THE KAY GRAY AWARD 2011

Nominee: George H. Balazs
Proposer: Anne Rowberry, Conservation Officer BCG
Seconder: R.P. Langton, Conservation Consultant BCG

I would like to recommend George H. Balazs, sea turtle biologist with the National Marine Fisheries Service of the Pacific Fisheries Science Centre, NOAA (National Oceanic and Atmospheric Administration), and Leader of their Marine Turtle Research Programme, as recipient of the Kay Gray Award for his work with green turtles (*Chelonia mydas*) in Hawaii.

George Balazs has worked tirelessly for over 40 years to bring the green turtle in Hawaii back from the brink of extinction. His research during this time has been extensive and added a wealth of information to the understanding of the green turtle. Detailed records of individual turtles enabled researchers to have a much greater understanding of issues affecting green turtles. George's work has been widely published in scientific journals throughout the world and he is recognised as a leading authority on green turtles. Much of his research has centred around the turtles on Hawaii and their nesting sites in French Frigate Shoals 500miles away, the most important green sea turtle rookery in the Central Pacific Ocean.

Living on O'ahu, George became aware of the impact of inshore fishing, predation of nesting sites and the industry surrounding the supply of turtle meat. He realised that this inflicted such losses on the turtle population in Hawaiian waters that it was unsustainable. George worked tirelessly in the 1970s to persuade the authorities to introduce legislation to give the turtles some protection. He spent many summers living on East Island collecting data on the size of the breeding population; he discovered that the fate of the turtles throughout the entire 1,500-mile-long archipelago depended upon fewer than 150 females nesting. George spent time writing and publicising the precarious state of the turtles in scientific journals as well as in magazines and newspapers in Hawaii; he went to meetings, testified at public hearings and relentlessly pursued his aim to get legislation passed to protect the turtles.

As a result of continued lobbying and the significant decline in numbers of the species, in 1974 the green sea turtle gained protection from commercial harvest in the state of Hawaii. George continued his work and gathered further evidence about the link between the turtle meat being taken and the increase in tourism.

For two decades after the legislation was introduced the turtle population nesting on French Frigate Shoals increased and in 1981 Balazs counted nearly

300 nesting females. Since 1987, George has worked for NOAA with the Hawaiian Preparatory University (HPA) to capture, measure, tag and study the threatened Hawaiian green sea turtle. This work originally took place at Kiholo Bay, one of the prime habitats for juvenile and sub-adult green turtles on the leeward coast of Hawaii. While Kiholo is still a main focus of the work, there are now study sites along the entire coast from Honaunau in the south to Kawaihae in the north. Over the last 24 years, HPA students and NOAA scientists have captured and tagged several thousand green turtles.

In the 1990s an emerging worldwide threat to green turtles was Fibropapillomatosis, a marine turtle disease found most commonly found in green turtles. The disease is characterised by benign tumours that grow both externally and on internal organs. These tumours can impede movement, feeding, vision and organ function, which can lead to death. However, studying the progress of the disease in Hawaii, George noted that the disease is not always a death sentence as some tumours regressed. This would not have been possible except for the numerous and meticulous records kept on the turtles he has tagged over a prolonged period. Working with Karen Arthur on her research they found further evidence to support the theory that, although a herpes virus has been found in conjunction with the disease, the cause of the tumours is likely to be multifactorial.

Working with NOAA George has facilitated many postgraduate researchers who have acknowledged his support in their work, for example:

"Our work could not have been accomplished without the support of George Balazs and his team at the Marine Turtle Research Program, NOAA Pacific Islands Fisheries Science Centre. George graciously shared his wisdom and always provided the big-picture ecological perspective from his vast experience. Furthermore, his field technicians were truly fantastic, and their efficiency and know-how working with the turtles made this project possible." (Characterizing juvenile green sea turtle (*Chelonia mydas*) habitat use in Kawainui, Ocahu: a multi-disciplinary approach. Brenda Fumiko Asuncion, May 2010.)

