



Philopatry: A return to origins

Author: Pearce, John M.

Source: The Auk, 124(3) : 1085-1087

Published By: American Ornithological Society

URL: [https://doi.org/10.1642/0004-8038\(2007\)124\[1085:PARTO\]2.0.CO;2](https://doi.org/10.1642/0004-8038(2007)124[1085:PARTO]2.0.CO;2)

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

type localities but also to other important bits of data—dates, page and volume numbers, spellings, etc.

Acknowledgments.—We thank C. Benkman and S. Buskirk for information on the Black Hills in Wyoming, and N. Rice for information on the specimens in the Academy of Natural Sciences in Philadelphia. A. P. Peterson and J. D. Rising commented on a version of the manuscript.—RICHARD C. BANKS, *Division of Birds, National Museum of Natural History, MRC 116, P. O. Box 37012, Washington, D.C. 20013, USA (e-mail: banksr@si.edu)*; and DANIEL D. GIBSON, *University of Alaska Museum, 907 Yukon Drive, Fairbanks, Alaska 99775, USA.*

LITERATURE CITED

- AMERICAN ORNITHOLOGISTS' UNION. 1910. Check-list of North American Birds, 3rd ed. (revised). American Ornithologists' Union, New York.
- AMERICAN ORNITHOLOGISTS' UNION. 1931. Check-list of North American Birds, 4th ed. American Ornithologists' Union, Lancaster, Pennsylvania.
- AMERICAN ORNITHOLOGISTS' UNION. 1957. Check-list of North American Birds, 5th ed. American Ornithologists' Union, Baltimore, Maryland.
- AMERICAN ORNITHOLOGISTS' UNION. 1983. Check-list of North American Birds, 6th ed. American Ornithologists' Union, Lawrence, Kansas.
- AMERICAN ORNITHOLOGISTS' UNION. 1998. Check-list of North American Birds, 7th ed. American Ornithologists' Union, Washington, D.C.
- AUDUBON, J. J. 1839. Ornithological Biography 5, p. 66, pl. 398.
- AUDUBON, J. J. 1841. Birds of America, oct. ed. iii, 71, pl. 161.
- BANKS, R. C. 2004. Ornithological nomenclature. Pages 13–25 in *Handbook of the Birds of the World*, vol. 9: Cotingas to Pipits and Wagtails (J. del Hoyo, A. Elliott, and D. A. Christie, Eds.). Lynx Ediciones, Barcelona, Spain.
- CASSIN, J. 1856. Notes on North American birds in the collection of the Academy of Natural Sciences, Philadelphia, and National Museum, Washington. *Proceedings of the Academy of Natural Sciences of Philadelphia* 8:39–42.
- DEIGNAN, H. 1961. Type specimens of birds in the United States National Museum. *United States National Museum Bulletin*, no. 221.
- GRINNELL, J. 1932a. An United States record of the Timberline Sparrow. *Condor* 34:231–232.
- GRINNELL, J. 1932b. Type localities of California birds. *University of California Publications in Zoology* 38:1–11.
- HELLMAYR, C. E. 1938. *Catalogue of Birds of the Americas and the adjacent islands*, part XI. *Field Museum of Natural History Zoological Series* 13, no. 11.
- MERRIAM-WEBSTER. 2001. *Merriam-Webster's Geographical Dictionary*, 3rd ed. Merriam-Webster, Springfield, Massachusetts.
- MILLER, A. H., H. FRIEDMANN, L. GRISCOM, AND R. T. MOORE. 1957. Distributional Check-list of the Birds of Mexico, part II. *Pacific Coast Avifauna*, no. 33.
- PARKMAN, F. 1969. *The Oregon Trail Bison Book*. University of Nebraska Press, Lincoln.
- PAYNTER, R. A., JR. 1970. Subfamily Emberizinae. Pages 3–214 in *Check-list of Birds of the World*, vol. XIII (R. A. Paynter, Jr. and R. W. Storer, Eds.). *Museum of Comparative Zoology*, Cambridge, Massachusetts.
- RIDGWAY, R. 1901. The birds of North and Middle America. *Bulletin of the United States National Museum*, no. 50, part 1.
- STONE, W. 1899. A study of the type specimens of birds in the collection of the Academy of Natural Sciences of Philadelphia, with a brief history of the collection. *Proceedings of the Academy of Natural Sciences of Philadelphia* 1899:5–62.
- SWARTH, H., AND A. BROOKS. 1925. The Timberline Sparrow a new species from northwestern Canada. *Condor* 27:67–68.
- TOWNSEND, J. K. 1839. Narrative of a journey across the Rocky Mountains, to the Columbia River, and a visit to the Sandwich Islands, Chili, &c. H. Perkins, Philadelphia.

