Home range and body size data compiled from the literature for marine and terrestrial vertebrates

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Data Type: Other Field Results
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Project
» Adaptations of fish and fishing communities to rapid climate change (CC Fishery Adaptations)

Contributors	Affiliation	Role
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Abstract
Home range and body size data compiled from the literature for marine and terrestrial vertebrates.

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Dataset Description

Home range and body size data compiled from the literature for marine and terrestrial vertebrates.

These data were published in McCauley et al. (2015) Table S2.

Methods & Sampling

We compiled the home range size of a representative selection of adult marine and terrestrial vertebrates: seabirds (n = 19), marine reptiles (n = 6), marine fishes (n = 20), marine mammals (n = 22), terrestrial birds (n = 95), terrestrial reptiles (n = 65), and terrestrial mammals (n = 616). We only accepted home range estimates that described > 75% of an adult individual's total utilized area. Home range sizes in our compilation were estimated by authors using a variety of analytical techniques, including kernel utilization distributions, minimum convex polygon estimates, and geometric estimation techniques. We primarily accepted studies that used satellite, radio, or acoustic telemetry to obtain data for home range size estimation, though estimates produced from visual observations were accepted if a species' home range was small enough that the author could accurately describe it in its entirety without issue (e.g., the 1.3x10-5 km2 home range of the 2 g lizard Anolis distichus). If multiple home range estimates meeting these criteria were available from different studies on the same species, we averaged these values. Likewise, we averaged values for different groups of individuals within a species (e.g., sexes) if these values were reported in a single study. Data on the adult body mass of all species included in the home range dataset were preferentially drawn from the primary literature source from which home range data were taken. If body mass data were not available in these sources, they were collected from alternate databases or from peer-reviewed publications.

Scientific names in this dataset were obtained from literature and include some misspelled names and

unaccepted synonyms. These names were matched to species in several authoritative name sources. Taxonomic identifiers and match quality results can be found in the supplemental document "Species Name Match Results."

Data Processing Description

BCO-DMO data manager processing notes:
* changed commas in reference column to pipe characters due to an issue with data export from the JGOFS data system.
* changed multiple tab(s) between genus and species names to one space character. This was affecting taxon checking tools.
* strange character encoding after export to csv for "Eudyptes filholi" changed to "Eudyptes filholi"
* Species name "Melosplizal melodia" was a typo, it the paper it was accurately spelled "Melospiza melodia." Updated that name in the data file since that is how it was spelled in the literature cited.
* Matched species names in this dataset to EOL, GBIF, and ITIS. Attached a supplemental document "Species Name Match Results" with identifiers for the matched scientific names, and the match type (e.g. exact or fuzzy).

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Data Files

File
animal_mobility.csv (Comma Separated Values (.csv), 32.17 KB) MD5:9c8b3cc93c49e949a377f7d0cd18c218 Primary data file for dataset ID 752795

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Supplemental Files

File
Reference numbers for McCauley et al., 2015 filename: McCauley_et_al_2015_references.pdf (Portable Document Format (.pdf), 150.99 KB) MD5:1acefa9a89f4f2a94a49ad645a800a55 These reference numbers for McCauley et al., 2015 were included within the "Vertebrate home range and body size" data and are non-home range references used for body mass.

File

Species Name Match Results

filename: speices_name_match_results.csv

(Comma Separated Values (.csv), 145.55 KB)
MD5:499d33375d46424eaa7bde643e5052bf

This file is a species list for the dataset "Vertebrate home range and body size" BCO-DMO dataset #752795. Species names were matched to three data sources using the Global Names Resolver (http://resolver.globalnames.org/about).

Column "Species" contains species names in the dataset (#752795). These names were obtained from literature and include misspelled names and unaccepted synonyms. "Species" were matched to names in three data sources:

- Global Biodiversity Information Facility (GBIF)
- Encyclopedia of Life (EOL)
- Integrated Taxonomic Information System (ITIS)

The "match_value" columns (e.g. GBIF_match_value) contain a description of how well the names in the dataset match the names in the authoritative source. A fuzzy match indicates the spelling is incorrect but close enough to match to a known species name.

The "matched_name" is the correct spelling of the matched name.

The "taxon_id" contains the taxonomic identifier for the authoritative source. For example, ITIS_taxon_id contains the TSN, the identifier in ITIS.

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Related Publications

McCauley, D. J., Pinsky, M. L., Palumbi, S. R., Estes, J. A., Joyce, F. H., & Warner, R. R. (2015). Marine defaunation: Animal loss in the global ocean. Science, 347(6219), 1255641–1255641. doi:10.1126/science.1255641
Results

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Parameters

Parameter	Description	Units
System	System (Marine or Terrestrial)	unitless
Group	Group (M = Mammals, B = Birds, R = Reptiles, F = Fishes)	unitless
Species	Species name from literature	unitless
BM	Body mass	grams (g)
HR	Home range	square kilometers (km^2)
Refs	Reference identification number for resources used for home range data. Any numbers that follow semi-colons were used for body mass data. References associated with these numbers can be found in the supplemental document "McCauley_et_al_2015_references.pdf."	unitless

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Project Information

Adaptations of fish and fishing communities to rapid climate change (CC Fishery Adaptations)

Coverage: Northeast US Continental Shelf Large Marine Ecosystem

Description from NSF award abstract:
Climate change presents a profound challenge to the sustainability of coastal systems. Most research has overlooked the important coupling between human responses to climate effects and the cumulative impacts of these responses on ecosystems. Fisheries are a prime example of this feedback: climate changes cause shifts in species distributions and abundances, and fisheries adapt to these shifts. However, changes in the location and intensity of fishing also have major ecosystem impacts. This project's goal is to understand how climate and fishing interact to affect the long-term sustainability of marine populations and the ecosystem services they support. In addition, the project will explore how to design fisheries management and other institutions that are robust to climate-driven shifts in species distributions. The project focuses on fisheries for summer flounder and hake on the northeast U.S. continental shelf, which target some of the most rapidly shifting species in North America. By focusing on factors affecting the adaptation of fish, fisheries, fishing communities, and management institutions to the impacts of climate change, this project will have direct application to coastal sustainability. The project involves close collaboration with the National Oceanic and Atmospheric Administration, and researchers will conduct regular presentations for and maintain frequent dialogue with the Mid-Atlantic and New England Fisheries Management Councils in charge of the summer flounder and hake fisheries. To enhance undergraduate education, project participants will design a new online laboratory investigation to explore the impacts of climate change on fisheries, complete with visualization tools that allow students to explore inquiry-driven problems and that highlight the benefits of teaching with authentic data. This project is supported as part of the National Science Foundation's Coastal Science, Engineering, and Education for Sustainability program - Coastal SEES.

The project will address three questions:
1) How do the interacting impacts of fishing and climate change affect the persistence, abundance, and distribution of marine fishes?
2) How do fishers and fishing communities adapt to species range shifts and related changes in abundance? and
3) Which institutions create incentives that sustain or maximize the value of natural capital and comprehensive

social wealth in the face of rapid climate change?

An interdisciplinary team of scientists will use dynamic range and statistical models with four decades of geo-referenced data on fisheries catch and fish biogeography to determine how fish populations are affected by the cumulative impacts of fishing, climate, and changing species interactions. The group will then use comprehensive information on changes in fisher behavior to understand how fishers respond to changes in species distribution and abundance. Interviews will explore the social, regulatory, and economic factors that shape these strategies. Finally, a bioeconomic model for summer flounder and hake fisheries will examine how spatial distribution of regulatory authority, social feedbacks within human communities, and uncertainty affect society's ability to maintain natural and social capital.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1426891

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