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CLEANING SYMBIOSIS BETWEEN HERBIVOROUS REEF FISHES AND GREEN TURTLES (CHELONIA MYDAS) AT PUAKO, HAWAII

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Cleaning Symbiosis between fishes and turtles has been documented in many areas of the world. The increasing population of Hawaiian green turtles (*Chelonia mydas*) has highlighted the occurrence of turtle cleaning stations in waters 10-15 meters in depth at various locations along the west coast of the island of Hawaii. Puako, Hawaii is a designated fisheries management area (FMA), and two turtle cleaning stations have been identified there. Our work centered on one station that has been in existence for at least 15 years, although it has expanded in size over the last three years. This study was conducted from August 2005 to January 2006. The number of green turtles that visited the cleaning station and their behavior were evaluated based on digital video and still shots as well as an in-water Pan Tilt and Zoom (PTZ) wireless remote video camera. A total of 93 hours were spent on scuba at the station, with an additional 23 hours utilizing the PTZ video camera. In order to evaluate the effectiveness of turtle behaviors in attracting cleaner fish, 35 complete cleaning episodes were video taped. Turtles spent an average of 10 minutes per cleaning episode and would often participate in several successive episodes punctuated by returning to the surface to breathe. The predominant species of fishes involved in cleaning were the yellow tang (*Zebrafish flavescens*) (present 81% of time) and the golden eye surgeon fish (*Ctenochaetus strigosus*) (present 88% of time). Occasionally, parrot fish (*Scarus dubius*) (present <1% of time), pink tailed triggerfish (*Melichthys vidua*) (present <1% of time), and black triggerfish (*Melichthys niger*) (present <1% of time) were observed cleaning turtles. Turtle behaviors were categorized as swimming, resting, posing and shifting on substrate. Posing was the most effective behavior for attracting cleaners, followed by swimming, resting and shifting on substrate (relative index of effectiveness 1, .37, .04 and <.01 respectively). Posing while on the bottom attracted an average of 10.2 cleaners while posing in the water column attracted an average of 8.1 cleaners. Using head scale patterns for identification, 102 individual turtles were recorded being cleaned at the station. Fifty-nine (58%) of the turtles were present on 5.8% of the scuba dives, 20 were present on 11.6% and 23 were present on at least 17.4% of the scuba dives. Two turtles were present on 37%, and one turtle was present on 42% of the dives. Time allotted to cleaning behavior by turtles at the Puako station varied greatly among individuals with some visiting the station every couple of days and others once every 7 to 10 days. Identification of cleaning station turtles at other sites occurred on two occasions and indicated that the turtles will travel at least 0.5 km between foraging grounds and the cleaning station. All data indicates that cleaning symbiosis is an important aspect of green turtle biology at Puako, Hawaii. Acknowledgements: AC and AW gratefully acknowledge travel support from Disney Animal Kingdom, Western Pacific Regional Fisheries Management Council, US National Marine Fisheries Service, and US Fish and Wildlife Service through the Symposium Travel Committee.

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