



# Rethinking the Trap

## *(And Other Advances in Lionfish Control)*



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NOAA Office of National Marine Sanctuaries



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# INVASIVE LIONFISH BY THE NUMBERS

## BIOLOGY

**50,000**  
EGGS EVERY 3 DAYS

**1 YEAR**  
to maturity

**30 YEAR**  
LIFESPAN

**18**  
venomous  
spines

## DISTRIBUTION

**17X** DENSITY in Atlantic  
vs. native Pacific range



## CONTROL

**164** restaurants  
SERVING  
LIONFISH

**28,770** lionfish  
REMOVED  
during REEF sanctioned lionfish derbies

**51,420** lbs  
command of lionfish caught in U.S.

## IMPACTS

### INVASIVE SPECIES THREATEN CORAL REEFS



BEFORE INVASION



AFTER INVASION

**OVER 100**  
PREY FISH SPECIES

**5 MILLION**  
PREY FISH IN 1 YEAR

**0**  
KNOWN PREDATORS

LEARN MORE & GET INVOLVED: <http://coastalscience.noaa.gov/research/pollution/invasive/lionfish>

**CAN we do this?**

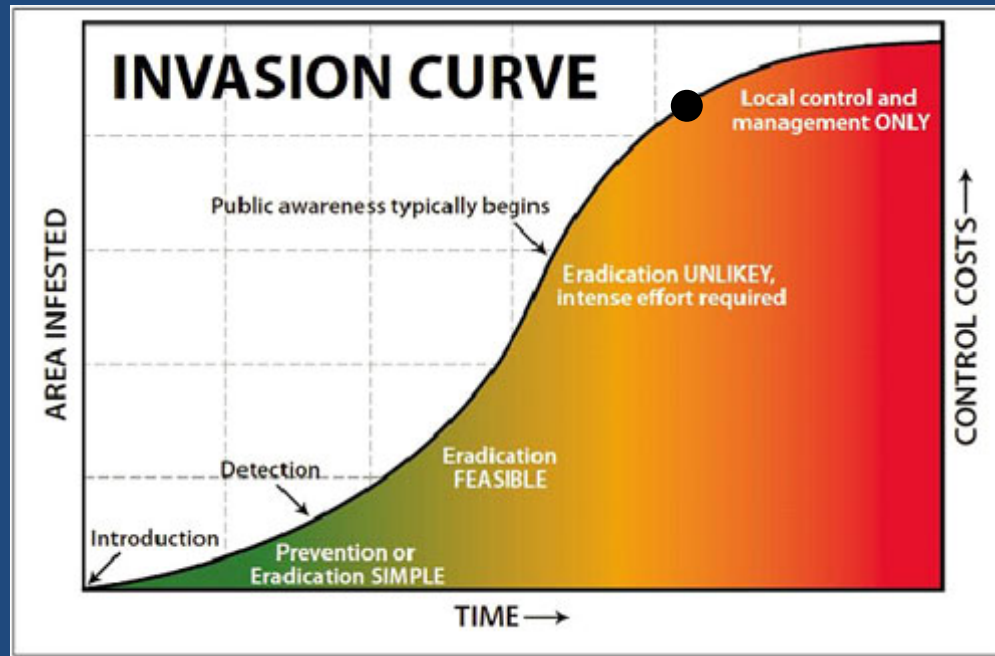


TXSTE



**Demand**  
*I hope we can do this!*

# WHAT CAN BE DONE?



***Eradication vs. Control  
Shallow vs. Deep***



# Genetic Engineering

(lethal genes, sterility)



Too widespread

Too many fish

Pair spawners

Long lived

Not spawning in captivity

Regulatory and social hurdles



***We can do this...***





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***We CAN do this!***

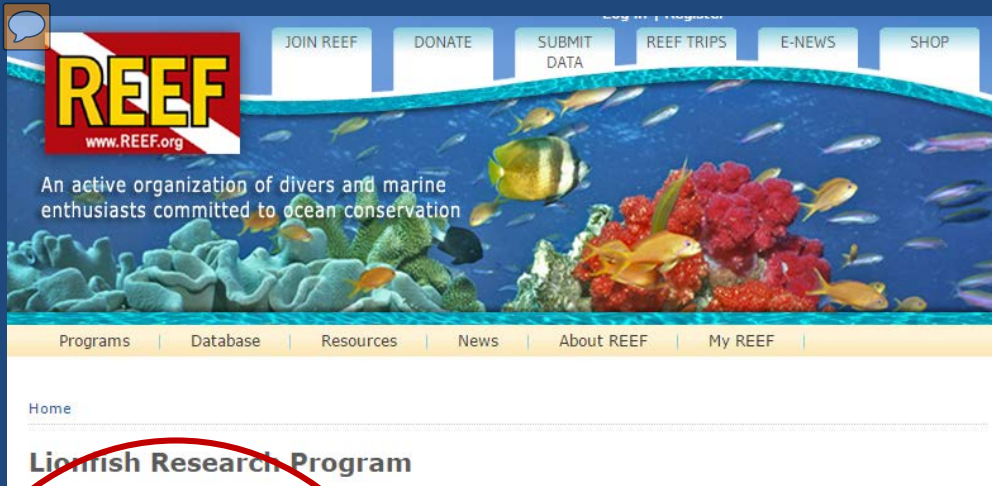








***We want more of this!***



**Lionfish Reports**  
Have you seen or captured a lionfish? Help REEF and USGS track the invasion by submitting a report. You can also use this form to submit details about other non-native marine species seen while diving or snorkeling.

**Lionfish Resources**  
Information on collecting and/or reporting lionfish, safe handling practice preparing and eating lionfish, current research and media attention, and lionfish quickfacts.

**Lionfish Derbies**  
REEF Lionfish Derbies in Florida; including upcoming derby dates, derby team registration, and past results.

**REEF Sanctioned Lionfish Derbies**  
Join this program and host your own successful lionfish derby with our help.

**Lionfish Collecting & Handling Workshops**  
Attend a lionfish workshop and removal dive to learn about the invasion, safe collecting and handling techniques, and to obtain collection permits for the FKNMS SPAs.

**Lionfish Jewelry Workshops**  
REEF Lionfish Jewelry Workshops create a market to promote lionfish participation in this workshop, you are helping to keep our oceans healthy.

**OUR MISSION**

Here at ReefSavers we are committed to using education as a tool to save the reefs of the South Eastern US from the lionfish invasion. We have set out to create a steady market for lionfish throughout the U.S. using effective and sustainable state of the art methods and technology to ensure supply always meets demand. Our approach is addressed through 4 main steps: Control the outbreak of lionfish, Development of a process to make lionfish readily available to the general consumer, Create a desire to serve lionfish in restaurants and homes across the US, and Management of the fishery to make sure we are able to maintain a reef healthy level of lionfish in our waters.

