



# *Will Lionfish Change Marine Systems in the Invaded Range?*



*...and how can we best address this invasion?*





# *Reef Environmental Education Foundation*

- REEF HQ in Key Largo with a Pacific office in Seattle*
- Coordinate the Fish Survey Project*
- Conduct monitoring and assessments*
- Spawning aggregation projects*
- Education/Outreach*
- Exotic Species Program*



# Lionfish in the Atlantic



# Opportunities (and responsibilities?)





# REEF Lionfish Activities

- Reporting
- Derbies
- Training/permitting workshops
- Market Development
- Current Field research
- Upcoming research



# REEF Lionfish Activities

- **Reporting**
  - Online reporting at [www.REEF.org](http://www.REEF.org)
  - Phone in reports to REEF HQ
  - E-mail reports via REEF.org
  - Inclusion in regular REEF fish surveys
  - Removal specimens to REEF HQ
  - Lobster by-catch reports
  - Derby data

Office use only: FK-YY-##

Date rcvd:

By:



## Florida Keys Lionfish Collection Report Form

Name:

Phone:

E-mail:

Affiliation (dive shop, agency, etc):

Size of fish -tip of snout to tip of tail (mm):

Collection method:

Date:

Location (region, reef, buoy #):

Latitude:

Longitude:

Time of day:

Depth:

Habitat (high relief coral, hardbottom, artificial, etc):

Disposal (given to REEF, FKNMS, etc., disposed of offshore, eaten, etc):

Notes:

Return all reports within 48 hours of collection to REEF: (305) 852-0301 fax or [Lionfish@reef.org](mailto:Lionfish@reef.org)  
or MEERA: (305) 745-2730 fax or [cwalter@mote.org](mailto:cwalter@mote.org)  
Please attach any photos...Thank you!!!

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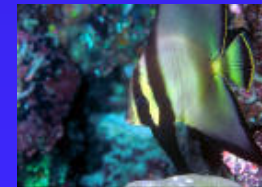
# Field Guide to the Non-native Marine and Estuarine Fishes of Florida



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



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





# REEF Lionfish Activities

- Reporting
- **Derbies**
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- Upcoming research

# Events



**WANTED**

★ ★ ★ LIONFISH HUNTERS ★ ★ ★

FLORIDA KEYS LIONFISH DERBY

Saturday, September 11th • Upper Keys @ Coconuts - Key Largo  
 Saturday, October 16th • Middle Keys @ Keys Fisheries - Marathon  
 Saturday, November 13th • Lower Keys @ Hurricane Hole - Key West

Over \$10,000 in cash and prizes! Help control the Lionfish population.

For information or registration, go to [www.reef.org/lionfish](http://www.reef.org/lionfish) or call 305-852-0030

REEF [www.reef.org](http://www.reef.org)

NATIONAL MARINE SANCTUARIES FLORIDA KEYS

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## Lionfish Derby was huge success, caught 1408

### Green Turtle Cay hosted first lionfish tournament ever



*Green Turtle residents won first place in the Lionfish Derby held on Green Turtle Cay on June 5 and 6. Thomas Roberts with his son Clark and Gavin Roberts with his captain Gaby Cross were awarded \$2000 for bringing in 289 lionfish. Mr. Thomas Roberts is a well-known Abaconian. They are shown with Ted Arace, a marine biologist and director of special projects for REEF, on center.*

*By Paul Arcevausk*

Black skies, booming thunder, Tremendous flashes of lightning.

The some fishermen sank up to around number on the morning of June 5 was less than ideal for the start of the Lionfish Derby. And still, boats were heading out against the elements for a chance to win \$2,000 and the opportunity for revenge against an invader that has been decimating the reefs of the Bahamas.

Their quarry, a red and white striped predator known as the lionfish, characterized by elongated venomous spines and flowing, poisonous fins. Native to the waters of the Pacific Ocean, these marine animals have no natural predators, reproduce at an alarming rate and consume many important reef fish including juvenile grupper, snapper and parrotfish.

The First Annual Lionfish Derby, organized by Boulder Lindbay and held on Green Turtle Cay, hoped to be a start in the fight back against these invaders. By day's end, the 25 registered boats had pulled 1,408 lionfish from the waters.

Most of the fish were taken from the Sea of Abaco, which may mean that they are surviving at a greater rate on the tallois side. Lionfish were found in a vast range of depths, but most fishermen noticed they liked to be in shallow water and near structures, particularly metal structures.



