High site fidelity, strong associations and long-term bonds: short-finned pilot whales off the island of Hawai‘i

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Pilot whales off Hawai‘i Island
- Most frequently encountered odontocete
- Evidence of reproductive isolation from elsewhere in Pacific1
- Present year-round in mixed age/sex groups
- Sightings strongly associated with island slope
- 267 photographic encounters 2003-2007
- Mean group size of 20.6 (range 1-53; SD=9.6)

Site-fidelity and residency
- 448 distinctive individuals identified
- 68.1% seen more than once, 55.8% seen>1year
- Sightings of individuals ranged from 1-29 (median=3) indicating differing levels of site-fidelity
- Multi-year site-fidelity used to define residency

Pair-wise associations
- Associations: seen≥5 times, half-weight association index
- Strong preferential associations
- Only 10.1% of possible dyadic associations were observed
- Mean maximum association per individual 0.91 (range: 0.50-1.00)

Detecting Community Structure
Community division was strongly supported using hierarchical cluster analysis (CCC=0.983) and social network analysis (Q=0.798)

9 social Units (A-H) defined using shared sighting histories: key individuals seen ≥8 times in≥4 years and their constant companions seen ≥5 times in ≥3 years
NA-residents with insufficient sightings for Unit assignment

Conclusions
- Heterogeneous sighting histories and social network analysis suggest multiple populations
- Individuals associate preferentially in stable long-term Units of mixed age & sex
- Encounter size indicates multiple Units present during encounters
- Lagged association rates indicate companions not documented in encounters still present in the study area
- Further genetic analysis is needed to inform the social structure of this genetically-isolated, island-associated population
- Existence of a resident population demonstrating strong long-term site-fidelity may warrant special management considerations

References

For more information: www.cascadiaresearch.org/hawaii/hawaii.htm
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