



# Senses

*Today it's an idea. Tomorrow it's reality.*

## 7Senses Foundation Project Report

### 1. Short description

*During the 7Senses project we conducted a short research on a lionfish trapping program through the use of traditional Antillean arrow head traps. The budget was used to build about 20 traps, of which 10 were made as traditional arrow head traps without any modification. The other 10 traps were built in the same style, however, with the addition of three funnels with a diameter of 7inch. The reasoning behind the extra funnels was to prevent aggregation of lionfish around the trap by giving multiple entrances to the trap and escape options to by-catch. Inside the traps an orange Fish Attracting Device was used to give more structure inside the trap to attract lionfish. Finally, the traps met all the requirements written by law. The traps were hauled every 7 days and placed at a depth ranging from 80 feet to 350-375 feet on the East side of the Saba Bank.*

### 2. Problem statement and reasons for the project

*The lionfish is an invasive species that has spread through the Caribbean and has negatively affected fish populations around the reef. In two decades since 2005 the population of *P. volitans* has expanded rapidly throughout the Caribbean with the highest density in the reefs of the Bahamas. Limited population control is being implemented through spear fishing, which has resulted in reduced numbers of lionfish on sites where regular lionfish hunting takes place. However, this effect is most likely local in nature and limited to the depth that scuba divers can reach without resorting to the use of technical diving skills. Invasive lionfish are both unique and effective predators of small fishes and crustacean, with the use of their elongated pectoral fins they are able to herd their prey and give them the opportunity to ambush their prey. Atlantic native fish are not used to such a predator in their evolutionary history, this explains why invasive lionfish have a higher consumption rate than native predators inhabiting the same habitat. Moreover, the lionfish has no natural predator in the Caribbean. Altogether, a broad combination of different traits makes the lionfish strong interactors with native fishes impacting commercially important fish species and marine ecosystems, such as coral reefs. Traditionally the lionfish has not been of commercial value in the Caribbean, but with the new influx of speared specimens a small niche market has developed, whereby local restaurants have been starting to put lionfish on the menu.*

*However, on the Saba Bank, most likely similar to other places in the Caribbean, commercial fishermen are catching lionfish in their 'red fish' (several species of deep-water snapper), indicating that at depth these fish also occur in potentially large numbers. This finding was corroborated by visual sightings in a submersible surveying Bonaire waters finding large numbers of lionfish between 50 and 300 meters of depth, inaccessible to humans without the use of advanced diving gear or submersible vessel.*

*There has been some research aiming to develop traps specifically aimed at lionfish in order to catch them from greater depth. Many individuals have designed traps and several organizations have been able to enhance the design into traps that could potentially catch large numbers of lionfish per trap.*

*Saban fishermen have seen a decline in 'red fish' populations over the past decades and have unanimously agreed to implement a closed season on the Saba Bank in which no 'red fish' trapping is allowed for 6 months. To investigate possibilities for a viable commercial alternative, a pilot project to commercialize lionfish trapping on the Saba Bank will be investigated. This concept was discussed with fishermen and all fishermen support the project.*

### **3. Project approach**

*We used a total of 30 traps of which 10 went missing of which the cause or reasoning of it is unknown. The longest soaking time was 21 days. Originally most of the traps were placed at a depth of 80-90 feet. Through the study we added up extra length to the rope to reach depths of 120-130 meters. One fishermen participated in the research by providing boat assistance almost every week for about 7 to 8 months (\$100 per day and kept all the by-catch that he was able to sell). The traps were placed on the East side of the Saba Bank. Most of the materials were bought from a local supplier in St. Maarten and other materials were important from Atlantic & Gulf Fishing Supplies in Miami.*

### **4. Execution of the project**

*We started with 20 traditional/Antillean arrowhead traps. After the first couple of weeks the traps were lost and only found a couple weeks ago (end of October) by one of our fishermen. The deployment of the traps started in May and will be ended by mid-December so we can start the experimental design again to be able to show significant results and exclude factors that may have been influencing our catches. Traps were hauled with the help of fishermen by supplying them with a \$100 compensation for hauling our traps weekly.*

### **5. Results of the project**

*A total of a 166 lionfish were caught during the 20 weeks of hauling. The average size of lionfish caught was approximately 28 cm at an average depth of 225 feet/69 meters. All local restaurants on Saba have a demand for lionfish. Brigadoon, a restaurant located in Windward side of Saba, has a constant supply of lionfish and has lionfish year-round on their menu. Prices on Saba are mostly USD \$4/lb, but can differ throughout the Caribbean region and up to New York in the United States. Prices in the United States can go up to USD \$30/filet. Neighbouring islands of Saba, such as St. Maarten will buy lionfish for USD \$5-8/lbs. St. Barts has a policy on food quality for lionfish because of the presence of the ciguatera toxin in the lionfish meat. This prevents Saban fishermen from selling the lionfish caught on the Saba Bank to St. Barts. As far as we know today, lionfish from the Saba Bank does not have ciguatera and does not pose any threat to human health. To prove the concentration of the ciguatera toxin samples from lionfish will be collected and tested.*

## **6. Communication results**

*Most communication was done through word of mouth and a few events were hosted by Ayumi Kuramae and volunteers to bring awareness about the lionfish to the public. Interesting catches and results were places on Facebook and Instagram. The project is being promoted through word of mouth, through regional network, and through the Oceanwitness and private website. For the future, the project will be promoted through social media (e.g. Facebook) by regular posts and video's.*

## **7. Effects for nature conservation and local population**

*By removing the lionfish from the ecosystem we might be stimulating the survival rate of juvenile local (commercially important) fish species. We hope to stimulate fishermen to get an alternative source of income through the years.*

## **8. Project successes**

*Our traps are catching lionfish, however, not on the scale that have have hoped. I am still running analyses on the catches and I cannot provide concrete results yet. For us to be able to provide good recommendations and results, we need to continue this study for a longer time period, have time to adapt the traps and do the experiment over again. The other thing that makes this project very successful, is the use of gear that fishermen are already using by having minor adjustments so fishermen will not need to invest in new gear to be able to target species. As I call it: "innovative gear technology" for fishermen which they have more trust in then having a totally new design to be introduced.*

## **9. Challenges and limitations**

*One of our biggest limitations was to rely on fishermen to haul our traps and pay them to do the job. Saba Conservation Foundation could have invested in a portable winch or to use a part of the budget to push for the placement of the hydraulic winch on our Saba Bank boat, the Queen Beatrix II. Another very important challenge was the theft of the traps/hauls by our own fishermen or neighboring islands. We had lost 7 traps at the beginning of our project, however suddenly the traps were found back by a fisherman by his own trap line. Because we have relied on fishermen, it was not feasible for us to redo the deployment on the same deployment site, to have repetition to create better results. Our work has also been set back by the delivery time of the materials, since it may take up to 3 weeks for materials to arrive on Saba.*

*Our two most important challenges were bycatch and depth. Bycatch is very high and at certain depths the traps are catching a high number of snappers, a species we are trying to prevent catching. A solution for this would be the introduction of escape gaps, which have proven to be successful by a previous study done by Martin de Graaf.*

## **10. Conclusion**

*Our research/project has proven to be working for lionfish. Although we have a couple of challenges, those challenges can be taken away by continuing the project for another year. With a relatively small research budget, we can continue our work with adaptations to the traps and prove the successfulness of a targeted fishery on the lionfish.*