# Events

## Green Turtle Abaco

2009 – 1408 lionfish

2010 – 941 lionfish

2011 – June 24



## Florida Keys

2010 - Key Largo, Marathon, Key West – 664

2011 – Long Key, Key Largo, Key West

## Palm Beach

2011 – August 13

## Bimini

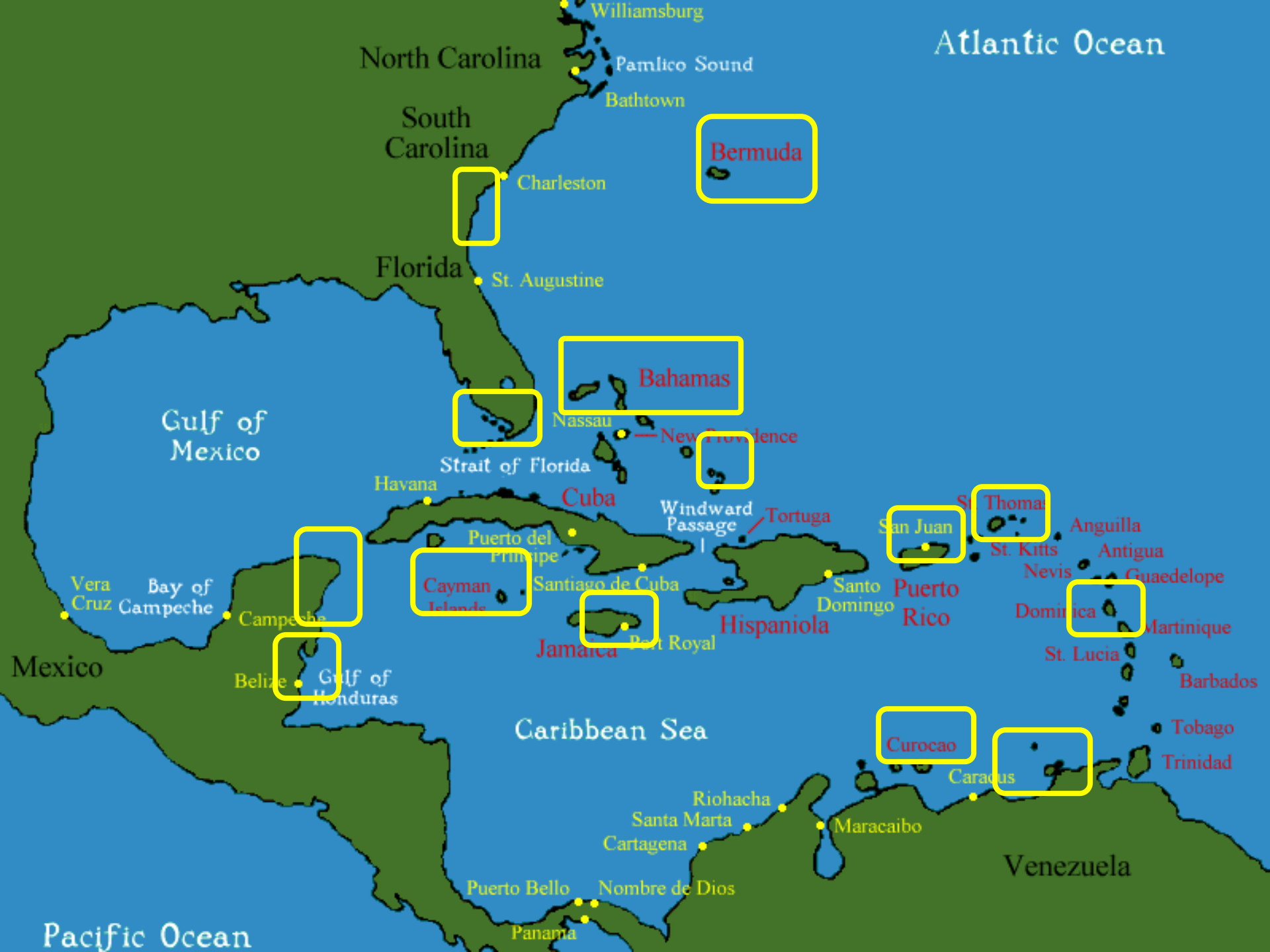
2011 – July 23





# REEF Lionfish Activities

- Reporting
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- Current Field research
- Upcoming research



