

# Value-Added Products as Tool for Management of Invasive Lionfish



Phil Karp  
Independent Citizen Scientist  
[pkarp24@gmail.com](mailto:pkarp24@gmail.com)



@pkarp24



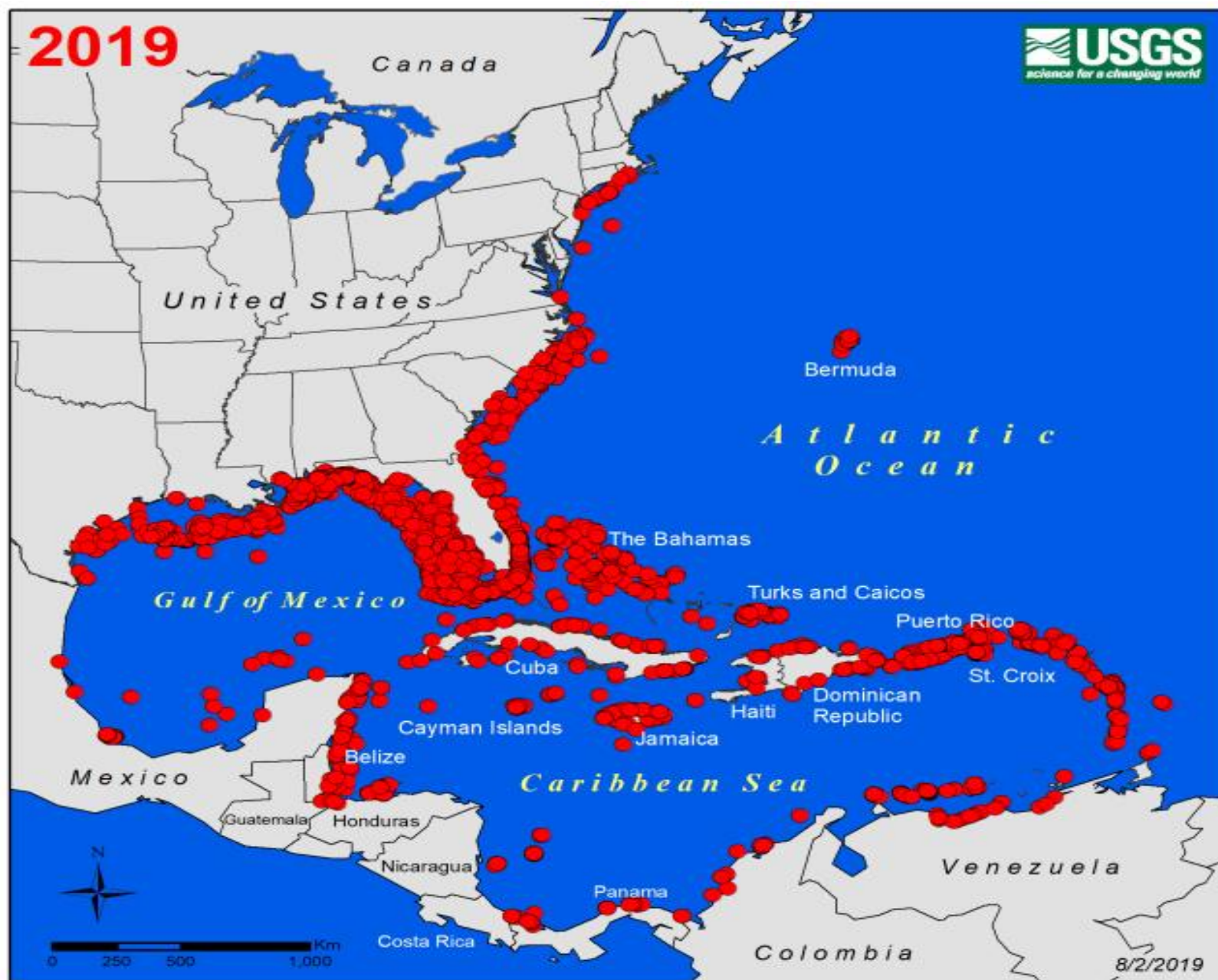
This species of lionfish, *Pterois volitans* along with closely related *Pterois miles* pose a serious threat to Western Atlantic, Caribbean, and Mediterranean marine ecosystems and fisheries

