Development of a Web-Based Mid-Atlantic Humpback Whale Catalog: 2016 Annual Progress Report

Submitted to:

Naval Facilities Engineering Command Atlantic under Contract No. N62470-15-D-8006, Task Order 27, issued to HDR, Inc.

Prepared by

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VIRGINIA AQUARIUM & MARINE SCIENCE CENTER

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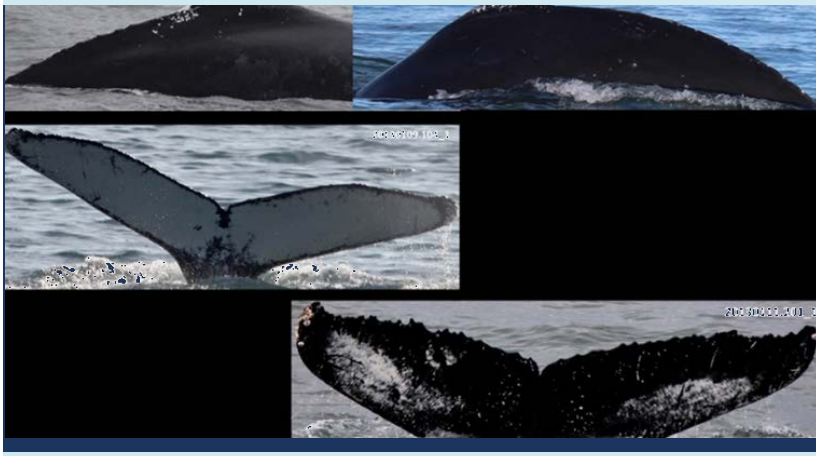
Submitted by:

Virginia Beach, VA



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Cover Photo Credit:

Humpback whale (*Megaptera novaeangliae*) fluke and dorsal fin images used for photo-identification.

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Table of Contents

Appendix

Figures

Acronyms and Abbreviations

CCS	Center for Coastal Studies
CCTKW	California Current Transient Killer Whale
CDOC	California Dolphin Online Catalog
DPS	Distinct Population Segment
GOM	Gulf of Maine (Humpback Whale Catalog)
MABDC	Mid-Atlantic Bottlenose Dolphin Catalog
MAHWC	Mid-Atlantic Humpback Whale (Photo-ID) Catalog
MMPA	Marine Mammal Protection Act
NAHWC	North Atlantic Humpback Whale Catalogue
NAVFAC LANT	Naval Facilities Engineering Command, Atlantic
NMFS	National Marine Fisheries Service
OBIS-SEAMAP	Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations
photo-ID	photo-identification
PIPIN	Pacific Islands Photo-Identification Network
U.S.	United States
VAQF	Virginia Aquarium & Marine Science Center Foundation, Inc.

1. Introduction and Background

The United States (U.S.) mid-Atlantic coast provides an important foraging habitat and migratory corridor for a diversity of marine mammals. Evidence of seasonal use, foraging, and site fidelity from mark-recapture efforts suggest the mid-Atlantic may provide important seasonal habitat for mysticetes, including humpback whales (*Megaptera novaeangliae*) (Swingle et al. 1993, Barco et al. 2002, Mallette et al. 2016). Barco et al. (2002) suggested that some individual humpback whales overwinter in the mid-Atlantic and that this region may serve as a supplemental feeding ground. Although the humpback whale is protected under the Marine Mammal Protection Act (MMPA), this region poses challenges for management and conservation due to its heavy use by commercial and military ship traffic, commercial fishing, and offshore energy development activities.

Humpback whales that utilize mid-Atlantic Ocean waters are part of the West Indies Distinct Population Segment (DPS; Bettridge et al. 2015). Although the West Indies DPS is no longer listed as endangered under the Endangered Species Act (81 Federal Register 62,260, September 8, 2016), the National Marine Fisheries Service (NMFS) and cooperators are responsible for monitoring de-listed DPSs for 10 years (NMFS 2016). This project contributes to the overall community effort to help monitor the West Indies DPS and compliments existing U.S. Navy (Navy) marine species monitoring efforts (Mid-Atlantic Humpback Whale Monitoring, Mid-Atlantic Continental Shelf Break Cetacean Study, and Aerial Survey Baseline Monitoring). The results of these studies may be used to support environmental planning and regulatory compliance along the east coast of the U.S.