Atlantic Ocean

North Carolina

South Carolina

Bermuda

Charleston

Florida

St. Augustine

Gulf of Mexico

Bahamas

Nassau

Bahamas

New Providence

Strait of Florida

Havana

Cuba

Windward Passage

Tortuga

St. Thomas

Anguilla

Antigua

Puerto del Principe

Santiago de Cuba

Hispaniola

Santo Domingo

Puerto Rico

St. Kitts

Nevis

Guadeloupe

Vera Cruz

Bay of Campeche

Campeche

Cayman Islands

Jamaica

Port Royal

Hispaniola

Santo Domingo

Puerto Rico

Dominica

Martinique

St. Lucia

Barbados

Tobago

Trinidad

Belize

Gulf of Honduras

Caribbean Sea

Curacao

Caracas

Venezuela

Riohacha

Santa Marta

Cartagena

Maracaibo

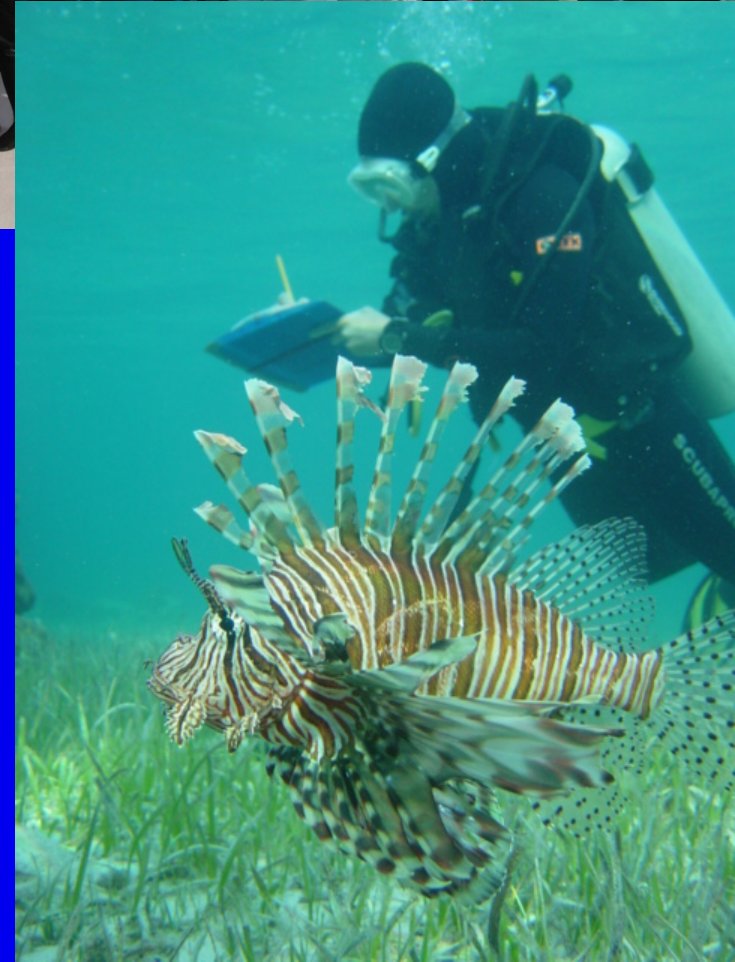
Puerto Bello

Nombre de Dios

Panama

Pacific Ocean

# Stakeholders/ Government



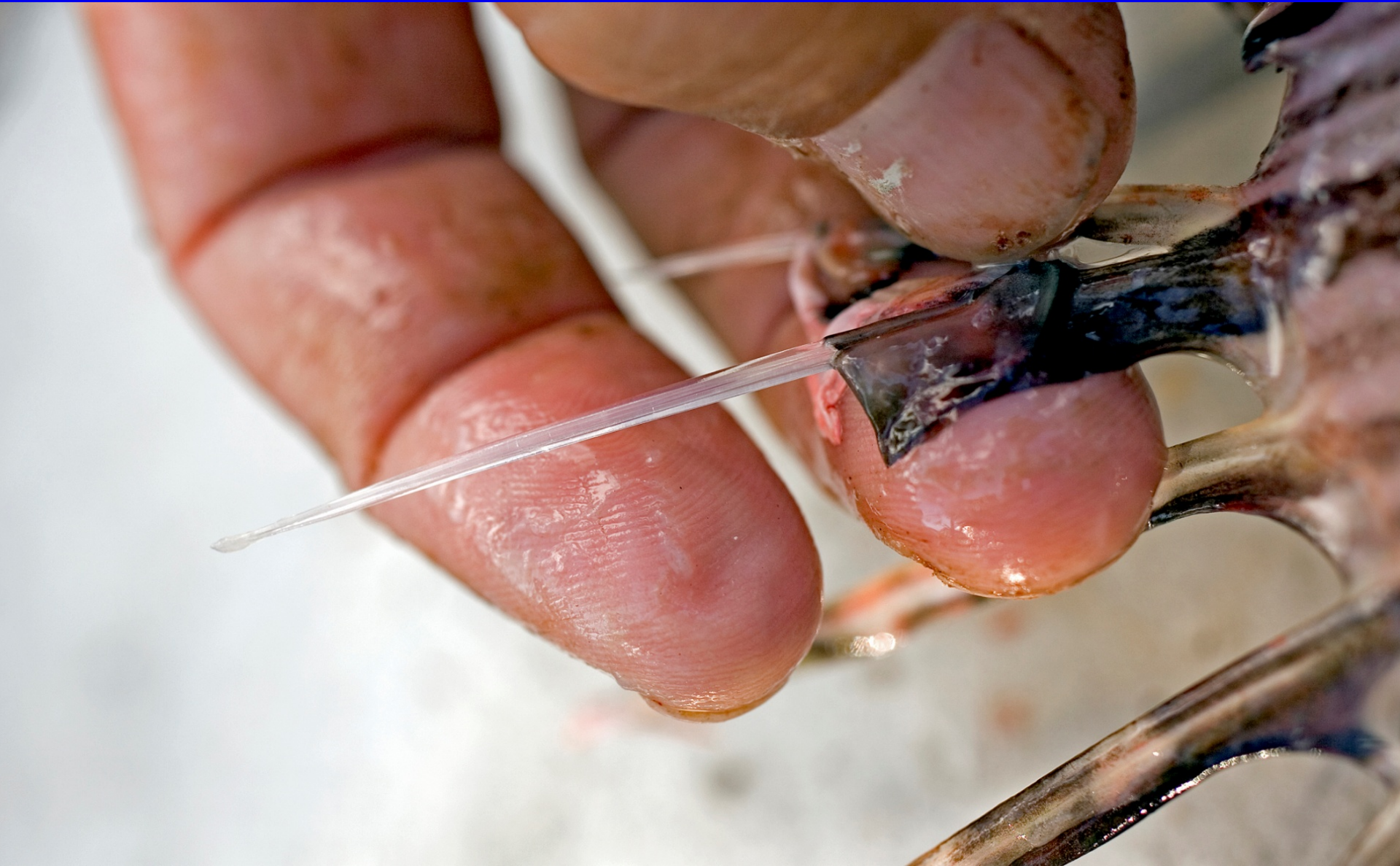
# Training



# Collecting and Handling



# Lionfish venomology

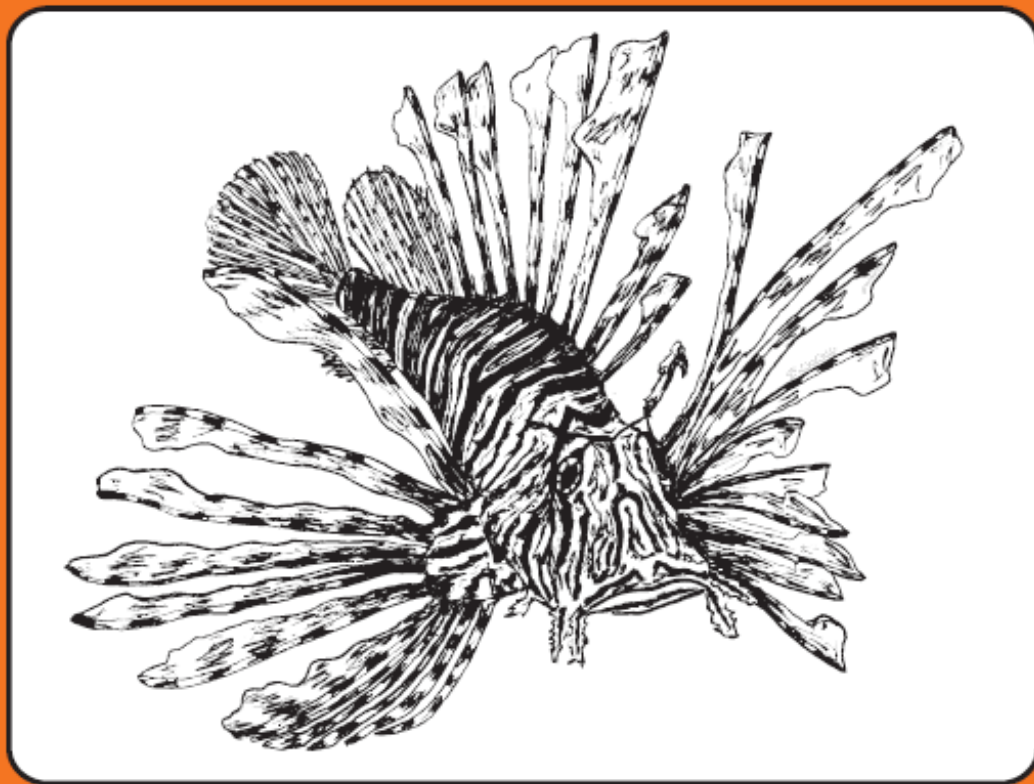


# Lionfish stings

## Symptoms & treatment



# Outreach and Education



## **INVASIVE LIONFISH**

**Report All  
Sightings**

***Note Location***

**REPORT SIGHTINGS TO**

***MEERA (305) 395-8730***



**(305) 852-0030**

**[www.reef.org/lionfish](http://www.reef.org/lionfish)**

# INVASIVE LIONFISH

## REPORT SIGHTINGS AND NOTE LOCATION

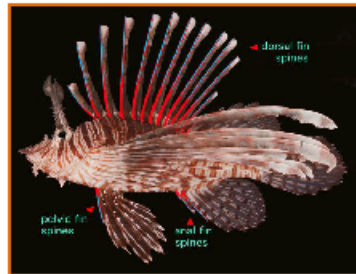
Note Marine MEERA -(305) 395-8730



OR  
([www.reef.org/lionfish](http://www.reef.org/lionfish))

Venomous Indo-Pacific lionfish are now regularly observed in waters of southeast US and northern Caribbean. In January 2009 the first lionfish sighting was confirmed in the Florida Keys.

Lionfish are not native to Atlantic waters and are having a negative impact on marine life.



### HOW TO IDENTIFY LIONFISH

- Distinctive dark or maroon and white vertical stripes
- Fan-like pectoral fins
- 13- long separated dorsal spines
- Fleshy tentacles around mouth
- Adults can grow as large as 18" length

### What to do if you sight a lionfish?

Note the location of the fish (including information such as GPS coordinates, dive site name, depth and characteristics of the surrounding habitat) and report to the hotline above.

### **SPINES ARE VENOMOUS & CAN CAUSE EXTREME PAIN!**

**DO NOT ATTEMPT TO CAPTURE FISH WITHOUT TRAINING**

### What to do if you are stung by a lionfish?

Stings from lionfish can be serious, and should not be taken lightly. If stung, immerse wound in non-scalding hot water until pain subsides and seek medical treatment.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE

