management policies.

4. Save the Manatee Club requires quarterly updates and an annual report to be submitted with request for payment.

5. All proposals should include a literature review and citations in addition to answering the above criteria.

Proposals are reviewed for merit by the Club's Scientific Advisory Council and its Executive Committee. Please allow two (2) months for review.

LOCAL NEWS

AUSTRALIA

Loss of Seagrass and Loss of Dugongs. - Until recently, Hervey Bay, in southeast Queensland, supported the second-largest seagrass meadow and dugong "population" in eastern Australia. A large flood in the Mary River in February 1992 was followed three weeks later by the passage of a downgraded cyclone and a second flood. These events were coincident with what now appears to be the death of virtually all of a 1000 km^2 seagrass meadow that stretched from the intertidal zone to a depth of 20 m in southwest Hervey Bay. During a 1988 survey, seagrass cover at the 53 of 97 sample sites (55%) in the southwest of the Bay that contained seagrass averaged 39.5%, with a maximum of 100%. In the same area in January 1993, 11 of 79 sites (14%) contained seagrass, but often only isolated plants. The average ground cover was just 1.5%, and the maximum was only 7%. Sixty-six of the sites sampled in 1988 were resampled in 1993. At those sites, average seagrass cover changed from 39.0% (range = 0.1-100%) in 1988 to 0.13% (range = 0-5%) in 1993. At eight sites where seagrass was recorded in 1988, but not in 1993, the remains of dead seagrass rhizomes were found during the 1993 survey.

During the second half of 1992, unprecedented numbers of dead dugongs

were recorded from Hervey Bay and areas to the north and south. Autopsies revealed that most of the animals were emaciated, and starvation was likely to be the ultimate cause of death. Some animals had unusual food items in their stomachs, including algae, decomposing fiber and sand. The number of dugongs that died in Moreton Bay (260 km south of Hervey Bay) and in New South Wales (NSW), south of the dugongs' normal range, suggested there had been a mass exodus of dugongs from Hervey Bay. While only eight dugongs had been recorded in NSW in more than 30 years prior to 1992, at least 17 dugongs were reported from that state in the second half of 1992.

The population of dugongs in southern Hervey Bay in 1988 was estimated to be 1466 (±326). In November 1992, the same area had an estimated population of 50 (±33). At the same time, the population in the Great Sandy Strait (GSS), immediately south of Hervey Bay, changed from 291 (±135) to 656 (±272), confirming local fishermen's suggestion that many of the displaced dugongs moved into this area. However, the estimated total population of the Hervey Bay region (including GSS) changed from 1971 (±359) in 1988 to 787 (±277) in 1992, suggesting that a large number of dugongs died or left the area. Seventy-four dead dugongs can be accounted for.

The February 1992 flood of the Mary River was the third largest this century. In combination with the Burrum River, this flood presumably put a huge plume of turbid water into Hervey Bay. This plume would have shaded the light-demanding seagrasses, especially in the deeper areas where most of the seagrass occurred. As a result of the reduced photosynthesis, the seagrasses would have starved. Three weeks after the flood, ex-cyclone "Fran" passed over Hervey Bay, physically excavating large amounts of seagrass. Wave action would have resuspended fine sediments, and the flood produced by the cyclone presumably put an additional load of turbid water into the Bay. The combination of these events is likely to have been responsible for the massive loss of seagrass over such a wide area.

Although the initial flood was big, it was far from a record height (21.4 m cf. 25.45 m at Gympie, and 9.5 m cf. 12.27 m at Maryborough). Oral history suggests that no flood in the previous 100 years has had such an impact on the seagrasses, as the dugongs have not, in the past 90 years, disappeared as they now have. There are several possible explanations for the destructiveness of the 1992 flood. These include a relatively greater sediment load due to greater erosion in the rivers' catchments, the influence of the tropical depression, and the impact of pollutants flushed from the catchments.

There is no doubt that the catchments of the Mary River and the Burrum and associated rivers had less forest cover than during previous floods, especially during the last decade of last century, when three record floods occurred. There is also no disputing the considerable erosion associated with the 1992 flood on the Mary River. However, I have no data on the sediment loads during different floods to establish clearly a relationship between land practices and seagrass mortality.

