

A PLAN FOR THE OCEAN RELEASE
OF 1-YEAR-OLD HAWAIIAN GREEN TURTLES RAISED IN CAPTIVITY

By

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Background

On September 8 and 19 of 1980, 235 green turtle, Chelonia mydas, hatchlings were collected at French Frigate Shoals in the Hawaiian Islands National Wildlife Refuge and transferred to Sea Life Park on Oahu for captive rearing under a 1-year contract from the National Marine Fisheries Service. Under a separate contract from the National Marine Fisheries Service to Dr. John Hendrickson, a scute grafting experiment was carried out on the hatchlings with the objective of developing a contrasting mark that would remain visible as growth occurs. The final results of this study will be reported elsewhere by Dr. Hendrickson.

Approximately 175 turtles with a mean carapace length of 25 cm will be available for return to the wild upon completion of the contract with Sea Life Park. An opportunity therefore exists to undertake a small "head starting" study designed to gain additional information on the survival, growth, and movements of juvenile Hawaiian Chelonia after having been raised in captivity.

The head starting of sea turtles is currently an unproven conservation practice that nevertheless offers some potential for aiding in the recovery of depleted populations. The basic procedure involves the captive rearing of hatchlings for varying periods of time, with the intended objective of reducing the high natural mortality believed to occur during the early life stage. Head starting conducted in other areas of the world has shown that at least some of the released turtles have the ability to grow and survive in the wild. No turtle from a head-starting project has as yet been recovered as an adult, but this may be due in part to the loss of identification tags placed on the turtles at the time of release. The recovery of such a turtle as a breeding adult will be an encouraging sign. However, in order to be considered a valid and proven conservation technique, head starting must (in the author's view) be shown to 1) result in the recruitment of adults to an established breeding colony at a significantly higher rate than would occur under natural conditions or in the absence of head starting, or 2) create a new breeding colony without significantly reducing the established colony where the hatchlings were originally obtained for head starting. An evaluation of the efficacy of head starting will therefore require knowledge of existing recruitment rates for use as a baseline comparison.

*Scientific
Statement*

The head starting of Hawaiian Chelonia has only been undertaken on a limited scale as a secondary research objective in projects conducted between 1972 and 1977. A total of 104 tagged turtles was released during this period. A summary of the results of this work appears on pages 49-50 of NOAA-TM-NMFS, "Synopsis of biological data on the green turtle in the Hawaiian Islands." A more detailed account, including all tag recoveries made to date, is available in manuscript form from the author.

Recommendations

A prime consideration in the head starting of the 175 Hawaiian Chelonia is the locations where release into the wild will take place. Habitat should be selected where turtles of approximately the same size are known to naturally occur due to the availability of food, shelter, and other essential ecological characteristics. In addition, releases should be in areas where the natural growth rates of turtles are known to be comparatively fast, and predation rates are believed to be low. Another criterion of importance is that at least some of the release sites should also be existing study areas where turtles are periodically live-captured for tagging and tag recovery purposes. Of course there is no assurance that head-start turtles will stay at the place where they are released. Based on earlier studies, an initial period of wandering may be undertaken before residency in a coastal foraging pasture is established.

Taking all of the above factors into account, the ecologically-sound choice would be to release the majority of the turtles at coastal locations in the main Hawaiian Islands, as opposed to the northwestern segment of the archipelago. The specific recommendations for release are as follows.

1. The releases should consist of: 30 turtles off Bellows Air Force Station in Waimanalo Bay, 25 off Kawaihoa Beach, and 10 in Hanauma Bay (Oahu total - 65); 20 turtles off Punaluu, Kau District, and 20 in Kiholo Bay (Big Island total - 40); 20 turtles off Nualolo Kai on the Na Pali Coast, and 10 off Kilauea Point (Kauai total - 30); 20 turtles off Kipahulu, Maui; and 20 turtles at French Frigate Shoals.

2. The releases should be carried out from a small boat over offshore reef areas in the case of Waimanalo Bay, and ideally from a low-hovering helicopter for Nualolo Kai. All other releases can be conducted directly from shore.

3. In order to lessen any undesirable human interactions during the turtles initial period in the wild, the releases in the main islands should be on a Monday that is not a holiday, or comes within 2 weeks before a holiday. Normal trade wind weather conditions should be present on the day of release.

4. The turtles should be tagged approximately 2 weeks before the date of release using Inconel identification tags weighing only 3.5 g. At the same time, the straightline and curved carapace measurements of each turtle should be recorded.

5. Dr. Albert Benedict of the Department of Microbiology, University of Hawaii, should be asked to inject each turtle with a harmless antigen he

has developed that can produce a characteristic immunoglobulin capable of being identified at a future date.

6. Starting at least 2 weeks before the date of release, liberal quantities of benthic algae, especially Ulva, Codium, Pterocladia, and Acanthophora, should be regularly offered to the turtles along with their standard captive diet of chopped fish, squid, and trout pellets.

7. The release should be undertaken as a cooperative effort involving the National Marine Fisheries Service, the Fish and Wildlife Service, and the Department of Land and Natural Resources of the State of Hawaii. Appropriate descriptive announcements prepared for the news media should be sent out shortly after the turtles have been released.

G. H. Balazs

Captive Reared 1-Year Old Green Turtles Released into the
Wild as of September 18, 1981

| Location | Date | No. of Turtles |
|-----------------------|---------|----------------|
| Kauai | | |
| Kilauea Point | 9-5-81 | 20 |
| Maui | | |
| Paia | 9-11-81 | 10 |
| Hawaii | | |
| Hilo Bay | 9-11-81 | 25 |
| Oahu | | |
| Bellows - Waimanalo | 9-10-81 | 15 |
| " " | 9-15-81 | 8 |
| Hanauma Bay | 9-9-81 | 10 |
| Chun's Reef | 9-15-81 | 24 |
| French Frigate Shoals | | |
| Tern Island | 9-15-81 | 9 |
| | TOTAL | 121 |

(All from Sea Life Park -
no NMFS turtles remaining
at this facility).

Recommended release sites for the remaining turtles now at Kewalo Basin:

Oahu
9-22 Mokuleia- 10¹⁴
 Kailua Bay- 10
9-24 Makaha- 10¹⁵
Lanai 5
French Frigate Shoals- 10 (air transport not possible until October 20)