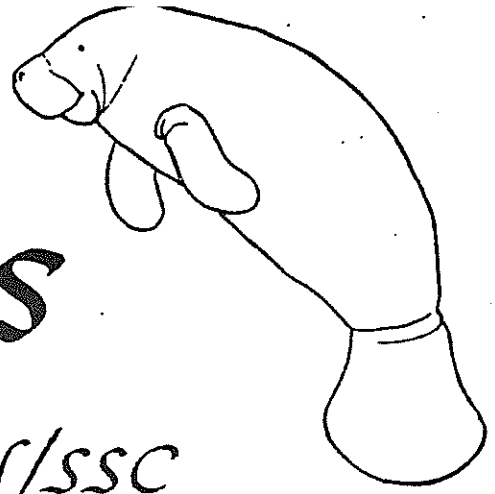

# Sirenews

## Newsletter of the IUCN/SSC Sirenia Specialist Group

NUMBER 33

APRIL 2000

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### Death Reported

**Cicely Kate Ricardo Bertram**

6 July 1999, in Graffham, Sussex, England

Dr. Kate Bertram, wife and collaborator of Dr. Colin Bertram, died on 6 July 1999 after suffering for several years from Alzheimer's disease. Her life was celebrated with memorial services at Graffham and at Cambridge, where she had formerly served as President of Lucy Cavendish College. She is survived by Colin, her husband of almost sixty years, and by numerous children and grandchildren.

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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The Bertrams' long career of joint biological research is detailed in Colin's privately-published 1987 autobiography *Antarctica, Cambridge, conservation and population: a biologist's story*. Kate, daughter of an engineer and granddaughter of a noted architect, was a specialist in Central African fishes and other aspects of tropical aquatic biology. But among their many other achievements, the Bertrams are best known to the readers of *Sirenews* for having done more than any other individuals to usher in the modern era of sirenian biology.

They carried out joint fieldwork on manatees and dugongs in the Guianas, Belize, Australia, Papua New Guinea, and Sri Lanka, and between 1962 and 1977 they published nearly two dozen scientific and semipopular articles and books on the biology, distribution, status, economic uses, and conservation of sirenians. These papers, appearing in *Nature* and other widely-disseminated publications on wildlife and conservation, were frequently cited (being, indeed, almost the only sources of up-to-date information on sirenians and their status) and attracted the attention of many researchers to these neglected species. Much of this information on status and distribution was necessarily collected at long range and second hand, through a worldwide network of correspondents -- a time-consuming chore in pre-Internet days. Their work was a major stimulus for the creation of the IUCN/SSC Sirenia Specialist Group (of which Colin was the first Chair). In the 1970s they also devoted much effort to establishing a manatee research center in Guyana, but ultimately without success. Elsewhere, however, the continued flourishing of sirenology and the improved chances for survival of the animals themselves stand as monuments to Kate and Colin's patient prodding. - **DPD**

## THE EMILY B. SHANE AWARD

The Emily B. Shane Award supports conservation-oriented, non-harmful research on free-ranging odontocetes and sirenians. The award honors Emily B. Shane (1924-1995), a fine amateur naturalist and dedicated conservationist. The award, given annually, will total approximately $10,000. Typically, the award has been divided between two or three winners. Although awards will be made for no more than one year at a time, applicants may apply more than once for the same project. Applications are due by **Monday, 12 June 2000** and should be sent to:

*Shane Award*
*Marine Mammal Research Program*
*Texas A & M University*
*4700 Ave. U, Bldg. 303*
*Galveston, TX 77551 USA*
*409-740-4718 (for delivery via express mail, Federal Express, etc.).*

E-mail applications will be accepted at: <**wursigb@tamug.tamu.edu**>. Applicants outside the U.S. must take responsibility for insuring the timely delivery of their applications. The award recipient(s) will be announced by 1 September 2000.

**Eligibility**: The award is available to students and other researchers who meet the evaluation criteria. The application should be submitted by the person conducting the

research. A student's professor should send a cover letter of support, if his/her involvement in the project is essential to the completion of the project.

**Evaluation Criteria**: Applicants should send four copies of the proposal (one e-mail copy is sufficient) to the address above. The following materials should be included:

- A proposal, not exceeding three pages (use Times font, 12-point type, single spacing, 2 cm margins) in length, outlining the proposed research, its objectives, methods, the role of the proposed work in conservation, the time period for research, the persons conducting field research and their roles, and literature cited.

In addition to the 3-page proposal, applicants must include:

- A budget, including other funding applied for or already held for the proposed research (applicants demonstrating the greatest financial need will be given special attention, and requests for funds covering direct research expenses will be given greater consideration);
- A current C.V./resumé of the applicant (include a demonstration of the applicant's ability to convey scientific information to both general and professional audiences via writing and speaking; an applicant's age and level of schooling will be taken into consideration);
- Three references with phone number, e-mail address and relationship to the applicant.

**General**: Applicants must have applied for any necessary permits or authorizations for conducting the proposed research. Permits and authorization must be obtained before the award funds are disbursed.

Non-harmful research is that which poses a proven minimal risk to the health and life of an individual animal and to other species within the ecosystem. Research which involves handling animals or invasive techniques is acceptable only if carried out by competent, experienced personnel and provides clear benefits in terms of conservation and scientific knowledge.