Cyclones have been implicated in the loss of seagrasses in the southwestern Gulf of Carpentaria. However, ex-cyclone "Fran" was a weak system, and maximum 10-minute-average wind speed was only 40 kt. Substantial amounts of seagrass were washed onto Hervey Bay beaches, but the extent to which these seagrasses had been weakened or already died as a result of the preceding flood is unclear.

Local fishermen are convinced that pollution flushed out by the flood was responsible for the die-off of seagrass and intertidal life. Experiments have shown that herbicides at concentrations of 100 ppb can result in substantial seagrass mortality, although most experts feel that the dilution during a large flood would be too great for any impact to occur.

There has been a suggestion that prawn/shrimp trawler activity, which was very high in southwest Hervey Bay at the time of the flood, may have been involved in the seagrass decline. In the absence of data on the effects of trawl gear on seagrasses, especially stressed seagrasses, this suggestion cannot be discounted.

This loss of seagrass from Hervey Bay is very significant, representing approximately 25% of the known seagrass area between the tip of Cape York Peninsula and Hervey Bay, a distance of some 2300 km.

According to local professional fishermen, the loss of seagrass has been reflected in dramatically reduced catches of several important species of fish.

Ten months after the perturbations that killed the seagrass, no germination or recovery could be detected in the areas previously rich in seagrass. Experience in other locations suggests that recovery could take up to a decade. Assuming that seagrass will not be limiting, recovery of the dugong population will take a minimum of 30-60 years (depending on assumptions).

The events of 1992 have important implications for the conservation of dugongs. The fact that the second most important dugong area along the east coast of Australia can be so dramatically altered in such a short time is alarming. Large dugong populations associated with large areas of deep-water seagrasses (like Hervey Bay) may not be as stable as previously assumed. It is important that the recovery of the seagrasses and dugongs in Hervey Bay be monitored. Information on these recoveries will provide important guidelines for the management of seagrass habitats elsewhere. - **Tony Preen**

FLORIDA

Save the Manatee Club and Florida Audubon Reach Agreement. - On March 18, 1993, the legal dispute between Save the Manatee Club (SMC) and the Florida Audubon Society (FAS) was ended by the signing of an agreement making the two organizations fully independent and pledging them to work together for the protection of manatees. The accord, described by the press as "a sort of no-contest divorce agreement", was signed at Wekiwa Springs State Park in central Florida, and is expected to be approved by Florida Governor Lawton Chiles.

The dispute had arisen when SMC sought to separate its affairs from those of FAS, under whose tax exemption SMC had originally been organized (see Sirenews Nos. 17 and 18). In March 1992, FAS seized SMC's assets and removed its Executive Director. SMC sued successfully and obtained a court injunction restoring its autonomy. The new agreement affirms SMC's exclusive rights to its trademarks, logos, and other assets; it will now have its own tax-exempt corporate status.

Members of both organizations will form a new effort called Toward Education and Advocacy for the Manatee (TEAM). SMC will spend $10,000 annually for three years on the program and another $10,000 a year to help FAS lobby the state government for manatee protection. - (Source: Orlando Sentinel)

Save the Manatee Club Offers Reward. - Save the Manatee Club is offering a $1500 reward for any information leading to the arrest and conviction of the person or persons who allegedly roped a manatee and forced the animal to pull a boatload of people around the Homosassa River near Homosassa Springs, Florida, recently. The U.S. government can also offer a reward of up to $2500 for violations committed under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973.

As reported in the Feb. 26, 1993, edition of the St. Petersburg Times, the incident took place at Blue Waters, an area of the Homosassa River just outside of Homosassa Springs State Wildlife Park. A visitor at the park reported to authorities that a pontoon boat was being pulled around the area by a manatee that had been tied to the boat. According to the witness, the manatee was able to get loose, but the boat operator went after it and the boat hit the manatee. Help was solicited from park volunteers and other boaters in the area, but no one was able to get identification numbers from the craft.