On the island of O'ahu, the increased abundance of turtles is particularly evident at several key sites; Laniakea on the north shore is the most well known turtle-watching site and is commonly referred to as 'Turtle Beach' due to the consistent abundance of turtles basking on the shore. On the windward side of O'ahu, Kaneohe Bay has been recognized as an important area providing resting and foraging habitats which turtles use consistently. Kaneohe Bay also hosts a variety of human activities including commercial and recreational fishing, aquaria fish collecting, recreational boating and ecotourism (i.e. jet-skis, kayaks, snorkelling, boat tours, etc). Other specific habitats have also been identified as hosting long term resident turtles. For example, NOAA's Hawaii Marine Turtle Research Program has been

monitoring juvenile turtles at a Kailua foraging area since 1999, and some individuals tagged in the first sampling year were recaptured in 2008. Brenda Fumiko Asuncion demonstrated in her research that it will become increasingly important to identify and monitor critical high-use areas in order to understand how joint habitat use between turtles and humans can be well-managed.

George's work on O'ahu has made an enormous impact on the public; he is well known and recognised for his efforts to return the green turtle to Hawaii. He was instrumental in setting up the Volunteer turtle watch on the North Shore where turtles haul out to bask, especially on 'Turtle Beach' where a team of volunteers daily monitor hundreds of tourists that visit the beach to view the turtles. One unique behaviour of members of this metapopulation is terrestrial basking, which is unknown in other populations except for occasional basking in the Galápagos, and the Gulf of Carpentaria in Australia. When Jill Quaintance had her paper 'Diel Behavior of Two Adult Basking Turtles at Laniakea, Hawaii' published, she wrote; "*I would like to thank George Balazs from the National Marine Fisheries Service for providing data used for the Laniakea turtles as well as his mentoring throughout the project.*"

To accommodate the many tourists wanting to view turtles and to indicate the precautions that need to be addressed George compiled the Hawaii Marine Mammal and Sea Turtle Viewing Guidelines which are widely publicised. He also introduced the programme 'Show Turtles Ahoa' and a website allowing the turtles' journeys to be followed plus news alerts when turtles appear at the beach.

George's work and recording has enabled much research into the feeding habits of green turtles over decades with turtles showing a high degree of fidelity to their feeding grounds, particularly around O'ahu. Green sea turtles are important grazers in both seagrass beds and coral reef ecosystems and, as such, are regarded as indicators of reef health. Because they serve an important role as herbivores in coral reef ecosystems, their grazing activities may become increasingly essential to control invasive algae in Hawaii's marine environments. During the 1970s, *Eucheuma striatum* and *E.denticulatum* were introduced to Kane'ohe Bay for research and cultivation. Karen Arthur worked with George to research the impact of diet on the turtles; she thanked George for his support: "*This project would not have been possible without the help of many hands . . . In particular, I would like to acknowledge the support and guidance provided by George Balazs.*"

Growth rates of pelagic-stage Hawaiian green turtles during the years when they are 'at sea' have not been measured under natural conditions, since contact with them is extremely rare. Growth rates of juveniles, sub-adults and adult turtles measured by George Balazs at seven resident sites in

the Hawaiian Archipelago revealed substantial variation, probably a result of food availability and quality. Based on growth rate measurements, George Balazs estimates the age of the Hawaiian green turtle at sexual maturity can range from 11 to 59 years. This is obviously extremely valuable information for research scientists around the world. Currently George is tagging hatchling turtles and hopes to add to the rather sparse field of knowledge about growth rates and feeding areas for these very young animals. He will also be able to gather data about their fidelity to their original hatchling sites.

I hope this brief summary of some of George's work will indicate his contribution to the world of chelonia. I cannot recommend George Balazs to you highly enough; the generosity he displays in sharing his great wealth of knowledge with groups and individuals all over the world is amazing, as is the incredible energy with which he works. He has been responsible for the return of the green turtle nesting on O'ahu and conserving the species in Hawaii; he must be one of the leading authorities, if not the leading authority on green turtles. He is a true 'friend' to these wonderful creatures.

Anne Rowberry, Conservation Officer BCG 2010
Editor's note: this citation takes a more detailed form than in the past. It was submitted fully referenced, and the complete version is available on request.

George Balazs on a green turtle mission

TESTUDO Vol. 7, No. 3 2011

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Cover photo: *Geochelone nigra* 'Two Heads' at Rotterdam Zoo.
Photo by Henk Zwartepoorte

TESTUDO

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The Journal of the
British Chelonia Group