Moreira, L., C. Baptistotte, J. Scalfone, J. C. ThomÇ, and A. P. L. S. de Almeida. 1995. Occurrence of Chelonia mydas on the Island of Trindade, Brazil. Marine Turtle Newsletter 70:2.

CLAUDIO BELLINI, Projeto TAMAR/IBAMA, CP 50, Fernando de Noronha - PE, BRAZIL 53999-000; MARIA ANGELA MARCOVALDI, Fundaçao Pró-TAMAR, CP 2219, Salvador - BA, BRAZIL 40210-970; TAISI MARIA SANCHES and ALICE GROSSMAN, Fundaçao Pró-TAMAR, CP 50, Fernando de Noronha - PE, BRAZIL 53990-000 and GIBERTO SALES, IBAMA, Av. L4 Norte, SAIN, Brazília - DF, BRAZIL 70800-200.

MEDITERRANEAN LOGGERHEADS ARE THRIVING IN LIBYA!

From 19 June to 5 July 1995, a team of six scientists undertook the first scientific survey of the eastern Libyan coast in order to assess possible nesting sites for sea turtles. The research team came up with some astonishing figures. More than 9,000 loggerhead (Caretta caretta) nests were estimated along 1250 km of coast, meaning that Libya is host to the largest nesting colony of loggerhead turtles in the Mediterranean! Equally exciting was the discovery of previously unknown nesting grounds near the Egyptian border [see MTN 71:9-10]. Libya's nesting sea turtles are still thriving because the coast has not as yet been developed for tourism. Beaches are "off-limits", even to local people, and soldiers patrol the coast to enforce the rules. The 1995 survey was co-ordinated by the UNEP/MAP Regional Centre for Specially Protected Areas, located in Tunis, co-funded by the Mediterranean Association to Save the Sea Turtles (MEDASSET), and supported by Libya's Technical Centre for Environment Protection (TCEP), the Libyan Marine Research Centre (MRC), and WWF's Mediterranean Programme. When the survey data have been fully assessed, a more detailed account will be prepared for readers of the Marine Turtle Newsletter.

LILY VENIZELOS, MEDASSET, 24 Park Towers, 2 Brick Street, London W1Y 7DF, U. K.

CHELONIA AGASSIZII - VALID OR NOT?

Our title asks two questions. First, a biological question: do the eastern Pacific populations of the green sea turtle (colloquially known as the black turtle, *tortuga negra*, or *tortuga prieta*) represent a different species from the western Pacific and other populations of Chelonia? Second, a nomenclatural question: if the eastern Pacific populations are a distinct species, is Chelonia agassizii the correct name?

We cannot fully answer the biological question in this forum. Although recent studies provide strong hints to the resolution of the specific status of eastern Pacific Chelonia, the data do not provide an unequivocal solution. A complete answer to the nomenclatural question requires a full resolution of the biological one, i.e, the phylogenetic affinities of the various Pacific populations. Nevertheless, owing to the increasing use of the specific name Chelonia agassizii, a review of the problem seems essential at this time.

The major nesting populations of Chelonia in the eastern Pacific occur from the Galapágos northward to Michoacán, México. The epithet agassizii or agassizi has been applied to these turtles by various authors (e.g., Carr 1967; Pritchard and Trebbau 1984; Alvarado and Figueroa 1986). This designation is based mainly on the dark color and domed carapaces of

these populations. Pritchard and Trebbau (1984) note that smaller adult size (see also Figueroa and Alvarado 1991) and extreme caudal dimorphism are also diagnostic of these populations.

A morphometric analysis of the skulls of six populations of Chelonia (Kamezaki and Matsui 1995) shows that specimens from the Galapágos differ markedly from those of other areas of the world. Although Mexican and Central American populations were not sampled, the results are concordant with the hypothesis of a distinct eastern Pacific form. Despite the uniqueness of Chelonia skulls from Galapágos, the authors argue against a species designation. They base this interpretation, in part, on the absence of a single diagnostic character differentiating the skulls of the Galapágos Chelonia from those of the other samples.

An analysis (Bowen et al. 1992) of mitochondrial DNA (mtDNA) from 15 major nesting beaches around the world yields somewhat different results. A phylogeny based on mtDNA demonstrates that the 'black' sea turtles of Mexico and the Galapágos are very closely related and further shows these eastern Pacific populations to be closely related to those of Hawai'i (central Pacific) and Oman (Indian Ocean). The absence of close affinities of the eastern Pacific Chelonia populations to those of the south-central and western Pacific is a zoogeographical enigma. However, it matches Carr's observations that, in addition to México and the Galapágos, "To my eye... the black turtle stock occurs elsewhere- ...among the mid-Pacific Islands, and in parts of the Indian Ocean." (Carr 1972: 24).