Since 1989, the Virginia Aquarium & Marine Science Center Foundation, Inc. (VAQF) has collected sighting data and images for photo-identification (photo-ID) of whales in the mid-Atlantic and currently curates the mid-Atlantic Humpback Whale Photo-ID Catalog (MAHWC), an expanding collection of photos of 282 unique whales. The objectives of these long-term efforts are to establish baseline data on humpback whale movement patterns, population demographics, site fidelity and seasonal habitat use in the mid-Atlantic while supporting multi-decadal mark-recapture research in the broader western North Atlantic. These efforts can also serve to support assessment of human impacts (e.g., injuries from entanglement or watercraft), body condition and behavior (e.g., foraging). Longitudinal mark-recapture data can also serve as a non-invasive mechanism to investigate and detect changes in patterns of humpback whale occurrence, inter-annual variation and changes in distribution and phenology over time.

The Navy has expressed an interest in the identity, residency, site fidelity, and habitat use of humpback whales sighted in the mid-Atlantic region. Survey effort and opportunistic sightings in the mid-Atlantic and southeast U.S. have increased substantially in the past few years. To more effectively integrate data from a multitude of sources both current and historic, a streamlined process for submissions, management, and access is necessary. In addition, simplifying and standardizing submissions from the mid-Atlantic to the broader regional and North Atlantic catalogs is essential to the efficiency of information exchange between regions. VAQF has been tasked with developing a collaborative web-based mid-Atlantic Humpback Whale Photo-ID Catalog (MAHWC); an integrative platform that provides a broad scale and high quality scientific

product that can elucidate questions to inform users of the identity, residency, site fidelity of, and habitat use by humpback whales in the waters off the mid-Atlantic and southeastern U.S.

The development of the MAHWC is currently in the first year of the proposed three-year project. The overarching goal of this project is to facilitate exchange of information among researchers who have been involved in humpback whale photo-ID efforts over the last 40 years in the North Atlantic. To accomplish this, three key objectives must be achieved:

1. A data sharing agreement must be developed and agreed upon among the contributors of the catalog.
2. Standardized protocols for data/image submission and quality assurance need to be established.
3. A streamlined mechanism for exchange of information between the MAHWC, larger regional catalogs and contributors must be designed.

With increasing survey effort in the mid-Atlantic, this project serves as a strategic opportunity to standardize protocols and streamline submissions to the larger catalogs. A streamlined process will minimize the duplication of efforts and ultimately increase the efficiency of information exchange. During the first phase of this project, VAQF has been working with key stakeholders to develop a data sharing agreement, standardize matching and data submission protocols, and draft a web interface/database design modeled after that of the Mid-Atlantic Bottlenose Dolphin Catalog (MABDC). This report describes the progress on MAHWC project development between June and December 2016.

2. Methods

Existing examples of web-based photo-ID catalogs [e.g., MABDC; Gulf of Mexico Dolphin Identification System (GoMDIS), Pacific Islands Photo ID Network (PIPIN) Catalog for Spinner Dolphins; the California Dolphin Online Catalog; California Current Transient Killer Whale (CCTKW) Matching; and Antarctic Humpback Whale Catalogue (AHWC)] have served as models for identifying the key components needed to develop an online catalog accessible by multiple researchers and one tailored specifically to humpback whale collaborative photo-ID efforts. Additionally, consultations with the core stakeholder group provide invaluable guidance through the development of the data sharing agreement, protocols, and draft web interface/database of the MAHWC.

2.1 Photo-Identification of humpback whales

Humpback whales are catalogued based on unique variations in the ventral fluke pattern, fluke trailing edge shape, and the shape, size, and scarring of the dorsal fin and flank (Katona and Whitehead 1981; see cover images for examples). Fluke and dorsal fin images of individual humpback whales are collated and compared to the catalog to identify resightings and assign new individuals to the catalog. Currently, 282 individual whales sighted from 1989 to present have been incorporated into the MAHWC and include contributions from New York to Florida, although most images in the catalog were collected from Virginia and North Carolina.

Two other formal catalogs exist for humpback whales in the north Atlantic. The North Atlantic Humpback Whale Catalogue (NAHWC), curated by Allied Whale at the College of the Atlantic, and the Gulf of Maine Catalog (GOM) curated by the Center for Coastal Studies (CCS). The NAHWC collection includes over 9,000 individual whales documented over the last 40 years between the high latitude feeding grounds and the low latitude calving grounds in the western North Atlantic. The NAHWC catalog contains only fluke images. The GOM catalog contains over 30 years of detailed sighting and life history data on individual humpback whales that have been sighted on the Gulf of Maine feeding ground.

VAQF submits images to both of these catalogs annually to support ongoing research efforts and to gain information on the sighting history of individual whales outside of the mid-Atlantic region. Due to the large size of these catalogs, the associated processing times of large numbers of submissions, and the historic lack of dedicated funding to support matching efforts, sighting histories typically take extended periods of time to compile. Also, these catalogs have a large number of contributors and therefore any matches and associated sighting data between institutions must be requested from each contributing group, elongating the process and, in some cases, limiting use of those data.

