



Lionfish Update



Lad Akins, Director of Special Projects
Reef Environmental Education Foundation

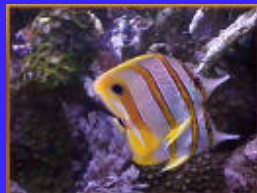


REEF Programs

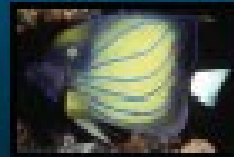
- REEF HQ in Key Largo with an office in San Diego
- 50,000 members
- 160,000 fish surveys
- Fish Survey Project
- Grouper Spawning project
- Artificial Reef Projects
- Exotic/Invasive Species
 - Regional management
 - Research
 - Control
 - Outreach



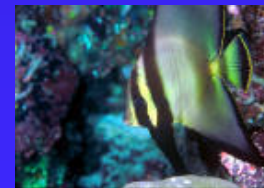
South Florida marine fish introductions – A unique place....



Field Guide to the Nonindigenous Marine Fishes of Florida



Schofield, P. J., J. A. Morris, Jr. and L. Alkins



Lionfish in the Atlantic





Habitats



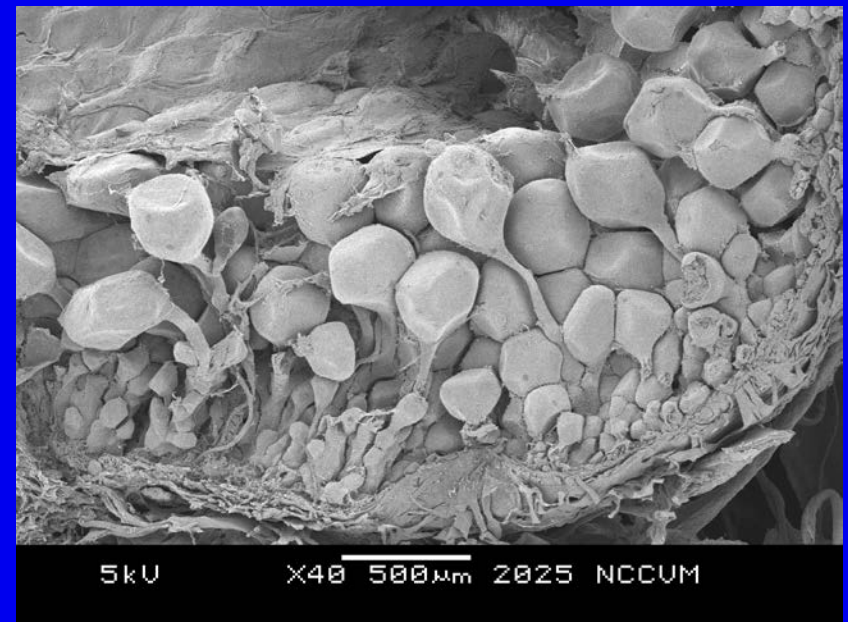
Why are lionfish so successful?



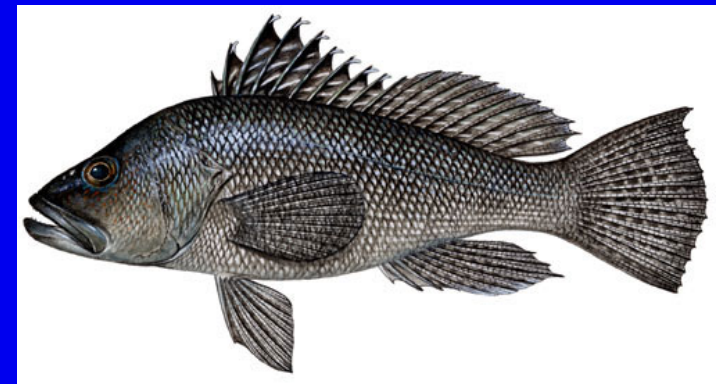
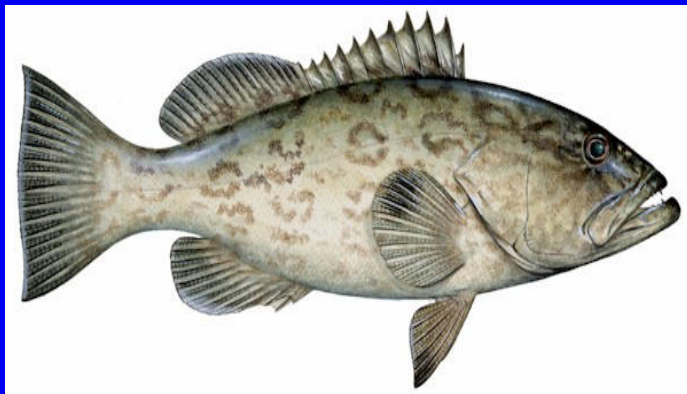
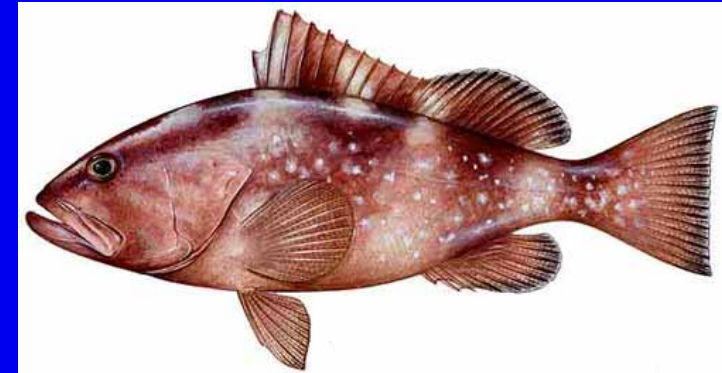


Lionfish reproduction

- Early reproduction
- Spawn in pairs
- Lionfish release two buoyant egg balls
- ~30,000 eggs per spawn



Predation experiments







Additional Invasion Factors...