Nuclear DNA (nDNA) from 15 major nesting beaches, including most of those surveyed by Bowen et al. (1992), have also been analyzed (Karl et al. 1992). Although the nDNA data indicate that the Mexican and Galapágos populations are very closely related, the study does not suggest that they are distinct enough to warrant species status. Even though the nDNA data may be able to identify closely related populations, its use in describing the relationships between globally scattered populations is limited (Karl et al. 1992). For example, a phylogeny derived from nDNA links the eastern Pacific populations with, in addition to other Pacific populations, those from Ascension Island and the Atlantic coast of Africa. Thus, the available evidence indicates that the eastern Pacific Chelonia populations are not a distinct species [neither in sense of the biological nor the evolutionary species concept], but the data are insufficient presently to determine the precise affinities of the various Chelonia populations.

Regarding our second question, more than a dozen specific names are available for the populations of Chelonia around the world. The principal available names are: mydas Linnaeus, 1758 [type-locality restricted to Ascension Island]; viridis Schneider, 1783 [restricted to Charleston, South Carolina]; japonica Thunberg, 1787 [Japan]; chloronotus Bechstein, 1800 [Isla Blanquilla, Caribbean Sea]; rugosa Daudin, 1802 [Maldive Islands, Indian Ocean]; cepediana Daudin, 1802 [type-locality unknown]; virgata Schweigger, 1812 [restricted to Bermuda Islands]; cepedii Merrem, 1820 [substitute name for cepediana]; esculenta Merrem, 1820 [Atlantic Ocean]; nasicornis Merrem, 1820 [Ocean near America]; thunbergii Merrem, 1820 [substitute name for japonica]; lachrymata Cuvier, 1829 [type-locality unknown]; maculosa Cuvier, 1829 [restricted to Ascension Island]; bicarinata Lesson, 1834 [Atlantic Ocean]; marmorata DumÇril & Bibron, 1835 [Ascension Island]; formosa Girard, 1858 [Fiji Islands]; tenuis Girard, 1858 [Honden Island, Tahiti, etc.]; albiventer Nardo, 1864 [Malamocco, Adriatic Sea]; agassizii Bocourt, 1868 [mouth of Rio Nagualate, Pacific coast of Guatemala]; lata Philippi, 1887 [Valparaiso, Chile]; carrinegra Caldwell, 1962 [Baja California Norte, México].

We use "available" in the nomenclatural sense; that is, each name was proposed properly and meets all criteria necessary for subsequent nomenclatural use. Although several names may meet the criteria for availabilty, only one name can be used for a particular population(s) or species. For example, if we accept that all Chelonia populations in the Atlantic and Mediterra-

nean represent a single species, Chelonia mydas is the only **valid** name for Atlantic green sea turtles. The names viridis, chloronotus, virgata, esculenta, maculosa, bicarinata, marmorata, and albiventer are junior synonyms of mydas [the senior synonym]. These names are available, but they are not nomenclaturally valid for the Atlantic population.

The same situation applies to Pacific populations of Chelonia, and that is why it is ***critically*** important to know the relationships of the eastern Pacific populations of the green sea turtle to those elsewhere in the Pacific before using the various available names. Chelonia agassizii is valid if and only if the Guatemalan [type locality for this name] and adjacent east Pacific populations represent a distinct species from all other Pacific populations. If the eastern Pacific populations are not distinct from the central Pacific ones, but these populations are distinct from those in the rest of the world, the valid name for the eastern and central populations is Chelonia formosa. If the eastern and central Pacific populations are not distinct from those of the western Pacific, but Pacific populations are distinct from those in the rest of the world, the valid name for all Pacific populations is Chelonia japonica. Finally, if Pacific populations are not distinct from those of the rest of the world, the valid name for all Pacific populations (and all other populations) is Chelonia mydas.

Our review of the recently published data and interpretations shows that two east Pacific populations (Galapágos, México) are closely related to one another based on morphological and DNA data. Because these two populations represent the "ends" of the range, we can assume that all populations between them are part of a single eastern Pacific metapopulation. Nonetheless, a comparison of these end point populations with the Guatemalan and other populations in the middle remains necessary, but even more relevant are comparisons with the populations in the central and western Pacific.