To provide quality assurance and increase the efficiency of submissions to the MAHWC and among larger catalogs, standardized protocols are being developed based upon existing examples and input from the core stakeholder group. Standardized protocols include those for coding images for quality to reduce the potential for false negatives, categorizing and matching individual whales based upon unique identifier codes and those that are standardized with the GOM and NAHWC photo catalogs. Additionally, standardized data fields for the database structure of the MABDC are data fields and definitions developed by Naval Facilities Engineering Command, Atlantic (NAVFAC LANT) and HDR, Inc., for purposes of data collection and management under the Navy's Marine Species Monitoring Program. Based upon this structure, contributors will provide pertinent data to the catalog via standard templates and following image and data accession protocols which contribute to the maintenance and quality of the database. This step also is an important for processing efficiency.

2.2 Online platform & interface

One of the deliverables of this project is an online platform and interface to share photo-ID data that have been collected and archived. The MAHWC online catalog will be hosted on the Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP; Halpin et al. 2009) and modeled after the MABDC. OBIS-SEAMAP is a web-based biogeographic database of multi-platform survey data for marine megafauna. It provides tools for mapping and visualizing species sighting data on a global scale. Currently, OBIS-SEAMAP hosts multiple other photo-ID catalogs (e.g., MABDC, PIPIN) and provides a user-friendly interface that provides efficient tools for comparison of collections.

To facilitate the exchange of sighting and individual life history information between contributors the current project is developing a data sharing agreement approved by collaborators and key contributors to share data for this specific project instead of gaining permission for each match, as is the case with other existing catalogs. Another important aspect in the development of this project will be a stakeholder workshop. A questionnaire will be delivered to contributors and key

collaborators prior to the meeting. The responses will be summarized, pertinent components addressed prior to the meeting and used to prioritize meeting objectives. This workshop will tentatively be held in Virginia Beach, Virginia in June 2017 pending the development of the strawman database. Demonstrations of the existing MABDC and the preliminary MAHWC will be presented to the group. Meeting outcomes will be summarized in a report and modifications to the database incorporated as agreed to by the group.

3. Progress

3.1 Local Photo-ID Matching Efforts

All humpback whales in the current MAHWC catalog from 1989 through 2015 have been compared to the NAHWC. 2016 images are at various stages of comparison with both the NAHWC and GOM. Whales with MAHWC IDs are being compared with images from other mid-Atlantic contributions. Contributed images that match a whale in the MAHWC are given that MAHWC ID and the ID number (if) submitted by the contributing organization remains linked for reference in the database. Contributed images that represent new individuals in the catalog are assigned a MAHWC ID number and included in all subsequent comparisons. At the end of each season the best images (including mid-Atlantic contributors) of all new whales added to the MAHWC are sent in batch to CCS and Allied Whale to be added to and compared with the GOM and NAHWC catalog.

3.2 Standardized Data Fields and Protocols

Among the many photo-ID catalogs that exist for various species, whether they are internal catalogs or larger formal catalogs, standardization among protocols remains a common issue. This lack of standardization contributes to long processing times of submissions and resulting exchange of information between catalogs. Important information can be lost (e.g. original date/location of image) or analyses may be limited if these considerations are not addressed in the early phases of development. As collections are integrated into larger catalogs this provides an important quality assurance/quality control step to improve protocols and standardization among groups. Standardizing protocols for quality assurance, data/image submission and data fields will increase the efficiency and efficacy of this tool for research, management and conservation. To maximize the applicability of the MAHWC as a high quality scientific tool for contributors, efforts are being made to standardize data fields, develop protocols for consistency and streamline submissions and maintenance. Additionally, planning for compatibility issues during database development which may arise if other advanced features for matching, analyses or modeling may be of interest to stakeholders is being considered.

Standardized protocols are being developed for the MAHWC based upon existing photo-ID catalogs. Unique feature codes used for categorizing and filtering (e.g., dorsal fin, fluke, peduncle knuckles, body scarring) for comparison among collections are being tailored to those whales in the MAHWC. Fluke code categories have been modified from those developed by the NAHWC. Flukes are initially classified by the grading of fully white (Type 1) to fully black (Type

5) coloring on the ventral surface of the flukes. There are generally common patterns in the distribution of pigmentation on of the ventral flukes. Within each Type, the most represented subcategories to be used in categorizing flukes in the catalog are being determined (e.g. "typical, wide black trailing edge, white on trailing edge, white eyes"). An example of the subtypes "typical" and "white eyes" for each fluke Type (1-5) are illustrated in **Figure 1**. These types and subtypes are consistent with the NAHWC categories and are being refined based upon common fluke patterns in the MAHWC.