A report summarizing the research completed with support from the Emily B. Shane Award must be submitted at the end of the year of funding. This report should include relevant conservation recommendations, plans for publication of the results, and ongoing research plans. Ten percent (10%) of the total amount of the award will be withheld until the final report is received at the above address.

## The Culture Corner

. . . Being an Occasional Sampling of the Inexorable Penetration of Popular Culture by Sirenia

By now, many readers of this newsletter (at least those of us with small children) have become aware of Pokémons™, the latest wave of Japanese exports in the cartoon and toy industry. This merchandizing mega-craze centers around imaginary creatures called Pokémons (short for "pocket monsters"), which are caught and trained for combat, cockfight-fashion, by the human characters in a cartoon series. These fanciful beasts come in over 150 species, variously adapted to land, sea, and air. Some forms are capable of "evolving" (i.e., metamorphosing) into others under the proper conditions. Their diversity and varied attributes offer endless possibilities for matches among the cartoon

combatants, as well as for games, trading cards, toys, and other collectible items in the all-too-real world of kid-oriented commerce.

Since many Pokémons are based (very loosely and imaginatively) on real organisms, it is appropriate that at least one of them should represent a sirenian - not a manatee this time but (fittingly, in view of the West Pacific origin of this adaptive radiation) a dugong. Pokémon variety no. 87 in the official handbook (of course there is one) is a creature called Dewgong, which is said to be a fast swimmer and tolerant of very cold water. It sports a single short horn on its head, apparently for breaking through sea ice. (I did say that the resemblance to real animals is typically loose.) It also happens to be the more "evolved" form of another Pokémon called Seel - no doubt in recognition of the fact that sirenians are a notch above pinnipeds on the grand scale of aquatic adaptation. - **DPD**

## LOCAL NEWS

AUSTRALIA

***Update on Captive Dugong in Australia.*** - Readers of *Sirenews* will be aware that Sea World (Australia) has been attempting to rear a stranded male dugong which came into our care as a neonate (1.09m, 19.7kg) in November 1998. Although two other young dugongs have been reared - at Toba Aquarium in Japan (1.47m, 47kg) and at Underwater World in Singapore (1.48m, ~65kg), respectively - all previous attempts to raise neonatal dugongs in captivity have been unsuccessful.

The dugong is now about 16 months old, and is 1.89m long and weighs 131.5kg. We have been gradually weaning him from 11 bottle feeds per day down to six, since he turned 12 months old. At the same time, we greatly increased the amount of vegetables offered after each bottle, from token amounts (a few hundred grams) up to 1.5-2kg per feed. Initially he continued to gain 2-4kg per fortnight, but then at 6 bottles/day at 3-hour intervals he hit 117kg and ground to a halt for three consecutive weighings (two fortnights). We assumed that we had decreased his total calories by not matching vegetables offered against milk withheld, and with increased effort on our part he started gaining again. He has now gone down to four bottles at 4-hr intervals, and his greens have been upped to 3.5kg offered per feed.

We have not yet seriously addressed the question of converting him from vegetables to seagrass. We discovered that it took about an hour of threading to put 100g of *Zostera capricorni* (the most robust locally-available species) into one of his feed plates. In half this time we could have loaded up (and he could have eaten) more than 1.5kg of lettuce, etc. An attempt last August to get him to eat some faeces passed by wild dugongs was quite successful, but he was much less enthusiastic during a recent attempt to repeat the exercise.

We now have the challenge of another dugong - a 2m, 167kg female with a severe shark bite on her tailstock - which had beached herself in shallow water at Bundaberg three days ago. In addition to the gaping muscle defect on the right side of her tail (which is at least a few days old) she bears the marks of

two other less successful bites, one adjacent to the wound and one over her left shoulder. Serum biochemical values reflect the severe tissue trauma caused by these injuries. This is our first experience with a non-naive dugong, and we were very relieved when she was prepared to eat seagrass from one of the PVC-pipe-and-vinyl-tubing contraptions which serve as our original animal's feed plates. At this stage, however, she has only consumed about half of what we think should be her average daily intake. - **Wendy Blanshard** (Veterinarian, Sea World, Gold Coast, Australia; **<Curator@seaworld.com.au>**)

***Turtle and Dugong Hunting Management Plan***. - As dugong hunting by Indigenous Australians is a Native Title Right, most informed stakeholders acknowledge that hunting must be managed by establishing formal partnerships between Indigenous communities and the relevant government managing agencies. *The Great Barrier Reef Marine Park Act* requires Indigenous communities or individuals to have a permit to hunt in the Great Barrier Reef Marine Park. At present permits are not issued for hunting on the urban coast of the Park , but are available to communities in remote regions on Cape York Peninsula.

In a historic first, Hope Vale, one of the major green turtle and dugong hunting communities in Cape York, recently developed "A Guugu Yimmithirr Bama Wii" - a plan to manage turtle and dugong hunting. The Plan is the culmination of years of effort by elders, individuals, groups and agencies inside and outside of Hope Vale. The development and publication of the Plan was funded by the Hope Vale Aboriginal Council and the Great Barrier Reef Marine Park Authority, with support from the Pew Foundation, James Cook University, the Cape York Land Council, and the Queensland Parks and Wildlife Service.

