

VELADOR

The Newsletter of the Caribbean Conservation Corporation

Center Gets New Associate Director

Dr. Karen A. Bjorndal has been chosen to be the Associate Director of the Center for Sea Turtle Research at the University of Florida. After a careful search, the Department of Zoology voted on February 26, to offer the faculty position to Dr. Bjorndal.

Dr. Bjorndal received her Ph.D. in 1979, at the University of Florida under Dr. Archie Carr. Her dissertation addressed the nutrition and grazing behavior of the green turtle. Her current research interests focus on the nutritional ecology of herbivores, primarily the green turtle, with emphasis on how and to what extent nutrition acts as a controlling mechanism on their growth and reproductive output.

In addition to holding a post-doctoral research position with the Department of Animal Science at the University of Florida, Dr. Bjorndal is a Research Fellow of the CCC and Technical Director of the CCC/Bahamas National Trust Union Creek Marine Turtle Research Station. In 1984, she succeeded Dr. Carr as Chairman of the Marine Turtle Specialists Group of the Species Survival Commission of IUCN.

The Center for Sea Turtle Research was established last year in recognition of the outstanding achievements of Dr. Carr in sea turtle biology and to insure that this area of research is continued after he retires. Dr. Carr is



Dr. Karen Bjorndal and friend at Union Creek, Great Inagua Island, Bahamas

Graduate Research Professor of Zoology, Technical Director of the CCC and Director of the Center. He is marking his 50th year at the University and plans to move to emeritus status in June.

In support of the Center, Charles F. Sidman, Dean of the College of Liberal Arts & Sciences, wrote: "The establishment of such a Center would allow us to give more formal recognition to the international eminence of Archie Carr's pioneer work on the biology of sea turtles. Archie's seminal efforts have resulted in the acquisition of a massive data base on sea turtle migrations and nesting behavior that becomes ever more valuable with the passage of time."

The CCC served as an *ex officio* member of the search committee for the Associate Director and is a

member of the Policy Board of the Center.

Establishment of the Center was welcomed by the CCC as evidence of the University of Florida's continuing support for sea turtle research. The creation of the Center insures that various projects jointly operated by Dr. Carr and the CCC, including the Tortuguero tagging program, will continue uninterrupted by his retirement. The Center is repository for the massive body of data on the more than 40,000 turtles that have been tagged at Tortuguero since 1954. In summarizing his research activities, Dr. Carr indicated that the relation of open-ocean fronts and driftlines to the ecology of marine turtles would be the central focus of the Center's research program in the future.



Mexico Establishes Sea Turtle Refuges

Sixteen turtle refuges have been designated and geographically defined in Mexico including nesting beaches for the black turtle (*Chelonia agassizi*) in the state of Michoacan and beaches where the olive ridley (*Lepidochelys olivacea*), Kemp's ridley (*L. kempii*) and leatherback (*Dermochelys coriacea*) are found.

The famous arribada beach at Rancho Nuevo, which provided the answer to Archie Carr's "Riddle of the Ridley", has been reaffirmed as a sanctuary. In 1947, 40,000 nesting females were filmed on this beach, but from 1979 to 1982 the number had declined to no more than 400 to 600 nesters. Additional areas along Mexico's east coast have been defined for hawksbill and Atlantic green turtle refuges.

President Miguel de la Madrid signed legislation in October 1986, to recognize these refuges that are located on the Pacific, Gulf and Caribbean coasts of Mexico. This commendable action is the culmination of efforts by many conservation minded people both in and out of the government and is supported by the Ministry of Fisheries (PESCA), Urban Development and Ecology (SEQUE) and the Navy.

CCC Receives Grant for Beach Protection Plan

The CCC received a grant of \$10,000 from the Chelonia Institute to develop a plan for the protection of the green turtle nesting beach between the Green Turtle Research Station and village of Tortuguero in Costa Rica. The funds will be used to make a land survey of the privately owned land and to do the legal work necessary to insure that subsequent purchase of the land results in its permanent protection. Because of Costa Rica's maritime zone law which generally prohibits private ownership of property within one kilometer of the coast, outright purchase of coastal property is complicated.