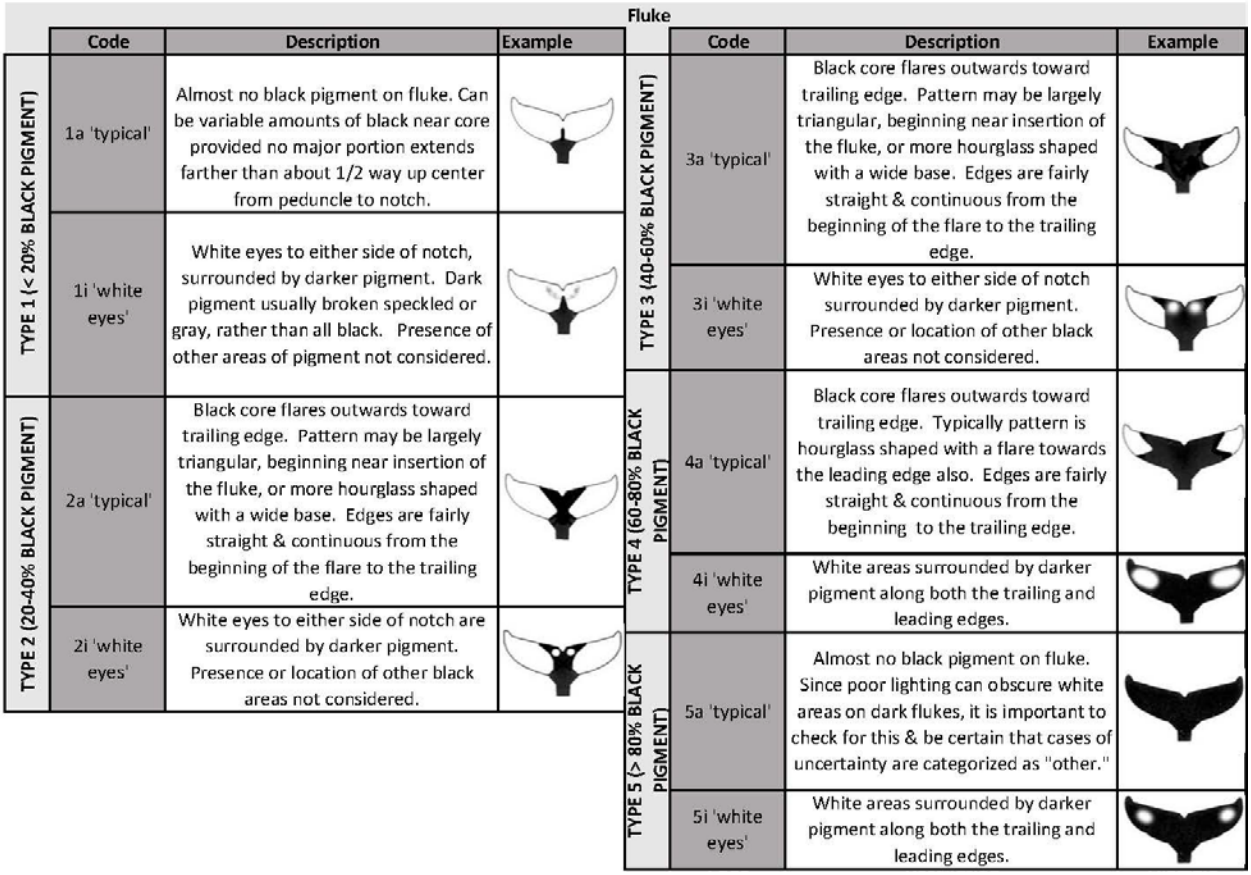

Figure 1. Flukes are categorized by Type based upon the grading of black to white on the ventral flukes, ranging white (Type 1) to black (Type 5). Two examples of sub categories ("typical" and "white eyes") are also displayed for each Type 1-5. A description and reference image are also provided. These types and subtypes are consistent with the NAHWC categories and are being refined based upon common fluke patterns in the MAHWC.

Dorsal fin, peduncle knuckle, and body scarring categories have been modified based upon those utilized by CCS. Catalogs from other species have also been reviewed for possible adaptation for the MAHWC. A protocol for systematically categorizing each identifying humpback whale image is in the process of being developed. This includes "Type" feature codes with text descriptions and will also include an example image or diagram for contributor reference when searching for matches. In order to maintain as much consistency as possible, one of the primary roles of the MAHWC curator will be to assign initial feature codes to images that are included in the catalog. These unique codes will permit more efficient filtering through

the catalog. As technology advances and automated matching improves, we will continue to evaluate software that is compatible with the OBIS platform for dorsal fin and fluke matching.