The communities' vision is: "To develop and implement controlled and sustainable hunting practices that will minimize the impact on and contribute to the protection and survival of dugong (Girrbithi) and turtle (Ngawiya) for the enjoyment and use of future generations." The Plan builds on the GBRMPA requirement for hunting permits by empowering the community Natural and Cultural Resource Management Office to issue individual hunting authorities under the community permit. The following controls have been introduced: a defined Hunting Area, a Hunting Season (Christmas season), and an annual quota (20 dugongs for the entire community). Hunters must return catch information. It is forbidden to hunt obviously pregnant female dugongs or cows and their accompanying calves. The community quota includes a "special hunt" conducted through the Natural and Cultural Resource Management Office to provide one dugong and two turtles to the Old Folks' home and others in the community who do not have the opportunity to hunt. Within the annual quota, licensed hunting is allowed outside the hunting season for funerals of community members but not for birthdays or weddings.

The Plan includes penalties for breaching the conditions on a hunting license or for illegal hunting. These penalties are to be decided by the local Turtle and Dugong Hunting Management Council. Penalties can range from a warning to severe penalties including community justice measures

and prosecution by the managing agencies under relevant legislation No bartering of meat will be permitted and meat is not allowed to be transported outside the community.

This Plan is a model for other communities interested in community-based management of turtle and dugong hunting in northern Australia. - **Mervyn Gibson** (Natural and Cultural Resource Management Office, Hope Vale Community) and **Helene Marsh** (James Cook University; **<helene.marsh @jcu.edu.au>**)

***Dugong Action Plan***. - With funding from IUCN, we are finally hoping to complete the Dugong Action Plan. A separate Manatee Action Plan will be produced by Miriam Marmontel with the assistance of the Sirenia Specialist Group. Please provide updates on the status of the dugong in your region to Carol Eros (**<C.Eros @telus.net>**). Your contribution will be formally acknowledged. - **Helene Marsh** (James Cook University; **<helene.marsh@jcu.edu.au>**)

***Dugong Genetic Study***. - I have recently commenced a Ph.D. at James Cook University with the aim of using micro-satellite markers to extend Dani Tikel's work on dugong stock identity. Thanks to many people (especially Dani) I have specimens from over 200 dugongs from most parts of northern Australia and from several other countries in the dugong's range. However, I am anxious to extend this sample and will send preservative to anyone who anticipates being able to supply specimens (a fingernail-sized piece of gray skin is preferred). We will also have to arrange CITES permits if you are overseas. The skin can be collected from live or freshly dead dugongs. I am very keen to collaborate with other dugong researchers and will return DNA from each specimen supplied so that it can also be used in more locally focussed studies, such as studies of dugong mating systems. - **Brenda McDonald** (School of Tropical Biology, James Cook Univ., Townsville, Australia 4811; **<brenda.mcdonald@jcu.edu.au>**)

***Dugong Necropsy Program***. - There were 72 records of stranded or dead dugongs for all of Queensland in the 1999 calendar year, approximately double the numbers reported in each of the previous three years. The greatest concentration of strandings occurred in the Hervey Bay-Sandy Straits DPA and adjacent areas. It is hypothesized that these deaths were largely a consequence of the chain of ecological events triggered by the record-level Mary River flooding event of February 1999 that caused a large local die-off of seagrass. There were 37 dugong mortality and stranding reports from within Dugong Protection Areas (DPAs) and one from within the Moreton Bay Marine Park. Fifty percent of recorded mortality occurred within the DPAs. Disease was implicated in the death of four of these. For most carcasses within the DPAs, the cause of death could not be determined - mostly because of the decomposition status of the carcasses. Two dugongs drowned in Department of Primary Industries Queensland Shark Control Program nets: one at Magnetic Island, one at the Sunshine Coast. At least nine dugong were killed within the Indigenous Yarrabah Community fishery and three dugong were reported as taken during non-permitted hunting activities within the Great Barrier Reef Marine Park Area. - **Colin Limpus**

(Conservation Strategy Branch, Queensland Dept. of Environment & Heritage; **col.limpus@env.qld.gov.au**)

BAHAMAS

***Florida Manatee Now Resident In The Bahamas***. - In January 2000, both the Bahamas National Trust and the Save the Manatee Club received reports of a manatee at Bullocks Harbor, Great Harbour Cay, Bahamas. Under permit with the Bahamas' Department of Fisheries, I visited Great Harbour Cay from 25 to 27 February 2000 to make a field assessment of the manatee, interview local residents, and provide management recommendations. Detailed below are findings from this trip and a review of this individual's interesting history.

Local residents first observed the manatee in the Great Harbour Cay marina on 31 December 1999; they considered this as a good omen for the coming millennium. Sightings of this rather tame, small adult female continued almost daily as she returned to drink fresh water from hoses in the marina. I photographed and videotaped the individual's distinctive scar patterns; she was given the photo-ID number BH-01 (and the nickname Gina) for inclusion in the USGS/Sirenia Project's Manatee Individual Photoidentification System. She appeared to be in good body weight and was behaving normally.

Gina's resighting history:

Using photographs of her distinctive scar patterns, we were able to determine that the manatee is the same as the one routinely seen at the Atlantic Undersea Testing and Evaluation Center (AUTEC) in Andros for a majority of 1999. Here she was reported to frequent the pier and boat ramp area, drink fresh water from hoses when they were provided, and to approach divers. The last recorded sighting in Andros was at AUTEC on 17 December 1999.