A fifteen mile section of the 22 mile nesting beach between the mouths of the Tortuguero and Parismina rivers was set aside in 1975 as Tortuguero National Park. This protects most of the nesting beach but the presence of the village of Tortuguero blocked extension of the park to include the northern three miles of the five mile long study beach. The village fronts on about a half mile of the beach and the CCC holds a long-term lease on about a mile and a quarter of the beach. The remainder is in private hands and is vulnerable to uncontrolled development.

Currently corridors are being cleared for electric utilities at Tortuguero, the government is planning to pave and lengthen the local airstrip, and there is even discussion of building a road to the village. These changes will surely attract development, and if this is not carefully planned it will wreck an important section of our 33 year old study beach.

CCC Land Holdings at Tortuguero, Costa Rica



Joshua B. Powers Fellowship in Sea Turtle Biology and Conservation

The Caribbean Conservation Corporation announces the availability of training fellowships in sea turtle research and conservation at its Green Turtle Research Station, Tortuguero, Costa Rica, to qualified applicants from Latin America and the Caribbean. The Tinker Foundation endowed this program in honor of Mr. Joshua B. Powers, founder of the CCC and long time member of the board of the Tinker Foundation.

Fellows may spend from two weeks to two months between July 10, and September 15, 1987 at Tortuguero, and will participate in the CCC green turtle research and conservation program that has been underway there for more than 30 years. Fellows will also have an opportunity to acquaint themselves with the operation and management of nearby Tortuguero National Park, which was established in 1975 to protect the nesting beach and interior Caribbean lowland landscapes. Fellowship stipends cover travel to and living expenses at the Green Turtle Research Station. Fellows must be at least 18 years old and a citizen of a Latin American or Caribbean country. Knowledge of English is helpful but not essential. Previous fellows have come from Saint Lucia, Honduras and Costa Rica.

For more information, or to apply, write to Dr. Archie Carr, Director, Center for Sea Turtle Research, Department of Zoology, University of Florida, Gainesville, Florida 32611 USA, telephone (904) 392-1250. Applications should include full name, address, telephone number, age, present affiliation and description of prior experience in sea turtle research and conservation, along with the names, addresses and telephone numbers of at least two references. Also please let us know the dates you would be available.

Applications must be received by May 1, and selection will be made by May 15, 1987.

Minutes from the Annual Meeting of May 1, 1986

The twenty-seventh annual meeting of the Caribbean Conservation Corporation was convened in the Jungle World Building of the Bronx Zoo, Bronx, New York, at 10:00 AM on Thursday, May 1, 1986.

The Chairman, Mr. Charles D. Webster, called the meeting to order and welcomed members and guests. The Chairman then asked whether a quorum was present and the Secretary responded that 28 members were attending and there were 36 proxy designations, which constituted a quorum. The Chairman then asked for a motion to approve the minutes of the May 2, 1985 annual meeting. The motion was made, seconded and approved.

Treasurer's Report

Mr. William H. Lane, Treasurer, reported that the Corporation had \$206,806.66 of which \$145,499.00 was in the endowment fund. Dues, contributions and other income amounted to \$82,531.73 for the fiscal year, and expenditures totaled \$78,075.58.

Chairman's Report

Mr. Webster reported that the CCC was laying plans for the acquisition and protection of the remaining beach property between the Green Turtle Research Station and the village at Tortuguero, Costa Rica. He pointed out that at present a stretch of more than a mile near the middle of the five mile long research beach was in private hands and vulnerable to development and could adversely affect the turtle rookery and the green turtle research program. He noted that if the CCC failed to control development along this stretch it might be forced to abandon the entire research beach on which it has been monitoring nesting turtles for more than 30 years.

President's Report

Mr. Colin S. Phipps, briefly commented that the CCC was making headway in its efforts at both Tallahassee and Costa Rica to improve the management and operation of the organization. He stressed that as pressure mounted for development at Tortuguero, the CCC was going to have to be even more vigorous in its efforts in behalf of the turtles and the whole region. He also noted that conserving sea turtle habitat benefited many other species, both marine and terrestrial, and that the CCC should recognize and exploit this common cause in its conservation program.