- Fewer parasites
- Faster growth
- Less competition
- Prey naiveté'
- Genetic vigor



Local Control Can Be Effective





INVASIVE LIONFISH COLLECTING AND HANDLING WORKSHOP

Reef Environmental Education Foundation & the Houston Zoo

invite you to learn about invasive lionfish and ways to get involved

When: Thursday, August 1, 2013

Where: Houston Zoo
Brown Education Center
6200 Hermann Park Dr.
Houston, TX 77030
(Enter through Gate 8, to the left of the main zoo entrance)



Time: 6:00 to 8:00 pm

Cost: Free and open to the public

Speaker: Keri Kenning, REEF Communications Manager

Who: Divers, fishers and ocean enthusiasts are encouraged to attend

The lionfish crisis is an ever increasing problem throughout the Atlantic, Caribbean and Gulf of Mexico. The invasive species, known for their voracious appetites, venomous spines and rapid reproduction, are depleting native fish and invertebrate populations at alarming rates. Marine scientists are concerned that lionfish will significantly harm ocean ecosystems. You can help control lionfish by reporting sightings and removing them whenever you see one.

Workshop topics include background of the invasion, lionfish biology, ecological impacts, current research findings, collecting tools and techniques, market development and ways to get involved. REEF is a grassroots non-profit organization committed to ocean conservation and education. The REEF team conducts workshops to educate resource managers, divers, fishers and marine enthusiasts. By engaging stakeholders, REEF seeks to reduce negative ecological impacts.



Register and see more workshops at
www.REEF.org/lionfish/workshops



Funding provided
by a grant
through U.S. Fish
and Wildlife
Service Aquatic
Invasive Species
Program

SE US Workshops

- Morehead/Beaufort/Charleston
- Jacksonville/Canaveral
- Miami/Ft Lauderdale/Palm Beach
- Naples/Ft Myers/Tampa
- Tallahassee/Pensacola/Mobile
- Houston/Galveston/Corpus Christi



Collecting and Handling Workshops

- Background of the invasion
- Biology and Ecology
- Impacts
- Current Research
- Removal tools
- Collecting and Handling
- Use of fish