Received 18 September 2006, accepted 16 November 2006

The Auk 124(3):1085–1087, 2007

Philopatry: A return to origins.—The word “philopatry” is a combination of the prefix *philo* (from the Greek *philos*, “beloved”) and the Latin *patria*, which means “fatherland” or “homeland.” Since the first English-language use of “philopatry” in an ornithological context by Huntington (1951), the term has been applied to two types of site-faithful behavior in birds. Closest to the etymological meaning is the first, “natal philopatry,” which means not dispersing far from, or returning to, a birthplace for reproduction. The second is “breeding philopatry,” which means returning to the same breeding area each year, though that area may not be an individual’s birth place (Shields 1982, Anderson et al. 1992). Therefore, any assessment of breeding philopatry likely includes some immigrant individuals, whereas assessments of natal philopatry include only locally hatched or born individuals.

In the past several years, the use of philopatry in the ornithological literature has widened further, to include site fidelity to nonbreeding areas, such as sites used for molting (Iverson et al. 2004), wintering (Robertson and Cooke 1999, Mehl et al. 2004), or stopover during migration (Merom et al. 2000). Use of the term “philopatry” to describe not only natal

homing, but general site fidelity to both breeding and nonbreeding sites of individuals whose natal areas are unknown is, I believe, problematic and warrants reconsideration. This is because there are substantial genetic and demographic implications of philopatry in its purest and historical sense (i.e., natal philopatry), such as increased relatedness and population differentiation (Greenwood 1980, Quinn and White 1987, Avise et al. 1992). Indeed, the historical and theoretical discussions of natal philopatry focus on the behavior of limited dispersal from a birth place, how this promotes inbreeding, why inbreeding might be adaptive, and how a lack of gene flow might promote speciation (Mayr 1963, Shields 1982, Anderson et al. 1992). I believe that these population-genetic and demographic implications are potentially misapplied when "philopatry" is used to describe site-faithful behavior in general (see Pearce and Talbot 2006).

The potential danger of applying philopatry to non-natal and nonbreeding conditions is that it creates the expectation of certain outcomes, such as low dispersal rates, population genetic differentiation, and unique population segments, when such conditions may not exist. Given that most avian species do not molt, winter, or have migratory stopovers where they breed, I propose that the term "philopatry" and its genetic expectations be used only in relation to natal philopatry and not extended to (1) breeding-site fidelity of individuals whose natal areas are unknown and (2) nonbreeding areas where site-faithful behavior is observed. I believe this correctly distinguishes natal philopatry as a specific type of site fidelity with its own implications for population genetics and dynamics. Thus, philopatry should be viewed as synonymous and interchangeable with the terms "natal-site fidelity" and "natal philopatry," and the term "breeding-site fidelity" should replace "breeding philopatry," because it reflects the unknown natal origins of birds captured as adults. Although the broader condition of site fidelity may have implications for fitness, mate pairing, and population delineation—as examined in several studies (Robertson and Cooke 1999, Merom et al. 2000, Iverson et al. 2004, Mehl et al. 2004)—future investigations of site fidelity should be pursued without automatically invoking the term "philopatry" and assuming that the genetic and demographic connotations of natal philopatry also apply. In contrast to philopatry, the probability of fidelity (F) and dispersal ($1 - F$) are estimable parameters (Burnham 1993, Kendall and Nichols 2004), and the demographic and genetic consequences of site fidelity, regardless of where it occurs, can serve as hypotheses for testing with multiple data types (e.g., Arsenault et al. 2005). Such data mergers should enhance our understanding of the demographic, behavioral, and genetic implications of natal philopatry and site fidelity.

