

POTENTIAL IMPACT OF LIONFISH (PTEROIS SPP.) ON DEVELOPMENT HABITATS OF SEA TURTLES AND POPULATION CONTROL STRATEGIES IN BOCAS DEL TORO, PANAMA

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Bocas del Toro is an archipelago located in the northwest Caribbean coast of Panama. It is an area with high marine ecosystem biodiversity, including mangroves, coral reefs and sea grass beds, all key benthic development habitats for sea turtle. Of the four sea turtle species present in the region, *Dermochelys coriacea*, *Eretmochelys imbricata*, *Chelonia mydas* and *Caretta caretta*, all but *D. coriacea* have been documented in benthic developmental stage at many sites.

Potentially competing for these ecosystems are the invasive lionfish species *Pterois volitans* and *P. miles*. Native to the Indo-Pacific, they are highly predatory to native species, and will quickly reproduce and colonise an area due to the absence of natural predators. Since their first report in Florida in the mid-80's, lionfish have been invading the Caribbean Sea and the Western Atlantic causing great ecological problems; they were first registered in Bocas del Toro in 2009. La Autoridad de los Recursos Acuáticos de Panamá (ARAP) is a public Panamanian institution that organises lionfish catching tournaments in Bocas del Toro to reduce its population and provide an alternative food source to mitigate overfishing of threatened species. Since 2015 there have been six tournaments, observing the presence of lionfish in very important fishing sites such as Bocas del Drago and Isla Escudo de Veraguas. Up to 60 native species (around 50 of them in the juvenile phase) have been identified from lionfish stomachs, among them parrotfish species, which graze on toxic algae that poison reefs, keeping the coral healthy. It is estimated that lionfish can consume up to 0 per cent of an area's small reef fish in the space of just five weeks. They also feed on crustaceans, species that are a basic element of sea turtle's diet in developmental stages. The impact of lionfish on marine ecosystems and food availability, in addition to human impact such as fisheries (including sea turtles hunting) and pollution is a major problem for the survival of sea turtles in Bocas del Toro. The Sea Turtle Conservancy (STC) conducts sea turtle research and conservation programs in many countries, including Florida, Nevis and Bermuda, in addition to Bocas del Toro. Lionfish have been documented in very high numbers at these locations, and due to their potential threat to sea turtles, STC collaborates with different public institutions and private organizations to create strategies to manage their impact. The current abundance of lionfish in Bocas del Toro is not at the levels observed in other Caribbean regions, so population control strategies, if implemented quickly, may be more effective. Data obtained during previous lionfish campaigns and one planned in Bocas del Toro for November 2017 by ARAP and other organizations will be used to study distribution and abundance of lionfish in the region, length, weight, and stomach content analysis. Distribution will be mapped and compared to areas known to support sea turtles in benthic developmental stage. The other parameters will be evaluated to understand how the lionfish population is evolving. At the same time, outreach and educational strategies are being designed to promote the local use of lionfish as a handicraft and food resource through workshops, presentations, fishing and cooking contests, among others. The implementation of these strategies is expected to reduce sea turtle hunting by giving an alternative resource to local fishermen and communities. Also, reduction of lionfish populations will help restore the natural biodiversity of mangroves, coral reefs and sea grass beds, which will provide a stable food resources and habitats for sea turtles.