Florida Keys National Marine Sanctuary  
33 East Quay Road  
Key West, FL 33040

October 22, 2009

Mr. John "Lad" Akins  
Reef Environmental Education Foundation (REEF)  
P.O. Box 246  
Key Largo, FL 33037

Dear Mr. Akins:

The National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries (ONMS) has approved the issuance of permit number FKNMS-2009-300 to conduct activities within Florida Keys National Marine Sanctuary (sanctuary) to assist with sanctuary management. Activities are to be conducted in accordance with the permit application submitted to the sanctuary on September 28, 2009, and the terms and conditions of permit number FKNMS-2009-300 (enclosed).

This permit is not valid until signed and returned to the ONMS. Retain one signed copy and carry it with you while conducting the permitted activities. Additional copies must be signed and returned, by either mail or email, to the following individuals within 30 days of issuance and before commencing any activity authorized by this permit:

Scott Donahue  
Associate Science Coordinator  
Florida Keys National Marine Sanctuary  
33 East Quay Road  
Key West, FL 33040  
[Scott.Donahue@noaa.gov](mailto:Scott.Donahue@noaa.gov)

National Permit Coordinator  
NOAA Office of National Marine Sanctuaries  
1305 East-West Highway (N/ORM6)  
SSMC4, 11<sup>th</sup> Floor  
Silver Spring, MD 20910  
[nmspermits@noaa.gov](mailto:nmspermits@noaa.gov)

Your permit contains specific terms, conditions and reporting requirements. You are responsible for understanding all of these requirements. Review them closely and fully comply with them while undertaking permitted activities. Of note are the following:

- This permit authorizes you to capture and remove invasive Indo-Pacific red lionfish only from within the Sanctuary Preservation Areas (SPAs). No other organisms or materials, living or dead, may be removed from any SPA.
- You may use hand nets or slurp guns to remove invasive lionfish from within the SPAs. No other gear types are allowed.
- No collections of any other kind (tropical fish, invertebrates, living or dead substrate, or any other item) are authorized by this permit, from any location.
- You must report all lionfish captures from within the SPAs within 48 hours to REEF or MEERA using the enclosed form.