Quality assurance standards are being developed for the MAHWC and based upon standards used in the AHWC and recently updated for the NAHWC (Allen et al. 2011*;* Jones et al. in prep). This rating system ranges from high quality (a clear photo with excellent contrast, clarity, completely in focus, and the fluke is at nearly right angle to the camera. All marks and the trailing edge are visible. At least 80 percent of fluke is visible) to extremely poor quality (Photo quality is poor enough to substantially obscure the information content of the fluke and compromise the ability to re-identify the individual. The photo is blurry; has too much or too little contrast; is out of focus, the fluke is at a poor angle; the trailing edge is not visible; and/or less than 20 percent of fluke is visible). The majority of marks on the fluke are obscured images, establishing a vetting process and cut off quality for those images being added to the catalog. For humpback whales, distinctiveness has been shown to be difficult to code independently of photo quality. Analyses performed on images in the NAHWC to detect positive matches based on images coded for photo-quality and fluke distinctiveness revealed the effect of distinctiveness was as small compared to that of photo quality (Friday et al. 2008). Unless the stakeholder group suggests distinctiveness codes are important features of the MAHWC, flukes will not be coded for distinctiveness. It may be worth conducting a similar analysis as Friday et al. 2008 for dorsal fins to determine whether a minimal effect of distinctiveness on analyses is similar for dorsal fins.

Image and sighting data submission protocols will be developed upon finalizing the database structure for the MAHWC so that the submission protocols are consistent (in terms of data fields and format) with the database. These protocols are currently under development and will be reviewed and finalized during or shortly after the stakeholder's meeting. These protocols will be provided to project collaborators for the initial phase of integrating images from other organizations to validate protocols. Other contributors will be invited to join after the process has been tested.

The core stakeholder group will review each of the draft protocols. The refined protocols and standard data fields will be discussed at the stakeholder workshop.

3.3 Model Database Structure

The MAHWC database workflow is modeled after that of the MABDC (**Figure 2** with data fields adapted for humpback whales. The web-based interface permits searches by study site and/or coded features of identifying characteristics. It provides mapping features of sightings and enables a matching workflow between contributors.