1985





2019





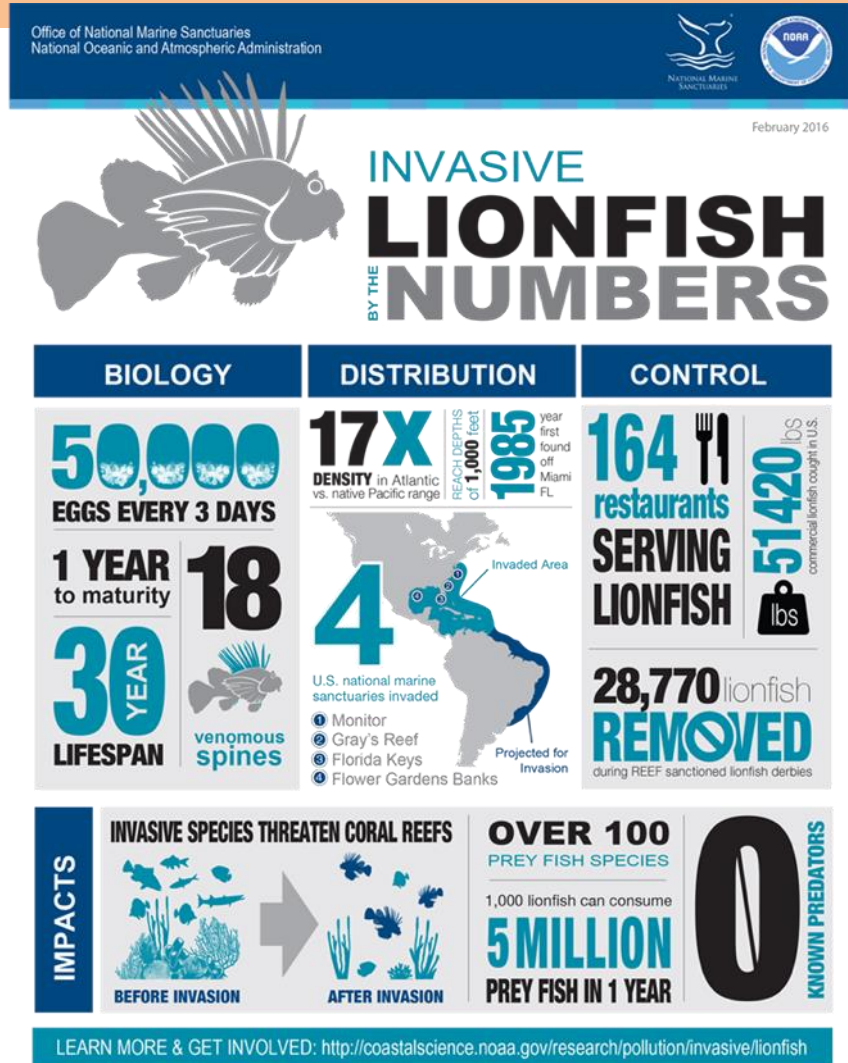


ASTEL MEDIA

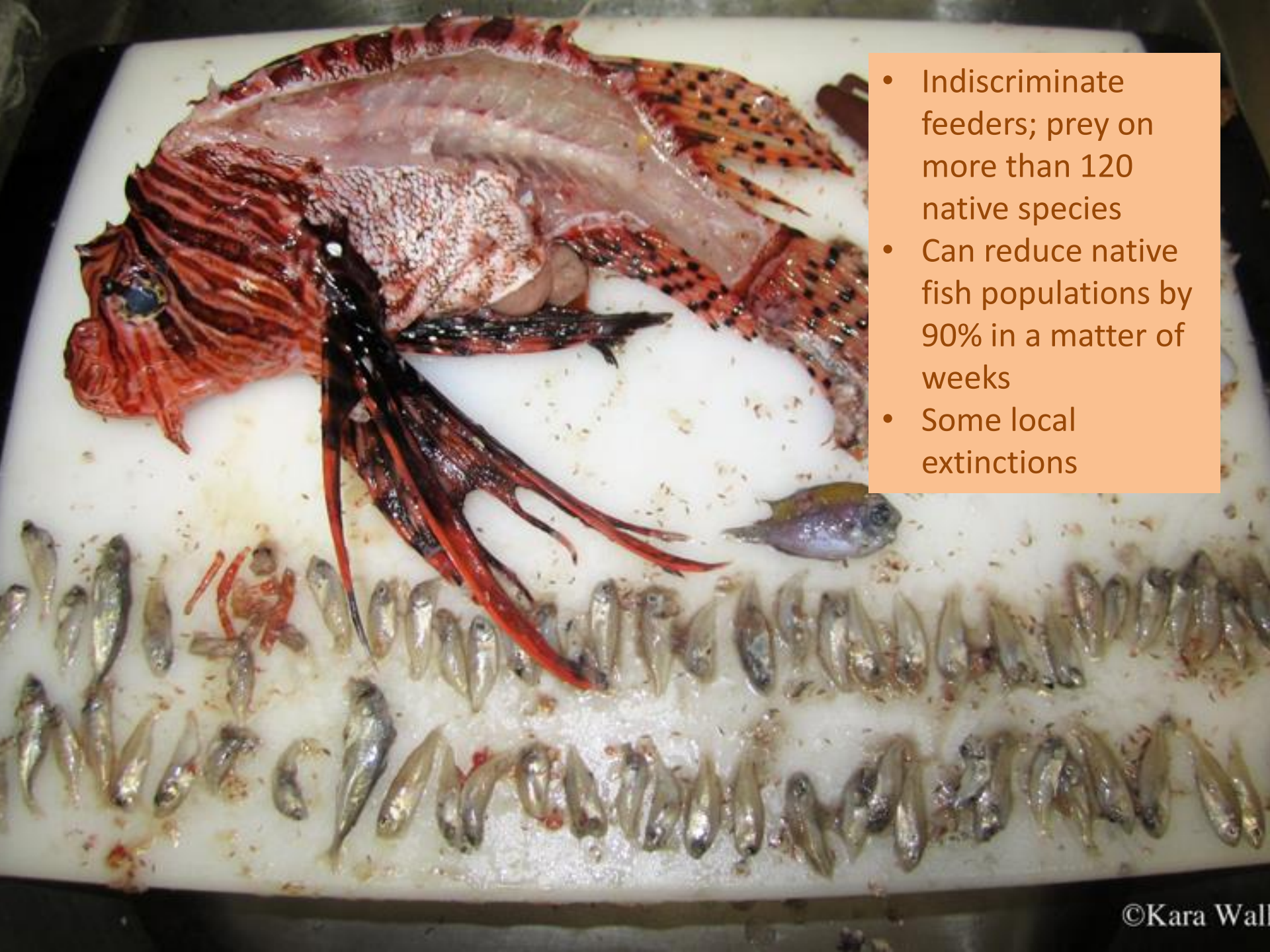
Population  
Densities in  
Atlantic up to ten  
times those found  
in native range

# What's the problem?

- No native predators
- Consume juveniles of commercially important fish
- As well as biologically important species
- High growth & feeding rates
- High reproductive rate
  - Reach sexual maturity at 12 months
  - Year round spawning
  - Multiple spawning each month
- Venomous spines
- Highly adaptable
  - Found in mangrove, rocky bottom & coral reef environments
  - Found at depths up to 300 meters
  - Can survive in low salinity







- Indiscriminate feeders; prey on more than 120 native species
- Can reduce native fish populations by 90% in a matter of weeks
- Some local extinctions



# Management Strategies

- Broad agreement that eradication is impossible
- Only solution is to control lionfish population densities via
  - Regular Removals (Marine Protection Agencies & Volunteer Divers)
- Challenge: How to undertake these removals on a financially sustainable basis





# Development of markets for lionfish products offers one set of Solutions

Development of a series of **vertical markets** can provide a sustainable approach to suppress invasive lionfish populations and provide an alternative income source for fishing communities, supporting fisheries management and native fish stock recovery