Collecting and Handling



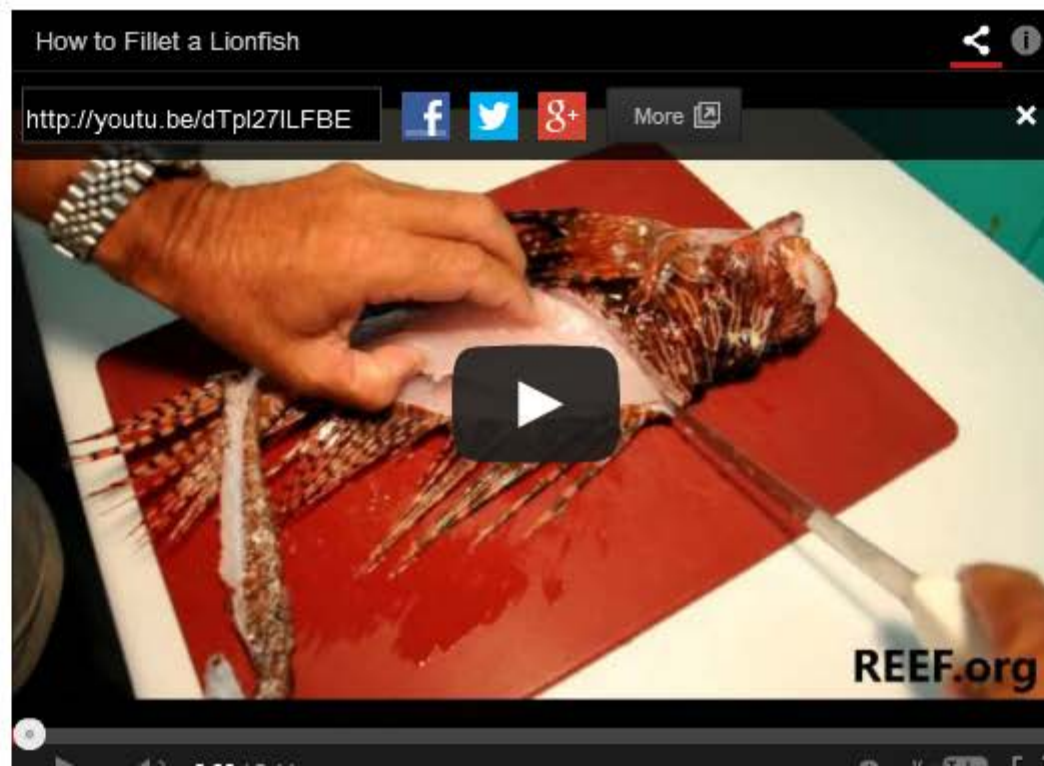




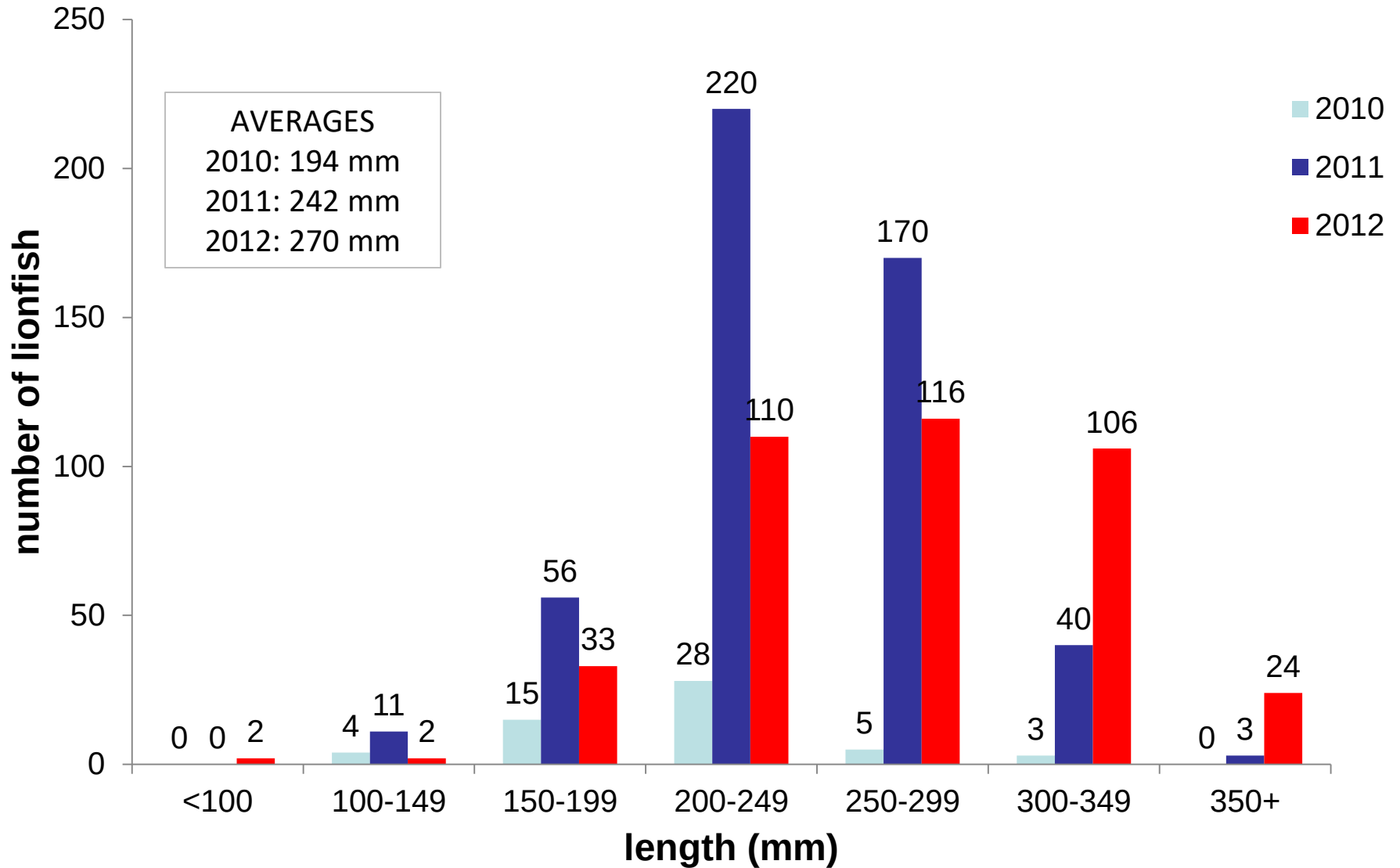


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How To Fillet a Lionfish



REEF Invasive Lionfish Removals in Belize



2013 Derby Locations

Bahamas – 1,204 fish

Curacao - 2,386 fish

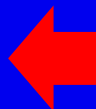
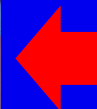
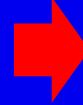
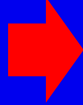
Ft Lauderdale – 265 fish

Palm Beach – 612 fish

Jacksonville – 435 fish

Key Largo – 707 fish





*What is a
lionfish
derby?*

Lionfish derbies as a tool for increasing awareness



Derbies can provide...

- *Outreach and Awareness*
- *Training for removers*
- *Media interest*
- *Samples for research*
- *Tasting opportunities*
- *Lionfish removals!*



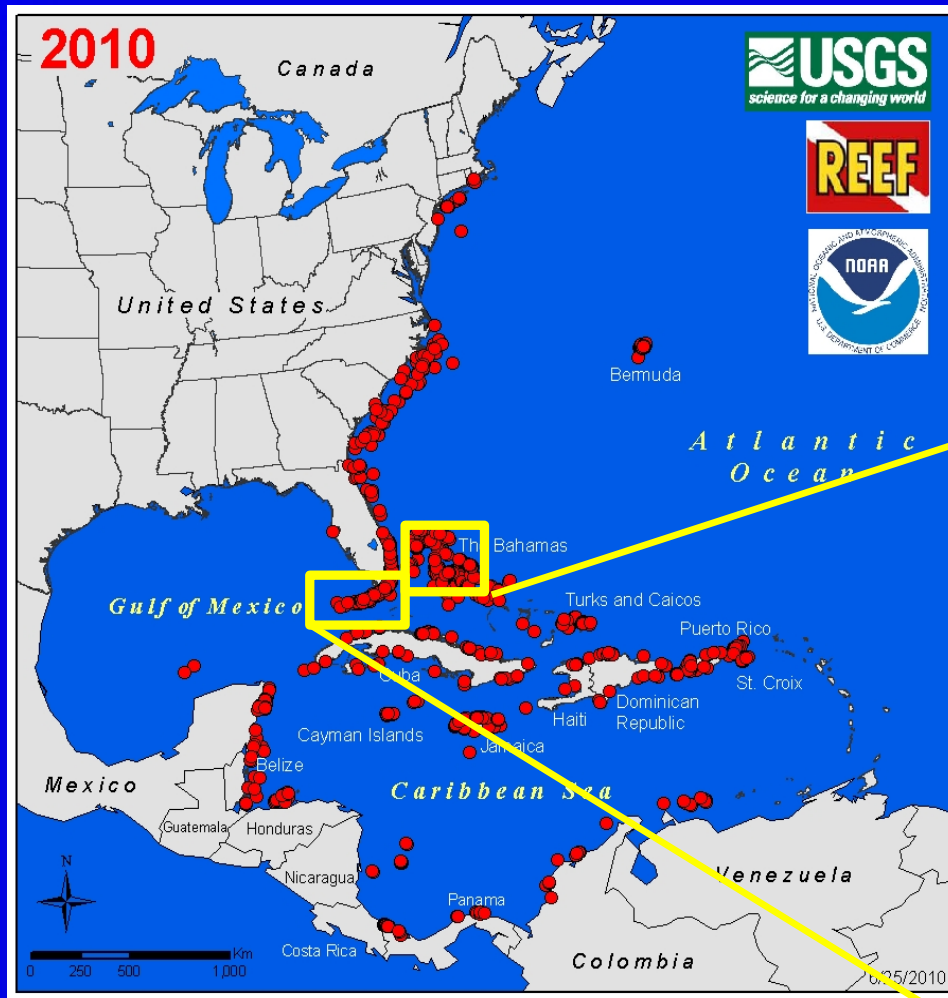
What about derbies as a tool for lionfish control?