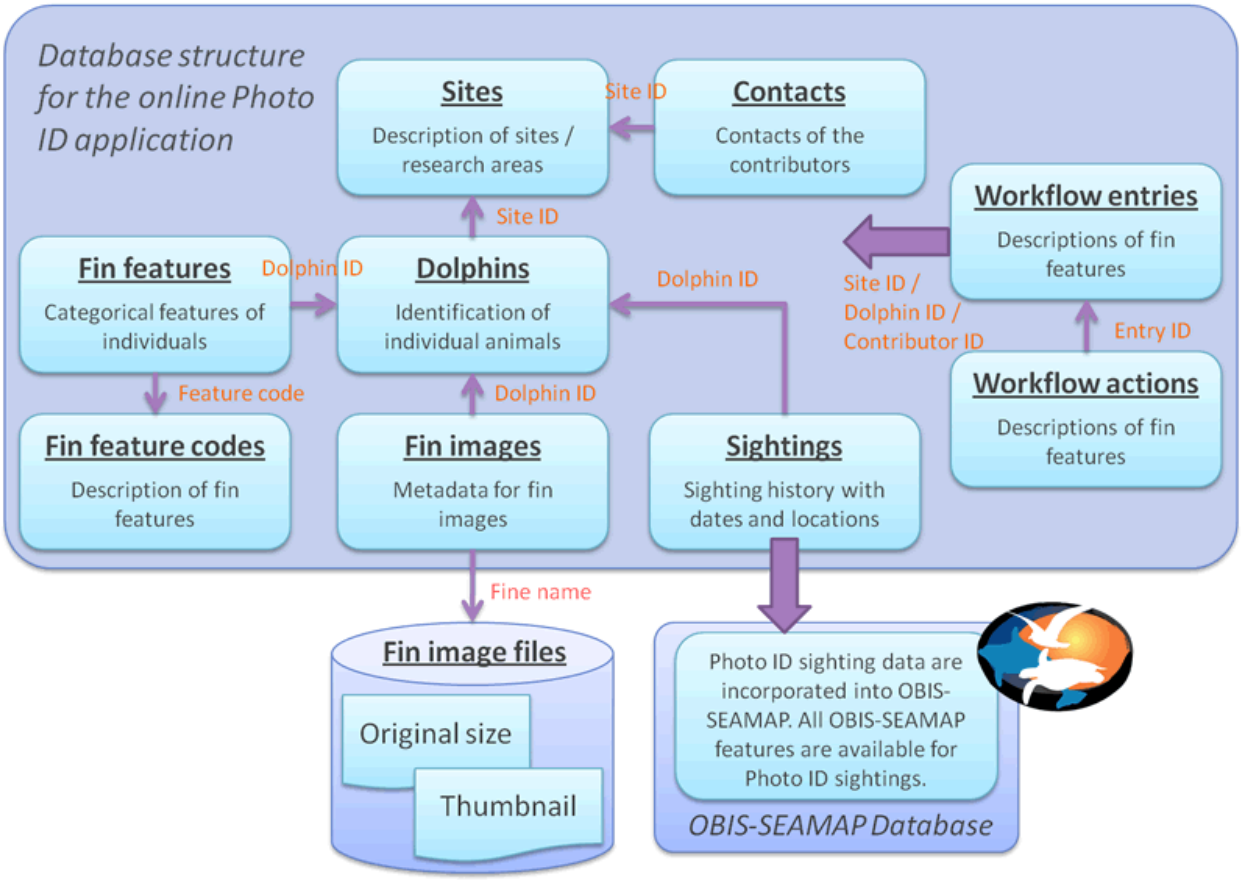

Figure 2. Mid-Atlantic Bottlenose Dolphin Catalog (MABDC) database structure. The MAHWC database structure is being modeled after the MABDC. Diagram represents the relational database structure. The orange words illustrate the link between databases and tables are represented in light blue rectangles.

When images are marked as a match, the image contributors are prompted by email to review the potential match. Each contributor of the proposed match either gives consent or rejects the match (**Figure 3**). If both parties agree, and the curator verifies the match, it is placed into a 'Verified' state. At the time of consent or rejection, the database is updated with a unique match identifier for the two matched IDs. An email prompt is then sent to the matching team and the contributors. The curator oversees this process.

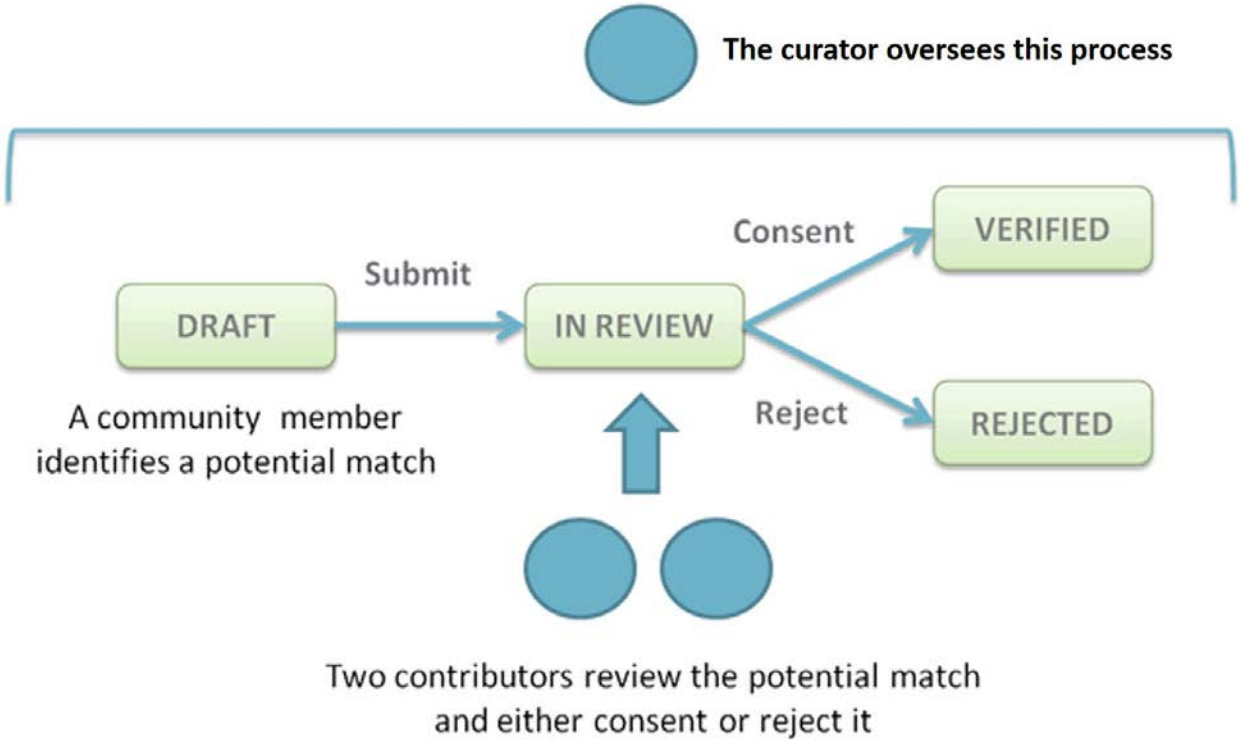

Figure 3. Mid-Atlantic Bottlenose Dolphin (MABDC) matching workflow which we propose to adopt for the MAHWC.