Law enforcement officials report that the incident is a federal misdemeanor punishable by a fine of up to $100,000 and/or one year in prison. Under Florida state law, the incident is considered a misdemeanor and is punishable by a fine of up to $1000 and/or one year in prison.

This incident of manatee harassment is one of several that have been reported in Citrus County lately. Recently, it was reported that divers caused a separation of a mother manatee and her calf in the spring waters of Kings Bay in Crystal River, and also that a group of people were climbing on manatees that were mating near Three Sisters Spring. A suit filed in October 1992 against the U.S. Fish & Wildlife Service by a coalition of environmental groups claims that the Service is not properly managing national wildlife refuge lands and is allowing incompatible use

of those lands. The lawsuit names 11 different national refuges, including the Crystal River National Wildlife Refuge because of conflicting recreational activities in a refuge.

Anyone with information pertaining to the Homosassa River violation can call the Citrus County Florida Marine Patrol District Office at (904) 382-5058 or, if they live outside Citrus County, they can call the Florida Marine Patrol Manatee Hotline number at 1-800-DIAL-FMP. Callers should refer to Complaint Number C93-03-0142 and may remain anonymous if they choose.

For a free brochure on manatee dos and don'ts or for information about manatees, call Save the Manatee Club at 1-800-432-JOIN, or write: SMC, 500 N. Maitland Ave., Maitland, FL 32751.

THE GAMBIA

New Manatee Contact in West Africa. - Dr. Michael Jones, currently a biology lecturer at Gambia College, has a long-standing interest in sirenians and joins the vanishingly small contingent of such folks presently in West Africa. He reports that "it appears that the manatee may be more numerous in the River Gambia than the limited amount of literature suggests, although it has obviously declined in numbers." We hope he will have the opportunity to gather more data on this, the least-studied species of living sirenian. His addresses are: 13 Princess Street, Wrexham, Clwyd LL13 7UR, Great Britain; and c/o British High Commission, P.O. Box 507, Banjul, The Gambia; fax 96134.

INDIA

New Dugong Project at Salim Ali Centre. - This center was established nearly a year ago in memory of Dr. Salim Ali to conduct research in areas related to nature conservation. It is an autonomous center of the Ministry of Environment & Forests, Government of India. One of our major initiatives is on ecological and population studies on marine mammals of the Indian coast. We are starting off with a project on the dugong. The Indian population of this species has dropped drastically in the last three decades. It has almost disappeared off the Saurashtra coast, and is very threatened in its stronghold, the Gulf of Mannar. Even in the Andaman and Nicobar Islands the population has been going down over the years. In contrast to the eastern Indian Ocean, no ecological or population studies of the species have been carried out in the western end of the Indian Ocean.

The major objectives of our project are to (1) assess the population's distribution, abundance and status off the Indian coast; (2) assess its major habitat requirements; (3) identify major threats; and (4) assess the distribution and status of potential habitat. We hope to conduct aerial and ground surveys for population and habitat assessment. We would conduct intensive ecological studies at one or two sites (Gulf of Mannar and Andaman and Nicobar Islands) to assess habitat requirements. We plan to use satellite telemetry to track long-distance movement of 1-3 groups, if possible.

We are, therefore, very keen to receive copies of relevant publications and reports, especially those dealing with methodology of studying marine mammals. We are also keen to hear about the feasibility and costs of radiotelemetry. We are presently looking for funds for the project, and would appreciate being informed of potential funding sources. - **Ajith Kumar** (Principal Scientist, Salim Ali Centre for Ornithology and Natural History, Kalampalayam P.O., Coimbatore-641010, India; fax/phone 0422-32273)

THAILAND

Dugongs in Thailand. - Dugongs are known as an endangered species in Thailand. Five years ago, no one but fishermen knew where they lived in the surrounding areas. Dugongs were accidentally caught in fishermen's nets and drowned. Unfortunately, illegal techniques of fishing such as push-netting and dynamite have been destroying the seagrass beds which are the dugong's main source of food.