Acknowledgments.—I thank N. Tileston of the Alaska Resources Library and Information Services for assisting with literature. P. Flint, A. Harding, D. Derksen, M. Lindberg, H. Wilson, F. Cooke, and one anonymous reviewer offered constructive commentary on the manuscript.—JOHN M. PEARCE, U.S. Geological Survey, Alaska Science Center, 1011 East Tudor Road, Anchorage, Alaska 99503, USA, and Department of Biology and Wildlife, University of Alaska, Fairbanks, Alaska 99775, USA. E-mail: jpearce@usgs.gov

LITERATURE CITED

- ANDERSON, M. G., J. M. RHYMER, AND F. C. ROHWER. 1992. Philopatry, dispersal, and the genetic structure of waterfowl populations. Pages 365–395 in *Ecology and Management of Breeding Waterfowl* (B. D. J. Batt, A. D. Afton, M. G. Anderson, C. D. Ankney, D. H. Johnson, J. A. Kadlec, and G. L. Krapu, Eds.). University of Minnesota Press, Minneapolis.
- ARSENAULT, D. P., P. B. STACEY, AND G. A. HOELZER. 2005. Mark-recapture and DNA fingerprinting data reveal high breeding-site fidelity, low natal philopatry, and low levels of genetic population differentiation in Flammulated Owls (*Otus flammeolus*). *Auk* 122:329–337.
- AVISE, J. C., R. T. ALISAUSKAS, W. S. NELSON, AND C. D. ANKNEY. 1992. Matriarchal population genetic structure in an avian species with female natal philopatry. *Evolution* 46:1084–1096.
- BURNHAM, K. P. 1993. A theory for combined analysis of ring recovery and recapture data. Pages 199–213 in *Marked Individuals in the Study of Bird Population* (J.-D. Lebreton and P. M. North, Eds.). Birkhauser Verlag, Basel, Switzerland.
- GREENWOOD, P. J. 1980. Mating systems, philopatry and dispersal in birds and mammals. *Animal Behaviour* 28:1140–1162.
- HUNTINGTON, C. E. 1951. "Ortstreue" and subspecies formation in the Pied Flycatcher. *Ecology* 32: 352–355.
- IVERSON, S. A., D. ESLER, AND D. J. RIZZOLO. 2004. Winter philopatry of Harlequin Ducks in Prince William Sound, Alaska. *Condor* 106:711–715.
- KENDALL, W. L., AND J. D. NICHOLS. 2004. On the estimation of dispersal and movement of birds. *Condor* 106:720–731.
- MAYR, E. 1963. *Animal Species and Evolution*. Belknap Press of Harvard University Press, Cambridge, Massachusetts.
- MEHL, K. R., R. T. ALISAUSKAS, K. A. HOBSON, AND D. K. KELLETT. 2004. To winter east or west? Heterogeneity in winter philopatry in a central-Arctic population of King Eiders. *Condor* 106: 241–251.
- MEROM, K., Y. YOM-TOV, AND R. MCCLEERY. 2000. Philopatry to stopover site and body condition

- of transient Reed Warblers during autumn migration through Israel. *Condor* 102:441–444.
- PEARCE, J. M., AND S. L. TALBOT. 2006. Demography, genetics, and the value of mixed messages. *Condor* 108:474–479.
- QUINN, T. W., AND B. N. WHITE. 1987. Analysis of DNA sequence variation. Pages 163–198 in *Avian Genetics* (F. Cooke and P. A. Buckley, Eds.). Academic Press, London.
- ROBERTSON, G. J., AND F. COOKE. 1999. Winter philopatry in migratory waterfowl. *Auk* 116:20–34.
- SHIELDS, W. M. 1982. *Philopatry, Inbreeding, and the Evolution of Sex*. State University of New York Press, Albany.

Received 14 November 2006, accepted 7 March 2007