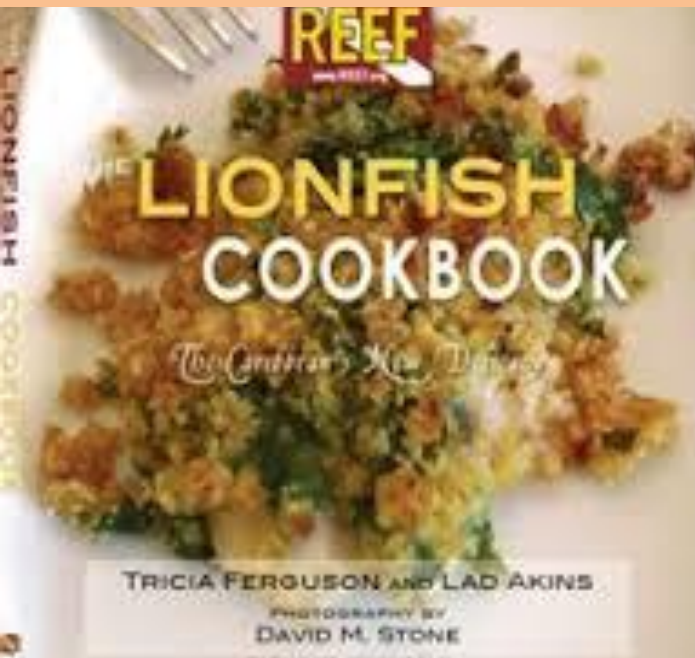
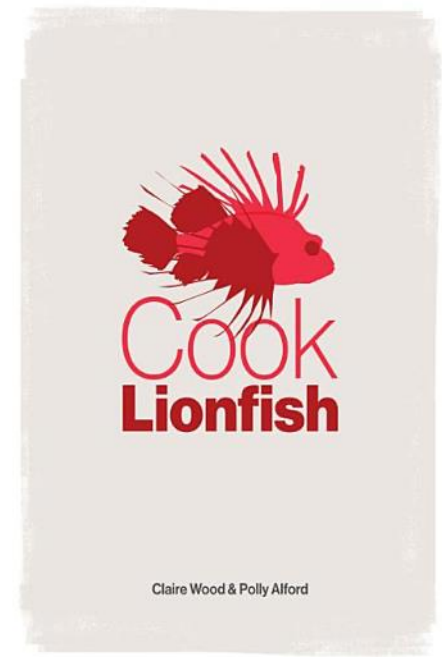




# Vertical Market #1

- Fishers
- Seafood Sellers
- Restaurants / Chefs

*Eat'em to Beat'em!*  
*Eat da Lion!*







f /LionfishMatters

**Eat Them to Beat Them!**  
SUPPORT RESTAURANTS THAT SERVE LIONFISH!

# GRILL'S GUIDE TO LOCAL LIONFISH



BAD  
LIONFISH



GOOD  
LIONFISH



GREAT  
LIONFISH

Monterey Bay Aquarium  
**Seafood Watch**

[Ocean Issues](#)

[Seafood Recommendations](#)

[Consumers](#)

[Businesses & Organizations](#)

[About Us](#)

[Resources](#)

[♥ D](#)

All Recommendations for Lionfish



SEARCH AGAIN

Seafood Watch

lionfish



8  
BEST

REFINE YOUR SEARCH

What kind is it?

Select one

BEST CHOICE



Type

**Lionfish, Devil firefish**  
Butterfly Cod, Firefish,  
Lionfish, Ornate Butterfly  
Cod, Peacock Lionfish, Red  
Firefish, Red Lionfish,  
Turkeyfish, Zebrafish