Amazingly, photo-identification analysis using the Manatee Individual Photo-identification System reveals that this manatee over-wintered in the Homosassa River, near Crystal River on the west coast of Florida, in 1993 and 1994! She was a calf when photographed with her mother in the winter of 1993. She was photographed again as an independent juvenile in the winter of 1994. The photo match was confirmed by scar patterns, mutilations in the tail, and even wrinkle patterns on the face.

Proposed travel routes:

We are very excited about this discovery. While we have documented the animal's recent movements through photo-identification records, radio-tracking data from other manatees and analyses of ocean currents and bathymetry allow us to propose a mechanism for how this individual arrived in the Bahamas and eventually at Great Harbour Cay. These are relevant findings for explaining certain aspects of manatee distribution.

In April of 1998, a manatee that had been raised in captivity since it was rescued as a newborn was radio-tagged and released at Crystal River, FL. This naïve individual, named Mo, soon wandered offshore and for three weeks no satellite-relayed locations were received. Finally, in late May, Mo's transmitter indicated that he was about 120 miles off the southwest coast of Florida, in deep water and well outside normal manatee habitat. Mo was rescued

on 3 June, 20 miles off the Dry Tortugas and approximately 480 km (300 miles) south of his release site, after drifting in offshore currents for 4 weeks.

Mo's saga provides a scenario for how Gina arrived in the Bahamas. Manatees have been known to survive long periods without food or fresh water. It is likely that had Mo not been rescued, currents could have then taken him south of the Florida Keys and into the Gulf Stream. The opportunities for landfall are then to the west in Florida or east on the Great Bahama Bank. Gina could have had a similar offshore misadventure and come ashore in the Bahamas. Given the deep waters and strong currents separating Florida and the Bahamas, it is extremely unlikely that manatees purposely or repeatedly travel between them.

Another clue fits into the Gina story. For several weeks in February 1998, a subadult-sized manatee was seen at Bimini. This animal was seen daily at the marina docks taking fresh water from hoses. These sightings are interesting because Bimini, Andros, and Great Harbour Cay are all located on the Great Bahama Bank with no deep-water passages between them. It is possible that the Bimini sighting was of Gina and that she then traveled to Andros.

Manatee distribution throughout the species' range is marked by close proximity to fresh water. Limited sources of fresh water are believed to have been the main factor restricting their numbers in the Bahamas. Bullocks Harbor and the near-shore waters of Great Harbour Cay provide appropriate habitats for manatee use. Given her human-tolerant behavior and a reliable source of fresh water provided by people in the marina, it is possible that Gina will thrive at this location. Provided that she remains oriented to shallow waters, future movements will likely be limited to other sites on the Great Bahama Bank, especially those where fresh water is available.

Acknowledgment - This research was covered under permit from the Department of Fisheries; thanks to Mr. Braynen, Director of Fisheries, and Mr. Vallierre Deleveaux. David O'Donald with Sapphire Aviation graciously provided transportation. Leslie Kauseman and the Save the Manatee Club assisted with coordination. Thanks to the folks of Great Harbour Cay for the care and consideration they have shown their new resident manatee, Gina. - **Jim Reid** (Biologist, USGS Sirenia Project)

BENIN

***New Manatee Project.*** - I have recently (November 1999, January 2000) initiated a research and conservation project for the manatee in Benin, West Africa, which is aimed at establishing the manatee's current distribution and numbers as well as gathering data on its ecology and behavior. A campaign for more efficient protection of the manatee by local populations will also be a part of the project.

In order to help my team and myself to gain a better knowledge of manatee biology and of research methods, I would greatly appreciate copies of publications on sirenians. - **Jean-Paul Risch** (P. O. Box 05-762, Cotonou, Republic of Benin, W. Africa; **<jeanpaulrisch@netscape.net>**)

BRAZIL

***Amazonian Manatee Rehabilitation and Release.*** - On 26 January

2000, the Sociedade Civil Mamirauá successfully transported three captive Amazonian manatees from an urban setting into a floating pen in the Mamirauá Sustainable Development Reserve (MSDR), in the western Brazilian Amazon. Hunting still goes on throughout the region, and the destiny of some of the calves, after serving as bait for mothers to be more easily harpooned, is to be raised in captivity in someone's private property pond (at best) or to be sold as meat to river traders.

One of the manatees under Mamirauá's care was captured under these circumstances, and confiscated by IBAMA (Brazilian's equivalent of the Department of Environmental Protection) from the buyer's house in town. Another one, emaciated and being tethered by its tail to the margin of a lake, was confiscated in the field. The third was eventually donated to the Mamirauá Project by hunters, who could not care for it.

Boinha (female, 6 years old), Mixirinha (male, 4.5) and Quinquim (male, 4) were bottle-raised from an early age and recently weaned and maintained only on aquatic plants from water bodies nearby. Prior to transport they were seen by a vet, at which time feces and blood samples were collected. The animals were marked in three ways: liquid nitrogen, antibiotics and cookied. They were each fitted in a specially-built wooden bed and placed in three speedboats powered by 40 HP motors, with help from the local army. The trip to final destination took about 2 hours, during which they were constantly kept wet.

The floating pen was built with submersion-resistant timber (piranheira) and measures roughly 6.5 x 9 x 2 m, quite an improvement from the modified human swimming pool they lived in for the past years and shared with two giant river otters. The manatees adapted well and started eating normally after a couple of days.

