Commercial Whale Watching Areas
Northeast United States
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1. INTRODUCTION

The Commercial Whale Watching Areas layer depicts activity areas mapped by participants in the Northeast Coastal and Marine Recreational Use Characterization Study, which was conducted by SeaPlan, the Surfrider Foundation, and Point 97 under the direction of the Northeast Regional Planning Body (NE RPB). In order to fill a regional need to better understand the spatial patterns of important recreational activities in New England, the study was focused on collecting information on a commercial whale watching, SCUBA diving, sailing races and regattas, competitive board and paddle events, beach going, wildlife viewing, surfing, and non-motorized boating sports. This document describes the processes for developing the commercial whale watching data component of this study. Additional information can be found in the study's final report.

The economic value of commercial whale watching combined with a lack of data on whale watch activity in the region made this sector a priority for inclusion in this project. The commercial success of whale watching businesses depends heavily on highly variable environmental and economic conditions. Variations in weather, the presence and activities of marine mammals, fuel costs and other economic indicators can impact whale watch businesses on a year-to-year basis. These variations coupled with a relatively short operating season mean that whale watch companies in the Northeast employ a relatively unique business model, compared to other recreational industries in the Northeast.

For the purpose of this study, a commercial whale watch operator is defined by a business whose primary activity includes regularly scheduled trips dedicated to finding and observing whales in their natural habitat. Commercial whale watching vessels are typically over 65 feet

in length and hold at least 100 passengers. Some operators have higher capacities and may have over 300 passengers on a trip. This study's scope focused on commercial operators that specifically target whales and did not include smaller charter boat operators that may offer whale watching excursions as a complement in their suite of other services, nor did this study include other boat-based wildlife tourism platforms which target seals or other offshore wildlife. These large commercial whale watch operators are expected to have a spatial footprint and industry characteristics that are unique to that sector.

The team collaborated with members of the whale watching industry to help guide the development, execution, and review of the study components. Based on input from industry leaders and guidance from an NE RPB project steering committee, data collection efforts began in the spring of 2015.

Data collection

Initial data collection took place at dedicated in-person workshops held in Bar Harbor, ME, Portsmouth, NH, Plymouth, MA and New York, NY. A total of 32 individuals, including vessel owners, operators, naturalists, and data managers attended as participants.

Workshop facilitators followed a procedure adapted from the Participatory Geographic Information Systems (PGIS) workshop methodology developed by NOAA, which employs eBeam participatory mapping technology. The eBeam tool consists of a wireless electronic stylus, a receiver, and computer software, and utilizes a projector to project a computer screen onto a flat surface (such as a whiteboard or wall) onto which a stylus is used by participants to draw areas of activity. With use of the eBeam tool, participants digitized polygons on the projected GIS-based map, which allowed the features to be automatically saved and then attributed with information the participants shared during the concurrent discussion.

The standardized workshop facilitation approach involved having participants digitally map the following types of use areas.

- General use areas: Includes the full footprint of whale watch activity in the last three to five years, regardless of frequency or intensity; does not include areas where the use may occur once or twice or where it might conceivably occur now or in the future.

- Dominant use area: Includes all areas routinely used by most users most of the time, within seasonal patterns for that use; must be within the general use area.
- Transit routes: Includes areas used for transit to and from general or dominant use areas.

- Supplemental use areas: Includes areas used for closely-related activities, historical uses, and infrequent specialty trips.

Participants were asked to map these areas in three steps, starting with general use areas, followed by dominant use areas and finishing with supplemental and transit areas. Participants were asked to focus on activities taking place over the past 3 – 5 years (2010-2014). While participants map, the process facilitator asks specific questions about industry characteristics (e.g. size of boats, length of season), about the mapped areas (e.g. whether the mapped area coincides with a specific depth range or bathymetric feature), and also listens for opportunities to ask follow-up questions and capture input from participant discussions. This information is later used to attribute the mapped polygons.

Additional commercial whale watching data were also collected during an on-site visit to the operator in Kennebunkport, Maine, as well as through meetings of the Rhode Island Ocean Special Area Management Plan (RI OSAMP) update process. As part of this process, the Rhode Island Coastal Resources Center and Rhode Island Sea Grant held in-person meetings with stakeholder experts who identified additional areas where whale watching takes place in Rhode Island waters and to confirm that the information contained in the original RI OSAMP document is still accurate.

Data processing

These data were edited to eliminate self-intersecting loops and other topological errors using ArcGIS editing tools. Mapped areas were also edited to reflect the definitions of use areas, for example, expanding general use areas to include all dominant use areas.

2. PURPOSE

This dataset fills a specific need identified by the Northeast Regional Planning Body to develop a better understanding of how and where humans use the ocean in the Northeast, inform regional ocean planning, and minimize ocean use conflicts. In addition, this dataset can also be used by the commercial whale watch industry to show the importance and location of whale watching in the region and to inform business planning.

3. SOURCES AND AUTHORITIES

- Bloeser, J., Chen, C., Gates, M., Lipsky, A., & Longley-Wood, K. 2015. Characterization of Coastal and Marine Recreational Activity in the U.S. Northeast. Point 97, SeaPlan, & Surfrider
- Guidebook to Participatory Mapping of Ocean Uses, NOAA, 2014

- Rhode Island Ocean Special Area Management Plan (Ocean SAMP) Vol I, Rhode Island Coastal Resources Management Council, 2010
- NOAA Medium Resolution Shoreline Dataset

4. DATABASE DESIGN AND CONTENT

Native storage format: ArcGIS File Geodatabase – simple feature class

Feature Types:

General use area
  Includes the full footprint of whale watch activity in the last three to five years, regardless of frequency or intensity; does not include areas where the use may occur once or twice or where it might conceivably occur now or in the future.