CONTROL	DEVELOPMENT	CREATE	MANAGEMENT
With the help of other nonprofits and commercial fishers, we look to the waters to stop the further outbreak in population. With the creation of the Lionfish Market, this will put a higher demand on the Lionfish and will encourage more sustainable fishery and trade.	We look to develop a centralized wholesale Lionfish market. With the collaboration of other always having a place to sell their catch and in turn raising money for their individual cause. We look to have a market that will be able to sustain itself.	When the ability to have Lionfish readily available to most markets we will set out to create a desire and homes. This will be accomplished through a strategic marketing campaign with live product demos, print ads, and social media.	With creation of the Lionfish Market we will be able to create a variety of private and government researcher. This will include but not be limited to number of Lionfish harvested, size, biology, locations harvested and trade volume.





**We tried this?**

*Jose J. Massis B.*



*Paul Van Pelt*



***Bob and Maria Hickerson***

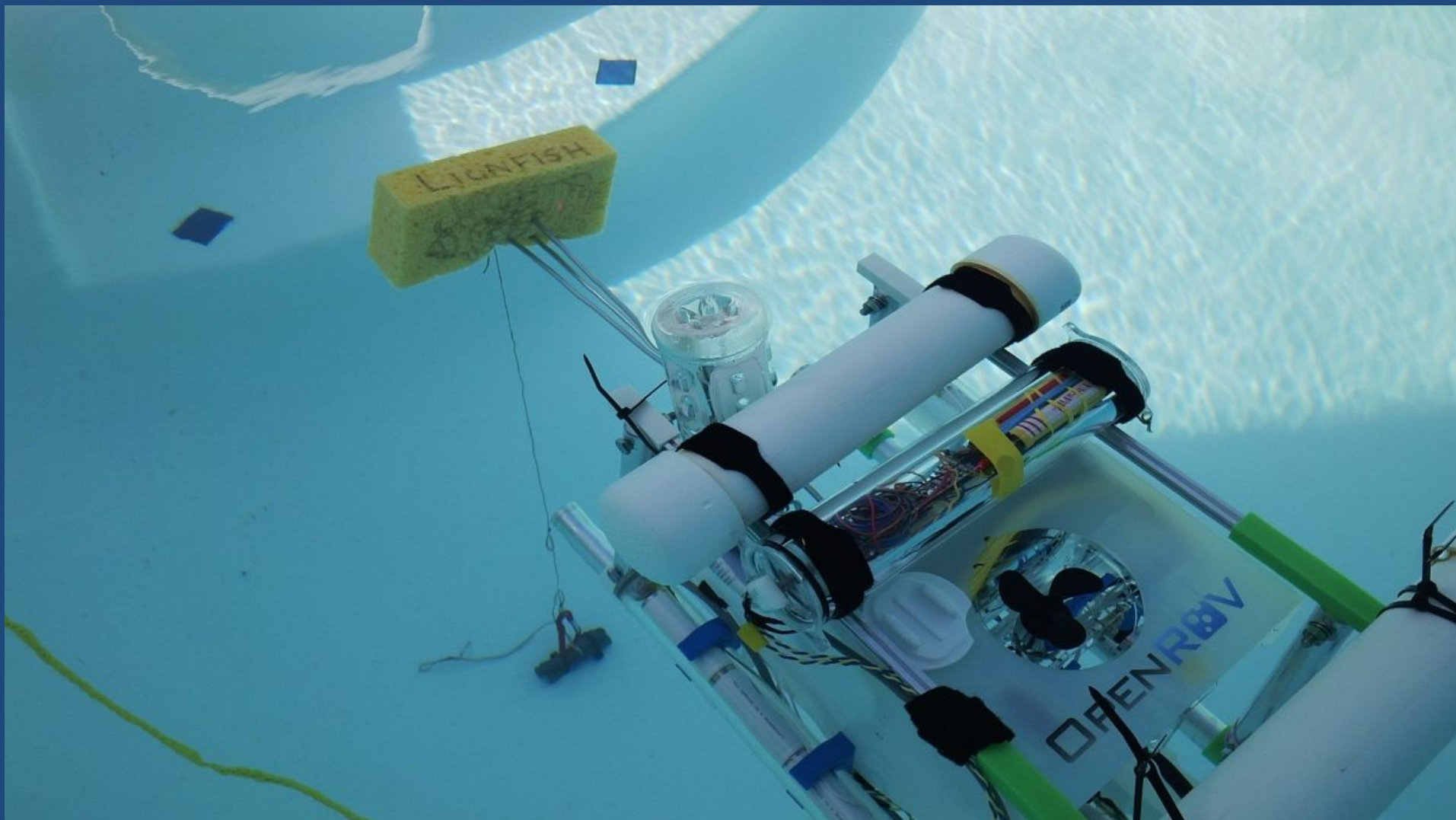




# FTEK Proof of Concept

*(instrumented spiny lobster trap)*



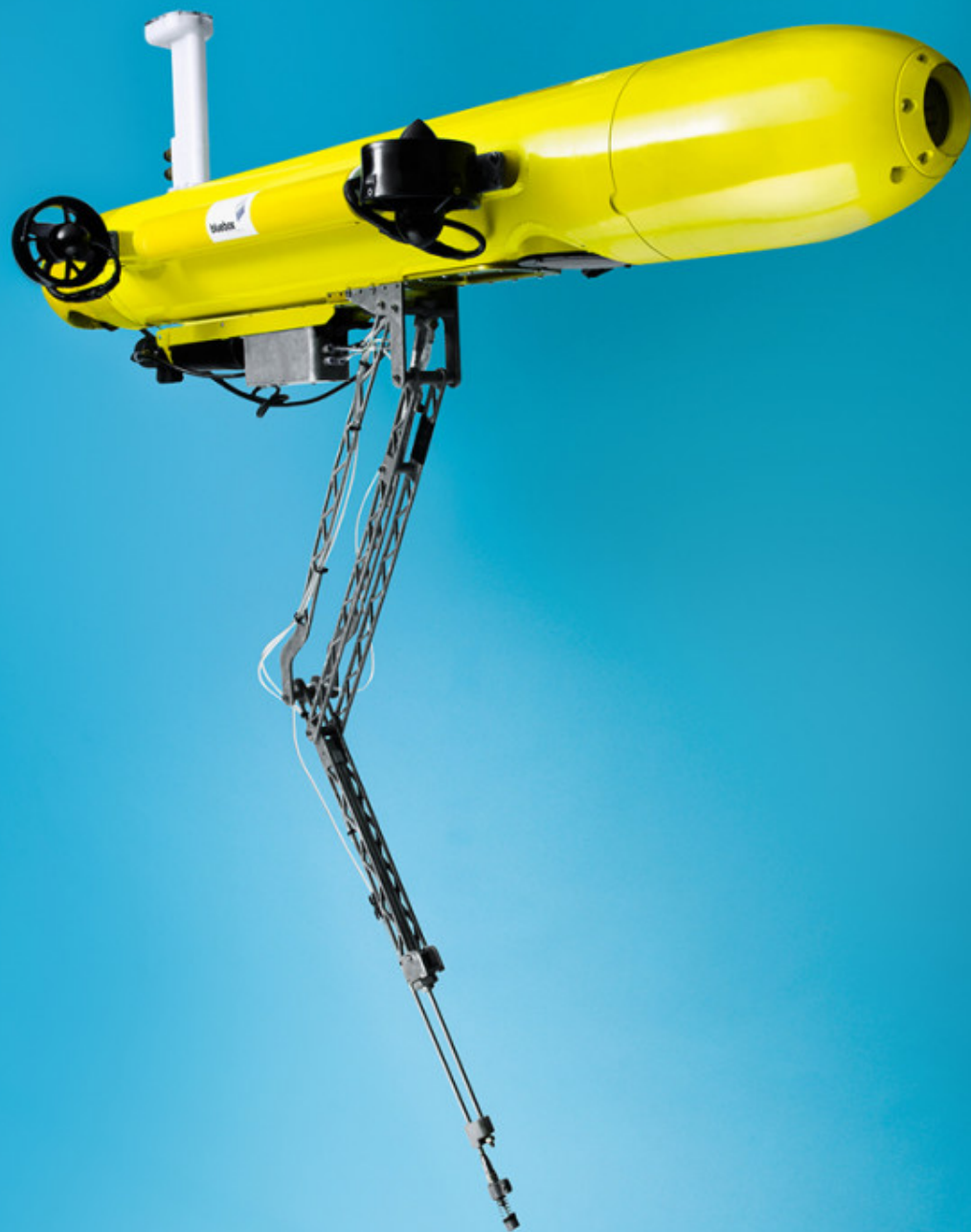






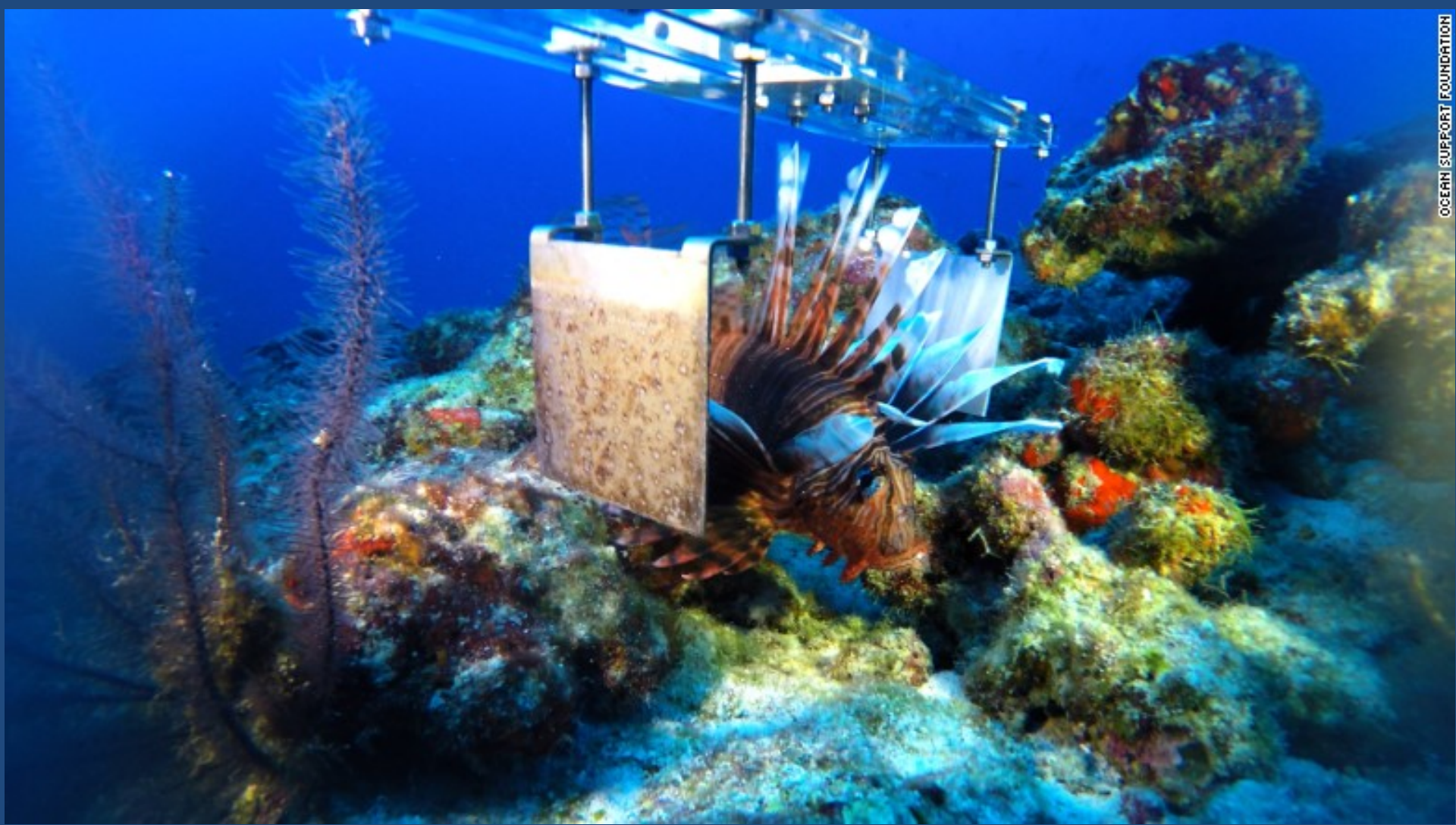


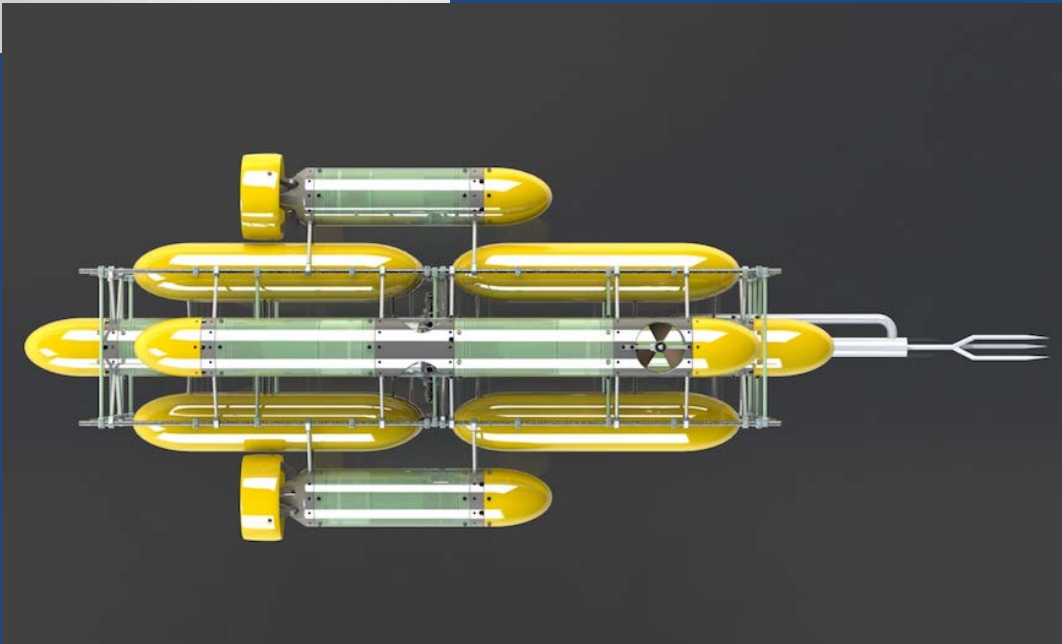
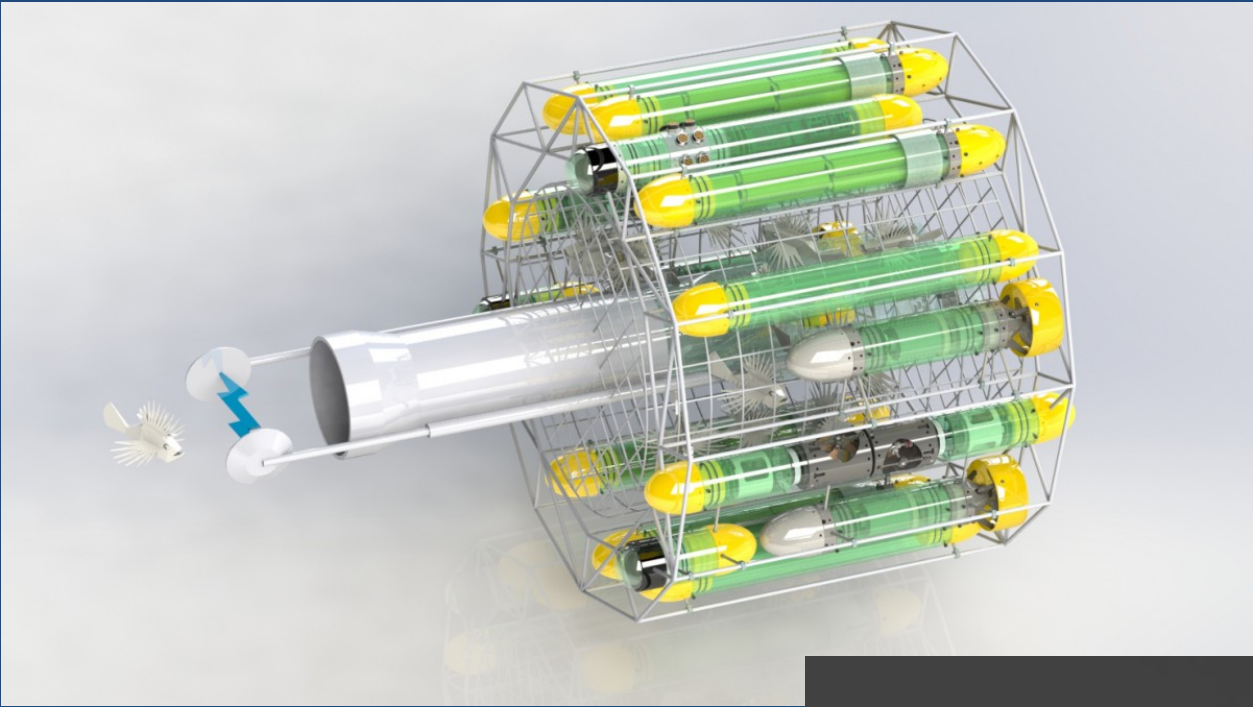




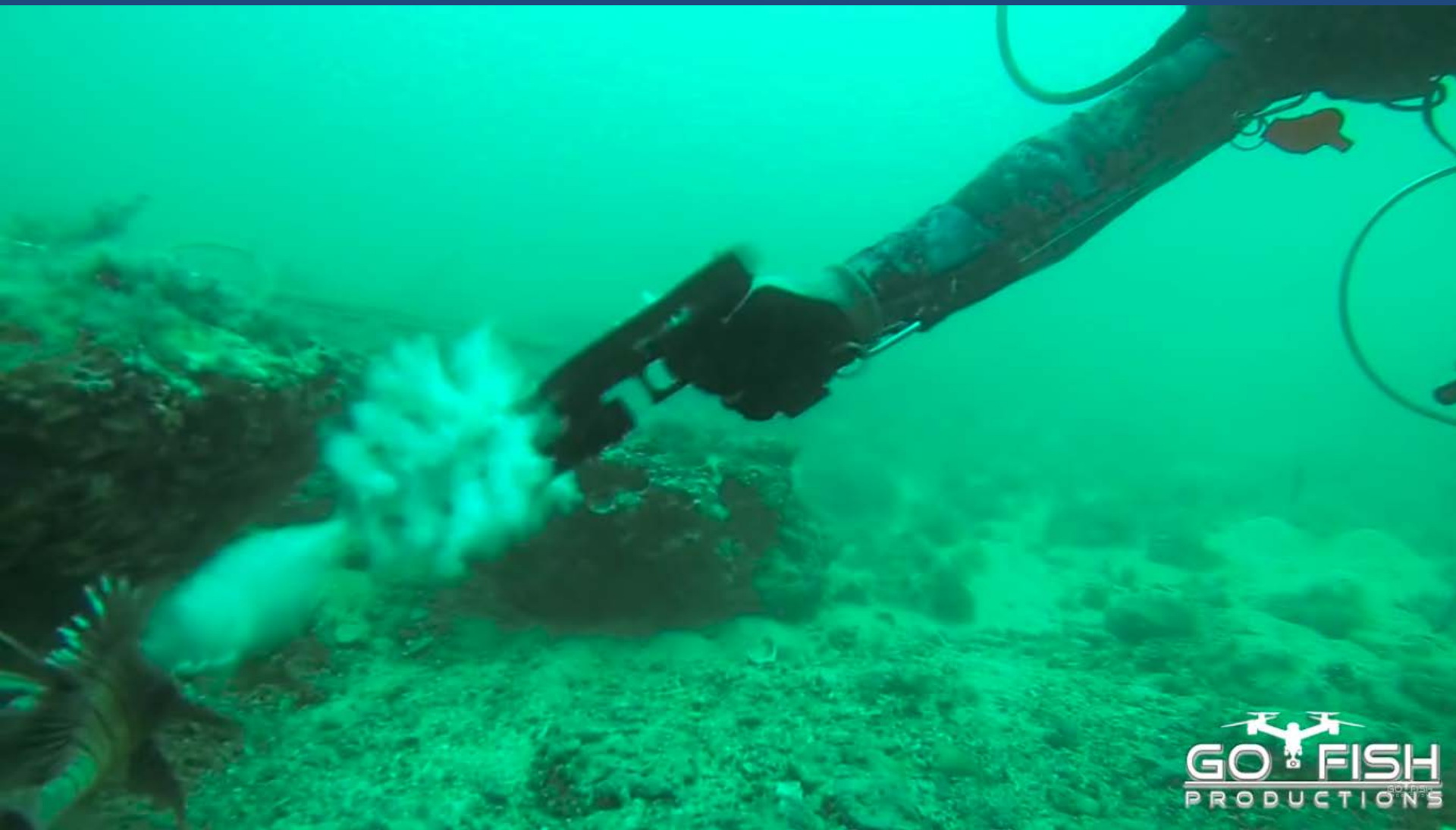
*Grant Harvey*













# What if we try this?

- *Deep water control of lionfish*
- *FAD/LAD-based attraction*
- *Minimize by-catch*
- *Prevent ghost fishing*
- *Transportable on fishing boats*
- *Easy to deploy & retrieve*