On Carnival Sunday, for the first time, an orphan, captive-raised Amazonian manatee was released back into its natural environment. The lucky male, Mixirinha, was a healthy 2.0 m and 200 kg at the time. To help minimize the possibility of its being hunted, Marmontel and team will spend most of the next 12 months close to Mixirinha. At the same time they will monitor its movements and behavior by means of a VHF-radio transmitter adapted to a belt by the Sirenia Lab (Gainesville). Communities and hunters will be advised of the presence of a manatee in the area.

Mixirinha was released in a total-protection zone of MSDR, where there is a local population of manatees. He will have a few months to get acquainted with the natives and follow them in their yearly migration in July (normally to next-door Amanã Sustainable Development Reserve). If successful, the experiment may be used to avoid having orphan calves spend the rest of their lives confined in tanks and pools without mating.

The Mamirauá Reserve, located 700 km west of Manaus, and 40 km from the Amazonian town of Tefé, is a 1,124,000 ha flooded-forest protected area where the local human population was maintained and involved in the decision-making process. Along with Amanã Sustainable Development Reserve and adjacent Jaú National Park (closer to Manaus), it comprises the largest block of protected tropical forest in the world, with over 6 million hectares, and represents the embryo of

the Central Amazon Ecological Corridor. For more information on MSDR, please visit **<http://www.pop-tefe.rnp.br/mamiraua.htm>. - Miriam Marmontel**

FLORIDA

***Legislators Seek to Give Away Public Wetlands; Floridians Feeling the Population Pinch.*** - Two bills making rapid progress through Florida's legislature would convey some 500,000 acres of public lands into the hands of private owners by redefining the boundary of the State's ownership of wetlands.

Cloaked under the title "Florida Land Title Protection Act", House Bill 1807 and Senate Bill 1824 would change Florida law dating back 141 years, which says that the boundary between waterfront uplands and publicly-owned navigable waters is the "ordinary high water boundary" or the normal reach of water during the high-water season. The new bills would move this boundary well downward, exposing to development an estimated half-million annually-submerged acres in rivers, estuaries, lakes, and tidal flats that have always been open to the public for boating and fishing. This would greatly hamper the State's ability to regulate individual and cumulative development impacts that degrade manatee habitat.

Numerous conservation and environmental groups are opposing this legislation, together with four of seven members of the Governor's Cabinet, sitting as trustees for Florida's public lands. However, the terms of 63 of 160 members of the legislature are expiring, and term-limit laws prevent them from running for re-election; so a considerable number of pro-development bills are being sponsored by lame-duck members who have minimal accountability to the voters.

A related concern is the revelation (by the *Tampa Tribune*, April 2, 1999) that "growth management" plans *already approved* for Florida's 470 cities and counties by the state's Department of Community Affairs would eventually accommodate a total of **101 million people** in a state that is presently home to 15 million. Florida's population has doubled in the last 25 years and is now growing faster than the population of the Earth as a whole (2% per year vs. 1.3%).

Negative Population Growth (NPG) and Floridians for a Sustainable Population (FSP) jointly issued a statement decrying the absurdity of the 101 million-person build-out. NPG subsequently commissioned a telephone poll of 500 likely Florida voters, taken Sept. 23-27, 1999, with a ±4.4% margin of error. Among other results:

- 76% agreed and 17% disagreed that "Continued population growth is a threat to Florida's resource base, environmental health, and quality of life."
- 68% agreed and 22% disagreed that "Florida would be better off in the long term with a smaller population to maintain a sound economy and a healthy environment."
- 52% would be more likely and 15% less likely to vote for a candidate for statewide office who supported immigration reduction.
- However, only 28% supported and 61% opposed a state or local income tax to deter population growth.

Another poll, conducted several weeks later by the *Miami Herald* and *St. Petersburg Times*, confirmed widespread

public dissatisfaction (extending across all three major ethnic groups) with the current high levels of immigration into the state. Both polls received wide coverage by Florida news media. A guest editorial by Wade Matthews in the *Sarasota Herald-Tribune* (Oct. 17, 1999) asked, "Can we support such population (in Florida)? Possibly, that is if we don't mind drastically reducing our consumption of natural resources, drinking our own wastewater, outlawing green lawns, accepting extinction of wild manatees and many other endangered wildlife, either paving over the state with massive traffic jams or accepting strict limits on who can have a private car and whether they can drive, crowding our schools and jails, cutting down forests already reduced worldwide by half and filling up our few remaining wild places where a person can just be alone for a while without the constant noise and jostling of other people." - (Sources: FPS, NPG)

***State Conservation Agency Reorganized.*** - An agency reorganization in the Florida state government in 1999 has moved the manatee program from the Department of Environmental Protection (DEP) to the newly created Florida Fish and Wildlife Conservation Commission (FWCC). This new commission unites the former Marine Fisheries Commissioners and Game and Freshwater Fish Commissioners. The Bureau of Protected Species Management (David W. Arnold, Chief), which includes the manatee program, will now be part of the FWCC's Office of Environmental Services, headed by Bradley J. Hartman; it continues to exercise responsibility for manatee-related management activities (speed zone rules, manatee protection plans, permit review, habitat protection, education, and public awareness), which will still be based in Tallahassee. The FWCC also now includes the Florida Marine Patrol. DEP retains some responsibility for law enforcement, however, in the form of the park police and an environmental crimes unit.

