Record of lionfish collected near Little Cayman Island during 2011 (Lionfish Invasion project)

Website: https://www.bco-dmo.org/dataset/3987
Data Type: Other Field Results
Version: 1
Version Date: 2013-07-02

Project
» Ecological Release and Resistance at Sea: Invasion of Atlantic Coral Reefs by Pacific Lionfish (Lionfish Invasion)

Contributors	Affiliation	Role
Hixon, Mark	Oregon State University (OSU)	Lead Principal Investigator
Kindinger, Tye L.	Oregon State University (OSU)	Scientist
Rauch, Shannon	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
This dataset includes dates, locations, and biological information (e.g. length) of lionfish (Pterois volitans) that were collected off of Little Cayman Island, Cayman Islands during the summer of 2011. This dataset includes only lionfish that were collected (handled).

Table of Contents

Coverage

Spatial Extent: **N**:19.7067 **E**:-80.01219 **S**:19.65497 **W**:-80.1036
Temporal Extent: 2011-08-04 - 2011-08-29

Dataset Description

This dataset includes dates, locations, and biological information (e.g. length) of lionfish (*Pterois volitans*) that were collected off of Little Cayman Island, Cayman Islands during the summer of 2011. This dataset includes only lionfish that were collected (handled). For all lionfish sighted, see the "lionfish sightings Cayman 2011" dataset.

Methods & Sampling

Information was recorded on all invasive lionfish collected from 04 August to 29 August 2011 for all studies conducted throughout the summer of 2011 at Little Cayman island, Cayman Islands .

Data Processing Description

BCO-DMO Processing Notes:
- Modified parameter names to conform with BCO-DMO naming conventions.
- Added lat and lon values for each site included in the original metadata.
- Replaced blanks with 'nd' to indicate 'no data'.
- 08-Jan-2018: released embargo from dataset.

[table of contents | back to top]

Data Files

File
lionfish_collections_Cayman_2011.csv (Comma Separated Values (.csv), 6.25 KB) MD5:bc2e14114fb44217e22a478535a2251d Primary data file for dataset ID 3987

[table of contents | back to top]

Parameters

Parameter	Description	Units
site	Name of individual reef site where the fish were collected.	text
lat	Latitude of the reef site.	decimal degrees
lon	Longitude of the reef site.	decimal degrees
fish_id	Unique code given to each lionfish collected.	code
date_collected	The date of collection in mm/dd/yyyy format.	unitless
depth_ft	Depth of collection.	feet
len_tot_est	Underwater visual estimate of total body length of lionfish (in centimeters).	cm
len_tot	Measured total body length of lionfish (in centimeters).	cm
person	Initials of the individual that collected the lionfish (TK = Tye Kindinger; LT = Lillian Tuttle).	text
location_moved	Location where lionfish were stored/released (Wet Lab = wet lab at CCMI research station).	text
used_for	Which studies individual lionfish were used (if any): TK Bottle Expt = damselfish behavioral response to lionfish (Kindinger) LT Cleaner Expt = lionfish-cleaner lab experiments (Tuttle) LT Parasite Work = lionfish parasites 2009-2011 (Sikkel)	text

[table of contents | back to top]

Deployments

Cayman_Reef_Surveys_10-11

Website	https://www.bco-dmo.org/deployment/59048
Platform	Cayman_Islands
Start Date	2010-06-14
End Date	2011-08-29
Description	Coral reefs were surveyed/studied near the Cayman Islands during the summers of 2010 and 2011 as part of the projects "Ecological Release and Resistance at Sea: Invasion of Atlantic Coral Reefs by Pacific Lionfish" and "Mechanisms and Consequences of Fish Biodiversity Loss on Atlantic Coral Reefs Caused by Invasive Pacific Lionfish" (NSF OCE-0851162 & OCE-1233027).

[table of contents | back to top]

Project Information

Ecological Release and Resistance at Sea: Invasion of Atlantic Coral Reefs by Pacific Lionfish (Lionfish Invasion)

Website: http://hixon.science.oregonstate.edu/content/highlight-lionfish-invasion

Coverage: Bahamas; Cayman Islands; Mariana Islands; Philippines

Invasive species are increasingly introduced by human activities to new regions of the world where those species have never existed previously. In the absence of natural enemies (predators, competitors, and diseases) from their homeland, invasives may have strong negative effects on invaded ecosystems, especially systems with fewer species ("ecological release"), and may even drive native species extinct. However, if native natural enemies can somehow control the invaders ("ecological resistance"), then ecological disruption can be prevented or at least moderated. Most of the many invasive species in the sea have been seaweeds and invertebrates, and the few documented invasive marine fishes have not caused major problems. However, this situation has recently changed in a stunning and ominous way. In the early 1990s, lionfish (*Pterois volitans*) from the Pacific Ocean were accidentally or intentionally released from aquaria to the ocean in the vicinity of Florida. Camouflaged by shape and color, protected by venomous spines, consuming native coral-reef fishes voraciously, and reproducing rapidly, lionfish have subsequently undergone a population explosion. They now range from the mid-Atlantic coast of the US to the Caribbean, including the Bahamas. Native Atlantic fishes have never before encountered this spiny, stealthy, efficient predator and seldom take evasive action. In fact, the investigator has documented that a single lionfish is capable of reducing the abundance of small fish on a small coral patch reef by nearly 80% in just 5 weeks. There is great concern that invasive lionfish may severely reduce the abundance of native coral-reef fishes important as food for humans (e.g., grouper and snapper in their juvenile stages) as well as species that normally maintain the integrity of coral reefs (e.g., grazing parrotfishes that can prevent seaweeds from smothering corals). There are far more species of coral-reef fish in the Pacific than the Atlantic, so this invasion may represent a case of extreme ecological release with minor ecological resistance. Dr. Hixon and colleagues will study the mechanisms of ecological release in lionfish, as well as examine potential sources of ecological resistance in the heavily invaded Bahamas. Because very little is known about the ecology and behavior of lionfish in their native Pacific range, he will also conduct comparative studies in both oceans, which may provide clues regarding the extreme success of this invasion. In the Bahamas, the investigator will document the direct and indirect effects on native species of the ecological release of lionfish, both as a predator and as a competitor. These studies will be conducted at various scales of time and space, from short-term experiments on small patch reefs, to long-term experiments and observations on large reefs. Whereas direct effects involve mostly changes in the abundance of native species, indirect effects can be highly variable. For example, lionfish may actually indirectly benefit some native species by either consuming or outcompeting the competitors of those natives. The project will explore possible ecological resistance to the invasion by determining whether any native Bahamian species are effective natural enemies of lionfish, including predators, parasites, and competitors of both juvenile and adult lionfish. Comparative studies of natural enemies, as well as lionfish ecology and behavior, in both the Atlantic and the Pacific may provide clues regarding the explosive spread of lionfish in the Atlantic.

Regarding broader impacts, this basic research will provide information valuable to coral-reef and fisheries

managers fighting the lionfish invasion in the US, the Bahamas, and the greater Caribbean, especially if sources of native ecological resistance are identified. The study will fund the PhD research of U.S. graduate students, as well as involve assistance and participation by a broad variety of undergraduates and reef/fisheries managers, including women, minorities, native Bahamians, and native Pacific islanders. Participation in this project will promote education in marine ecology and conservation biology directly via Dr. Hixon's and graduate students' teaching and outreach activities, and indirectly via the experiences of undergraduate field assistants and various associates.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0851162

[table of contents | back to top]