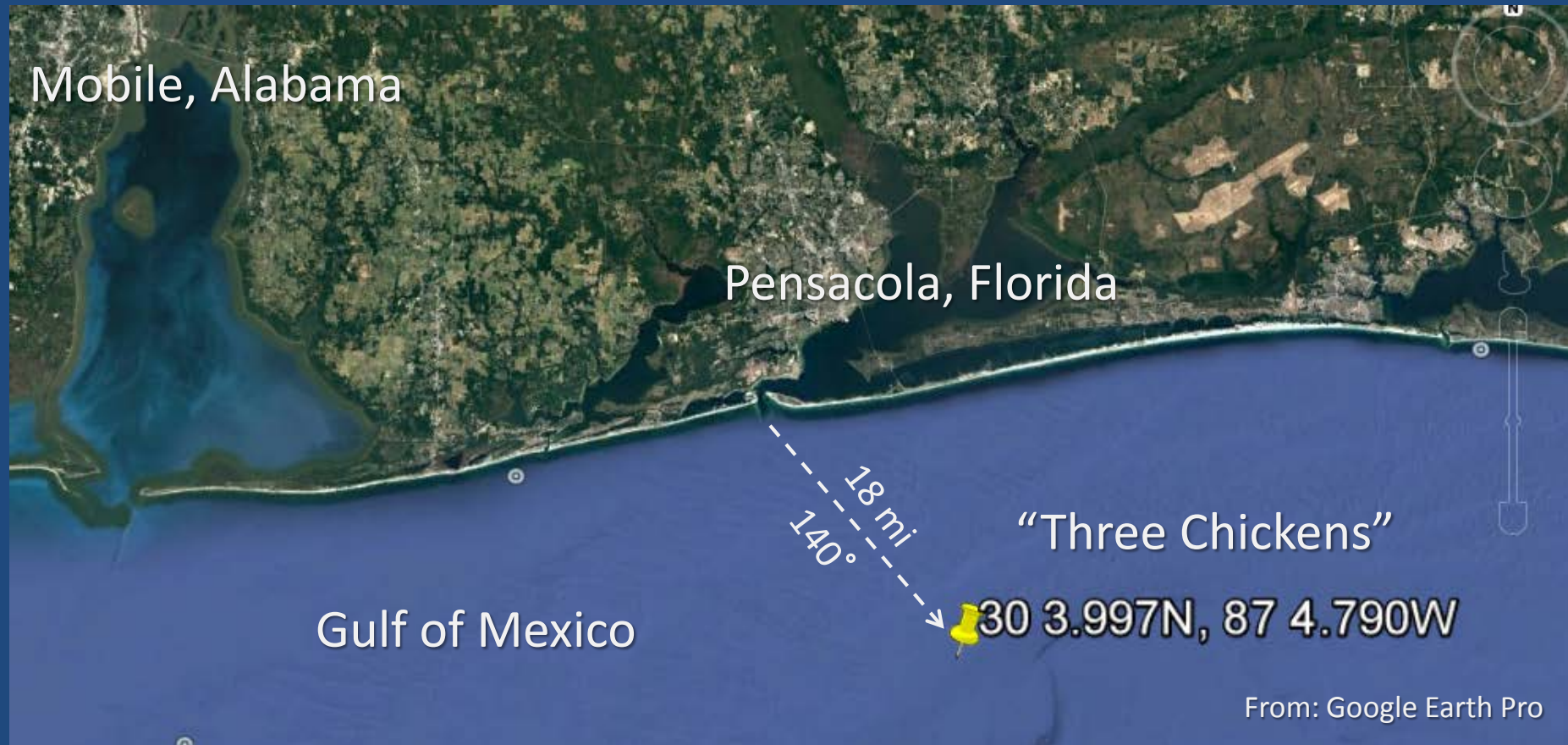


# Prototype II (Cube Trap)

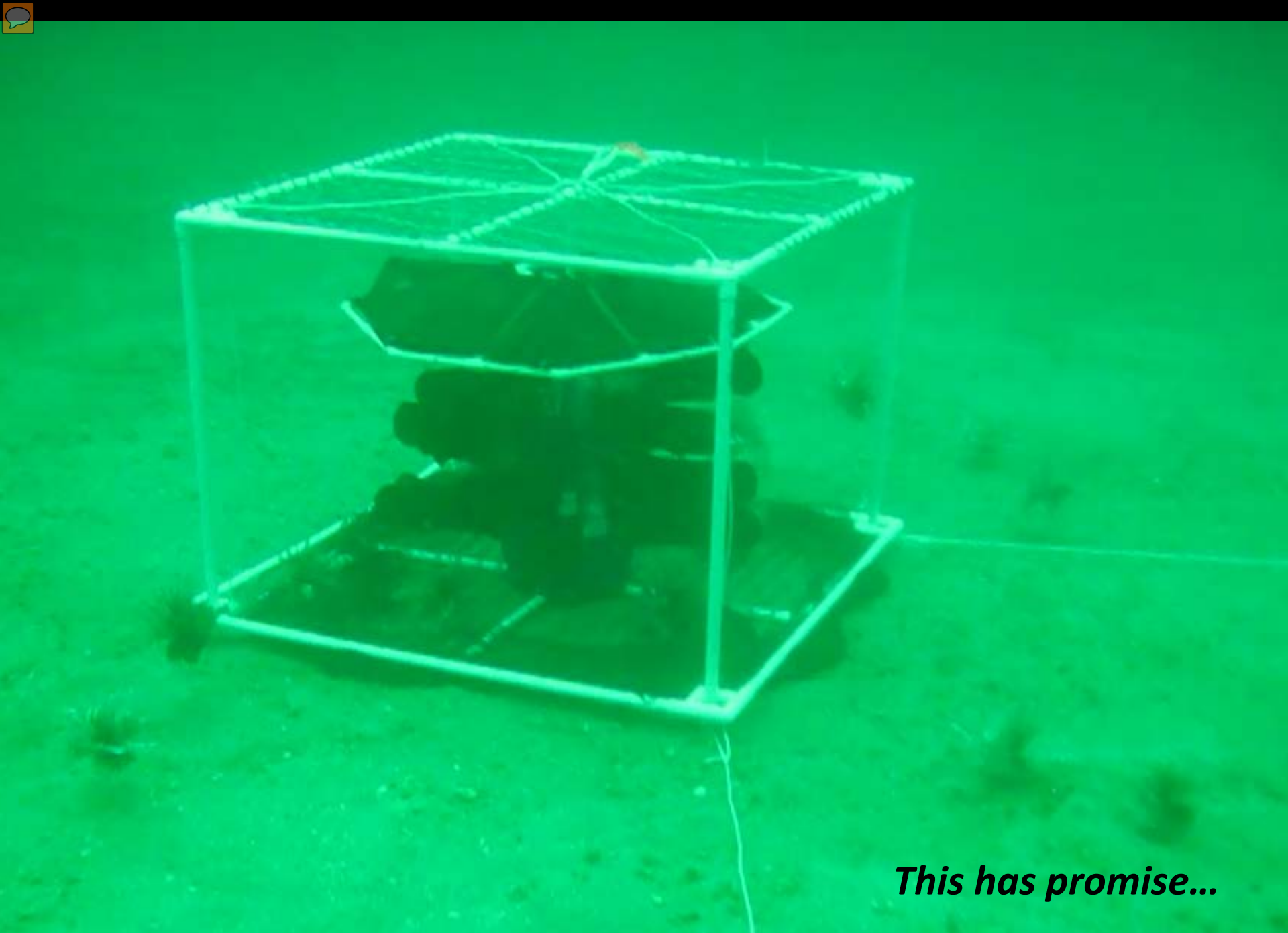
FAD- Based  
Non-Containment  
Curtain Trap



