# Executive Summary for PNW CESU Task Agreement P10AC00468

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***Introduction***

Glacier Bay National Park and Preserve (GBNP) provided funding to the University of Alaska Southeast (UAS) Whale Lab to design and integrate a collaborative database, reconcile all data and provide an updated 2010 to 2013 digital photographic catalog for humpback whales in southeastern Alaska. Specific tasks included updating the Alaska humpback website with the most current catalog, adding historical data collected by C.S. Baker in 1984-5, adding available genetic data (historical and current), provide data to Oregon State University graduate student Sophie Pierszalowski. The project supported annual updating of records into the main database in 2009-2013, as well as project partners exchanging a CD of the "best photo" of each whales' flukes (or tail) for each of those years.

***Background***

Since the late 1970s data on humpback whales have been collected by NPS resource management biologists (early years it was contractors) and UAS biology faculty (early years as an independent researcher). Both databases include data using identical methods. These data existed in Microsoft Access databases at GBNP and at UAS in Sitka. The goal of this project was to bring the two databases together and have a common set of core tables collected using identical methods to facilitate data exchange of information. The benefit to NPS was to provide details about the movements of the whales seen in NPS waters when they move out of NPS waters to other areas of southeastern Alaska. The database is managed by Glacier Bay National Park resource management (Christine Gabriele PI) and by the University of Alaska Southeast Sitka Campus (Jan Straley PI).

***Methods***

Photographic matching was done by eye by UAS technician Jennifer Cedarleaf. The best photo of each whale was selected as a catalog whale each year and the unified catalog contains the best annual photo of each whale. Every whale that has been sighted (on a day) twice was given a catalog number. If a whale was sighted once the whale's identifier is the filmcode which contains the photographer's initials, research group and day. Each year the best photograph was selected and submitted to GBNP on a DVD. The database was updated and all data reconciled and error checked. Consistency in data collection and data entry was maintained by staff from both research groups. All photographs were printed and digitally presented in a catalog of Southeast Alaska's humpback whales.

Another main accomplishment of the project was to incorporate genetic data from the 2004-2005 SPLASH project into the main shared database, so that these haplotype and genotype data will live on in the ongoing histories of numerous whales. The complexity lies in the fact that new data tables and protocols had to be designed collaboratively and set in place before this integration could occur; this work was completed in 2012. The new tables added to the existing database were 1) the tissue table and 2) tissue results table. Tissue table contains all data relating to the sample collection and 2) the tissue results table contains some or all of the following: sex, mtDNA haplogroups and nuclear DNA. An additional task to incorporate genetic data from prior to and after SPLASH into the database was completed in 2014.

***Results***

The results of this project updated the catalog and databases to contain historical data previously not entered from the 1980s collected by C.S. Baker and integrated data collected from 2010 to 2013 by GBNP and UAS. Additionally, the genetic data was added and the website (www.alaskahumpbacks.org) was update with a current version of the Southeast Alaska humpback whales catalogcfor use by the general public.

Photographs were matched through 2013 to create one unified catalog of nearly 2,900 photographs The summary of the number of records and unique whales matched and reconciled for years 2010 to 2013 are presented in Table 1 a and b. The data are presented for each record in Appendix 1 (attached as an excel spreadsheet for each year). At the end of this project in July 2015 UAS and GBNP had separate but equal databases. In November 2015, a real-time shared version of the unified database was established on the UAS server (accessed by both parties). While the two databases have a common core data set there is allowance for each research group to maintain flexibility in other data (existing in tables and data entry forms) that perhaps is not collected by the other group. This allows for each group to utilize and develop management strategies otherwise not achieved by either database alone. It also allows for a breadth in allowing each group to individually tailor their database to meet the needs of the specific agency or funder. The database exists under mySQL framework for Southeast Alaska humpback whale longitudinal data and was funded independently. The current database includes updated data through 2014 for UAS and 2015 for GBNP.

Table 1.

Table 1a is a summary of records of whales in the UAS/GBNP collaborative database, 2010 to 2013. Each record contains data from whales sighted where a photograph of the flukes was obtained. All data are presented in Appendix 1. Photographs were matched to the entire catalog of 2900 whales and reconciled to the number of unique whales seen each year.

1a.

| Year | Records GB | Records UAS | Other | Total | Total Unique |
|---|---|---|---|---|---|
| 2010 | 783 | 266 | 2 | 1051 | 390 |
| 2011 | 792 | 74 | 0 | 866 | 270 |
| 2012 | 1086 | 106 | 0 | 1192 | 285 |
| 2013 | 1003 | 190 | 0 | 1193 | 284 |

Table 1b is the unique number of whales seen by each research group each year. Some whales were seen in common each year hence the total unique whales in Table 1a is not the same as the total unique for all research groups (RG). In Table 1 b. subtracting the whales in common from total unique whales will result in the total unique sighted each year in Table 1 a. In 2010, the 2 under 'Other' in are whales seen by other contributors and not assigned to either GBNP or UAS, in the other years the other contributor field was assigned to either research group depending on the location of the data collected

1b.

| Year | Unique GB | Unique UAS | Unique Other | Total Unique All RG | Whales in Common |
|---|---|---|---|---|---|
| 2010 | 189 | 214 | 2 | 405 | 15 |
| 2011 | 220 | 61 | 0 | 281 | 11 |
| 2012 | 214 | 73 | 0 | 287 | 2 |
| 2013 | 241 | 56 | 0 | 297 | 13 |

The majority of effort to collect tissue samples was in conjunction with SPLASH, Structure of Populations and Status of Humpbacks, which consisted of a North Pacific Basin-wide snapshot of humpback whale photographs for identification and genetic samples, 2004 and 2005. The total number of tissue samples collected from SPLASH was 236. There are about 650 whales in the tissue results table encompassing samples collected prior to and after SPLASH.

The collaboration between UAS and GBNP resulted updating an existing public website for the catalog of individual photographs of humpback whales used by the general public and K-12 students. This catalog was updated in 2013 with photos through 2012 and contains 2,718 whales. The February 2017 catalog contains 2,806 whales and will soon replace the 2012 catalog on the website.