Method

**Hand implements**

Location

**U.S. - Western Cent  
Atlantic Ocean: Gul  
Mexico)**

Type

Method

Location





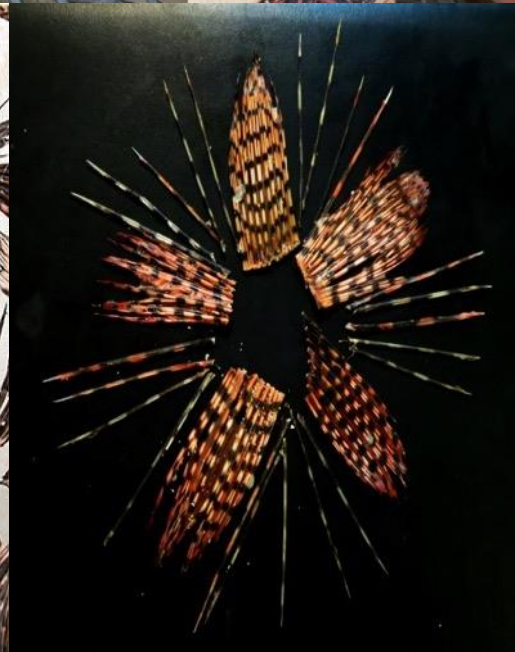
# Vertical Market #2

## Lionfish Jewelry and Handicrafts



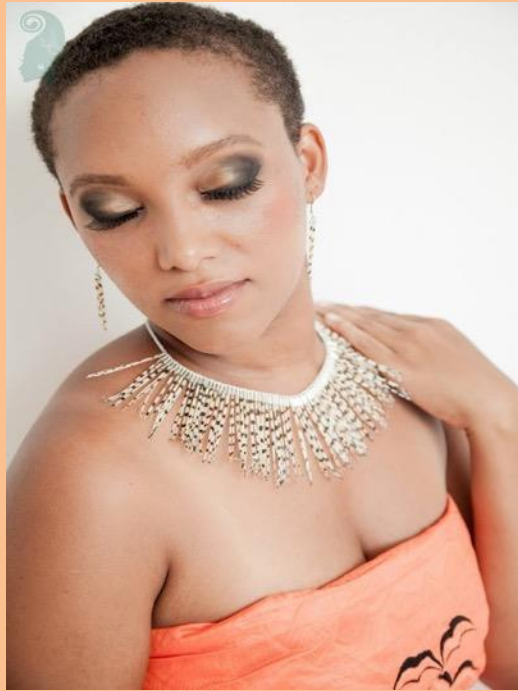


- Lionfish spines, fins and tails can be dried and preserved in a variety of shapes and colors
- Resulting in attractive material for use in jewelry





A variety of jewelry items  
can be produced, using  
spines....





## And fins / tails



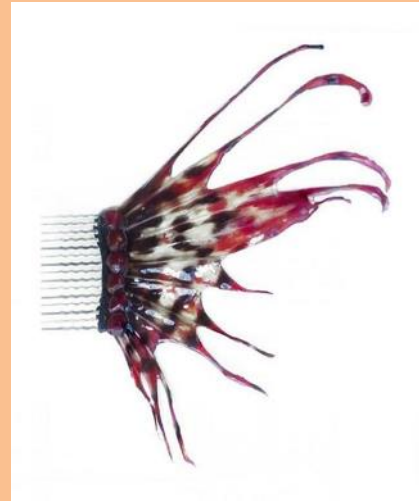






Some innovative artists are using other parts of the fish such as pectoral fins and operculum

And making other types types of products such as Christmas ornaments and hair stylizers