***How effective are derbies at
suppressing lionfish
populations?***

Derby effectiveness study

Green Turtle Cay,



Key Largo, Florida



Derby study locations



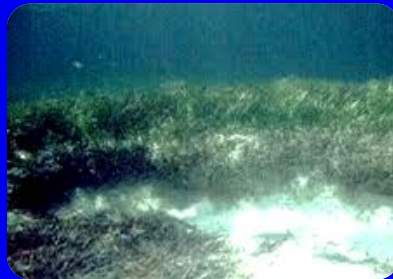
***shoreline
ledges***



***artificial
structures***



***patch
reefs***



***seagrass
blowouts***

***Green Turtle Cay,
Bahamas***

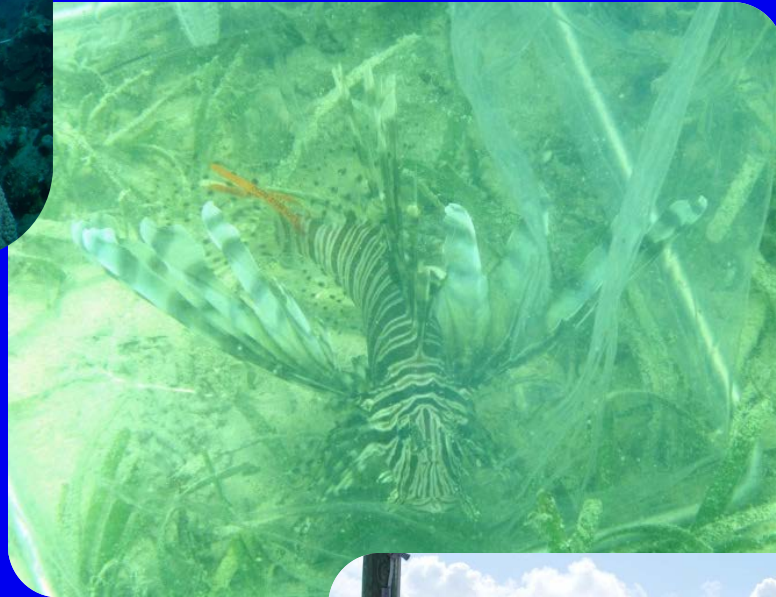


Key Largo, Florida





Lionfish tagging



***Pre- and post-
derby surveys***

***Derby
fishing
maps***



2013 Lionfish Derby Participant Survey



*Thank you for taking the time to tell us about your lionfish derby experience!
This survey contains 27 questions and should take approximately XX minutes to complete.*

Section 1: Lionfish Derby Experience

1. How many lionfish derbies have you participated in that took place: *(If none, please enter 0)*

____ IN THE U.S.A. (not including Florida)
2 IN THE STATE OF FLORIDA
____ OUTSIDE OF THE U.S.A.

2. How did you hear about *this derby*? REEF

3. How many times have you participated in *this derby*? 1 TIMES

5. Do you plan to attend this derby again next year? ☒ YES ☐ NO

6. Before you participated in a lionfish derby, had you captured a lionfish before? ☒ YES ☐ NO

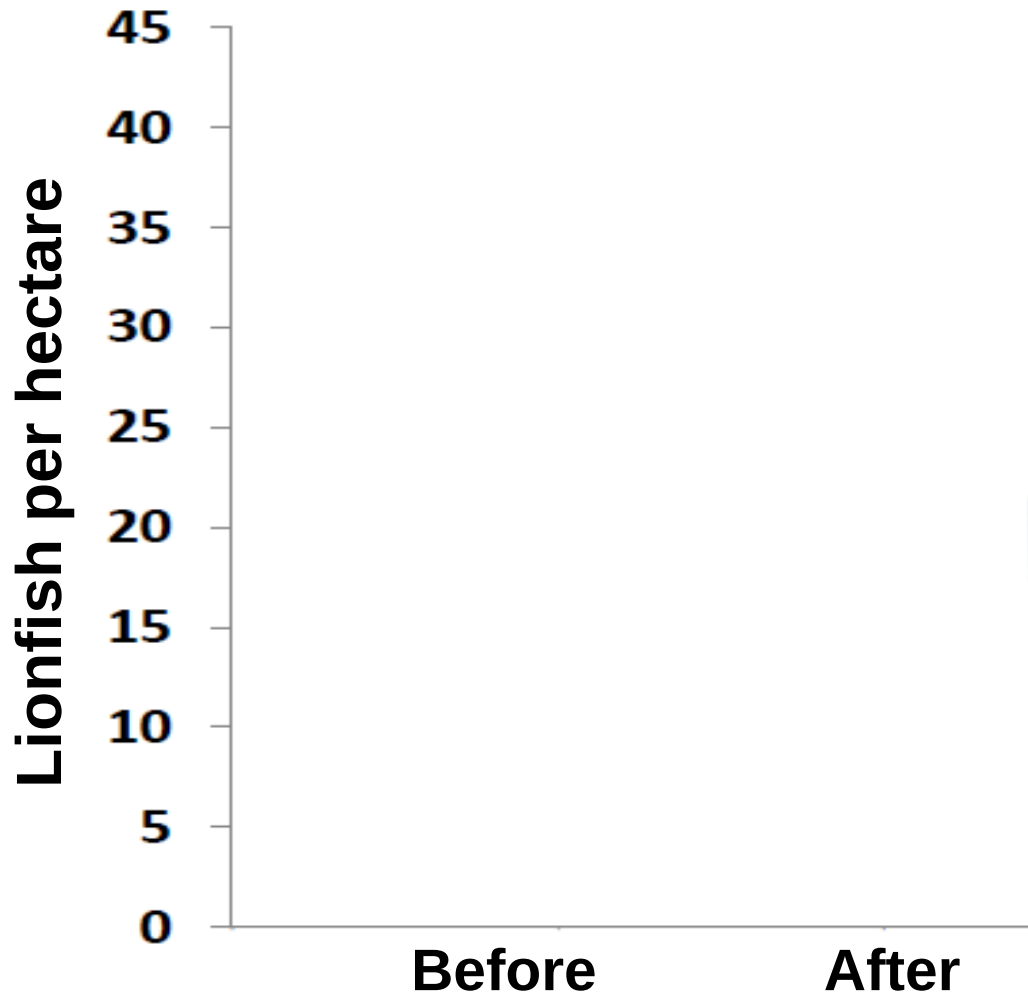
7. How many lionfish did you capture in *this derby* by: *(If none, please enter 0)*

5 SPEAR
____ NET

8. Please rank the following habitats by the number of lionfish you captured in *this derby*: *(If none, please enter 0)*

5 Patch reefs (average depth: 8 ft)
____ Continuous reef (average depth: ____ ft)
____ Artificial structure (including wrecks)
____ Seagrass
____ Mangroves
____ Other (please specify): _____