The state's manatee research activities (telemetry, population assessment, aerial surveys, photo-identification, Geographic Information System, carcass salvage, pathology, and rescues) continue to be based at the Florida Marine Research Institute in St. Petersburg, under the leadership of Buddy Powell. This Institute, directed by Ken Haddad, is now directly under the Executive Director of FWCC (Dr. Allan L. Egbert).

The practical consequences of this reorganization have yet to be clarified. Changes from the past system include the division of law enforcement responsibilities between two different agencies, partly separating them from manatee research and management; and the fact that the manatee program is now under a panel of commissioners, rather than the single Secretary of DEP. The details of how this new arrangement will work, and its impact on program coordination, are still being worked out.

The Manatee Technical Advisory Council has been continued in existence at least through the year 2000, but its future is also in question. One of the Council's major concerns has historically been the protection of the Save the Manatee Trust Fund from attempts to spend its monies on activities that do not contribute significantly to recovery of the species. This Trust Fund contains money from sales of a manatee specialty automobile license plate,

proceeds from state and county boat registration fees, voluntary contributions, and interest income, and it supports the manatee-related activities of the state government. The Trust Fund's integrity will continue to be a critical concern as the FWCC takes form.

The new agency's mailing address is: Florida Fish and Wildlife Conservation Commission, Bureau of Protected Species Management, 620 South Meridian St., Tallahassee, Florida 32399-1600; phone 1-850-922-4330; fax 1-850-922-4338. Its website is at **<http://www.state.fl.us/fwc/psm/>**.

GUINEA-BISSAU

***Manatees For Sale***. - River ZooFarm, the Schuhmann family's wildlife-exporting business in Bissau, West Africa, is advertising on the Internet **(Wildlifefound@hotmail.com, Riverzoofarm@hotmail.com)** the availability (exclusively to "bona fide public show-aquariums") of *Trichechus senegalensis*, "of which there are still large populations in Guinea Bissau.... For the year 2000 the Government of Guinea-Bissau will authorize the capturing and export of only six (6) Manatees." Prices ("live delivery guaranteed") are said to be available on request.

This was the source from which the Toba Aquarium in Japan acquired its pair of African manatees (see *Sirenews* No. 27, April 1997, and below). *T. senegalensis* is the only manatee species currently listed on CITES Appendix II, although less is known about its true status in the wild than about that of any other sirenian. Continued commerce in this species is likely to give cause for controversy in the future.

JAPAN

***Update on Sirenians at Toba Aquarium.*** - The first attempt to maintain a dugong in captivity was at the Steinhart Aquarium in San Francisco, USA, where a male dugong from Palau (182 cm, 82 kg) survived for only seven weeks in 1955. Subsequently, at least 33 dugongs were kept at 15 aquariums and institutes in 9 Australasian countries. The Toba Aquarium in Japan has kept dugongs as well as West African manatees; as of January 2000 it held the following animals:

*Dugong dugon* (Philippines): female ("Serena"), 268 cm, 345 kg, age 13, captured April 1987; male ("Jun-Ichi"), 252 cm, 308 kg, age 21, captured Sept. 1979.

*Trichechus senegalensis* (Guinea-Bissau): female ("Haruka"), 300 cm, <500 kg, age <20; male ("Kanata"), 300 cm, <500 kg, age <20; both captured June 1996.

The dugongs are kept in separate pools of seawater at 27-28°C, sharing these with tropical reef fishes and green sea turtles. The pools measure 9.1 x 6.1 x 3.4 m (female) and 10.0 x 6.7 x 3.4 m (male), and respectively hold 188.7 and 300.6 cubic meters of water. Also available for the dugongs is a holding tank (5.0 x 4.0 x 1.4 m, 28.0 cubic m).

The manatees are kept together with tropical river fishes and turtles in a freshwater tank measuring 12.0 x 6.7 x 3.8 m and holding 300.0 cubic m at 29-30°C. An additional 6.0 x 3.0 m holding tank (84 cubic m) is also available.

All these pools have high-quality filtration, circulation, and thermo-control systems. Especially to prevent the spread of coliform bacteria in the pool water, we have two types of sterilizers. One is called "Selfresher" (chlorination system

by electrolysis from NaCl), which is part of the circulation system for the dugong pools; the other is the ozonizer for the manatee pools.

The dugongs are fed *Zostera marina* twice a day (25-30 kg or 8-9% of body weight per animal per day). The manatees are fed Italian ryegrass (*Lolium multiflorum*; cultivated for racehorses), leaf lettuce (*Lactuca sativa*), saltgreen (*Brassica chinensis*), and seagrass (*Zostera marina*) three times a day (40-45 kg or 8-9% of body weight per animal per day).

Courtship and mating behavior of the dugongs has been observed; the period of the female's estrous cycle is 50 days. The manatees have also been mating in captivity. However, no signs of pregnancy have been observed in either species.

Since 1985 we have carried on a joint project of research on wild dugongs, conservation, and education at Palawan Island, Philippines, with the science staff of the Philippine Department of Environment and Natural Resources and NGOs. We have recorded more than 10 accidental catches of dugongs each year at fishing villages on Palawan. Our team rescued several of these that were caught in traps or fishing gear; these were rehabilitated (using artificial milk formula in the case of an infant) and released.