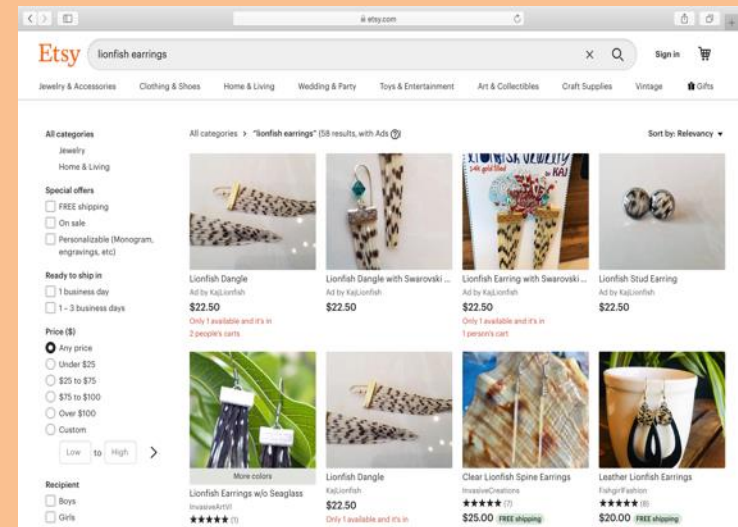
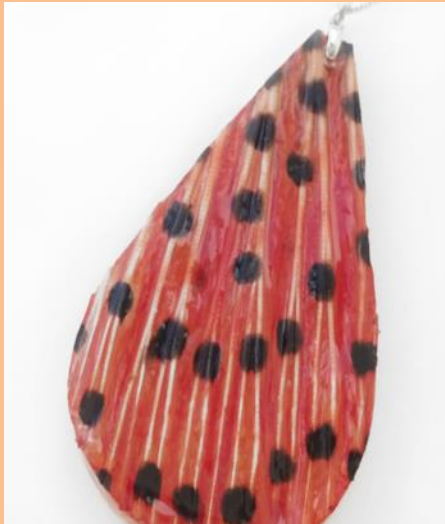
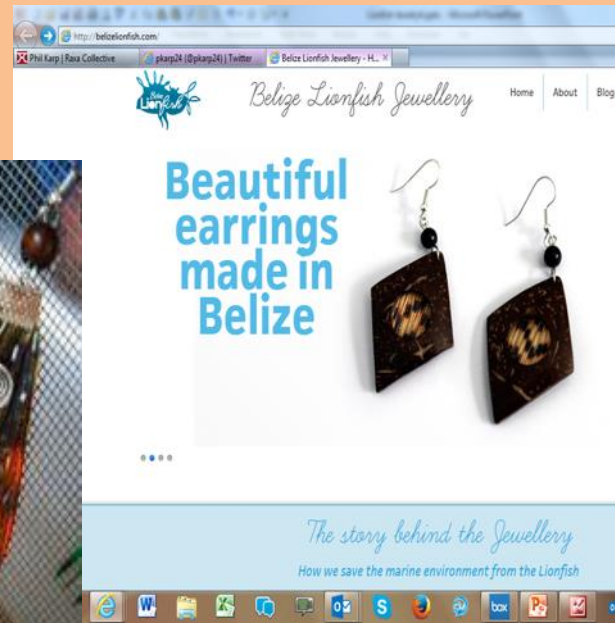
And mixing with other materials such as sea glass, feathers, coconut shell and husk, and even bottle caps!





# Where is lionfish jewelry being produced?

- Clusters of production in **Belize, Colombia, Grenada and St. Vincent & the Grenadines**
- Individual artists in **Aruba, Bahamas, Bermuda, Curacao, Cyprus, Puerto Rico, Mexico, Turkey, USVI**, and various parts of the **United States**





Another new  
value-added  
product:  
Lionfish Leather!





OK, so lionfish jewelry is cool...  
but how does this address the challenge of  
managing the invasion?

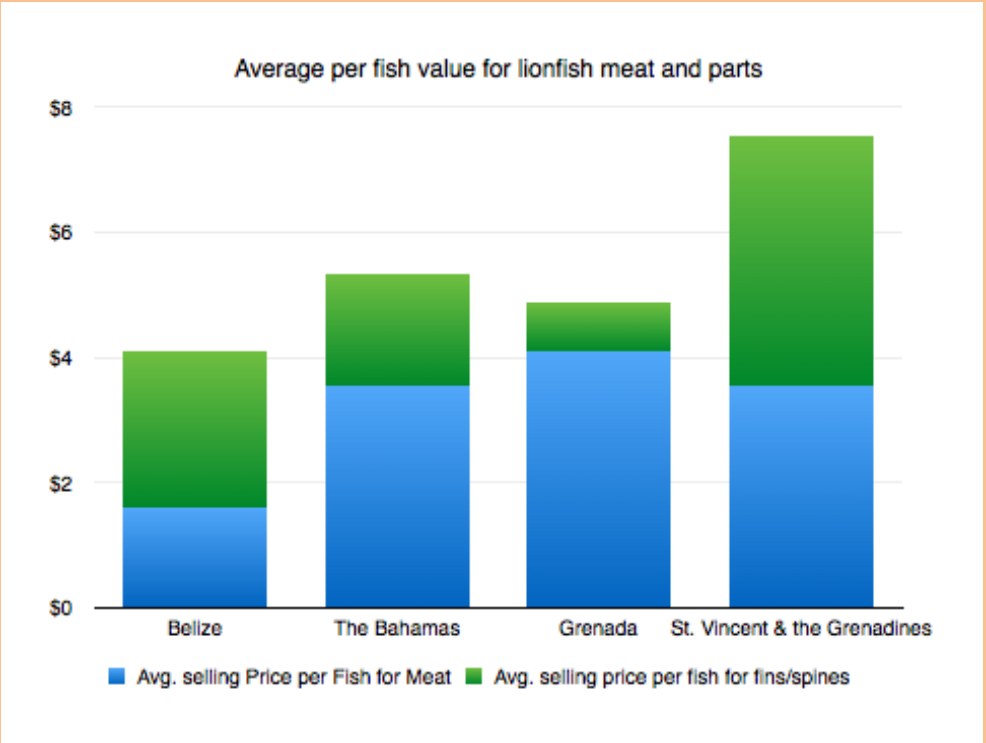
Some empirical evidence from Belize,  
the Bahamas, Grenada and the  
Grenadines