Derby reduced local lionfish population by 69%



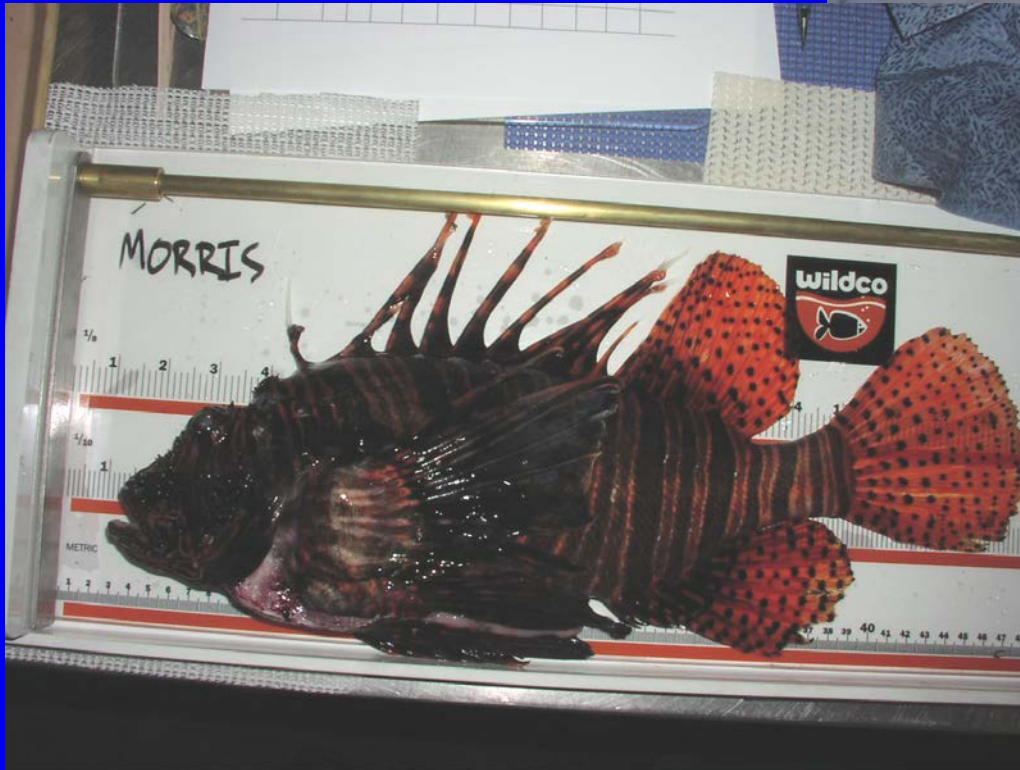
How many fish would these lionfish have consumed?



How many fish would these lionfish have consumed?



