Catch data conducted on hook and line along Pt. Lobos shore in California from 2007 to 2012.

Website: https://www.bco-dmo.org/dataset/712899
Data Type: Other Field Results
Version: 1
Version Date: 2017-08-04

Project
» Impacts of size-selective mortality on sex-changing fishes (Goby size-selection)

Contributors	Affiliation	Role
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Abstract
Catch data conducted on hook and line along Pt. Lobos shore in California from 2007 to 2012.

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Coverage

Spatial Extent: **N**:36.525859 **E**:-121.93559 **S**:36.451476 **W**:-122.010601
Temporal Extent: 2007-08 - 2012-09

Dataset Description

This dataset contains fish hook-and-line census data from offshore of Pt. Lobos California. Full description of details is provided in Starr et al. (2015).

Methods & Sampling

This dataset contains fish hook-and-line census data that were collected by hook-and-line fishing in a cooperative data collection effort on fishing boats offshore of Pt. Lobos California. Full description of details is provided in Starr et al. (2015).

Data Processing Description

Scripts that were used to process these data can be found here: github.com/jwilsonwhite/IPM_statespace.

BCO-DMO Data Processing Notes:

-Reformatted column names to comply with BCO-DMO standards
-Sorted data by year, month, site, then common name
-Moved year and month column to appear as the first and second column respectively.

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Data Files

File
hookline_survey.csv (Comma Separated Values (.csv), 173.52 KB) MD5:f240d49a09d1b46d21a0853ad41ef345 Primary data file for dataset ID 712899

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Related Publications

Starr, R. M., Wendt, D. E., Barnes, C. L., Marks, C. I., Malone, D., Waltz, G., ... Yochum, N. (2015). Variation in Responses of Fishes across Multiple Reserves within a Network of Marine Protected Areas in Temperate Waters. PLOS ONE, 10(3), e0118502. doi:10.1371/journal.pone.0118502
Methods

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Parameters

Parameter	Description	Units
Year	Year of sampling	unitless
Month	Month of sampling	unitless
Area	Area of data collection; Pt. Lobos (PL)	unitless
Site	Site type; Marine Protected Area (MPA) or Reference (REF)	unitless
Common_Name	Species common name	unitless
Length	Length of fish	centimeters
Depth_Released	Depth of fish release	meters

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Instruments

Dataset-specific Instrument Name	Hook and line
Generic Instrument Name	Hook and line
Dataset-specific Description	Used to collect fish census data
Generic Instrument Description	A type of fishing methodology sometimes used to collect fish census data. It is a hook at the end of a line.

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Deployments

PISCO_1997

Website	https://www.bco-dmo.org/deployment/712780
Platform	shoreside Calif_shore
Start Date	1997-01-01
End Date	2007-12-31

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Project Information

Impacts of size-selective mortality on sex-changing fishes (Goby size-selection)

Coverage: Southern California, Santa Catalina Island

Description from NSF award abstract:
Many marine fish species change sex during their lifetimes, and many of them are targets of commercial and recreational fishing. The timing of sex change in these animals is often related to body size, so populations typically consist of many small fish of the initial sex (usually female) and few large fish of the other sex (usually male). In nature, smaller fish are at a greater risk of mortality due to predation, but fishermen tend to seek larger fish. Thus fishing that targets larger individuals may skew sex ratios, removing enough of the larger sex to hinder reproduction. However, the extent to which size-selective mortality affects sex-changing fishes is poorly understood. This research will explore the effects of size-selective mortality on the population dynamics of sex-changing species using an integrated set of field experiments and mathematical models. It will provide the first experimental exploration of the sensitivity of different sex-change patterns and reproductive strategies to selective mortality. The results will advance our knowledge of the susceptibility and resilience of sex-changing organisms to different types of size-selective mortality and will reveal how sex-changing species can recover after size-selection ceases, as in populations within marine reserves where fishing is suddenly prohibited. The findings will inform fisheries management policies, which do not currently consider the ability of a species to change sex in setting fisheries regulations.

This project will consist of a three-year study of the effects of size-specific mortality on sex-changing fishes. Field experiments will use three closely related rocky-reef fishes that differ in sex-change pattern and are amenable to field manipulation and direct measurement of reproductive output. The species include a protogynous hermaphrodite (a female-to-male sex-change pattern common among harvested species) and two simultaneous hermaphrodites that differ in their ability to switch between male and female. Two types of experiments will be conducted on populations established on replicate patch reefs at Santa Catalina Island, California: (1) sex ratios will be manipulated to determine when the scarcity of males limits population-level reproductive output; and (2) experiments cross-factoring the intensity of mortality with the form of size-

selection (i.e., higher mortality of large or small individuals) will test the demographic consequences of size-selective mortality. In concert with the field experiments, size- and sex-structured population models (integral projection models) will be developed for use in three ways: (1) to evaluate how different types of selective mortality should affect population dynamics; (2) to predict outcomes of the field experiments, testing/validating the model and allowing direct prediction of the ecological significance of short-term selection; and (3) to fit to existing survey data for a fourth species, a widely fished, sex-changing fish, inside and outside of marine reserves. Part (3) will evaluate whether and how quickly the mating system and reproductive output of that species (not directly measurable in the field) is recovering inside reserves. This integrated set of field experiments and models will yield novel insight into the effects of size-selective mortality on the population dynamics of sex-changing marine species.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1435473

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