

## NEW ANALYSIS HIGHLIGHTS HAWAII'S GREEN TURTLE RESILIENCE TO TUMOR-CAUSING DISEASE

If you have encountered Hawaii's green turtles (known in Hawaiian as honu) while diving or snorkeling, chances are you have seen them with tumors on their skin. Since at least the late 1950s, the honu has been seen with these tumors, which are caused by a disease called fibropapillomatosis (FP). FP is the

main known cause of turtle strandings in Hawaii. There is no doubt that this disease affects individual turtles.

However, green turtles have been known to recover from FP, and the population has rebounded even in the presence of these tumors. A new analysis conducted by Milani Chaloupka, PhD, reveals that this disease has not caused a population decline even in an area considered to be a global FP hotspot.

The analysis used data from a long-term monitoring project spanning from 1982 to 2010 at the Pala'au foraging ground off Moloka'i. The monitoring project was led by George Balazs of the Pacific Islands Fisheries Science Center, working closely with several Moloka'i fishing families. Over the course of nearly 30 years of monitoring, thousands of individual immature green turtles were tagged, measured and checked for FP disease status. Turtles with FP were found to have lower annual apparent survival probability compared to those that were disease free, but the long-term population trend at this foraging site was found to be stable over time at approximately 1,860 immature turtles.

Consistent with previous studies, FP disease prevalence at the Pala'au foraging population increased following an outbreak in the early 1980s. At least 46 percent of the Pala'au population was affected by FP by the disease's peak in the mid-1990s, followed by a gradual decline.

The honu population has shown a remarkable rebound in the face of a chronic disease that was once feared would bring demise to the population.

Green turtles in Florida have also experienced high rates of population increase despite being the other global hotspot for FP. This highlights the resilience of green turtle populations to persist through significant threats.



A green turtle photographed in 1993 with tumors (A) and the same turtle photographed tumor-free in 2004 (B). Photo credit: Peter Bennett and Ursula Keuper-Bennett, [www.turtles.org](http://www.turtles.org).

## A CASE FOR HONU MANAGEMENT

Hawai'i, like much of the world that has green sea turtles (*Chelonia mydas*) in their environment, traditionally harvested the animal as food. Culturally, honu (Hawaiian green sea turtle) is an important part of the diet of native Hawaiians. In the early 1970s, about a decade after Hawai'i statehood, the argument was made that commercial harvest of green sea turtles was causing a precipitous decline in the honu population. The State, recognizing the importance of the animal as a traditional food, sought to allow home consumption. The State banned the commercial harvest of honu and implemented a permit system and catch limits to control the harvest and manage the species.

Then in 1978, the federal government listed honu and most of the world population of green sea turtles as "threatened" under the Endangered Species Act (ESA). A "threatened species" is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. An "endangered species" is one that is in danger of extinction throughout all or a significant portion of its range. The State argued for the continuance of home consumption of honu, but the federal authority of the ESA did not allow it.

be foraging in areas that that they were not known to frequent, areas that were occupied by other species and other species complexes. Recent research indicated that some foraging populations have reached the carrying capacities of their environment.

A recent green turtle review by the National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (FWS) recommended an analysis be conducted to determine the application of the DPS policy to the green turtle. If the population is determined to be a DPS and then delisted, the species can be managed by the State of Hawai'i rather than the federal government.

The required timeline for the Secretaries of Commerce and the Interior to respond to petitions is outlined in the Code of Federal Regulations (Title 50, Section 424.14):

- Within 30 days of receiving the petition, the Secretaries must acknowledge the receipt in writing.

- Within 90 days of receiving the petition, the Secretaries must publish a "90-day Finding" as to whether the petition presents substantial scientific or commercial information suggesting that the petitioned action may be warranted. [NMFS and FWS issued the 90-day finding on the petition to designate Hawaiian green turtle as a DPS and delisting it on Aug. 1, 2012, i.e., about 165 days after receiving the petition.]