*Palm Beach (1,043 LF) =
2.0-8.8 million prey!!!*



Western Atlantic Sizes

Smallest collected = 28mm

Largest collected = 474mm

Max size in native range ~ 320-350mm





NOAA

Science for Coastal Communities

Center for Coastal Fisheries and Habitat Research
CCFHR

Daily increments





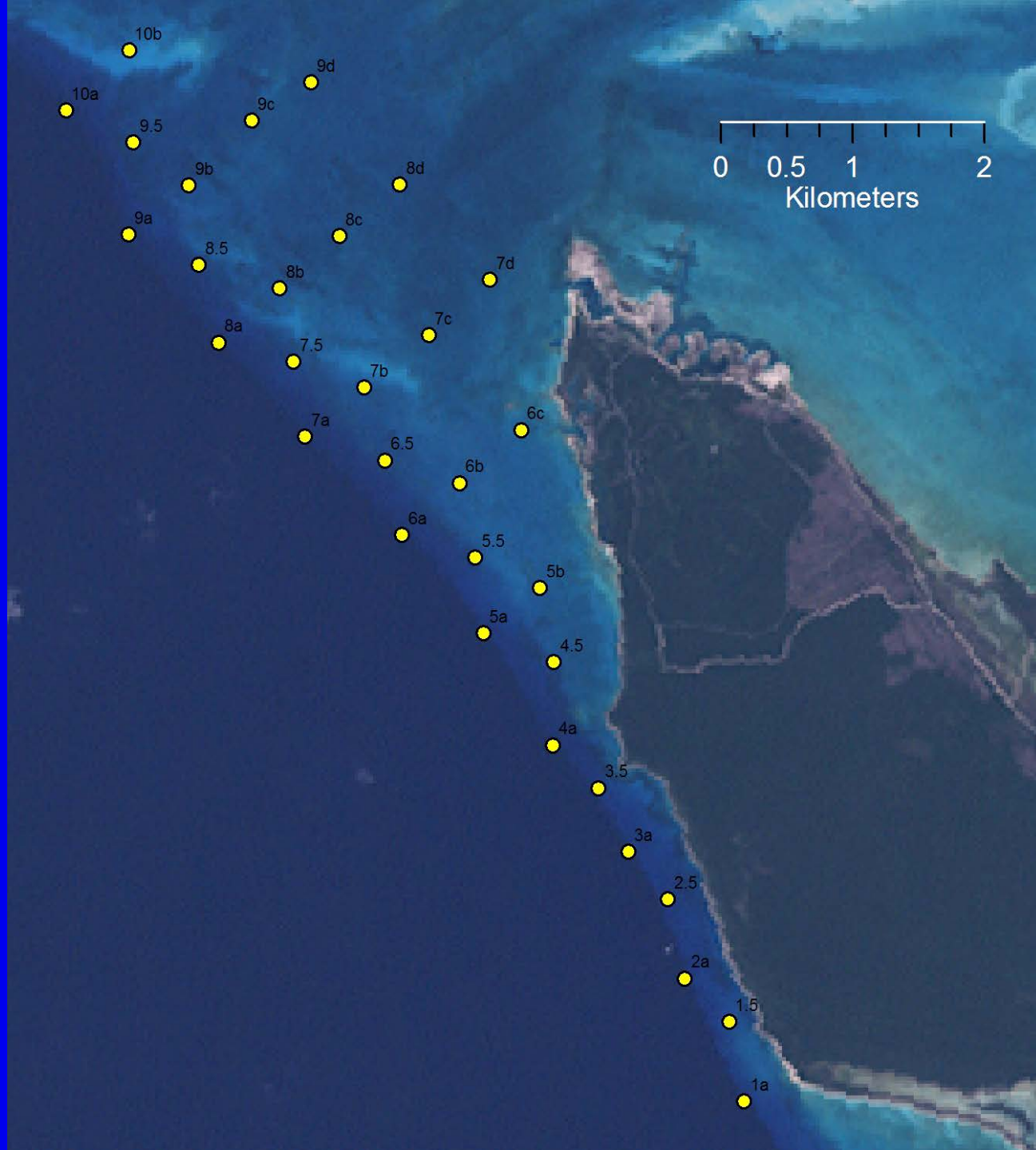
Collecting



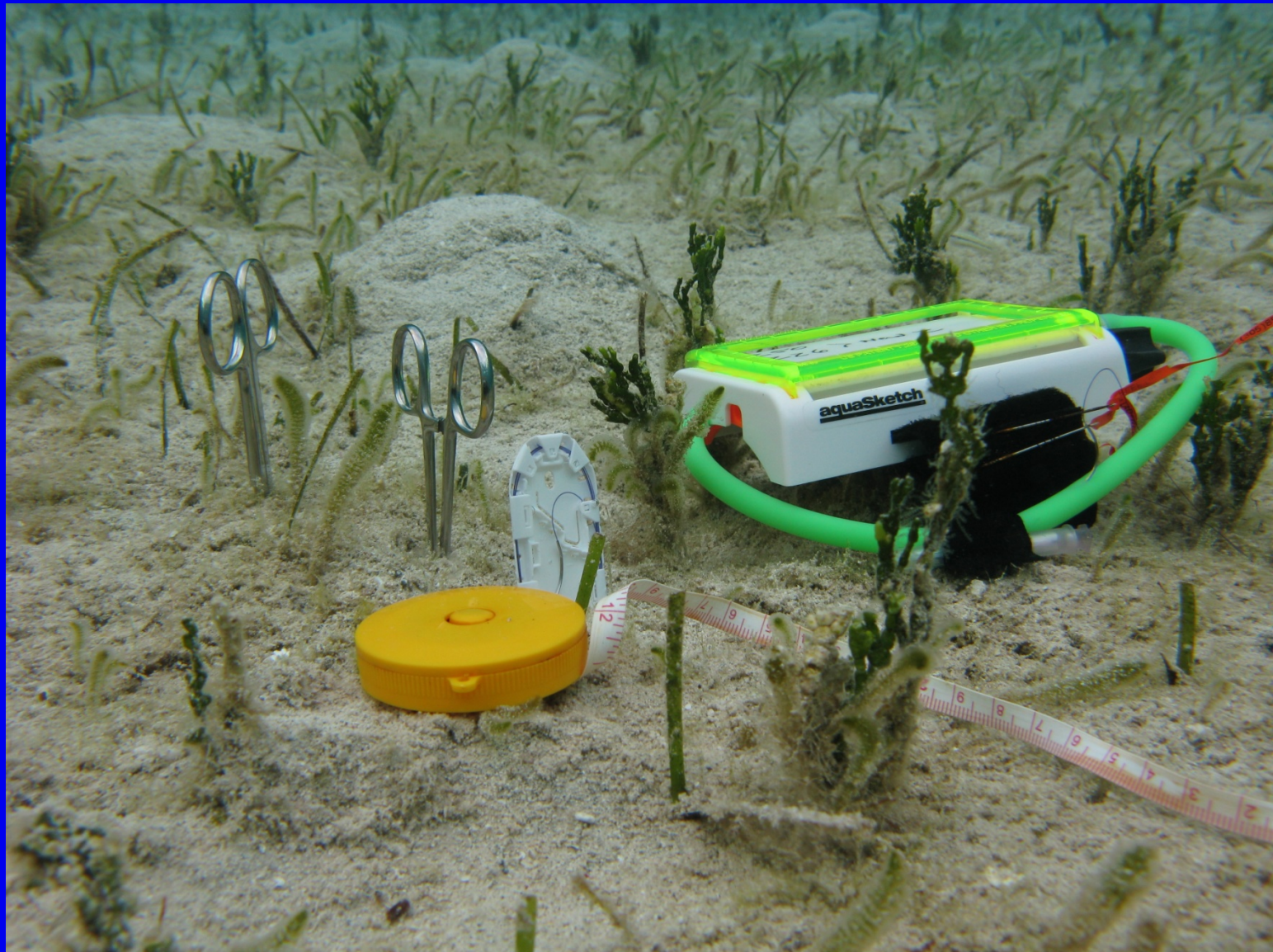


Tagging results

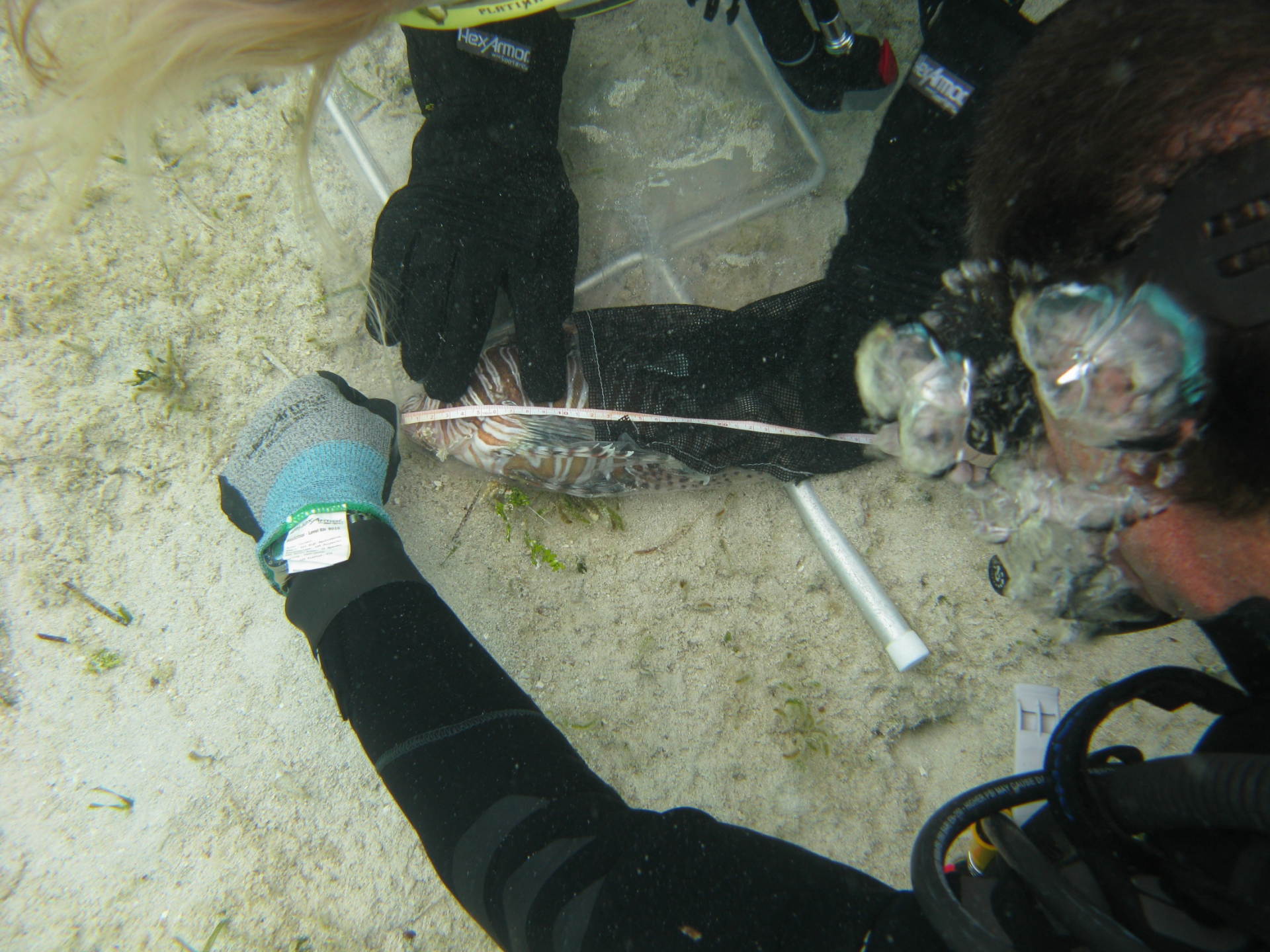
- **Lionfish exhibit high site fidelity**
- **Up to 7 months at the same site**
- **Rapid growth (up to .5-.6mm/day = 9"/yr)**
- **Growth rate is inversely related to size (bigger fish grow slower)**
- **Some fish do move**