Populations of dugongs in Asia are still threatened. We hope our experiences and knowledge of the captive care of sirenians will be useful for saving their lives in the wild as well as for public education. - **Teruo Kataoka, Shiro Asano**, and **Yoshihito Wakai** (Toba Aquarium)

***Threat to Dugongs in Okinawa.*** - The following notice was forwarded by Caryn Self Sullivan. The link below points to an English website. There are other pages in Japanese at **<http://www.hoops.ne.jp/~sea-jugon/index.html>** and **<http://www.hoops.ne.jp/~sea-jugon/save%20jugon.html>**.

The lethargic sea-mammal, the dugong, dwelling off the shores of Okinawa (one of the "South-Western Islands" of Japan), is now on the verge of extinction. A group of six dugongs was sighted in the spring of 1999; this is the largest group seen in this, the northern-most habitat of the species.

The Mammalogical Society of Japan classifies the dugong in the South-Western Islands as "critically endangered" according to the IUCN criteria; the Convention on International Trade in Endangered Species (CITES) lists the animal in Appendix 1 (a species to be dealt with under the most strict regulations). The Japanese Fisheries Agency and the Agency for Cultural Affairs also recognize the dugong as a species which needs special protection. Their habitat around Camp Schwab in Okinawa is one of the "Global 200", the areas chosen by the WWF as ecological domains to be protected.

In spite of all these considerations, and against the will of the Okinawan people and the local citizens of Nago City, Camp Schwab is now being targeted as the construction site for an enlarged U.S. military base to 'replace' the Futenma base which is to be returned to Japan. The Japanese government is putting pressure upon Okinawa Prefecture and Nago City so that the Camp Schwab site will be officially chosen for the new base. The Japanese government wants to finalize the plan to be presented at the "Summit" in July, 2000 to be held in Okinawa. We are certain that the enlarged base at

Camp Schwab will destroy one of the most precious remaining habitats of the dugong in the entire South-Western Islands region.

We urge all individuals and groups who care for the conservation of nature and the preservation of life to help us stop this destruction by expressing your concern. Please contact:

- Hon. William J. Clinton, President of the U.S.A., c/o The White House, Washington, D.C. 20045 U.S.A.
- Hon. Mori Yoshiro, Prime Minister of Japan, Prime Minister's Official Residence, Nagata-cho 2-3-1, Chiyoda-ku, Tokyo, Japan; Tel: 03-3581-0101; Fax: 03-3581-3883
- Hon. Inamine Keiichi, Governor of Okinawa Prefecture, Izumizaki 1-2-2, Naha City, Okinawa, Japan; Tel: 098-866-2000; Fax: 098-860-1453
- Hon. Kishimoto Tateo, Mayor of Nago City, Minato 1-1-1, Nago-shi, Okinawa, Japan; Tel: 0980-53-1212; Fax: 0980-53-6210

- **Suzuki Masako** (Association To Save The Dugong Of The Northernmost Habitat; tel/fax: (Japan) 045-771-3658; **<ccf72790@nyc.odn.ne.jp>**; **<http://www.hoops.ne.jp/~sea-jugon/>**)

MEXICO

***Conservation Activities on the Alvarado Manatee Population.*** - The Alvarado Lagoon System (ALS) in Veracruz, Mexico, is located in the southwest part of the Gulf of Mexico and consists of 280,000 ha of coastal and interior wetlands. It was thought that the manatee population in this region had disappeared, although in March 1998, attention was attracted by a couple of manatee calves that were found alive in a gillnet by local fishermen. These manatees were sent to the Veracruz Aquarium, where they are being successfully maintained in captivity. Unfortunately, six months later another manatee calf was found in the same region, but with pellet wounds. This calf died, although he received the same attention from the personnel at the Veracruz Aquarium.

These events showed the urgent necessity of carrying out research and contingency activities, in order to be able to estimate the current status of the manatee population in the ALS. With this in mind, we formed a state working group integrating several agencies, including research institutes, non-profit and private organizations, and the state office of Ministry of Environment, Natural Resources and Fishery (SEMARNAP).

We held periodic meetings of the group during that year, in order to define priority work actions. Since 1999, we began to coordinate work on two projects in the ALS. The first one is developed by the Instituto de Ecología, A.C., which has an ecological approach. The objectives of the project include assessing the current status of the manatee population, identifying the critical areas for conservation, and identifying current and potential threats to the manatee population and its habitat. The second project, developed by the Instituto de Investigaciones Biológicas-Universidad Veracruzana and Pronatura, A. C., has a social and anthropological point of view. Its objectives are to know the traditional significance of manatees, and to achieve an environmental awareness as well as attitude changes in the behavior of the local communities towards the manatees. These projects have the financial support of the Wildlife

Preservation Trust International and the U.S. Fish and Wildlife Service.

The information gathered by these studies indicates that the manatee population is small, although it has a spatial distribution wider than was described in the most recently published documents. Unfortunately, some of the fishermen interviewed informed us that manatees continue to be used as a food resource in several communities throughout the region. Though manatees have been protected by Mexican legislation since 1921, and are listed as an Endangered Species (SEMARNAP, 1994), poaching activities continue up to now. In many cases this is due to ignorance of the legal protection; nevertheless, even when there is knowledge of these rules, they are violated because of insufficient vigilance by the authorities.

All these circumstances obligated us to identify the critical poaching communities. In these places, we are conducting a series of workshops that involve the participation of the local people, especially fishermen. To facilitate this campaign, we have also printed educational material, such as posters, pamphlets, and workbooks for children, all of which are distributed within the communities.