VAQF is working with the core collaborators and Duke University to develop a draft MAHWC data sharing agreement. We have reviewed data sharing and usage agreements from a variety of catalogs during this process, including: OBIS-SEAMAP, MABDC; Gulf of Mexico Dolphin Identification System, PIPIN Catalog for Spinner Dolphins; the California Dolphin Online Catalog, CCTKW, and AHWC. Each of these projects had catalog-specific challenges which required data sharing agreements specific to the stakeholders' explicit objectives and needs. Fostering stakeholder consensus for data sharing and usage, although a time and labor intensive aspect of this project, is essential to resolve concerns and maintain and encourage support of contributors. As these other catalogs have demonstrated, the importance of sound data sharing agreements contributes to the effectiveness of the collaborative process. A draft data sharing agreement will be presented at or provided before the stakeholder's workshop. One of the primary goals of the workshop will be to finalize a consensus data sharing agreement among the primary collaborators.

3.4 Stakeholder workshop and summary report

A questionnaire has been drafted to summarize the project background, scope of field data and identify existing catalog features of the contributing institution. These responses will be summarized and used to prioritize items to be discussed at the stakeholder workshop.

A draft stakeholder workshop agenda has been developed based upon priority items that require stakeholder input to resolve for the online catalog including, the image/data sharing agreement, standardized protocols, and database fields and structure (**see Appendix A).** An

overview of select web-based photo-ID catalogs will be reviewed as examples to address specific questions and identify features of interest to be integrated into the user interface of the MAHWC. The workshop objectives will be identified based upon the Navy's expressed goal of collecting data in support of the Navy's humpback whale identification project in Virginia and the responses of the questionnaire. The strawman database will be presented to the group and stakeholder feedback will be compiled on functionality, interface and usability.

A summary report of the stakeholder workshop will be produced that identifies the following:

a. Outcomes of the meeting
b. Priorities for the online catalog
c. Data sharing needs
d. Protocols (e.g., image and associated data submission, data management, quality control
e. Guidelines for categorization of dorsal fins and body scars
f. Database parameters
g. Stakeholders.

VAQF will work with Duke University to identify concerns or issues from the core collaborators and other contributors. When these concerns are addressed and technical development, testing and de-bugging of the database completed, we will launch the MAHWC web-based catalog for beta testing with Virginia images.

4. Future Work

Year 2: August 2017-July 2018

- Finalize and publish data sharing agreement for Navy project goals and introduce future MAHWC agreement for projects on OBIS – VAQF, Urian & Collaborators
- Systematically assign image quality and feature codes to remaining subset of images from VA sightings (VAQF, HDR, Whale Watch) – VAQF (Mallette)
- Integrate remaining subset of images and data from VA sightings (VAQF, HDR, Whale Watch) into the Photo-ID Application – VAQF & Duke
- Collect and integrate images from mid-Atlantic and southeast groups (outside of VAQF and HDR) into catalog – VAQF & WDC
- Make modifications to the catalog and workflow – VAQF & Urian
- Implement changes to Photo-ID App and workflow – VAQF, Duke & Urian
- Identify bugs through testing OBIS-based catalog - VAQF
- Get feedback from stakeholders on usability and user interface of Photo-ID App – VAQF (Mallette)
- Validate fluke scoring codes for OBIS catalog and submission of mid-Atlantic images to the North Atlantic Humpback Whale Catalog (NAHWC) – VAQF & AW
- Validate dorsal fin scoring codes for OBIS catalog and submission of mid-Atlantic images to the Gulf of Maine Catalog (GOM) – VAQF & CCS
- Develop workflow to submit annual sighting data/images from the OBIS based catalog to the NAHW and GOM catalogs. –VAQF, Duke, AW & CCS

- Conduct systematic matching among all mid-Atlantic and southeast images and collate data agreed to in data sharing agreement – VAQF (Mallette)
- Investigate the feasibility of incorporating computer assisted matching algorithms from both data management and technical perspectives. VAQF, Urian & Duke
- Launch Beta version of OBIS-based MAHWC for use by collaborators – VAQF, Urian & Duke
- Prepare and submit monthly and annual reports – VAQF (Mallette)
- Outline manuscript and seek input/approval from co-authors – VAQF & collaborators

Year 3: August 2018 –July 2019

- Final bug fixing for OBIS-based catalog
- Develop website for MAHWC as a central location for communication between network participants including sharing information on the workshop, pertinent publications, relevant links to other websites such as the Navy Marine Species Monitoring website, current photo-identification techniques and guides to exemplar images.
- Develop training guide for coding images based on cross-training with AW and CCS for the curator training
- Finalize curator protocols and plan curator training for future sustainability of catalog
- Prepare and submit manuscript(s) from project
- Work with NE and SE Stranding Networks to collate and integrate stranding data into OBIS catalog
- Integrate automated matching as determined in Year 2Determine feasibility of integrating aerial ID images into the catalog.