Between 1980 and 1992, the Royal Thai Fisheries Department nursed four dugongs, all of which were accidentally caught by local fishermen. The first dugong, a 1.2-m calf, was nursed in a 5 x 4 m concrete tank for one year and died. The second dugong was caught by gillnet in Trung Province and died after being reared for only

four months. The third calf was caught in Phuket Province; it too died after being reared for six months. The last dugong was caught in Satun Province. It was reared for a few months before being released into the seagrass bed at Libong Island.

During the rearing period, the dugongs' behavior and health had been monitored by researchers at the Phuket Marine Biological Centre. Some dugongs tended to be weak, lose their balance and drown. Others were killed by infection from bacteria and parasites.

The Royal Thai Forestry Department observed dugongs in the Andaman Sea in 1991. An aerial survey was conducted using a helicopter in Had Chao Mai National Park and Libong Non-Hunting Area. This area is reported by marine biologists to be the richest seagrass bed in Thailand, and dugongs were frequently seen there by local fishermen. After three aerial surveys, several dugongs were located in this area (see Sirenews No. 17, and the report below).

Since this survey, the plight of dugongs in Thailand has been presented in newspapers, magazines and television to increase public awareness to protect dugongs.

Non-government organizations such as Wild Life Thailand and the Yard Phon organization have become interested in dugongs. These organizations try to encourage the local fishermen to protect seagrass beds and dugongs. Fishing styles are difficult to change. However, after an intensive campaign in the villages, illegal fishing has been reduced. A group of leaders from the village accompanied the scientists on the last aerial survey. This led to a change in the attitude of the fishermen towards dugongs.

Today people at Libong Island try to protect their seagrass beds and dugongs. However, there is still illegal fishing in seagrass beds in other areas such as in the Gulf of Thailand (Rayong, Chanthaburi and Trat provinces).

Sudara and Nateekanjanalarp (1992) reported that there were few dugongs seen or accidentally caught by fishermen. Sudara et al. (1991) reported several species of seagrass such as Enhalus acoroides, Halodule pinifolia, and Halophila ovalis in the Gulf of Thailand. However, there were no scientific data on distribution of dugongs in this area.

The campaign was not only successful in stimulating public awareness of seagrass beds and dugongs, but also initiated cooperation between several organizations (both government and non-government). However, this issue seems to be regarded as less important in Thailand than others like mangroves and coral reefs because there is not enough information, especially scientific data, to support the campaign. More research is needed. - **Piyaporn Manthachitra**

Update on Dugong Aerial Surveys in Thailand. - From 29 March to 3 April 1992, the third aerial survey of the Dugongs and Seagrasses Distribution Study Project in Haad Chao Mai National Park was carried out over the middle southwest area of Thailand's Andaman Sea coast by a National Parks Division group from the Royal Thai Forestry Department, consisting of Suwan Pitaksintom, Wijarn Witayasak, Rattana Rukanawarakul, Vissanu Rukvisaka, and Sean O'Sullivan. Sixty-one dugongs (including 8 pairs of cows and calves) were observed on a seagrass bed off the shores of the national park and Talibong Island. This is the highest number counted since surveys were begun in December 1991 (see Sirenews No. 17).

These sightings were the biggest nature-conservation news in Thailand at the time, and were very helpful in motivating conservation campaigns. Not long ago, most Thais knew dugongs (known locally as Payoon) only as mythical animals or mermaids (Ngiork), which are mentioned in the well-known mythological poem Pra Apai Manee. Now the popular understanding of dugongs has been much changed due to these new discoveries, though very few people can see dugongs swimming freely in their natural settings.

In December 1992, the Royal Forestry Department, a group of Thai conservationists from 11 private companies called the Think Earth Group, and several nongovernmental organizations organized the Conserve Dugong Week in Trang Province. This movement persuades people to view dugongs as an extremely endangered species which normally should be strictly preserved and not even be touched.

Several questions remain concerning dugong conservation and management. For example, very few data have been collected

regarding the herd we observed, what seagrass species they eat, the exact number of dugongs in the area, the extent of their daily or seasonal migrations, and so on. Sometimes dugongs have been accidentally caught in fishing nets, making them rarer in the area.