Importantly, none of the studies comparing geographic samples has proposed the recognition of the eastern Pacific populations as a distinct species. While this aspect might be considered as taxonomic conservatism on the part of these researchers, it more likely reflects their recognition that (1) their samples do not encompass the full variation within the Chelonia mydas complex and (2) their data do not argue convincingly for the reproductive isolation of the eastern Pacific populations. We concur with their interpretation and consider it inappropriate to use Chelonia agassizii to recognize a single geographic morphotype.

The same arguments are applicable to the formal recognition of the eastern Pacific populations as a subspecies. It invalidates the biological aspect of the subspecific concept to recognize the black green sea turtle as one evolutionary unit and to throw all the other populations of the world into another evolutionary unit. Assignment of agassizii to subspecific status requires just as detailed an analysis of variation in the world's populations of Chelonia mydas as the assignment of populations to specific status. This evaluation is well stated by Carr (1984: 263): " ...some of the people who do that then speak of the mainland black turtle as Chelonia mydas agassizi(sic). By implication that makes the name of all the other green turtle races of the Indo-Pacific grab bag Chelonia mydas mydas. And that of course is altogether intolerable."

Although not as elegantly stated as Carr, we conclude that Chelonia mydas should be used for green sea turtle populations throughout the world. Formal subspecific recognition is also unjustified. For the present, those researchers wishing to distinguish the eastern Pacific populations should use a common or colloquial name in association with Chelonia mydas.

Alvarado, J. and A. Figueroa. 1986. The ecological recovery of the sea turtles of Michoacán, Mexico. Special attention: the black turtle (Chelonia agassizi). Final Report to U. S. FWS/Endangered Species and WWF-USA.

Bowen, B. W., A. B. Meylan, J. P. Ross, C. J. Limpus, G. H. Balazs and J. C. Avise. 1992. Global population structure and natural history of the green turtle (Chelonia mydas) in terms of matriarchal phylogeny. Evolution 46: 865-881.

Carr, A. 1967. So Excellent a Fishe. A Natural History of Sea Turtles. Natural History Press, New York.

Carr, A. 1972. Great reptiles, great enigmas. Audubon 74:24-34.

Carr, A. 1984. The Turtle. So Excellent a Fishe. Revised edition. Univ. Texas Press, Austin.

Figueroa, A. and J. Alvarado. 1991. Morphometric comparison of the Chelonia populations of Michoacán, Mexico, and Tortuguero, Costa Rica. NOAA Tech. Memo. (NMFS-SEFC-278):179-182. U. S. Dept. Commerce.

Kamezaki, N. and M. Matsui. 1995. Geographic variation in skull morphology of the green turtle, Chelonia mydas, with a taxonomic discussion. J. Herpetol. 29: 51-60.

Karl, S. A., B. W. Bowen and J. C. Avise. 1992. Global population genetic structure and male-mediated gene flow in the green turtle (Chelonia mydas): RFLP analyses of anonymous nuclear loci. Genetics 131:163-173.

Pritchard, P. C. H. and P. Trebbau. 1984. The Turtles of Venezuela. Society for the Study of Amphibians and Reptiles, Athens, Ohio.

JAMES F. PARHAM and GEORGE R. ZUG, Department of Vertebrate Zoology, National Museum of Natural History, Washington D. C. 20560 USA.

FIRST RECORDS OF STRANDED JUVENILE FLATBACK TURTLES, AND SOME NEW RECORDS OF STRANDED JUVENILE HAWKSBILL TURTLES FROM THE SOUTHWEST COAST OF WESTERN AUSTRALIA

Limpus et al. (1994) reviewed the collections of juvenile marine turtles obtained by Australian museums. Generally, specimens were few and the locations from which they were obtained restricted. All of the juvenile turtles listed by Limpus et al. (1994) for the Western Australian Museum, Perth, collection were loggerheads (Caretta caretta) collected from the lower west and south coast of Western Australia.

L. A. Smith (Western Australia Museum, Department of Herpetology, in litt.) has since advised that Western Australian Museum collection records also include previous reference to receipt of four juvenile hawksbill turtles (Eretmochelys imbricata), ***viz.***, two specimens in July 1927 and another in September 1935, all three of which were discarded; and a fourth, collected on 15 August 1955, which is WAM R11573. Loggerhead strandings records are much more abundant.