Record of lionfish sighted during surveys near Lee Stocking Isalnd, Bahamas from 2009-2011 (Lionfish Invasion project)

Website: https://www.bco-dmo.org/dataset/3909
Data Type: Other Field Results
Version: 1
Version Date: 2013-04-10

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

Contributors	Affiliation	Role
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Abstract
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Coverage

Spatial Extent: **N**:23.83203 **E**:-76.02326 **S**:23.67021 **W**:-76.25727
Temporal Extent: 2009 - 2011

Dataset Description

This dataset includes dates, locations, and estimated length of lionfish (*Pterois volitans*) that were sighted in the vicinity of Lee Stocking Island, Bahamas from 2009 to 2011. Lionfish that were handled (collected) are reported in this dataset, as well as in the 'lionfish collections LSI 2009-2011' dataset, which contains additional biological information about the collected fish.

Methods & Sampling

From 2009 to 2011, a record was made for all lionfish (*Pterois volitans*) sightings in the vicinity of Lee Stocking Island, Bahamas for various sub-projects within the project titled "Ecological Release and Resistance at Sea: Invasion of Atlantic Coral Reefs by Pacific Lionfish". All lionfish that were handled for a specific sub-project were assigned a unique lionfish ID number (fish_id).

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'. Also replaced '?' with 'nd' where applicable.
- In the 2009 data, changed 'Long term Hixon Reefs' site name to 'Beauty' or 'Beast' as indicated in the location column.
- In 2010 data, changed the following site names: 'Bock_Hole' to 'HAPI_Hole'; 'N_Normans' to 'NE_Normans'; 'Near_Beauty' to 'Beauty'; and 'SE_Normans' to 'NE_Normans' (per info from Tim Pusack received 04/04/13).
- In 2011 data, changed the following site names: 'Inner_White_House' to 'Inner_White_Horse'; 'White_Horse' to 'Outer_White_Horse'; 'S_Norman's_Pond_Cay' site name to 'SW_Normans'; 'SE_Normans' to 'SW_Normans'; and 'Turtle_Rock' to 'Turtle_Reef' (per info from Tim Pusack received 04/04/13).
- Modified site names to standardize name used across all years (e.g. changed 'NE_Normans_Pond_Reef' to 'NE_Normans').
- 09-Jan-2018: removed embargo on dataset.

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Data Files

File
lionfish_sightings.csv (Comma Separated Values (.csv), 115.65 KB) MD5:2b92eadeed8d2e3b1a8431f4faa48f18 Primary data file for dataset ID 3909

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Parameters

Parameter	Description	Units
year	Year of collection in YYYY format.	unitless
site	The specific reef site where the lionfish was sighted.	code
lat	Latitude of the reef site.	decimal degrees
lon	Longitude of the reef site.	decimal degrees
fish_id	Unique code given to all lionfish that were collected. (Originally called 'Collection_ID'.)	code
date_sighted	The date that each lionfish was sighted in mm/dd/YYYY format.	unitless
location	Description of the location within each site where the lionfish was sighted.	text
depth	Approximate depth of lionfish sighting.	meters
len_tot_est	Estimated total length of lionfish (cenimeters).	cm
person	Identity of observer.	text
notes	Detailed description of the microhabitat where each lionfish was sighted.	text
used_for	If the lionfish was for an experiment, this column states for which experiment it was used for.	text

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Deployments

LSI_Reef_Surveys_09-12

Website	https://www.bco-dmo.org/deployment/59019
Platform	Tropical Marine Lab at Lee Stocking Island
Start Date	2009-05-30
End Date	2012-08-18
Description	Locations of coral reef survey dives and sightings, or collections of the invasive red lionfish, Pterois volitans, near Lee Stocking Island, Bahamas for 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). All dives were made from various small vessels (17' to 24' l.o.a., 40 to 275 HP outboard motors, 1 to 7 GRT). Vessel names include, Sampson, Orca, Potcake, Lusca, Lucaya, Zardoz, Parker, and Nuwanda.

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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.

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Funding

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

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