

Kinship, group structure and philopatry in beluga whales, *Delphinapterus leucas*: the genetic evidence

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Assessing the advantages of group formation is typically framed in terms of inclusive fitness. Determining the extent to which different types of animal groupings are kin-based is also central to understanding dispersal, and population structure and dynamics in social species. In recent decades, much research has been conducted on movements, dispersal and gene flow in beluga whales, *Delphinapterus leucas*, driven in large part by management needs. By contrast, research on group structure across much of the species range has been limited and no systematic genetic analysis has been conducted to date. Highly gregarious, beluga whales exhibit a wide range of group types, from large herds of 2000 or more to small groups of < 10 individuals. A number of authorities have assumed that beluga whale groupings are similar to killer whales and pilot whales where closely associated individuals are from the same maternal lineage. We genotyped 451 beluga whales sampled from 62 different groups across the species range, and found: 1) apart from cow-calf pairs, most group-members were not close relatives ($r = 0.0314$); 2) in almost all groups ($n=58/62$) multiple mtDNA matrilineal lines ($n=2-9$) were documented within groups, regardless of group size; and 3) despite the low level of observed kinship within individual groupings, close kin ($r=0.35-0.48$) were found across years in the same population, sometimes up to three years apart. These results suggest a unique social system that is not based on high association indices among kin, but high fidelity to natal herd, subpopulation and key locations.



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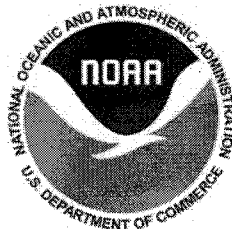
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