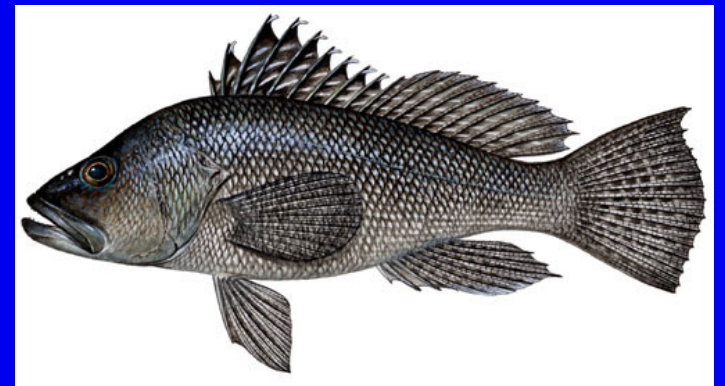
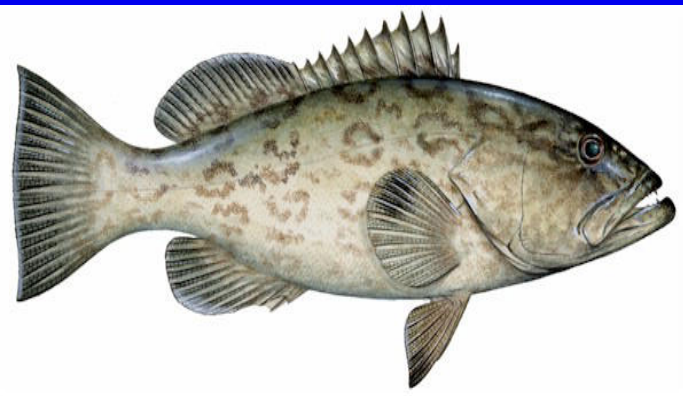
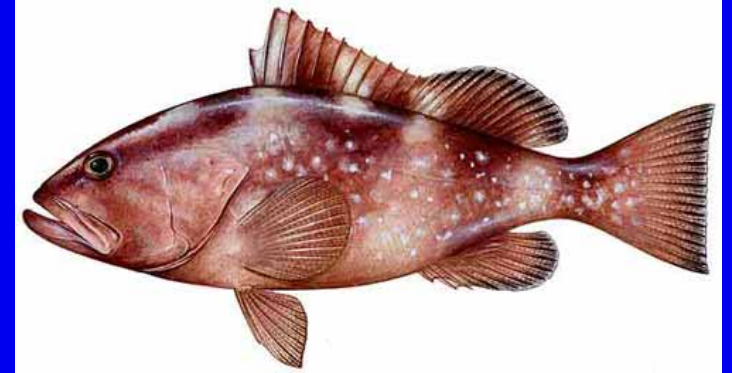




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- **Market Development**
- Current Field research
- Upcoming research

# Predation experiments



Morris et al *in review*





# Market Development

This book provides a unique blend of tantalizing recipes, background on the invasion and its impacts, as well as information on how to safely catch, handle and prepare the fish. Although it is highly unlikely that lionfish will ever be eradicated from their invaded range, it is very possible that their populations can be controlled and their impacts minimized simply by adding it to the menu. While many traditional native seafood species are under immense fishing pressure and in need of protection, lionfish are a tasty, nutritious and an environmentally conscious seafood choice. There is simply no "greener" fish to eat!

