

Curriculum Vitae

Peter O. Dunn

Department of Biological Sciences
Lapham Hall, P.O. Box 413
University of Wisconsin-Milwaukee
Milwaukee, WI 53201

Phone: 414-229-2253; Fax: 414-229-3926; e-mail: PDunn@uwm.edu

EDUCATION

1989	Ph.D. in Zoology	University of Alberta
1984	M.S. in Wildlife Biology	Colorado State University
1981	B.S. (honors) in Wildlife Biology	University of Maine

POSITIONS HELD

2008-present	Professor, UWM Department of Biological Sciences
2004-2007	Associate Professor, UWM Department of Biological Sciences.
1999-2003	Assistant Professor, UWM Department of Biological Sciences.
1996-98	Adjunct Assistant Professor, UWM Department of Biological Sciences.
1994-96	Postdoctoral Research Associate, Museum of Natural Science and Cooperative Fish and Wildlife Research Unit, Louisiana State University.
1992-94	Postdoctoral Research Associate, The Australian National University.
1990-92	Postdoctoral Research Associate, Queen's University.

AWARDS AND GRANTS (last 10 years)

2009-14	National Science Foundation, Population Biology Program. Project title: "Collaborative Research: Balancing selection and MHC variation in an endangered bird" (\$355,207) DEB-0948695 (Feb10-Jan14).
2007-10	Australian Research Council. Linkage Grant. Project title: Conservation genetics of the endangered Malleefowl. Co-PI with Drs. Raoul Mulder (U. Melbourne) and Steve Donnellan (SA Museum; Aus\$354,479). National Science Foundation, Animal Behavior Program, RET supplement (\$8500).
2006	Elected Fellow of the American Ornithologists' Union.
2004-08	National Science Foundation, Animal Behavior Program. Project title: "Sexual selection on male ornaments" (\$266,287; Aug04-Jul08).
2003	National Science Foundation, Animal Behavior Program, REU supplement (\$6000).
2002	National Science Foundation, Population Biology Program. Project title: "Dissertation Research: Phylogeography of the greater prairie-chicken" (\$9,458).
2002-05	National Science Foundation, Animal Behavior Program. Project title: "Evolution of sexual dimorphism in monogamous species" (\$59,632; Aug02-Jul05).
2001-03	National Science Foundation, FSML: Expansion of laboratory facilities at the University of Wisconsin-Milwaukee Field Station. (Co-PI with 4 others, \$138,642).

PROFESSIONAL ACTIVITIES

Editor, *Animal Behaviour*, 2008- 2011

National Science Foundation, Advisory Panel member, 2005, 2006, 2012

Associate Editor, *Evolution*, 2001-2003

Speaker, Student Grant Writing Workshops, IV North American Ornithological Conference, Veracruz, Mexico, 2006, and American Ornithologists' Union meeting, 2013.

Student Awards Committee, American Ornithologists' Union, 2000-2003

Student Research Awards Committee, Zoological Society of Milwaukee County, 1997-2004

TEACHING EXPERIENCE

At UWM my teaching evaluations from students in upper level courses average 95% (4.76/5, where 5 is the highest; range: 4.5 - 4.9). My evaluations for Introductory Biology (Bio 150), an undergraduate course with over 250 students average 92% (4.6/5).

Lecture Courses

University of Wisconsin-Milwaukee

Biometry 2000-2011

Foundations of Biological Science II 2000-2010

Behavioral Ecology 1999-2007

Conservation Biology 1996

Queen's University, Kingston, Ontario

Comparative Vertebrate Anatomy and Evolution 1989

Laboratory Courses

University of Wisconsin-Milwaukee

Avian Ecology and Evolution Laboratory 2001, 2003

Birds of Wisconsin 2005

University of Alberta (as graduate teaching assistant)

Wildlife Conservation, Vertebrate Zoology,
Vertebrate Fauna of Alberta 1984-89

Seminars

University of Wisconsin-Milwaukee

Avian Molecular and Behavioral Ecology (2000), *Ecology and Evolution of Mating Systems* (1999),

Model Systems in Behavioral Ecology (2004), *Sexual Selection* (2004), *Animal Behavior* (2006)

Louisiana State University

Conservation Genetics (1995)

Field courses

The Australian National University

Behavioral Ecology 1993, 1994

Graduate Students (year of graduation): Zach Bateson (Ph.D.- started 2012; co-supervised with Linda Whittingham), John Eimes (Ph.D.- 2012), Medhavi Ambardar (M.S. - 2011), Jessica [Koederitz] Armenta (Ph.D.- 2007), Julie Garvin (Ph.D.-2006), Amberleigh Henschen (Ph.D.- started 2012), Dan Mitchell (M.S.-2006), Marc Pedersen (M.S. -2004), Jeff Johnson (Ph.D.- 2003), Vanessa Torti (M.S. - 2003), Jackie [Nooker] Augustine (M.S.-2002), Renee Netter (M.S.-2001), Mary Stapleton (M.S.-2001; co-supervised with Linda Whittingham).