In Situ Tagging



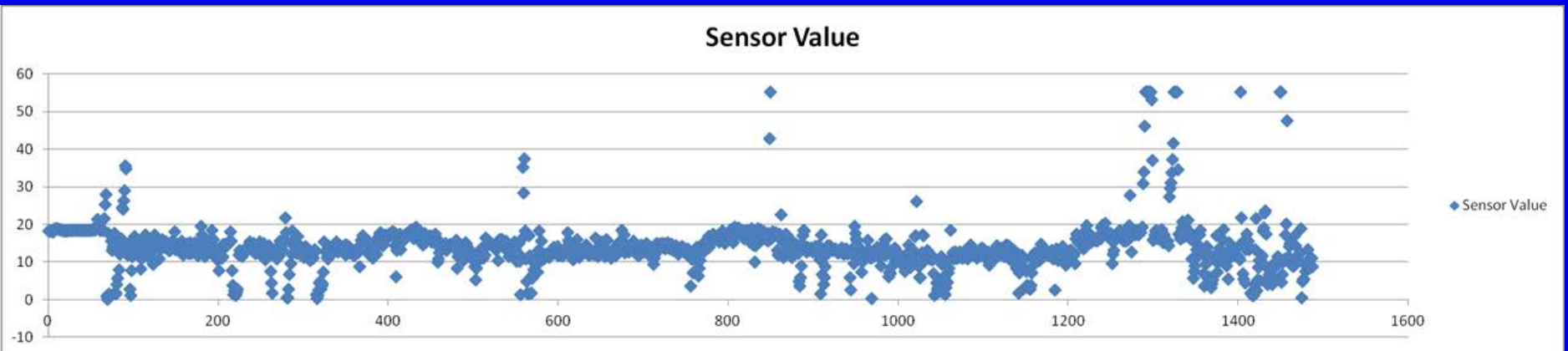
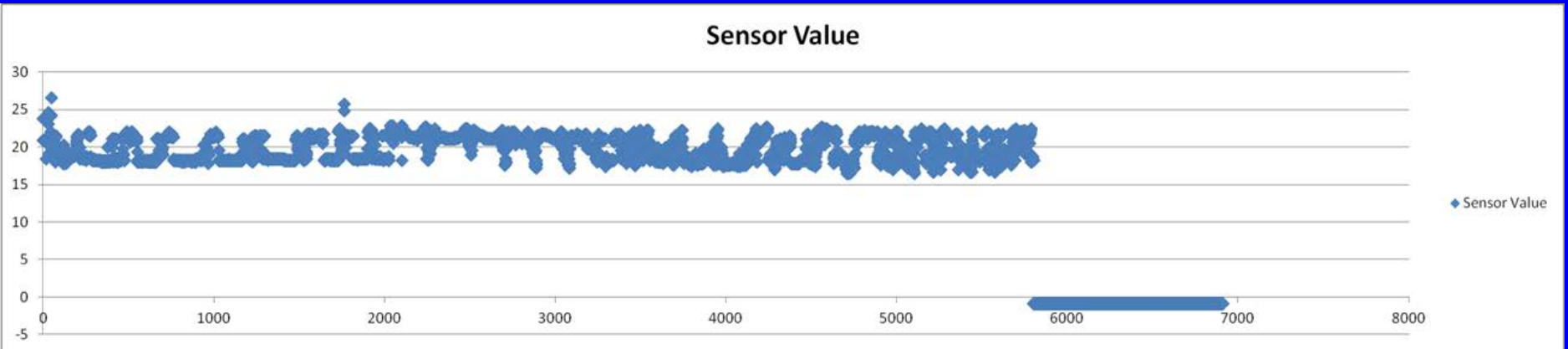