As part of a national strategy for recovery of the priority species, the 4th National Meeting of the Technical Consultant Subcommittee for Mexican Manatee Conservation, Recovery and Management was held during November 1999 in Veracruz City. This subcommittee is a federal initiative that gathers specialists from the seven states where manatees are distributed. Amongst the working group's goals is the elaboration of the Manatee Conservation and Recovery Plan in Mexico, in which strategies and management policies for conservation are established. During this meeting the importance of protecting the manatee population in the ALS was highlighted; and fundamental to making this protection effective is to maintain a close collaboration with the local people.

In conclusion, there is now an important group of agencies interested in collaborating in the conservation of the manatee population in the ALS. We have observed that this interest had never existed for any other species in Veracruz, and that this probably has happened because of the manatees' charismatic appearance. We should take advantage of this awareness to continue with the protection actions, as well as to expand this cooperation within other states in the country. - **Alejandro Ortega-Argueta** (Instituto de Ecología, A.C., Xalapa, Veracruz, México; **<argueta@ecologia.edu.mx>**

OHIO

***Six Florida Manatees Transferred To Zoos In Ohio.*** - In 1999, six Florida manatees were sent to zoos in Ohio (USA). The Cincinnati Zoo and Botanical Garden accepted two manatees in March, and the Columbus Zoo and Aquarium received four animals in June. The manatees were sent there to alleviate crowding at Florida critical-care facilities. Manatees receiving long-term care are frequently displayed at various oceanaria when their display does not interfere with their rehabilitation and release preparations.

(The manatee "Comet", originally transferred to the Columbus Zoo, was returned to Florida in February 2000. He was released at Blue Spring State Park into the upper St. Johns River,

where he appears to be adapting well.)

Both Ohio facilities use natural Florida habitats as settings for their exhibits. Included in these exhibits are extensive educational displays that describe these habitats, wildlife, threats, and conservation efforts. The displays incorporate native plants and animals, sounds, photographs, graphics displays, interactive computer games, docents, and many other activities in their efforts to educate the public. With visitorship at the parks in the millions, efforts to educate people outside of Florida about manatees have been significantly enhanced.

The opening of the Cincinnati Zoo's exhibit was delayed by a fire on May 20, 1998. The fire, of unknown origin, destroyed most of the exhibit as zoo staff were putting the finishing touches on the displays. Fortunately there was no loss of life, human or otherwise, and the zoo was able to secure funds to rebuild the exhibit through insurers and private donors. The zoo had originally planned to open the exhibit in July 1998. - **Jim Valade** (U.S. Fish and Wildlife Service, Jacksonville, Florida)

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## SIRENIAN WEBSITE DIRECTORY

The Call of the Siren (Caryn Self Sullivan): **<http://members.aol.com/caryn1001/index.html/ homepage.html>**

Caribbean Environment Programme, Regional Management Plan for the West Indian Manatee: **<http://www.cep.unep.org/pubs/techreports/tr35/ct35indx.htm>**

Caribbean Stranding Network: **<http://netdial.caribe.net/~mignucci/>**

Dugongs: **<http://home.t-online.de/home/rothauscher/dugong.htm>**

Florida Fish and Wildlife Conservation Commission, Bureau of Protected Species Management: **<http://www.state.fl.us/fwc/psm/>**

Florida Fish and Wildlife Conservation Commission, Florida Marine Research Institute (Florida manatee mortality data): **<http://www.fmri.usf.edu>**

Jacksonville University (Florida) Manatee Research Center Online: **<www.ju.edu/juconnect/research/marco>**

Manatee neuroanatomy: **<http://www.neurophys.wisc.edu/Manatee/>**

News clippings on Florida manatees: **<http://www.n-jcenter.com/menus/enmanate.htm>**

Philippines Dugong Research and Conservation Project: **<http://www.wwf-phil.com.ph>**

Save the Manatee Club: **<http://www.savethemanatee.org>**

Sea World of Florida: **<http://www.seaworld.org>**

*Sirenews* (texts of current and recent issues): **<http://pegasus.cc.ucf.edu/~smm/>**

Sirenia Project, U.S. Geological Survey: **<http://www.fcsc.usgs.gov/sirenia>** or **<http://www.nfrcg.gov/sirenia>**

Smithsonian Institution sirenian bibliography: **<http://www.si.edu/resource/faq/nmnh/sirenia.htm>** [This is a relatively short bibliography, compiled by Joy

Gold, that provides a very good introduction to both the technical and the popular literature.]

Steller's sea cow: <**http://www.online.de/home/Rothauscher/steller.htm**>; also the website [in Finnish] of Dr. Ari Lampinen, University of Jyvaskyla, Finland: <**http://www.jyu.fi/~ala/ilmasto/steller.htm**>

## DISCUSSION LIST

Just prior to press time, *Sirenews* learned from Caryn Self Sullivan of a "Manatee Watchers" Internet discussion list which is said to be available as a tool to exchange sirenian information with the public (<**http://www.listbot.com/archive/MANATEE**>). No other details are available at this time.

## CHANGES OF ADDRESS

Florida Fish and Wildlife Conservation Commission [formerly Dept. of Environmental Protection], OES - Bureau of Protected Species Management, 620 South Meridian St., Tallahassee, Florida 32399-1600, USA (tel.: 1-850-922-4330; fax: 1-850-922-4338)

Florida Marine Research Institute, 100 8th Ave. SE, St. Petersburg, Florida 33701 USA (phone: 1-727-896-8626)

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