Post-doctoral Advisees: Jennifer Bollmer, PhD. Univ. of Missouri-St. Louis. Ethan Clotfelter, Ph.D. Univ. Wisconsin-Madison. co-supervised with Linda Whittingham (now Prof. at Amherst College). Scott Tarof, Ph.D. Queen's University, Canada (now Lab Manager at York University).

PUBLICATIONS

Invited Book chapters:

- DUNN, P.O. & D. WINKLER.** 2010. *Effects of climate change on timing of breeding and reproductive success in birds.* Pp 113-128. *In: Effects of climate change on birds*, A.P. Møller, W. Fieldler & P. Berthold (Eds.), Oxford University Press.
- DUNN, P.O.** 2004. Breeding dates and reproductive performance. Pp 67-85. *In: Effects of climate change on birds*, A.P. Møller, W. Fieldler & P. Berthold (Eds.), Advances in Ecological Research, Vol. 35. Elsevier Ltd.
- SPARKS, T.H., H.Q.P. CRICK, P.O. DUNN, & L.V. SOKOLOV.** 2004. Phenology of selected lifeforms: Birds. Pp 421-436. *In: Phenology: An integrative environmental science*, M.D. Schwartz (Ed.), pp. Kluwer, Amsterdam.

Refereed papers:

93. TAFF, C.C. , C.R. FREEMAN-GALLANT, **P.O. DUNN** & L.A. WHITTINGHAM. Spatial distribution of nests constrains the strength of sexual selection in a warbler. *Journal of Evolutionary Biology* 26: 1392-1405.
92. DUNN, P.O., J.L. BOLLMER, C.R. FREEMAN-GALLANT & L.A. WHITTINGHAM. 2013. MHC variation is related to a sexually selected ornament, survival, and parasite resistance in the common yellowthroat. *Evolution* 67: 679-687.
91. EIMES, J.A., K. REED, K. MENDOZA, J.L. BOLLMER, L.A. WHITTINGHAM, Z.W. BATESON & P.O. DUNN. 2013. Greater prairie chickens have a compact *MHC-B* with a single class IA locus. *Immunogenetics* 65: 133-144.
90. BOLLMER, J.L., P.O. DUNN, C.R. FREEMAN-GALLANT & L.A. WHITTINGHAM. 2012. Social and extra-pair mating in relation to MHC variation in common yellowthroats. *Proceedings of the Royal Society of London B* 279: 4778-4785.
89. SHUTLER, D. D. HUSSELL, R. NORRIS, D. WINKLER, R. ROBERTSON, F. BONIER, W. RENDELL, M. BÉLISLE, R. CLARK, R. DAWSON, N. WHEELWRIGHT, M. LOMBARDO, P. THORPE, M. TRUAN, R. WALSH, M. LEONARD, A. HORN, C. VLECK, D. VLECK, A. ROSE, L. WHITTINGHAM, **P. DUNN**, K. HOBSON, M. STANBACK. 2012. Spatiotemporal Patterns in Nest Box