In order to gain more information about dugongs and their occurrence in the area, the National Parks Division has recently tried to radiotag them and thereby collect data on individuals. However, the Thai Fisheries Department has unfortunately objected to the attempt and declared that radiotagging of dugongs would be useless.

I would much appreciate it if anyone with experience in dugong biotelemetry techniques and observations on dugongs in small groups would send me his or her comments. I am a scientist in the National Parks Division and currently the acting leader of the Dugong Survey Project in Thailand, succeeding Mr. Sean O'Sullivan who has returned to the United States. - **Suwan Pitaksintorn** (National Parks Division, Royal Forestry Department, Paholyothin Road, Chatuchak, Bangkok 10900, Thailand; fax 579-2791)

VENEZUELA

Project Mermaid. - During the three months of summer 1992, five biology students from the University of Newcastle Upon Tyne conducted a feasibility study for the setting up of a manatee research station in northeastern Venezuela. The study area was located in the State of Sucre, in a mangrove-lined river, Cano La Brea, a tributary of the Rio San Juan, north of the Orinoco delta.

Project Mermaid was invited to conduct the research by Sr. Claus Muller, the founder of the Vuella Larga Foundation, a non-governmental organization that assists conservation projects throughout the region. Sr. Muller has been involved in manatee research in the past, and is the local expert on the species.

The expedition team lived on a floating platform on the river and completed three weeks of surveying from a dugout canoe. The manatee research involved observing and recording evidence of manatee activity and actual sightings along the length of Cano La Brea. Firm evidence of the presence of manatees was obtained. A survey of other vertebrate species in the area was also carried out. A full report is being prepared, and funds are being sought for continuation of the project. - **Lucy Ward** (c/o Dr. P. J. Garson, AES, Ridley Bldg., Univ. of Newcastle Upon Tyne, NE2 1JX, England; fax 091-2611182)

* * * * *

ABSTRACT

Age Determination and Population Biology of the Florida Manatee, Trichechus manatus latirostris (**Miriam Marmontel**). - Florida manatees (Trichechus manatus latirostris) are at risk due to modern stresses on the population, primarily from boat traffic and habitat alteration. These stresses have population consequences which have been little understood. Life history and population studies have been hampered by the lack of a method of age estimation. Skeletal material of 16 known-age, minimum known-age, or tetracycline-marked Florida manatees (Trichechus manatus latirostris) was prepared using modifications of histological techniques employed in age-determination studies of dolphins. Results consistent with known age, minimum known age or tetracycline-labeling were obtained only from the dome region of the periotic bone. Age-specific aspects of mortality and reproduction were evaluated for 1,212 manatee specimens collected between 1976 and 1991. Approximately 59 layers were found in the periotic dome of one manatee of unknown age, and several had growth-layer-group counts ranging from 21-39. Sexual maturation can occur between 3 and 4 years of age, with first calving as early as age class 4. At any one time 33% of the mature females were pregnant, indicating an average calving period of 3.0 years. Fecundity remained relatively unchanged (0.24 female offspring/adult female/year) from age of first parturition throughout life. Half the carcasses belonged to age classes 0, 1 and 2, and average age was low (5.7 years). Survival rate was low among the very young, increased up to age class 4, and remained constant (89.9% $\pm$ 0.013) from age class 4 to at least 25. The manatee survivorship curve is consistent with the type expected in a long-lived mammal, but lacks a plateau through middle age. The steeper gradient is attributed

to exacerbated levels of adult mortality represented by the constant threat of collision with watercraft. Death from intense cold affected mostly juveniles, but the effect of boat strikes was constant across age classes. Life table analyses revealed a finite rate of increase r = 0.5%, indicating virtually zero population growth. Computer simulation (VORTEX51) projected a 97.3% chance of persistence of the population for 1,000 years. The current situation allows no margin of error. If increasing numbers of boats result in more deaths, the manatee population will tend toward extinction. Only cultural change will prevent this outcome. [Abstract of a doctoral thesis in Wildlife and Range Sciences submitted to the University of Florida in April 1993 and supervised by Stephen R. Humphrey and Thomas J. O'Shea.]

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