5. Acknowledgements

This project is funded by U.S. Fleet Forces Command and managed by NAVFAC Atlantic as part of the U.S. Navy's marine species monitoring program. We thank Joel Bell for his support of this important project. We thank Allied Whale and Center for Coastal Studies for their long term collaborations and for their relentless efforts in maintaining large longitudinal photo-ID datasets. We thank Kim Urian for her guidance on the MAHWC development and Ei Fujioka with Duke University for his guidance on database structure and with OBIS-SEAMAP.We thank Peter Stevick, Tom Fernald, Judy Allen and the many students and volunteers at Allied Whale. We thank Jooke Robbins, Jenn Tackaberry and the CCS staff for their dedicated photo-ID efforts and collegiality. Many thanks to Whale and Dolphin Conservation, particularly Regina Asmutis-Silvia and Monica Pepe. We thank HDR including Jessica Aschettino, Dan Engelhaupt, and Amy Engelhaupt for local photo-ID efforts and contributions of high-quality images and sighting data to the MAHWC. We thank Alexis Rabon (VAQ Atlantic Explorer) and Kristin Rayfield (Rudee Flipper) and the Whale Watch captains, crew and dedicated volunteers.

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A

Draft workshop agenda for June 2017 MAHWC stakeholder meeting

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Workshop Agenda

Stakeholder Workshop for the Mid-Atlantic Humpback Whale Catalog

Wednesday and Thursday, June 28-29, 2017

HDR Engineer Inc.
249 Central Park Avenue, Suite 201
Virginia Beach, VA 23462

Workshop Information:

Audio Conference Line:

Phone number: 1-866-583-7984;
Conference code: 9599613

Videoconferencing Info:

Please note link for videoconferencing is different each day.
Audio call-in is the same.

First GoToMeeting? Try a test session: https://care.citrixonline.com/g2m/getready

June 28, 2017: MAHWC Stakeholder Workshop

Wed, Jun 28, 2017 9:00 AM - 5:00 PM EDT

Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/477963573

Wednesday June 28, 2017

9:00-9:30 Introduction

- Welcome, housekeeping
- Introductions
- Rapporteur
- Agenda review and schedule

9:30-10:15 MAHWC background and workshop goals

- VAQ (SGB/SDM)
- HDR (JA/DE)

10:15-12:00 Demonstrations

- MABDC and OBIS-SEAMAP (KU)

15 min break

- MAHWC and OBIS-SEAMAP (EF)
- Examples of collaborative catalog agreements, terms of use and submission consent forms (KU & EF)

12:00-13:00 Lunch (Many options near meeting location)

13:00-1400 Discussions – Stakeholder input (stakeholders)

- Contributors' goals/desired outcomes for collaborative catalog
- Research and management priorities for Mid-Atlantic
- Methods used for photo-analysis
  - Scoring features for ID and photo-quality
  - Verifying matches

15:30 – 15:45 Break

15:45 – 16:45 Discuss guidelines for data contribution MAHWC

- Workflow for image and data submission (KU/EI):
  - Proposed curator role (SDM/SGB)
  - Feature codes used for scoring (SDM/NM/AW/CCS)
- Determine standards/best practices for MAHWC (KU)
  - Image and sighting data accession guidelines
    - image vs. animal specific data
    - photo quality guidelines (Lindsey Jones-AW)
  - Timeline on contributors confirming/rejecting matches
  - Inactive contributor
- Considerations for rolling up data/images to NAHWC and GOM catalogs (AW/CCS/EF)
  - Standardized submission template
  - Image file naming – do not change after submission
  - Minimum data to include in submission
  - Best of images from MAHWC– multiple contributors/sightings but only best of submitted?

16:45-17:00 Wrap-up

Thursday June 29, 2017

Update Agenda based upon Wed (6/28) Meeting

09:00 – 10:30 Recap of previous day

- Feedback
- Discussions
  - Schedule of catalog updates for on-going projects
  - Types of supplemental data and how to incorporate for those who want to contribute (tag data, biopsy sampling and genetic data, etc.) (EF)

10:30 - 10:45 Break

10:45 – 12:30 Discussions: Next steps in project development

- Future needs/considerations/meetings
- Advancement and improvements of the PhotoID App
- Unmined data/missing data- areas not surveyed
- Consideration of NMFS letter of authorization or permit and citizen science
- Collaboration with stranding networks to share and compare images of stranded humpback whales
- Technical considerations for computer assisted matching (e.g. Wildbook)
  - Formal partnership?

12:30-1:45 Lunch (Many options near meeting location)

1:45-3:00 Wrap up

- Sources of future funding/long-term curation
- Address any remaining items