# Incentivizing Removals

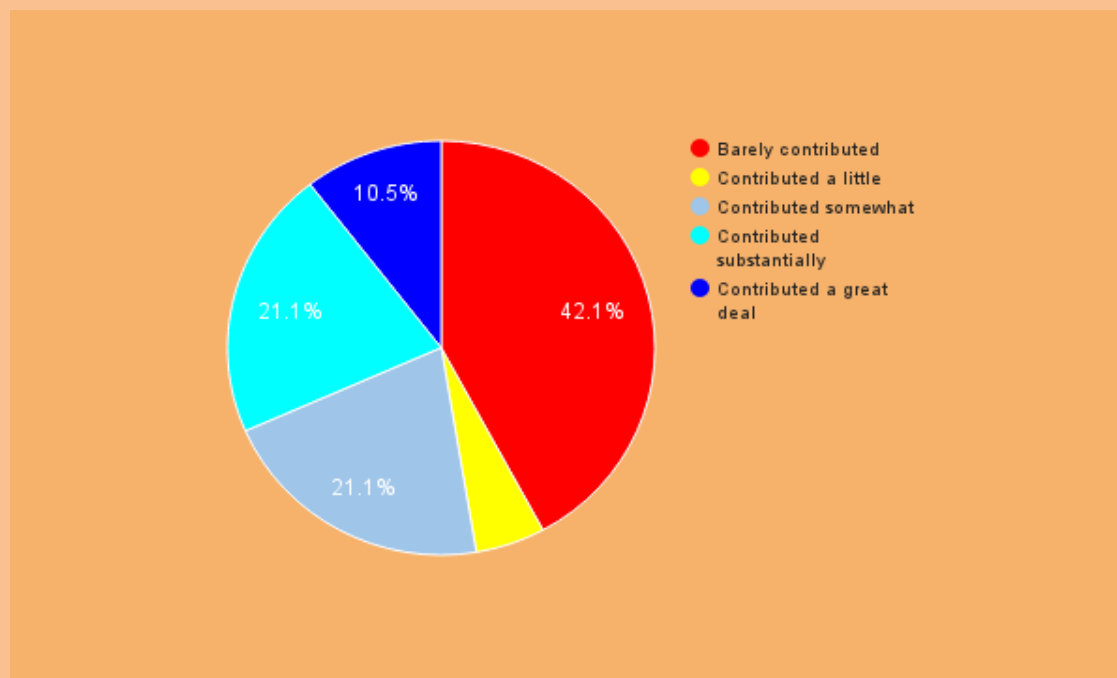
Experience from Belize, The Bahamas, Grenada and St. Vincent & the Grenadines demonstrated that **sale of fins and spines** can **increased landed value of lionfish** by up to 40 percent