Technical Director's Report

Dr. Archie F. Carr prefaced his remarks by pointing out that the activities of our members and collaborators have been too numerous to treat adequately, and can only be briefly summarized.

The most important of these was as always, the tagging at Tortuguero. We were fortunate in having Dr. Harold Hirth one of the earliest of the Tortuguero workers and now Professor of Zoology at the University of Utah, as team leader. Dr. Hirth was accompanied during pre-season work by Larry Ogren, another of the original marooners and a constant supporter of sea turtles and the CCC ever since. This redoubtable pair went down to Tortuguero in March, during the nesting season of the leatherback and carried out some long deferred work on that great beast with which Larry had done pioneering work during the 1950's.

Under Dr. Hirth's guidance the tagging team and associates did outstanding work. The group comprised six Costa Rican nationals, all selected by Billy Cruz and Costa Rican advisors, augmented by Kazuo Horikoshi, a Japanese graduate student at the University of Florida, doing Ph.D. research on the reproductive ecology of the Tortuguero colony; Carlos Diez, an extraordinarily able young Puerto Rican volunteer, and Mario Espinal

who was the Joshua B. Powers Fellow for 1985.

The Technical Director gave a rapid review of the research of special current concern to him--the so-called lost-year puzzle. The puzzle has been the whereabouts of young turtles during the months after they enter the sea as hatchlings. After fifteen years accumulation of observational data Carr's theory that they may lead a pelagic life in rafts of sargassum weed has been clearly substantiated. But this isn't the whole story, because many--perhaps most--turtle colonies nest where no sargassum drifts by offshore. This makes it necessary to explain how young turtles could exist in the open sea, where food resources are so thinly dispersed; and after a lot of floundering the idea that marine flotsam is not randomly distributed but is assembled, aligned, and after rough weather realigned at the edges of ocean currents--major, minor and minuscule. As the ecologic importance of this well known process of physical oceanography was beginning to be appreciated, new data on a hitherto missing developmental stage of the Atlantic loggerhead, which breeds by the thousands on southeastern beaches, especially those south of Cape Canaveral.

We have recently established a collaborative tagging project with the Department of Oceanography of the Azores. Data from the first 40 turtles tagged--all having been taken at sea on Princess Alice Bank--showed the missing West Atlantic age group to be abundantly represented in the Azores.

This windfall of data supports the idea of a west Atlantic origin for European loggerheads, and suggests that a period of at least three years may be needed for American loggerheads to go through their pelagic developmental period, and return to the U.S. coast as subadults.

After briefly discussing a few questions concerning the new views of the "lost year" the Technical Director announced that Dr. Jeanne Mortimer was still absent on her research and public relations assignment in the Seychelles, where her 3-year stay was financed by the World Wildlife Fund. Dr. Carr then introduced Dr. Anne Meylan who has

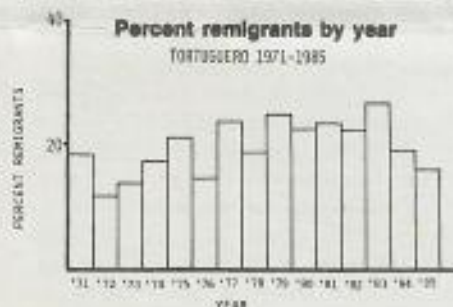
come to New York with her husband Peter for his post-doctoral fellowship in the Department of Vertebrate Paleontology at the American Museum. During recent months Anne has been closely involved with investigations of the remarkable advent of young sea turtles in Long Island Sound.

After some lively discussion of the great Ridley invasion, Dr. Carr introduced Dr. Karen Bjorndal, announcing that she had just been appointed Chairman of the Marine Turtle Specialists Group of the Species Survival Commission (IUCN).

