LONG-TERM RESIGHTINGS OF HUMPBACK WHALES OFF ECUADOR

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Abstract

This paper reports on the long-term re-sight histories of fifteen photo-identified humpback whales encountered to date transiting Ecuadorian waters. It also provides information about connections to feeding area destinations.

Whale EC1261 has been resighted over a 26 year span and provides insight into age and potential longevity of this species in the stock G. The resighting of whale EC1261 provides the earliest connection from Ecuador to Antarctica, and supports previous findings that Antarctic Peninsula is the main feeding area of humpback whales migrating to Ecuadorian waters.

Although there are only a low percentage of re-sighted animals between Ecuador and the Strait of Magellan, two records represent long-term observations of 17 and 21 years. Resightings of these whales previously confirmed the Straits of Magellan as a feeding area (Gibbons et al, 1998; Gibbons et al, 2003; Acevedo et al. 2007; Capella et al. 2008). These results are based on the individual identification of the ventral surface of humpback whale tails. This method has been used extensively by researchers, NGO’s and government institutions in Antarctica, Chile, and Colombia.

Introduction

Humpback whales are a migratory species and travel each year from their feeding areas located at the poles (Arctic and Antarctic) to breeding areas in the tropics (Matthews, 1937). Ecuador is part of a large breeding area of humpback whales Megaptera novaeangliae, in the Southeast Pacific, known as the Stock G (IWC) which extends from Costa Rica (Acevedo and Smultea, 1995; Rasmussen et al. 2007), Panamá (Flórez-González et al., 1998; Flórez-González et al. 2007; Rasmussen et al. 2007), Colombia (Flórez-González, 1991; Flórez-González et al. 2007), Ecuador (Scheidat et al., 2000; Félix & Haase, 2001) up to Peru (Pacheco et al. 2009; 2011; Castro et al. 2011).

Using photo-identification migratory connections have been established between the feeding area in the Antarctic Peninsula, Magellan Straits and wintering destinations off Ecuador and Colombia (Stone

A photo-identification study of humpback whales (*Megaptera novaeangliae*) was conducted between 1996 and 2011 in the Machalilla National Park, Ecuador. There are many methods to determine the age and longevity of humpback whales. For live whales, free-swimming mysticetes, age determination techniques are currently limited to photogrammetry and photo-identification (Zeh et al. 1993).

Age is fundamental to interpreting and understanding many aspects of the biology of marine mammals (Hohn, 2009). Comparing other catalogues with different years of research effort has given us the ability to learn about preferences and longevity records of humpback whales that visit the coast of Ecuador. This report provides the first data on longevity for humpback whales identified in Ecuador. These results are based on photo-ID data of numerous researchers, government institutions and NGO’s working in Antarctica, Chile and Colombia.

**Materials and methodology**

Humpback whales were photographed and identified by permanent marks natural to the whale or acquired located on the underside of the tail (Katona et al., 1979). The following research groups have systematic information of humpback whales between 1985 to 2012 off Colombia, Chile, Ecuador and Antarctica: Instituto Antártico Chileno (INACH), Proyecto Antártico Brasileño (PROANTAR), College of the Atlantic (COA), Centro de Estudios del Cuaternario (CEQUA), Fundación Yubarta (FY), Whale Sound-Juan Capella Catalogue (WS-JC) and Pacific Whale Foundation (PWF).

The study areas are as follows: Antarctica (63° S to 65° S - 61° to 72° W); Magellan Strait (53°30´S-54° S – 73°30´W-74° W); Colombia (03° N to 78° W) Machalilla National Park (01,16° N to 81,04° W). Catalogs from Ecuador, Antarctica, Chile and Colombia were compared and each match was confirmed by independently by each research group. Once a match was confirmed data pertaining to location, date, sex class and age (if known) was shared.

**Results and discussion**

A total of 1580 animals identified in Ecuador were compared with 611 identified humpback whales in Antarctica, 84 in the Strait of Magellan and 30 in Colombia (Table 1). There were 70 matches between Ecuador and feeding areas, and 6 matched between Ecuador and Colombia.

**Tabla No. 1:** Comparison effort between Ecuador, Colombia, the Magellan Strait and Antarctica

<table>
<thead>
<tr>
<th>AREA</th>
<th># CATALOGUE</th>
<th>YEARS</th>
<th># WHALES COMPARED</th>
<th># WHALES RESIGHTED</th>
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<td>3 CATALOGOS</td>
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With respect to life-span data, fifteen identified humpback whales have been observed at intervals of 10 to 26 years from first observation. Twelve of these resighting resulted from the comparison with other catalogs in Antarctica and Colombia and three cases were resighted only in Ecuador.

