

New insights on migrations and movements of North Pacific humpback whales from the SPLASH project

Calambokidis, John¹; Barlow, Jay²; Burdin, Alexander M.^{3,4}; Clapham, Phillip⁵; Ford, John K. B.⁶; Gabriele, Christine M.⁷; Mattila, David⁸; Quinn, Terrance J.⁹; Rojas-Bracho, Lorenzo¹⁰; Straley, Janice M.¹¹; Urbán R., Jorge¹²; Wade, Paul R.⁵; Weller, David²; Witteveen, Briana H.¹³; Yamaguchi, Manami¹⁴; Falcone, Erin A.¹; Huggins, Jessica¹; Camacho, Dominique¹; Havron, Andrea¹; Flynn, Kiirsten¹; Maloney, Nora¹.

(1) Cascadia Research Collective, 218½ West Fourth Avenue, Olympia, WA 98501 USA

(2) NOAA Southwest Fisheries Science Center, 8604 La Jolla Shores Dr., La Jolla, CA 92037 USA

(3) Kamchatka Branch of Pacific Institute of Geography, Far East Branch of the Russian Academy of Sciences, Rybakov Prospect, 19-a Petropavlovsk-Kamchatsky 683024 Russia

(4) University of Alaska, Fairbanks, Alaska Sealife Center, 301, Railway Ave., Seward, AK 99664 USA

(5) National Marine Mammal Laboratory, Alaska Fisheries Science Center, NOAA Fisheries, 7600 Sand Point Way NE, Seattle, WA 98115 USA

(6) Fisheries and Oceans Canada, Pacific Biological St., 3190 Hammond Bay Rd, Nanaimo, BC V9T 6N7 Canada

(7) Glacier Bay National Park, PO Box 140, Gustavus, Alaska 99826 USA

(8) Hawaiian Islands Humpback Whale National Marine Sanctuary, 726 S. Kihei Road, Kihei, HI 96753 USA

(9) Juneau Center for Fisheries and Ocean Sciences, Univ. of Alaska, 11120 Glacier Hwy, Juneau, AK 99801 USA

(10) Instituto Nacional de Ecología, c/p CICESE, Apto. Postal 2732, Ensenada, Baja California 22860, México

(11) University of Alaska, Southeast Sitka Campus, 1332 Seward Avenue, Sitka, AK 99835 USA

(12) Programa de Mamíferos Marinos, Universidad Autónoma de Baja California Sur. La Paz, BCS 23080 México

(13) University of Alaska Fairbanks, Sch Fisheries & Ocean Sci., 118 Trident Way, Kodiak, AK 99615 USA

(14) Ogasawara Marine Center, Byobudani, Chichijima, Ogasawara-mura, Tokyo 100-21, Japan

Email: calambokidis@cascadiaresearch.org

SPLASH is an international collaborative research program to determine abundance, population structure, and potential human impacts for humpback whales in the North Pacific. This collaboration involves more than 50 research groups and 300 scientists. SPLASH field efforts were conducted at all known North Pacific humpback whale feeding and wintering areas and comprised three winter breeding seasons (2004, 2005, and 2006) and two summer feeding seasons (2004 and 2005). Here, we summarize the photo-identification results from the study's first three seasons (Winter 2004, Summer 2005, and Winter 2005), which after matching of all fluke photographs yielded 5,348 unique individuals. Almost 500 migrations were documented between wintering grounds in 2004-2005 and summer feeding areas in 2004. This represents the largest and most complete examination of humpback whale migrations in this ocean basin and revealed a far more complex pattern of movements than had been previously documented. Past studies relied primarily on comparison of a limited number of sites where identifications were collected, while SPLASH provided a far more complete sampling of all known areas. For the first time, migrations were recorded between feeding areas off Russia and three Asian wintering areas (Ogasawara, Okinawa, and Philippines). The first detailed look at the migratory destination of the humpback whales that winter off the offshore Revillagigedo Islands off Mexico revealed their primary destination is the Gulf of Alaska, very different than the primary destination of the whales wintering off mainland Mexico (US West Coast). We also found that humpback whales feeding off the Aleutian Islands and in the Bering Sea had a significantly lower match rate to all of the sampled winter breeding areas; this suggests that there is an additional wintering area for humpback whales not previously documented that is probably located somewhere in the western Pacific between Asia and Hawaii.