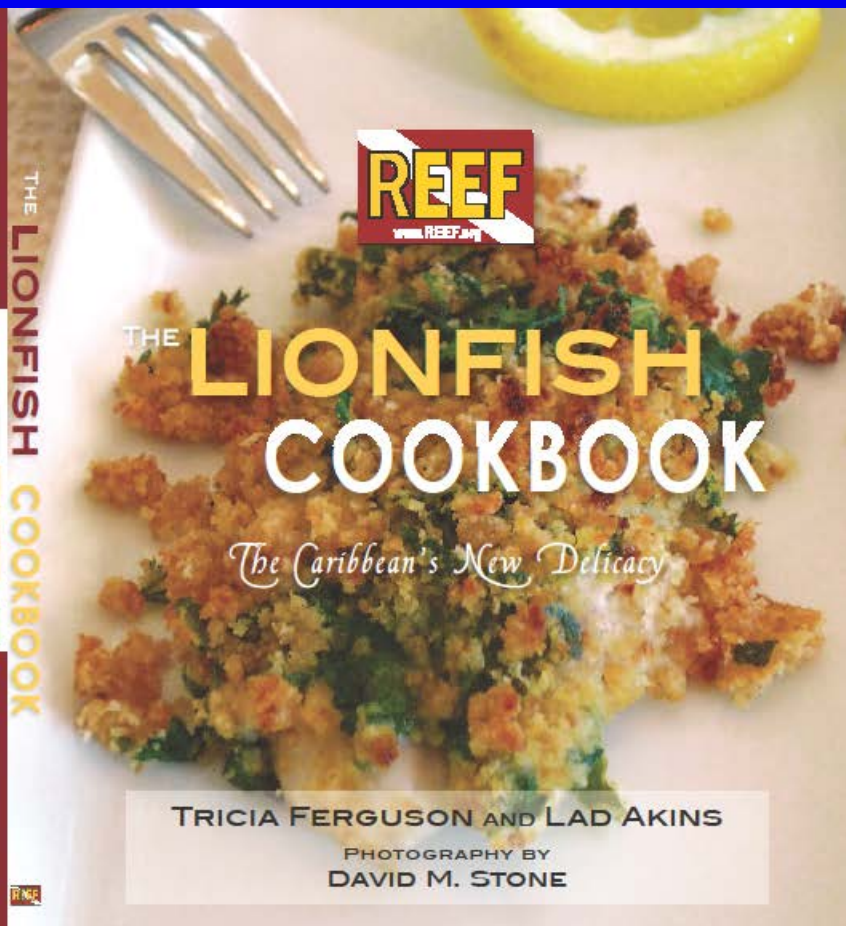


The proceeds from the sale of this book will continue to support marine conservation, lionfish research and control programs as long as there are oceans.

Recipes and Text by Tricia Ferguson and Lad Akins  
Photography by David M. Stone  
Cover and Book Design by Joanne Kidd

ISBN: 9780989444444

\$14.95











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# 2007 REEF Lionfish Projects

- Field Projects in the Bahamas  
600 Person Days - Feb, April, July, Nov, Dec

- Collection/documentation –
  - 1200+ specimens
  - Habitats
  - Stomach analysis
  - Reproductive frequency
  - Aging
  - Tagging for growth and movement
  - Parasites
  - Behavior



# Lionfish Projects/Workshops

- Bahamas 2008 – May, Sept, Oct, Nov
- Bahamas 2009 – Jan, May, Dec
- Bahamas 2010 – July, August, Dec
- Turks and Caicos 2009– Jan, Feb
- Cayman 2009, 2010
- Bonaire 2009
- Venezuela 2009
- Belize 2009, 2010
- Puerto Rico 2009, 2010
- St Croix 2009, 2010
- Mexico 2009, 2010
- Georgia 2009
- FL Keys 2009, 2010 (15 workshops)
- Dominica 2011

# Research Findings





# Lionfish Research Publications

- Source of invasion (2004)
- Stomach contents (2009)
- Volunteers in Early Detection and Response (2008)
- Biology and Ecology of Lionfish (2009)
- USVI Lionfish Response Plan (2009)
- Genetics (2009)
- Non Native Field Guide (2010)
- Mangrove use (2010)
- Foraging Behavior and Prey Consumption (2010)
- Nutritional value (2011)



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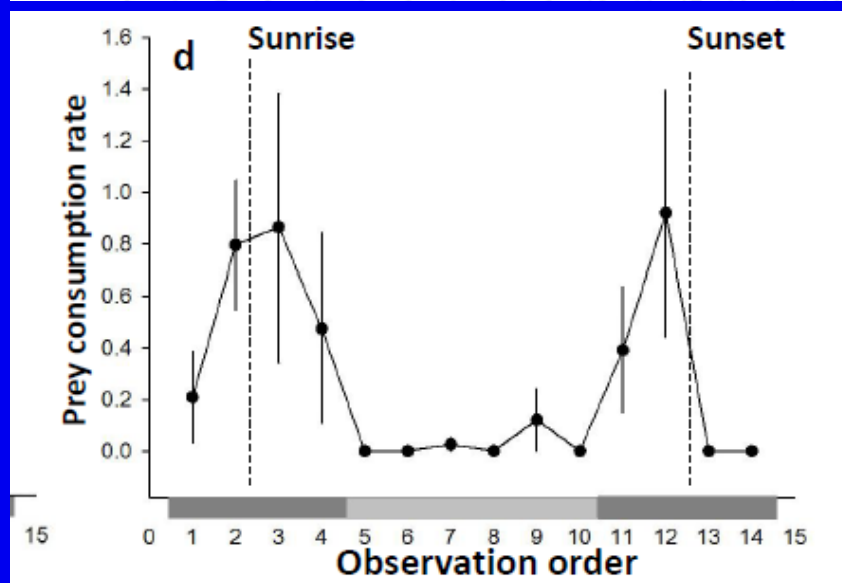
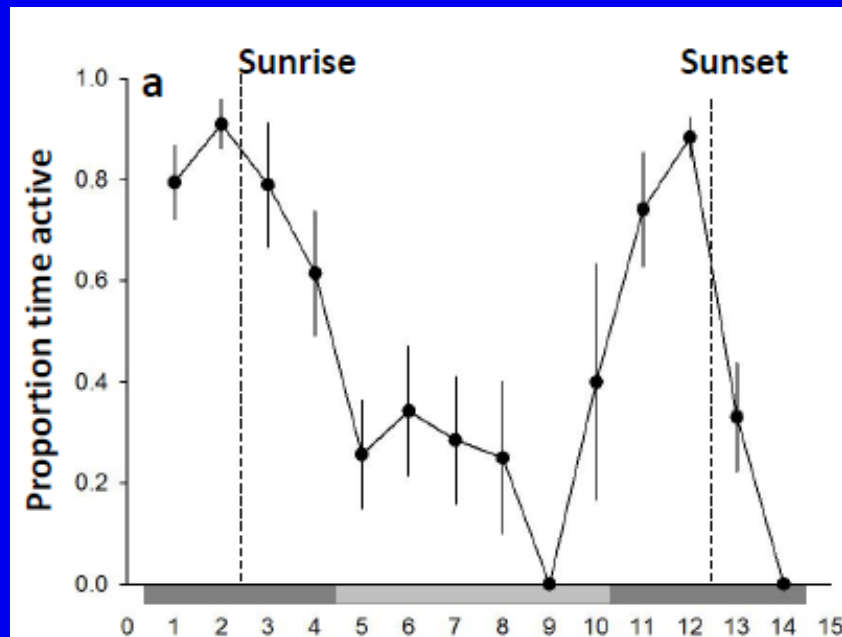
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# Emerging control methods