Yearly Change in the Composition and Size of the Assemblage of Nesting Female Green Turtles at Tortuguero

Number of turtles recorded on the five mile study beach

Year	Remigrants	Arrivals	Total
1971	146	648	794
1972	191	1,439	1,630
1973	133	830	963
1974	102	486	588
1975	136	508	644
1976	342	2,015	2,357
1977	102	327	429
1978	531	2,284	2,815
1979	103	310	413
1980	681	2,341	3,022
1981	138	448	586
1982	534	1,851	2,385
1983	403	1,098	1,501
1984	303	1,277	1,580
1985	207	1,061	1,268



Inagua Project

Dr. Karen Bjorndal, a Research Fellow of the CCC, reported on the current status of the Inagua Project. In November 1985, Hurricane Kate passed over the research area but damage to the wall and fences at Union Creek was not extensive.

The small amount of damage was attributed to the fact that half of the long wall--the more exposed portion--has been fortified with gabions. Gabions are 3 by 4 by 12 foot "baskets" made of heavy gauge, plastic-coated wire that are filled with rocks and lashed together to form a strong wall that can withstand storm winds and high tides. It is hoped that within the next few years, funds will be available to reinforce the entire wall with gabions.

The Inagua growth rate study is progressing well. Dr. Bjorndal now has recorded 148 growth intervals from 121 green turtles ranging in carapace length from 25 to 75 cm. She has determined that on the average it requires 20.5 years for a green turtle to grow from 25 to 75 cm straight carapace length. In contrast, three loggerheads in Union Creek took only 3 to 4 years to grow from 25 to 75 cm carapace length. Both species show a continuous decrease in growth rate with increasing body size.

With support from the National Marine Fisheries Service of the U.S. Department of Commerce, Dr. Bjorndal has been conducting a comparative test of the durability of seven types of tags commonly used on sea turtles. She is testing three styles of monel tags, one titanium tag, one inconel tag and two plastic tags. It is too early to draw conclusions on the relative success of the different tags, except that the Riese flexible plastic tag has performed very poorly to date. Dr. Bjorndal is now testing a new set of Riese tags to determine whether the poor performance was due to a faulty batch of tags.

Dr. Bjorndal's plans for the future at Inagua include continuation of growth rate studies, particularly trying to identify the sources of variation that she has recorded in turtles within the same size classes; expansion of the tag-testing work; additional nutritional studies of green turtles; and re-establishment of a loggerhead population within Union Creek to allow comparative studies of growth and feeding.

Sea Turtles Cold-Stunning in Long Island Sound

Dr. Anne Meylan, a Research Fellow of the CCC, who is now based at the American Museum of Natural History, reported on an unusual cold-stunning episode involving sea turtles in Long Island Sound. A total of fifty-two sea turtles representing three different species was recovered during November, December and January. Included in the total were 39 Kemp's ridleys (*Lepidochelys kempii*), which are considered to be the most endangered of all sea turtles, nine loggerheads (*Caretta caretta*), and two green turtles (*Chelonia mydas*). Although cold-stunning events involving sea turtles are not particularly unusual, the episode in Long Island was remarkable for a number of reasons. For one, no previous event involved primarily ridleys. Secondly, there are relatively few documented occurrences of ridleys in New York waters. The life cycle of the species is thought to be carried out primarily in the Gulf of Mexico, and although there are records from the eastern seaboard of the United States, they represent individuals generally considered to be waifs that have been swept out of their normal range--possibly permanently--by Gulf Stream currents. The discovery of 39 ridleys in apparently healthy condition in Long Island waters provides what may be interpreted as contradictory evidence for this hypothesis.

Dr. Meylan reported that she is continuing her research on the feeding ecology of the hawksbill turtle (*Eretmochelys imbricata*). She has recently been awarded a grant from the Lerner Grey Fund for Marine Research to pursue studies of the chemical ecology of sponge predation by hawksbills.

Election of Board of Directors

The Chairman asked for the slate of proposed directors. The slate was reported as follows.

Dr. Archie F. Carr * Dr. Archie F. Carr, II * Mr. David Carr * Mr. William G. Conway * Mr. Guillermo Cruz * Dr. David W. Ehrenfeld * Dr. H. Clay Frick * Mrs. Jane A. Halley * Dr. F. Wayne King * Mrs. Carolin P. Maynard * Mr. Colin S. Phillips * Mr. Joshua B. Powers, Jr. * Mr. Charles D. Webster

After a brief discussion regarding the nomination of additional members, the President moved that the slate be approved as presented. The motion was seconded and approved.