	USD price/ lb - Whole Fish	USD price/lb - Fillets	Avg. selling Price per Fish for Meat	USD price for fins/ tails	USD price for spines	Avg. selling price per fish for fins/ spines	Value- Added
Belize	\$1.50 - \$3.00	\$3.00 - \$6.00	\$1.59	\$0.25 - \$0.50	\$0.10	\$2.50	61%
The Bahamas	\$11.00	\$5.00	\$3.56	\$0.44	spines not used	\$1.77	33%
Grenada	\$3.00 - \$3.75	\$4.50 - \$6.00	\$4.10	\$0.15 - \$0.25	spines not used	\$0.80	16%
St. Vincent & the Grenadines	\$3.75	N/A	\$3.56	\$0.50 - \$1.00	\$0.10	\$4.00	42%



# Livelihood Contribution



Survey of 35 lionfish jewelry artists from Belize, Bahamas, Grenada, and St. Vincent and the Grenadines

- More than 82 percent indicated that production and sale of lionfish jewelry contributed **substantially** or **a great deal** their household income
- Jewelry artists also reported **enhanced self-worth** and **sense of contribution** to their communities.



# Lionfish jewelry production also has important ancillary benefits, including

- Empowerment and new livelihood opportunities for women
- Acquisition of new business skills
- Increased household income
- Raised awareness about the threat posed by invasive lionfish



Item	#UNITS	\$BZ	\$BZ/unit
CLASP SILVER, SMALL	195	48	25 ¢
CLASP GOLD, SMALL (###)	130	36	27 ¢
CLASP GOLD, SMALL (PLAIN)	72	24	33 ¢
CLASP SILVER, MEDIUM	100	32	32 ¢
CLASP GOLD, LARGE	80	30	37 ¢
CLASP SILVER, LARGE	80	28	35 ¢
HOOBS stainless steel	100	5	5 ¢
copper wire 5 feet (60")		13	21 ¢
silver wire 5 feet (60")		26	43 ¢
aluminum wire (soft) 25 feet (600")		20	6 ¢
stainless steel fishing wire 30 feet (360")		6	

LEANING MATERIAL	
nail polish remover	\$2.95
5-60 fins = 42 = 7 ¢/fin	
PRESERVATION	
Varnish	\$7.95 /bottle
le = \$1.98	
stretch fin = 19 ¢	\$73.95 /gallon
Food dye x4	\$6.25
COLOUR = 1 ¢ /fin	



# Lionfish jewelry initiatives are most effective when

- Included as part of an integrated lionfish management program
- Include training in small business skills along with jewelry making
- Involve jewelry artists in awareness raising about the threat posed by invasive lionfish
- Involve fishers in fin harvesting & preservation
- Combined with commercialization of lionfish skins





# HANDMADE LIONFISH JEWELRY

FROM THE WIDER CARIBBEAN REGION



## PROTECTING CARIBBEAN REEFS

FROM INVASIVE LIONFISH

- LIONFISH JEWELRY MARKETS INCENTIVIZE INCREASED REMOVALS
- SALE OF FINS & SPINES FOR JEWELRY RAISES VALUE OF FISHER'S CATCH BY UP TO:



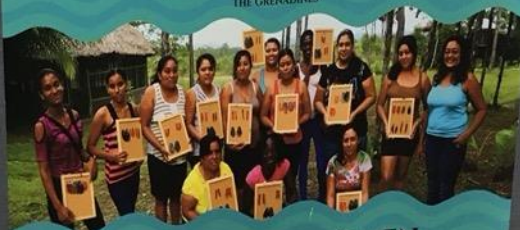
BELIZE



ST VINCENT &  
THE GRENADINES



GRENADA



## EMPOWERING WOMEN

LIONFISH JEWELRY PRODUCTION HELPS WOMEN IN COASTAL COMMUNITIES BY:

- PROVIDING NEW LIVELIHOOD OPPORTUNITIES
- ENHANCING SELF-ESTEEM
- DEVELOPING BUSINESS AND ENTREPRENEURSHIP SKILLS

[f /BELIZELIONFISHJEWELRY](https://www.facebook.com/BELIZELIONFISHJEWELRY)

PROUD PARTNERS

blue ventures  
social innovation



## Conclusions

- Value-added products have an important role to play in managing invasive lionfish
- Development of vertical markets in both seafood and jewelry can help support regular removals and a financially sustainable basis
- Moreover, lionfish jewelry production has important ancillary benefits, particularly for women

