

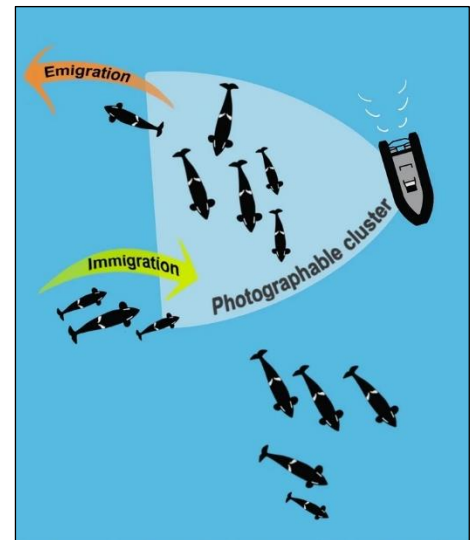
Assessing social structure: a data-driven approach to define associations between individuals

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Highlights:

- An approach is proposed for defining association thresholds on photo-identification datasets
- The approach uses lagged identification rates and a simple model of emigration/immigration from photographable clusters to identify a probabilistic association threshold
- The association threshold is a time-ordered lag value between identifications of two individuals that corresponds to a ~75% probability they were in close spatial proximity and likely associating
- The approach was tested on a photographic dataset of northern resident killer whales (*Orcinus orca*) in the Northeast Pacific
- The proposed approach captured social patterns at different structural levels better than two other arbitrary thresholds



This article is part of a thematic collection of articles (Special Issue) of *Mammalian Biology* and covers the following topics and taxa (marked with ☒) addressed in the Special Issue:

Article Type				
☐ Original Research	☒ Techniques	☐ Review	☐ Short Communication	☐ Concept Note
Taxon		Topic		
Terrestrial				
☐ Bats (Order Chiroptera)	☐ Primates : Great Apes (Family Hominidae)	☐ Acoustic ID	☐ Identification techniques	
☐ Carnivores : Bears (Family Ursidae)	☐ Primates : Old World monkeys (Family Cercopithecidae)	☐ Aerial surveys	☐ Life-history	
☐ Carnivores : Canids (Family Canidae)	☐ Ungulates : Bovids (Family Bovidae)	☒ Analytical innovations	☐ Machine learning	
☐ Carnivores : Felids (Family Felidae)	☐ Ungulates : Deers (Family Cervidae)	☐ Automated pattern recognition	☐ Mark-recapture analysis	
☐ Carnivores : Hyenas (Family Hyaenidae)	☐ Ungulates : Giraffes (Family Giraffidae)	☐ Behavioural ecology	☐ Morphometrics	
☐ Carnivores : Mustelids (Family Mustelidae)	☐ Ungulates : Horses (Family Equidae)	☐ Camera-trapping	☒ Network analysis	
☐ Elephants (Family Elephantidae)	☐ Multiple taxa (3 or more Families/Orders)	☐ Conservation management	☐ Photogrammetry	
Marine		☐ Data management	☐ Population ecology	
☐ Baleen whales : Right whales (Family Balaenidae)	☒ Large toothed whales (Families Delphinidae & Hyperoodontidae)	☐ Demographic parameters	☐ Site fidelity & Movement	
☐ Baleen whales : Rorquals (Family Balaenopteridae)	☐ Pinnipeds : True seals (Family Phocidae)	☐ Field methodology	☒ Social ecology	
☐ Carnivores : Bears (Family Ursidae)	☐ Porpoises (Family Phocoenidae)	☐ Genetic ID	☐ Software/Package development	
☐ Carnivores : Mustelids (Family Mustelidae)	☐ Sirenians : Manatees (Family Trichechidae)	☐ Health conditions	☐ Thermal imagery	
☒ Dolphins (Family Delphinidae)	☐ Multiple taxa (3 or more Families/Orders)	☐ Other: (please specify)		

References

- Karczmarski L, Chan SCY, Rubenstein DI, Chui SYS, Cameron EZ (2022a). Individual identification and photographic techniques in mammalian ecological and behavioural research – Part 1: Methods and concepts. *Mammalian Biology* (Special Issue), 102 (3) <https://link.springer.com/journal/42991/volumes-and-issues/102-3>
- Karczmarski L, Chan SCY, Chui SYS, Cameron EZ (2022b). Individual identification and photographic techniques in mammalian ecological and behavioural research – Part 2: Field studies and applications. *Mammalian Biology* (Special Issue), 102 (4) <https://link.springer.com/journal/42991/volumes-and-issues/102-4>