Early Results



Lionfish By-catch in the Florida Keys Commercial Spiny Lobster Fishery

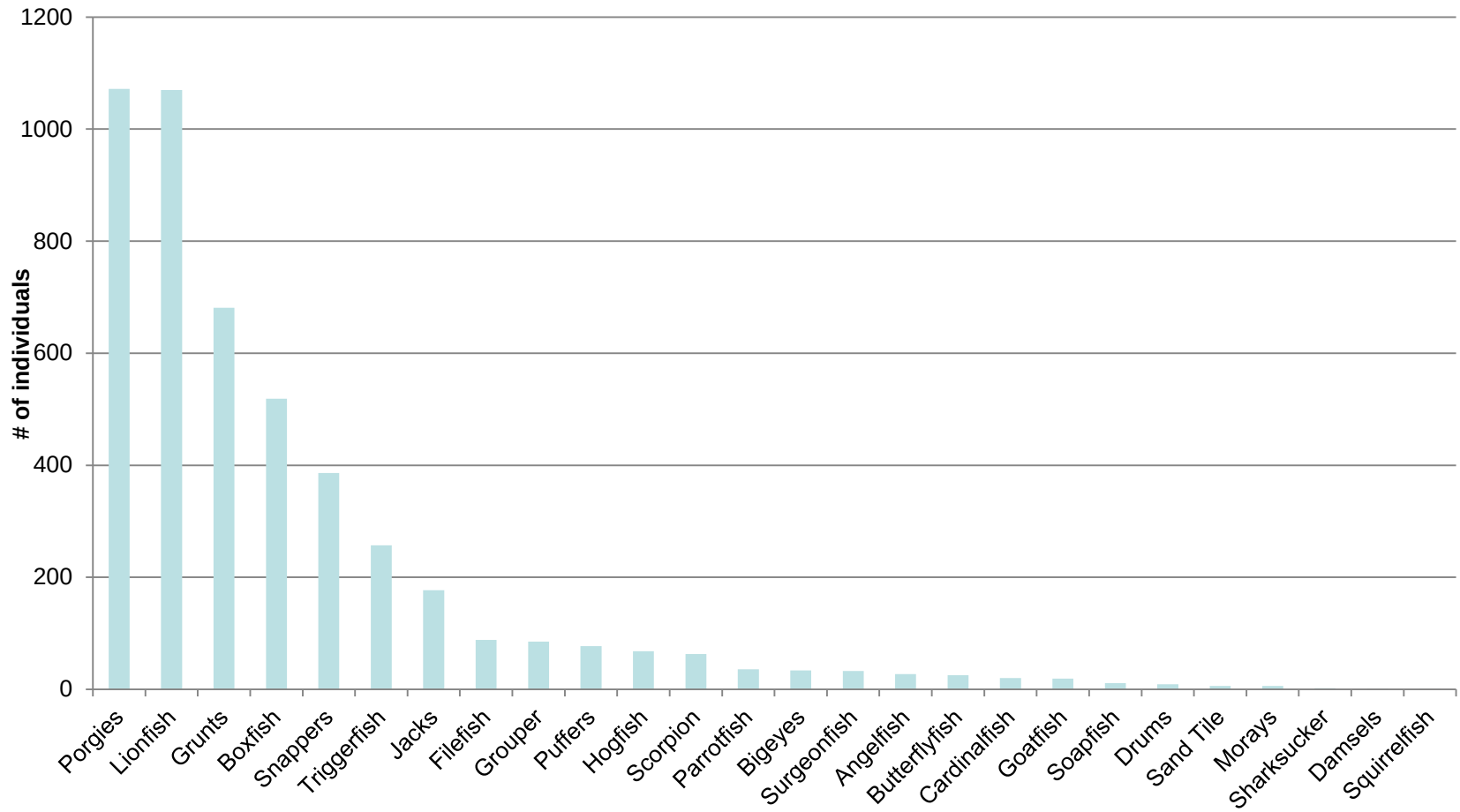


- *128 Commercial lobster vessels in Monroe County, FL*
- *\$12.6 Million USD in annual gross revenues*



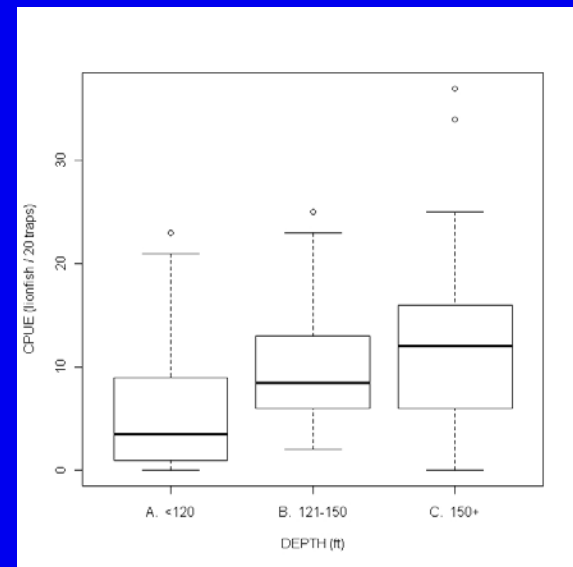
Trapping by-catch

N= 2,245 traps



Early results

- Mean total length of lionfish increases with depth and temporally during the fishing season.
- Catch rates of lionfish increase with depth
- Correlations show that when lionfish are present in traps, the catch rates for lobster is lower



Strategies and Practices for Invasive Lionfish Control

A guide for managers



Regional Lionfish Strategy



66th GCFI

Nov. 4-8, 2013 Corpus Christi, TX

- **6th Annual GCFI Lionfish Session**
 - **Oral Presentations**
 - **Posters**
- **Special Concurrent Lionfish Market Session**
 - **Ciguatera**
 - **Other market considerations, supply, price, etc**

Eat 'em to Beat 'em!



8 wonton wrappers
1/4 cup oil
8 lionfish fillets
2 tablespoons
2 tablespoons
"sauce"
1 tablespoon
1 cup sesame
1/4 cup wasabi

*Items can be found at oriental markets.

sauce, wasabi chili sauce and soy sauce together in a bowl and set aside. Spray skillet with non-stick cooking spray. Cook lionfish fillets in skillet over medium-high heat for 2 to 3 minutes until flaky and tender. Cut or flake lionfish so it is in small pieces. Toss lionfish in soy sauce mixture.

Place lionfish on wonton wrappers, top with seaweed salad and drizzle with wasabi mayonnaise.



1st Florida FWC Lionfish Summit

Cocoa Beach

Oct 22-24



FWC LIONFISH SUMMIT
OCT. 22-24, 2013

Help identify creative solutions to the management of lionfish in Florida. Attend the Florida Fish and Wildlife Conservation Commission Lionfish Summit, Oct. 22-24, at the Hilton Cocoa Beach Oceanfront. The goal of the three-day summit is to determine research and management gaps, work together on strategies to control the lionfish population and unite leaders in lionfish research and management. Presentations and discussions will feature the latest research, data, historical observations and management measures. Share your input and network with agency staff, professionals and other stakeholders.

RSVP for this free event at FWCLionfish.eventbrite.com.

Don't miss the Tuesday evening lionfish poster session and trade show. For questions, email Saltwater@MyFWC.com. Abstracts from interested presenters can also be emailed to this address. Abstracts are due by Sept. 20.

SAVE THE DATE

Follow the event live on Twitter at [#FWCLionfish](https://twitter.com/FWCLionfish)



Photo Credit: © Jason Arnold



REEF

Thank you!