Record of lionfish handled/collected during surveys near Lee Stocking Island, Bahamas from 2009-2011 (Lionfish Invasion project)

Website: https://www.bco-dmo.org/dataset/3908
Data Type: Other Field Results
Version: 1
Version Date: 2013-04-09

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
Record of lionfish handled/collected during surveys near Lee Stocking Island, Bahamas from 2009-2011.

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Coverage

Spatial Extent: **N**:23.8313 **E**:-76.02326 **S**:23.67021 **W**:-76.2684
Temporal Extent: 2009-09-09 - 2010-06-06

Dataset Description

This dataset includes dates, locations, and biological information (including length and mass) of lionfish (*Pterois volitans*) that were handled (collected) in the vicinity of Lee Stocking Island, Bahamas from 2009 to 2011.

Methods & Sampling

From 2009 to 2011, biological information was recorded for all lionfish (*Pterois volitans*) that were handled (collected) 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' and changed 'Overkill_Cay' to 'Overkill_Reefs' (per info from Tim Pusack received 04/04/13).
- 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: '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_collections.csv (Comma Separated Values (.csv), 190.42 KB) MD5:1f5bf76190494d57aad298d6439371d3 Primary data file for dataset ID 3908

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Parameters

Parameter	Description	Units
year	Year of collection in YYYY format.	unitless
site	The reef site in the vicinity of Lee Stocking Island Bahamas where the lionfish was collected from.	text
lat	Latitude of the reef site.	decimal degrees
lon	Longitude of the reef site.	decimal degrees
fish_id	A unique code given to each lionfish that was collected and used in various experiments. L = lionfish; and the numbers are in order of collection	code
date_collected	The date of collection in mm/dd/yyyy format.	unitless
location	The specific location in each site where the lionfish was collected from (note: A-00 to A-15 and T-00 to T-31 are specfiic patch reefs in the artifical and patch reef matrix).	text
depth	Approximate depth of collection.	meters
len_tot_est	Estimated total length of lionfish (in centimeters).	cm
len_tot	Measured total length of lionfish (in centimeters).	cm
len_tot_plus_damage	Total length plus estimated caudal damage (in centimeters).	cm
mass	Measured mass of lionfish.	grams
dorsal_spine_clipped	The particular dosal spine(s) that were clipped for identification purposes. The numbers start with the dorsal spin closest to the head of the lionfish and proceed posterially).	integer
tag_elastomer	Subcutaneous paint tag given for identification purposes.L- Left SideR- Right Side After the dash:O = ORANGER = REDB = BLACKG = GREENE = BLUEY = YELLOWUM = UPPER MIDDLEUC = UPPER CAUDALLC = LOWER CAUDAL	code
tag_streamer1	Alphanumeric number on the anterior streamer identification tag.	alphanumeric
tag_streamer2	Alphanumeric number on the posterior streamer identification tag.	alphanumeric
tag_tbar	Color code of the identification T-bar tag:BL = bluePU = purpleGR = greenYL = yellowWH = whiteRD = red	code
tag_num	Tag number.	nd
date_measured	Date that the measurement was taken in mm/dd/yyyy format.	unitless
person	Initials of the individual(s) that collected the lionfish.	text
location_moved	Location that the lionfish was moved to.	text
date_moved	Date that the lionfish was moved in mm/dd/yyyy format.	unitless
status	Current state of the lionfish whether it was moved; tagged; clipped; measured; released; or dead.	text
date_status	Date of the last status update in mm/dd/yyyy format.	unitless
notes	Specifies theexperiment that each lionfish was used for.	text
recapture_notes	Information obtained when lionfish were recaptured.	text
used_for	Specifies theexperiment that each lionfish 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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