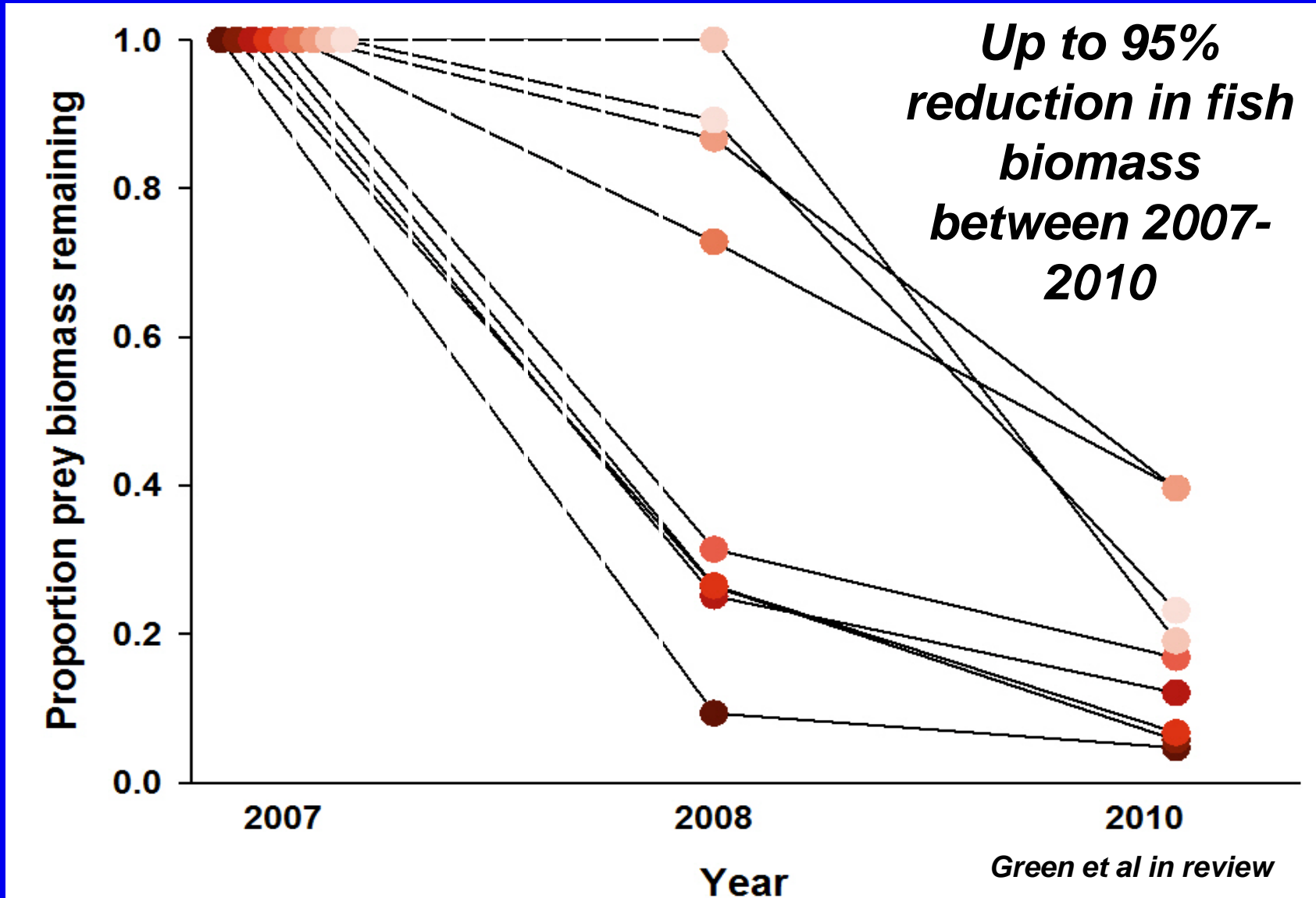


# Habitats





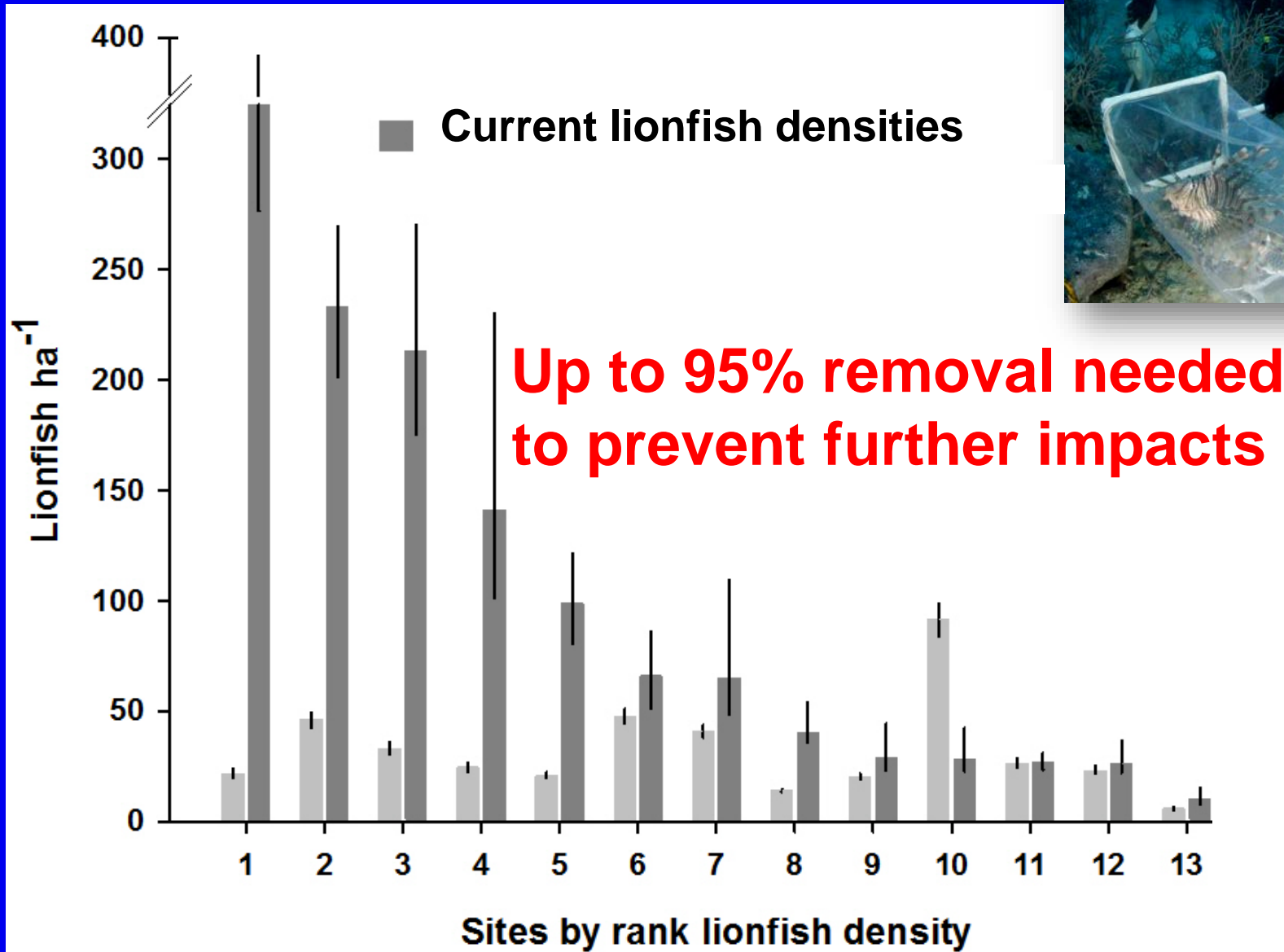
# Impact of lionfish on Bahamian reef fishes

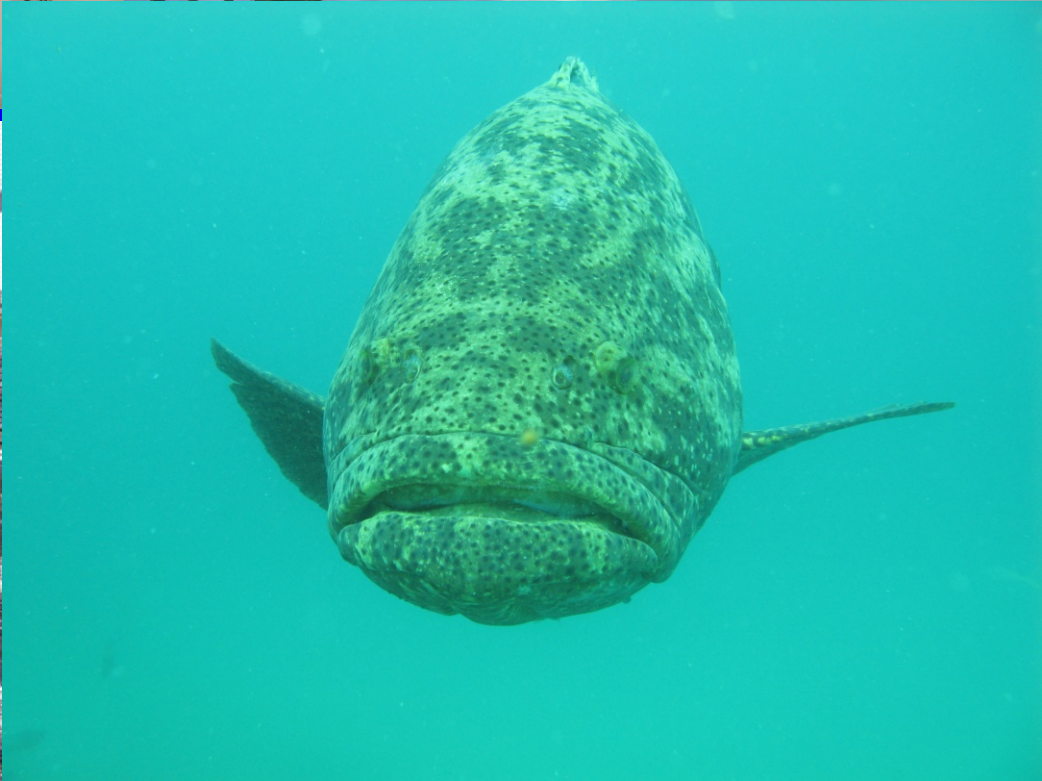


# MPAs and No-dive Zones: De facto lionfish reserves?



# Setting targets for lionfish removal







*Thank you! ...questions*



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