Three humpbacks (20%) were resighted 10 years from first identification, five humpback whales (33.3%) were sighted eleven years later and another three were sighted twelve years later. Twenty percent (n=3) of the identified whales have re-sighting span of 17 to 26 years after its first observation (Figure 1).

Figure 1: Life-span data with intervals of 10 to 26 years after its first observation

The sighting span more longest was by a humpback whale EC1261 that was first sighted February, 1985 off Bismarck Strait Antarctica (COA Catalogue), re-sighted August 9, 2007 off Machalilla National Park in Ecuador (PWF catalogue) and last observed off Ecuador September 30th, 2011 (PWF Catalogue). This is the longest resighting record for a humpback whale in Ecuadorian waters (26 years) and gives us the first references to age and potential longevity of this species in the stock G. It's interesting to note the acquired injury to the trailing edge of the tail in the later photos. This record is also the earliest sighting that connects to Ecuador to Antarctica, confirming that the Antarctic is the main feeding area of humpbacks coming to Ecuador (Figure 2).

Another two humpback whales were also resighted at various times on different years in the Magellan Strait - Chile, Colombia, Panama and Ecuador. Whale EC0267 was sighted in September 2003 was identified as male and re-sighted in Magellan Strait 17 years later. Humpback whale #6512 was initially sighted September 01th, 1991, again in 1993 off Gorgona Island – Colombia (Fundación Yubarta ), re-sighted in consecutive years since 2000 to 2012 in Magellan Strait (Juan Capella, Whale Sound Catalogue and CEQUA Catalogue) and observed off Ecuador on July 17th, 2009 (PWF Catalogue). This individual is identified in other catalogs as CEQUA # 003, CRC # 1031, EMa020, IG0333 (Acevedo et al. 2007; Capella et al. 2008) (Figure 3). With a 21 year resight history, whale #6512 represents the second longest recordation of a live whale in Ecuadorian water.

Although a low percentage of humpback whales were re-sighted between Ecuador and the Strait of Magellan, two records are among the longest observed at 17 and 21 years. These records also confirm that the Strait of Magellan use as a feeding area for more than a decade and reveals connection between this feeding area and the breeding grounds off Colombia and Panama (Acevedo et al. 2007; Capella et al. 2008).

The observations off Ecuador have been suggest to be animals in transit to more northern breeding area for those humpback whales that feed in Magellan Strait (Acevedo et al. 2007), although we recognize that need more effort to learn the movements of humpback whales in the breeding area and between breeding-feeding grounds. Likely some whales, perhaps males, are looking for opportunities
to mate and therefore may move extensively in the breeding area. Gender, maturity and activity may influence both the use of the breeding and the selection of feeding areas.

**Figure 2:** The longest resighted record, humpback whale EC1261.


**Figure 3:** Humpback whale #6512 resighted with Colombia and Magellan Strait


There are many methods to determine the age of whales, photo-identification is one of the few non-invasive techniques that provide information about life stories of living whales. This work is the product of continued collaboration of many research groups in Latin America will be useful in detailing migratory pathways, residencies, rates of interchange and general distribution of humpback whales in their feeding and breeding areas. Humpback whales are a shared resource among many countries and the continued collaboration and funding of research efforts is needed to understand linkages between feeding and breeding areas.

The observations off Ecuador are considered to be animals in transit (Acevedo *et al*. 2007). Whale EC0267, identified as a male, was sighted September 2003 and re-sighted in the Magellan Strait. Humpback whale #6512, also identified as male (Rasmussen *et al*, 2007), was sighted off Ecuador on July 17th, 2009 and also re-sighted in the Magellan Strait.

It is likely that some whales, in particular males, are looking for opportunities to mate and move extensively in the breeding area. Possibly there is segregation in the use of the breeding area depending on gender, maturity and activity of the whales. Selection of feeding areas could also depend on these aspects (gender, maturity).

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LITERATURE CITED

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<td>26</td>
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* Whale was sighted in Marine Protected Area Francisco Coloane in PANAMA on september 2003 (Acevedo et al. 2007). Catalogue Curator: Kristin Rassmusen.