



21st Biennial Conference on the Biology of Marine Mammals

13-18 DECEMBER 2015
HILTON SAN FRANCISCO UNION SQUARE
SAN FRANCISCO, CA USA

[Presentation Index](#) [Author Index](#) marinemammalscience.org

Nuclear SNPs reveal link between social and genetic structure in Hawaiian short-finned pilot whales

[Amy Van Cise](#) [Karen Martien](#) [Robin Baird](#) [Erin Oleson](#) [Phillip Morin](#)

Social structure and its effects on gene flow have been suggested as drivers of population structure among sympatric or parapatric groups of several highly social odontocete species. Short-finned pilot whales are another highly social species in which population structure may be driven by social structure. Long-term research in Hawai'i indicates that this species forms social groups that are stable across decades. Previous studies have demonstrated strong genetic and morphological differentiation among populations within the Pacific Ocean, and evidence has been presented for the existence of two distinct types. We used 123 mitochondrial control region sequences (mtDNA) and 59 nuclear SNPs (nuDNA) from 142 short-finned pilot whales to determine whether social bonds affect population structure and divergence. Samples were collected from the Hawaiian Islands, Mariana Islands and Eastern Tropical Pacific (ETP) to compare divergence between islands and social groups within the Hawaiian Archipelago to that between distinct oceanic regions. Using nuDNA we detected significant differentiation between the Mariana Islands, Hawaiian Islands, and ETP ($F_{st} = 0.28$ to 0.26 , $p < 0.0009$), which corroborates our previous findings using mtDNA. While mitochondrial diversity is low throughout the Hawaiian Islands, the data indicate the presence of two populations, in the Main Hawaiian Islands (MHI) and the northwestern Hawaiian Islands (mtDNA $F_{st} = 0.58$, $p < 0.0001$). There is evidence of additional population structure within the MHIs, though this could be driven by high relatedness within sampled groups. Relatedness estimates from social groups off Hawai'i Island with at least five samples indicate that individuals within social groups are more related than expected by chance. Socially-driven population structure in Hawaiian pilot whales could indicate a greater degree of vulnerability to anthropogenic threats, as the removal of an individual can have a greater effect on the entire social group than in non-social species.

Search

Online Help & Support

Copyright 2016 | Duplication of this product and its content in print or digital form for the purpose of sharing with others is prohibited without permission from [Society for Marine Mammalogy](#).

This [Digital Publishing Platform](#) was produced by [Omnipress](#).

[Privacy](#) : [Online Help & Support](#)