- If the 90-day Finding indicates the petitioned action may be warranted, then NMFS and FWS will initiate a status review and will also provide opportunity for public comment at this time. [NMFS and FWS accepted public comments on the

90-day finding until Oct. 1, 2012, i.e., the public had about 60 days to comment.]

- Within 12 months of receiving the petition, the Secretaries must publish a "12-month Finding" and in most cases will make the finding that a) the petitioned action is not warranted (no DPS designation and no delisting) OR b) the petitioned action is warranted and publish a proposed rule for DPS and delisting. If a proposed rule is published, a public comment period will follow. [On March 23, 2015, i.e., 37 months after

receiving the petition, NMFS and FWS published a proposed rule that divides the population of green sea turtles into 11 DPSs and maintains the threatened status for the honu while upgrading two other DPSs to the endangered status.]

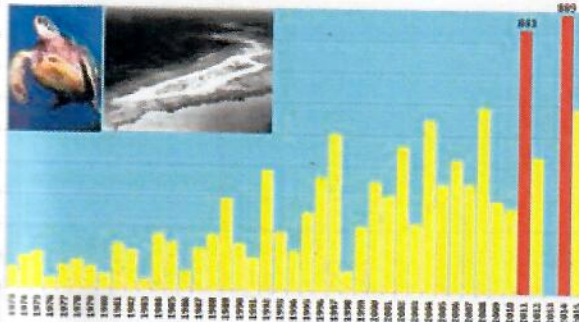
- Within a year of the proposed rule publication, the final rule will be due. [While the proposed rule should become final on March 23, 2016, an additional six-month extension has been requested to review the science used for the finding.]

Each of the above actions occurred well outside the required time, and a final rule is still being developed. Many of the public comments in response to the 12-month finding challenged the scientific justification for continuing ESA listing for the honu. The honu could and should be an example the successful application of the ESA when so few listed species are recovered. Instead, delays and an apparently arbitrary, indiscriminate use of science have delayed the finding of recovery.

The purpose of the ESA is to recover species, which for various reasons, are on the cusp of extinction. Oftentimes the reason for the depletion is the impact of human activities on the species or on the natural environment on which the species depend. It would be logical to assume then that recovered species could be protected under another regulatory regime. This would ease the cost of enforcement for a species no longer in danger of extinction and allow management of the resource so that the ecosystem can be maintained in a balance beneficial to the community. Without management, the ecosystem goes through cycles of abundance and scarcity, with species populations rising and falling depending on the availability of forage and habitat. When a population rises to the point of depleting its food sources, it will crash and the cycle will start again. This natural function can be exacerbated or enhanced by periodic naturally occurring events such as El Nino, La Nina, decadal oscillations and storms as well as anthropogenic causes. The point of management is to smooth out the effect of those events and keep resources abundant and sustainable.

The ESA is a tool that can be used to protect species that are seriously threatened with extinction, but it is not the tool to manage a recovered species or an ecosystem. True, some species will never be delisted and may go extinct while protected by ESA. The honu is not one of them.

Green Turtles Nesting at East Island, French Frigate Shoals, 1973-2015



Nesting at East Island in the French Frigate Shoals, Northwestern Hawaiian Islands, represents about half of all nesting activity in Hawai'i. Hawaiian green turtles nest approximately every four years, and it is natural to see high and low years over a several year cycle. Nesting in 2014 marked a record at 889 nesting females. 2015 represents the highest "low" year in 42 seasons at nearly 500 nesting females.

On Feb. 14, 2012, the Association of Hawaiian Civic Clubs filed a petition to determine if the honu was a distinct population segment (DPS) of *C. mydas* and petitioned for it to be delisted as no longer threatened. A DPS is the smallest division of a species permitted to be protected under the ESA. All Hawaiian green sea turtles nest in the Hawai'i archipelago, most in the Northwestern Hawaiian Islands. Numbers have increased. Tagging studies show that the adults remain near the Hawaiian Islands. Honu have been reported by community members to