# Field Trials



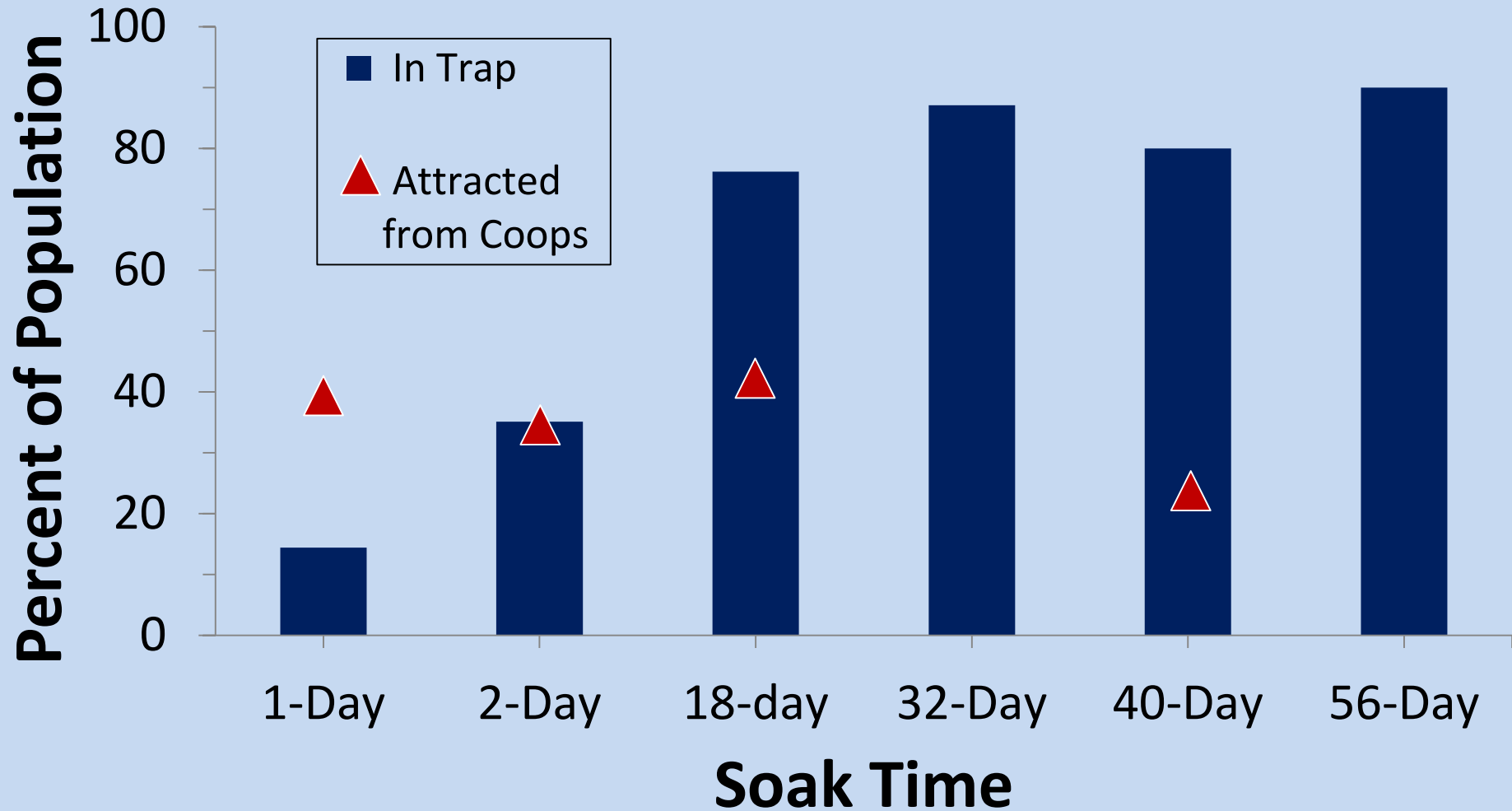




***This has promise...***

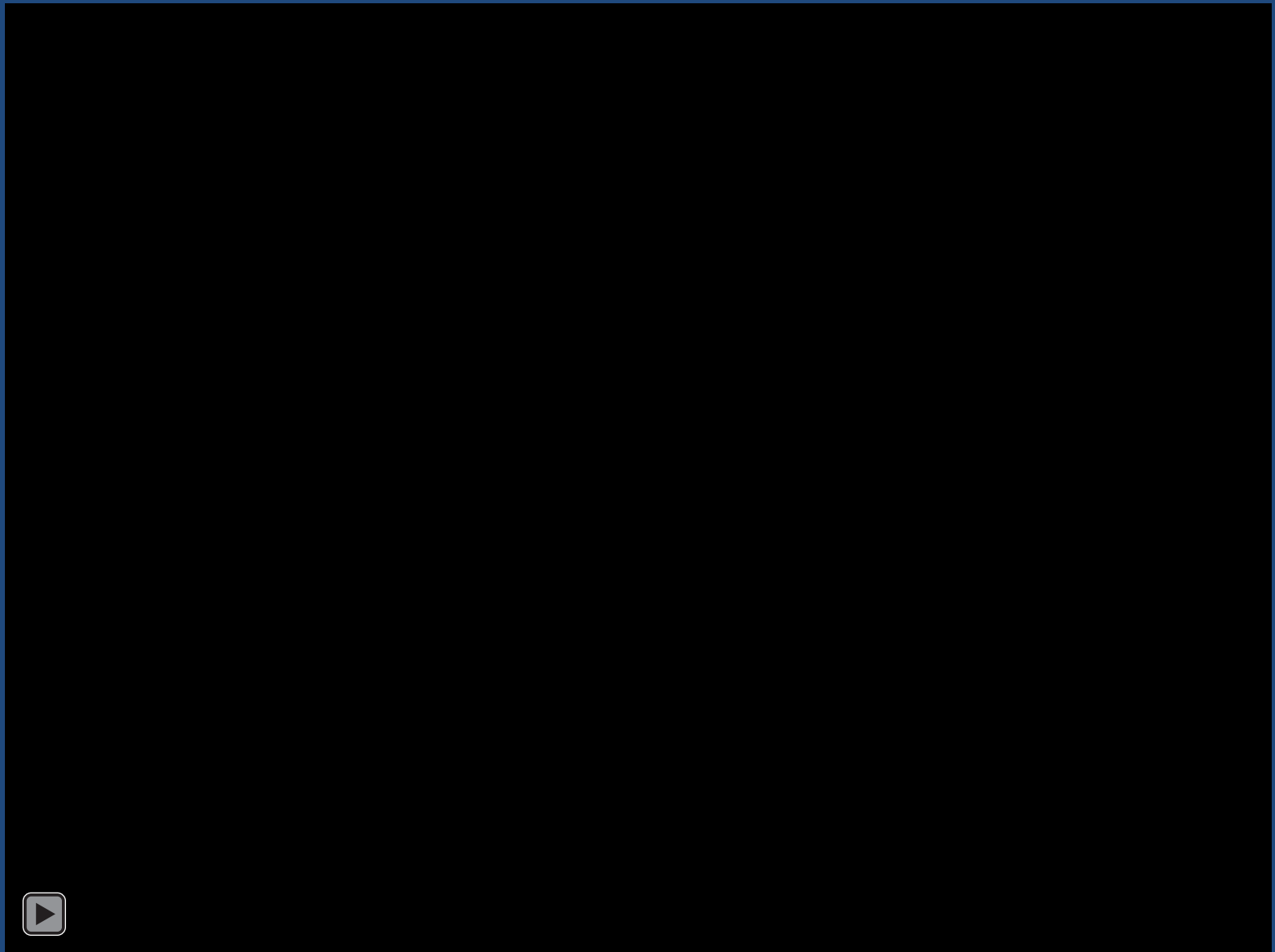


# Cube Trap Data





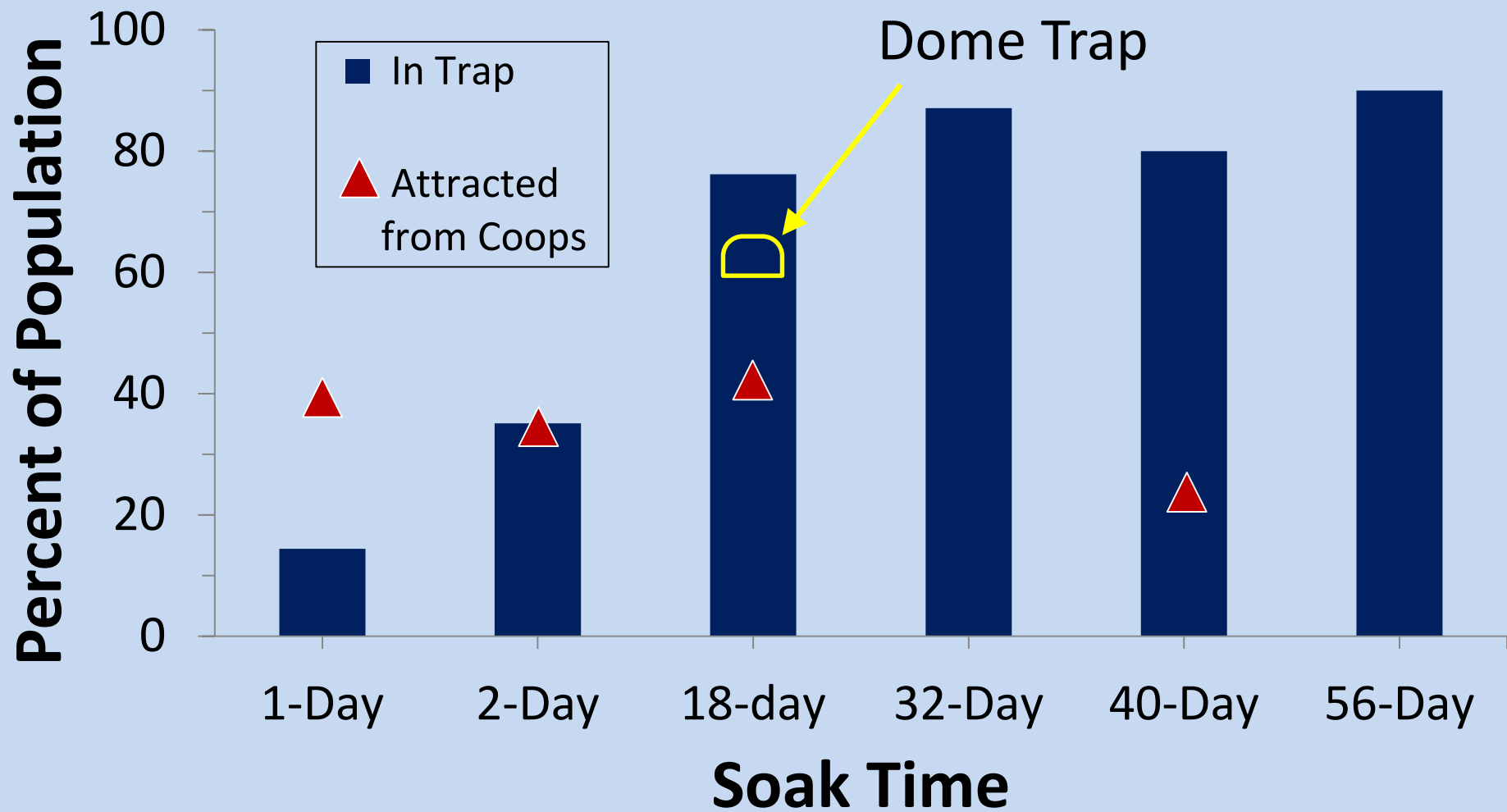




Courtesy of Scott Noakes - UGA



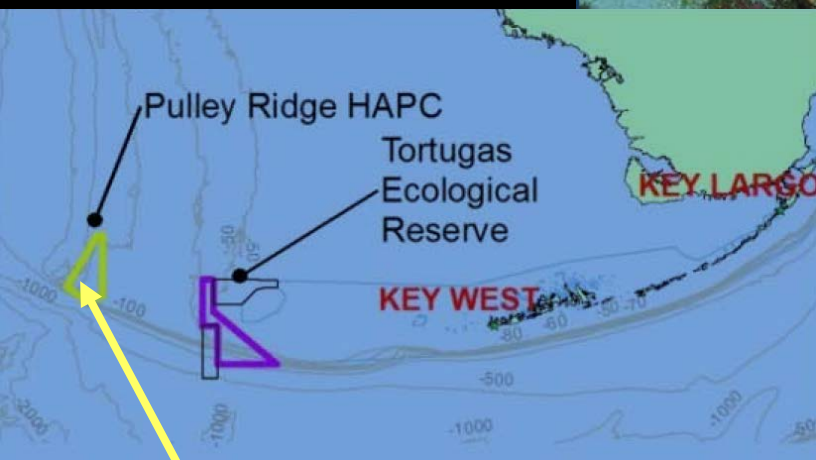