Dominant use area:
  Includes all areas routinely used by most users most of the time, within seasonal patterns for that use; must be within the general use area.

Transit routes:
  Includes areas used for transit to and from general or dominant use areas.

Supplemental use areas:
  Includes areas used for closely-related activities and infrequent specialty trips.

RI OSAMP areas:
  Includes whale watch areas documented in the original RI OSAMP, or additional areas identified in RI OSAMP update process workshops. These are symbolized differently in the data to reflect the fact that the RI OSAMP process did not employ the same categorization methods for whale watch areas as the Northeast Coastal and Recreational Use Characterization Study.

Data Dictionary:

Line	Name	Definition	Type	Size
1	OBJECTID	Uniquely identifies a feature	OBJECTID	*
2	Shape	Geometric representation of the feature	geometry	*
3	homeport	Identifies the port(s) from which the mapped whale watch activity originates	text	50
4	useType	Identifies whether the area is a general, dominant, transit, supplemental, or RI OSAMP use area	text	50

5	areaName	Identifies, if specified, name of general area based on underwater feature or other landmark		50
6	season	Identifies, if specified, the season(s) where use activity is likely to take place	text	50
7	species	Identifies, if specified, the species that are likely to be seen in this area	text	254
8	year	Identifies, if specified, the year(s) where activity took place	text	50
9	notes	Provides additional details or descriptors about the use area	text	254
10	Shape_Length	Length of polygon in spherical coordinates	double	*
11	Shape_Area	Area of polygons in spherical coordinates	double	*

Feature Class Name: CommercialWhaleWatchingAreas

Total Number of Unique Features: 124

Dataset Status: Complete

5. SPATIAL REPRESENTATION

Geometry Type: vector polygon
Reference System: GCS North American 1983
Horizontal Datum: North American Datum 1983
Ellipsoid: Geodetic Reference System 1980

XY Resolution: XY Scale is 1000000000.0000001
Tolerance: 0.000000089831528411952117

Geographic extent: -74.12 to -66.56, 39.30 to 45.05

IS0 19115 Topic Category: environment, oceans, biota, economy, transportation, society

Place Names: Place Names:
Atlantic Ocean, Bigelow Bight, Block Island Sound, Cape Cod Bay, Eastport Harbor, Frenchman Bay, Grand Banks, Grand Manan, Great South Channel, Gulf of Maine, Jeffreys Ledge, Massachusetts Bay, New Found Ground, Northwest Atlantic, Outer Falls, Rhode Island Sound, Schoodic Ridges, Stellwagen Bank, Tillies Bank, West Cod Ledge, Wildcat Knoll, Wolves Bank

Recommended Cartographic Properties:

(Using ArcGIS ArcMap nomenclature)

40% transparency; colors expressed as HSV

General Use Area: Solid fill, no outline; 284-100-90
Dominant Use Area: Solid fill, no outline; 60-55-100
Transit Route: Outline, no fill; 0-0-41
Supplemental Use Area: Solid fill, no outline; 0-0-70
RI OSAMP Area: 10% Crosshatch

Scale range for optimal visualization:100,000 to 4,500,000

6. DATA PROCESSING

Processing environment: ArcGIS 10.2, Windows 7 Ultimate SP5, Intel Xeon CPU

	Process Steps Description
1	Polygons were drawn in an editing session or imported from outside sources into ArcMap
2	Areas that overlapped with land were eliminated using NOAA Medium Resolution Shoreline dataset and the ERASE tool
3	Where applicable, general use areas were expanded so that all dominant use areas fell within general use areas using an editing session. In some cases, edits were made to eliminate drawing errors from the mapping tool, or based on recommendations from stakeholders during the workshops or in the data vetting period.
4	Attribute information was filled in using notes from workshops in an editing session

7. QUALITY PROCESS

Attribute Accuracy: Attribute information for the whale watch activity areas were provided by workshop participants who were asked to describe conditions over the past 3 – 5 calendar years (2010 – 2014). However, workshop participants stressed that whale watch sightings are highly variable, both within seasons and from year to year. As such, the mapped polygons should be considered to reflect a snapshot in time and should not be interpreted to definitively depict historical areas and past trends, or to predict future conditions.

Logical Consistency: Polygons are topologically consistent. Self-intersections were removed. Areas may overlap where they represent data derived from multiple sources.

Completeness: This database provides a comprehensive overview of whale watching in the region. While the workshops did not attract a representative from every whale watch operator in the region, there was substantial geographic overlap among whale watch operators (e.g., multiple operators hail from same home ports) and industry knowledge of where other

operators are likely to travel. The only known geographical data gap is the Boothbay Harbor region.

The dataset only reflects areas mapped by large, commercial whale watch operators who have dedicated whale watching trips, and thus excludes potential activity areas for smaller charter vessels, as well as operators targeting seals, birds, or other offshore wildlife viewing opportunities.

Positional Accuracy: The positional accuracy of the points is dependent on the individual mapping areas during the workshops. Workshop participants were able to use reference layers on the map, such as shipping channel locations, bathymetric contours, and other information to guide their mapping. Clipping this layer with a regional ocean shapefile derived from the NOAA medium resolution shoreline dataset excluded areas drawn over land, or in freshwater.

Timeliness: This dataset represents data collected during spring of 2015 and reflects activity from 2010 – 2014.

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