The Chairman asked for a motion of adjournment which was made, seconded and carried.

The Saga of Little K5404

On June 21, 1986 a tagged juvenile loggerhead turtle was caught by Mr. Thierry Brut off the French coast near Bordeaux. The metal tag clipped to the front fin was inscribed with the number and address of the University of Florida, where the worldwide collaborative tagging program of the Caribbean Conservation Corporation has been coordinated for thirty years. During the time that this joint effort of the CCC and the University of Florida has been in operation approximately 94,000 turtles have been tagged--about 40,000 at the research station of the CCC on the green turtle nesting beach at Tortuguero, Costa Rica, the rest by the dozens of collaborators in the worldwide program. In this the CCC has provided tags, paid recovery rewards, and recorded and communicated recovery data to the tagger.

The turtle caught by Mr. Brut had been tagged and released 20 months before on the Caribbean island of Barbados by Julia Horrocks of the Bellairs Research Institute of McGill University. Of the thousands of long and short range tag recoveries that have been made in various parts of the world this may be the most dramatic.

When the recorded and conjectural history of the turtle are examined it turns out to be much more impressive than a single transatlantic voyage. Although the birthplace of the turtle can't be fixed with certainty, it is virtually certain that it came from the Western Atlantic, and is only a little less likely that the natal beach was located on the east coast of the peninsula of Florida. By far the heaviest nesting in the Atlantic occurs there, and the Gulf Stream is close inshore; so the best assumption is that the hatchling entered the Gulf Stream or one of its eddies somewhere between Cape Canaveral and Cape Florida. It then passed at least two years drifting in the Gulf Stream and its rings and eddies, probably making one or more complete transatlantic circuits before reappearing. Finally, on one of its eastward crossings, instead of drifting

southward into the Canaries Current in the Azores area it was shifted northward into the north Atlantic Drift and this took it to England, where in June 1984, it and another juvenile loggerhead washed ashore on Perranport Beach at Gweek, on the Cornish Coast near Helston. For four months it was cared for there by Mr. Ken Jones at the seal sanctuary that he manages at Gweek.



Thierry Brut and K5404

Then, at the instigation of the Manchester Daily Star, it was flown to Barbados on British Airways in the care of Annette Brown, Travel Editor of the Star. In Barbados it was taken to the Bellairs Research Institute and turned over to Ms. Horrocks. The tag she used was inscribed: University of Florida, Gainesville Fl; K5404. At the time of release the overall carapace length of the turtle was 28.5 cm, and it weighed 9 pounds.

This was the turtle recovered by Mr. Brut back on the other side of the Atlantic on June 21, 1986. He caught it while fishing ten miles off Cape Ferret in the Golfe de Gascogne in the inner edge of the Gulf Stream. He communicated his find to the University of Florida, together with an excellent color picture of the turtle. Measurements were not sent, but as the photo shows, the overall shell length is clearly very close to 14 inches 35 cm long. The turtle was released on the date of the capture, and the tag, which was in good condition, was left in place.

This clearly supports the idea that young Atlantic loggerheads from U.S. nesting beaches spend 4 or 5 years of pelagic life drifting planktonically in gyres of the Gulf Stream System before moving into inshore bottom-feeding habitats. Also, it generates the devout hope that before long somebody will have the good luck to meet up with little K5404 again.

The Velador is Published Quarterly and Sent to Members of the Caribbean Conservation Corporation ... Join Now and Get Involved!

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Address _____

City _____ State _____ Zip _____

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Enclosed is my tax-deductible membership contribution of \$ _____

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Mark your calendar! Our annual meeting will be held Tuesday, May 5, 1987, 10:00 a.m. at Old Westbury Gardens, Long Island, New York.

The Tortuguero volunteer turtle tagging program still has openings for the upcoming summer season.

Contact Holbrook Travel, 1-800-451-7111.

Affiliated with the Center for Sea Turtle Research, University of Florida, Gainesville, Florida

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