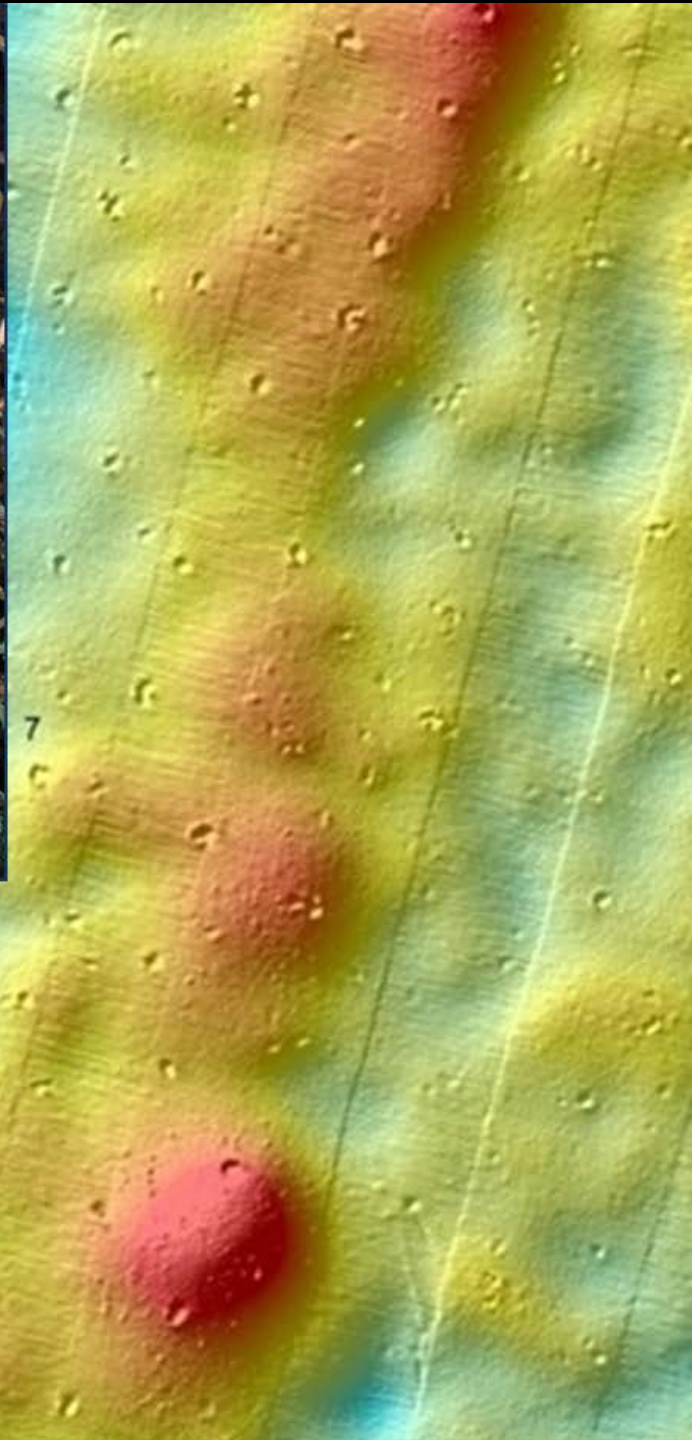


# Solution Holes



136,000 #

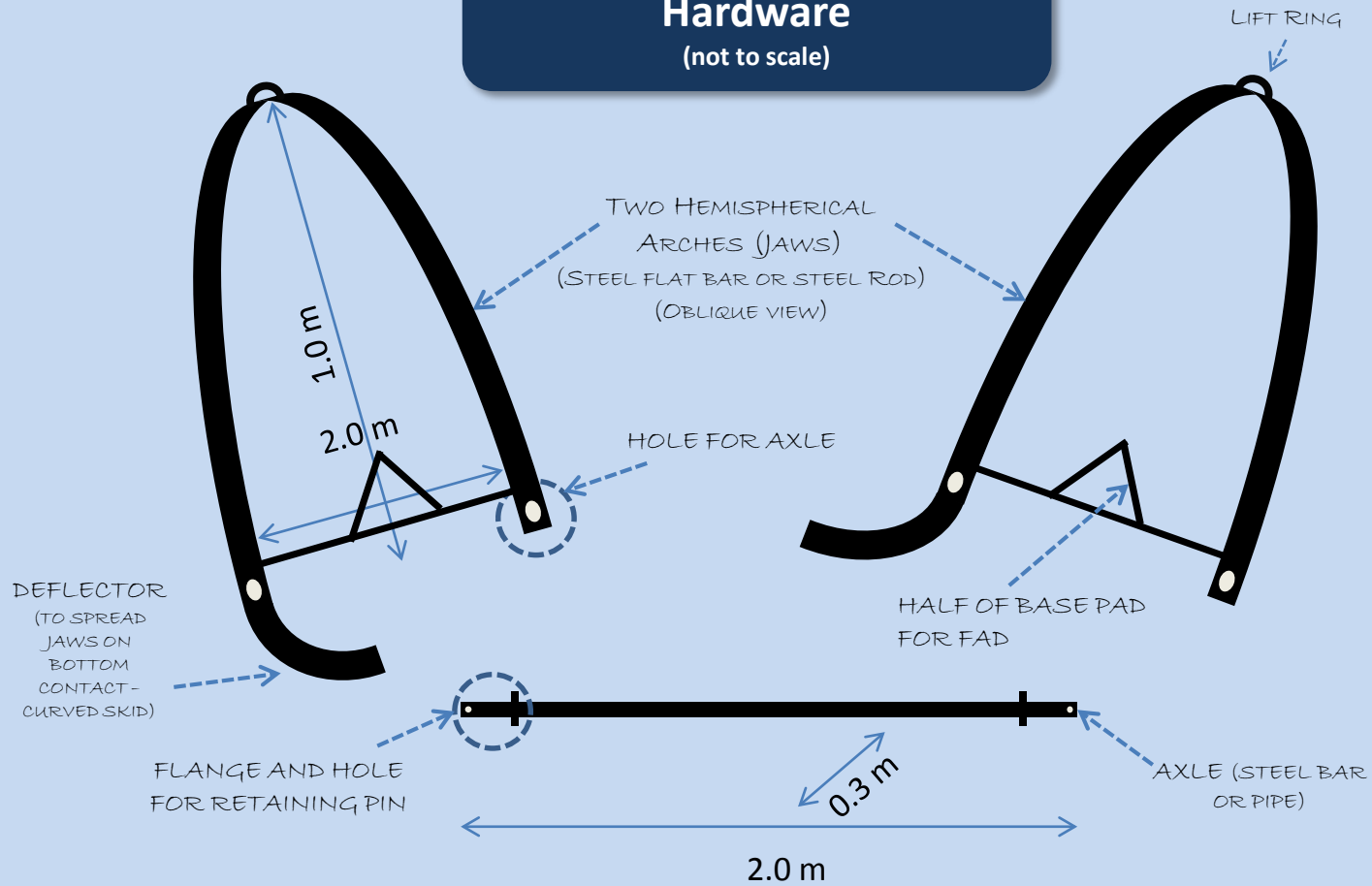
200 m





## 2-Meter Lionfish Purse Trap Hardware

(not to scale)







# We can do this!

- *Mods to dome trap*
- *Purse trap & design specs*
- *Partner trials*
- *Attraction: Soft FAD, sound, light, bait, pheromones...*
- *Carrying capacity*
- *Diurnal behavior*

National Marine Sanctuaries  
National Oceanic and Atmospheric Administration



<http://sanctuaries.noaa.gov>