

# EFFECT OF BEACH POLLUTION ON HAWKSBILL HATCHLINGS ONSHORE MIGRATION IN CARIBBEAN HONDURAS

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## ABSTRACT

- We examined the effect of plastic pollution on crawling rates of hawksbill turtle hatchlings (*Eretmochelys imbricata*) in Utila, Honduras (Fig. 1).
- We determined that different densities of pollution impacted crawling rates (Kruskal-Wallis H test).



Fig. 1 - Map of: (A) the Caribbean region, and (B) Utila, Honduras. Pumpkin Hill Beach is on northeast coast.

## INTRODUCTION

- The hawksbill turtle, *Eretmochelys imbricata*, is critically-endangered due to factors such as environmental pollution (Gibbons and Stangel 1999).
- Unfortunately, environmental pollution pose a major problem in Caribbean Honduras (Harborne et 2001).
- Known nesting sites for Hawksbill such as Pumpkin Hill beach in Utila, Honduras have been greatly impacted by such pollution (Dunbar et al., 2013).
- Some studies show impacts of pollution on juvenile and adult stages, yet little is known about impacts on hatchlings (Carr 1987).
- One study observed a reduction of crawling speeds in loggerheads hatchlings with an increase in pollution debris (Triessnig, et al. 2012)
- We investigated the effect of varying levels of plastic debris on the onshore movements of hawksbill hatchlings.

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## METHODOLOGY

- Four corridors (8.5 ± 1.3 m long) with different densities of trash were assembled perpendicular to the waterline of Pumpkin Hill beach (N16.12344°, W086.88614°) (Fig 2.). We arranged corridors with High density (HD), Medium density (MD), Low density (LD), and a Control (Fig 2. and 3.)
- One turtle at a time was taken and placed in a selected corridor. Run time for each hatchling began when the hatchling was placed on the substrate and ended when the hatchling reached the waterline (Fig 4).
- Observers only interfered if the hatchling became entrapped for 300 seconds (5 minutes), and stayed behind the turtle with no movement or light interference.
- When finished, the hatchling were measured for carapace length (SCL) and width (SCW), head width (HW) and flipper length (FL), then released.
- Hatchlings were only used once during the experiment.



Fig. 2 - Model of pollution densities for the hatchling run time study.



Fig. 3 - Pictures of corridors with different densities of pollution: (A) High; (B) Medium; (C) Low; and (D) Control. (E) Treatment corridors separated by driftwood logs. (F) The wire fence placed around the nest to protect hatchlings on emergence.



Fig. 4 - Pictures of hawksbill hatchlings. The two pictures on the right depicts hatchlings running through the various pollution corridors.

## RESULTS

- We found no difference in morphometrics among hatchlings in different treatment groups (1-way ANOVA,  $P > 0.358$ ), but a significant difference in the run time of hatchlings when subjected to different pollution densities (1-way ANOVA,  $F_{(3,31)} = 16.42$ ,  $P < 0.001$ ) with High density of pollution resulting in the longest run time (Fig. 5).

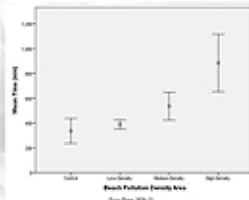


Fig. 5 - Mean run time for hatchlings among the four treatment densities.

While counts of plastic beach pollution were high among all treatment corridors, counts of all pollution at different risk levels were highest in the High density treatment corridor (Fig. 6).

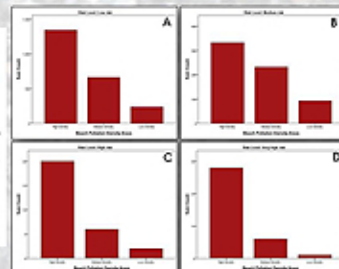


Fig. 6 - Sum counts of pollution items in each treatment density. Items were categorized in four threat risk levels for hatchlings: (A) Low; (B) Medium; (C) High and (D) Very High.

## CONCLUSION

- Plastic pollution may fall within different threat categories for hatchling turtles.
- Increased pollution densities may influence the survival rates of hatchlings by decreasing crawling rates. This decrease could increase exposure time to predators, waste precious energy, and disorient hatchlings.
- Finding methods to decrease plastic pollution on beaches is crucial for the survival of Hawksbill hatchlings.

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