- Occupancy by Tree Swallows Across North America. *Avian Conservation and Ecology* 7(1): 3. <http://dx.doi.org/10.5751/ACE-00517-070103>.
88. TAFF, C.C., C.R. FREEMAN-GALLANT, **P.O. DUNN**, L.A. WHITTINGHAM, K. Belinsky, D. Steinberger, C. Clark, H. Sacks. 2012. Multi-modal sexual selection in a warbler: plumage and song are related to different fitness components. *Animal Behaviour* 84: 813-821.
87. HESS, B., **P. O. DUNN** & L. A. WHITTINGHAM. 2012. Females choose multiple mates in the lekking Greater Prairie-Chicken. *Auk* 129: 133-139.
86. BOLLMER, J.L., E. RUDER, J.A. JOHNSON, J.A. EIMES & **P.O. DUNN**. 2011. Drift and selection influence geographic variation at immune loci of prairie-chickens. *Molecular Ecology* 20: 4695-4706.
85. EIMES, J.A. J.L. BOLLMER, J.A. JOHNSON, L.A. WHITTINGHAM, V. OOSTERHOUT & **P.O. DUNN**. 2011. Rapid loss of MHC class II variation in a bottlenecked population is explained by drift and loss of copy number variation. *Journal of Evolutionary Biology* 24: 1847-1856.
84. TAFF, C.C. , C.R. FREEMAN-GALLANT, **P.O. DUNN** & L.A. WHITTINGHAM. 2011. Relationship between brood sex ratio and male ornaments depends on male age in a warbler. *Animal Behaviour* 81: 619-625.
83. **DUNN, P.O.**, D.W. WINKLER, L.A. WHITTINGHAM, S.J. HANNON, & R.J. ROBERTSON. 2011. A test of the mismatch hypothesis: how predictable is food abundance for aerial insectivores? *Ecology* 92: 450-461.
82. WHITTINGHAM, L.A., & **P.O. DUNN**. 2010. Fitness benefits of polyandry for experienced females. *Molecular Ecology* 19: 2328-2335.
81. BOLLMER, J.L., **P.O. DUNN**, L.A. WHITTINGHAM & C. WIMPEE. 2010. Extensive MHC class II B gene duplication in a passerine, the Common Yellowthroat (*Geothlypis trichas*). *Journal of Heredity* 101: 448-460.
80. EIMES, J.A. J.L. BOLLMER, **P.O. DUNN**, L.A. WHITTINGHAM, & C. WIMPEE. 2010. Mhc class II diversity and balancing selection in greater prairie-chickens. *Genetica* 138: 265-271.
79. **DUNN. P.O.**, *J. GARVIN, L. A. WHITTINGHAM, & C. FREEMAN-GALLANT & DENNIS HASSELQUIST. 2010. Carotenoid and melanin-based ornaments signal similar aspects of male quality in two populations of the common yellowthroat *Functional Ecology* 24: 149-158.
78. FREEMAN-GALLANT, C. R., C. C. TAFF, D. MORIN, **P.O. DUNN** & L.A. WHITTINGHAM. 2010. Sexual selection, multiple male ornaments, and age- and condition-dependent signaling in the common yellowthroat. *Evolution* 64: 1007-1017.
77. **DUNN, P.O.**, J.T. LIFJELD, & WHITTINGHAM, L.A. 2009. Multiple paternity and offspring quality in tree swallows. *Behavioral Ecology and Sociobiology* 63: 911-922.
76. ARMENTA, J., **DUNN. P.O.**, & L. A. WHITTINGHAM. 2008. Effects of specimen age on plumage color. *The Auk*. 125: 803-808.
75. ARMENTA, J., **DUNN. P.O.**, & L. A. WHITTINGHAM. 2008. Quantifying avian sexual dichromatism: a comparison of methods. *Journal of Experimental Biology* 211: 2423-2430.

74. GARVIN, J., **P.O. DUNN**, L.A. WHITTINGHAM, D. STEEBER & D. HASSELQUIST. 2008. Do male ornaments signal immunity in common yellowthroats? *Behavioral Ecology* 19: 54-60.
73. **DUNN, P. O.** , L. A. WHITTINGHAM, C. FREEMAN-GALLANT & J. DeCOSTE. 2008. Geographic variation in the function of ornaments in the common yellowthroat. *Journal of Avian Biology* 39: 66-72.
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72. DALE, J., **P.O. DUNN**, J. FIGUEROLA, T. LISLEVAND, T. SZÉKELY, & L.A. WHITTINGHAM. 2007. Sexual selection explains Rensch's rule of allometry for sexual size dimorphism. *Proceedings of the Royal Society B: Biological Sciences* 274: 2971-2979.
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71. WHITTINGHAM, L.A., **P.O. DUNN** & J.T. LIFJELD. 2007. Egg mass influences nestling quality in tree swallows, but there is no differential allocation in relation to laying order or sex. *Condor*. 109: 585-594.
70. JOHNSON, J. **P.O. DUNN**, & J. BOUZAT. 2007. Effects of recent population bottlenecks on reconstructing the demographic history of prairie-chickens. *Molecular Ecology* 16: 2203-2222.
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69. MITCHELL, D.P., **P. O. DUNN**, L.A. WHITTINGHAM & C. FREEMAN-GALLANT. 2007. Attractive males provide less parental care in two populations of the common yellowthroat. *Animal Behaviour* 73: 165-170.
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68. ABROE, B., GARVIN, J., PEDERSEN, M., WHITTINGHAM, L.A., & **P.O. DUNN**. 2007. Brood sex ratios are related to male size, but not attractiveness in the common yellowthroat. *The Auk* 124: 176-184.
67. **DUNN, P. O.** & L. A. WHITTINGHAM. 2007. Search costs influence the spatial distribution, but not the level, of extra-pair mating in tree swallows. *Behavioral Ecology and Sociobiology* 61: 449-454.
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66. PEDERSEN, M., **P. O. DUNN**, & L. A. WHITTINGHAM. 2006. Extra-territorial forays are related to a male ornamental trait in common yellowthroats. *Animal Behaviour* 72: 479-486.
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65. GARVIN, J., B. ABROE, B., M. PEDERSEN, **P.O. DUNN** & L.A. WHITTINGHAM. 2006. Immune response of nestling warblers varies with extra-pair paternity and temperature. *Molecular Ecology* 15: 3833-3840.
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64. JOHNSON, J., & **P.O. DUNN**. 2006. Low genetic variation in the heath hen prior to extinction and implications for the conservation of prairie-chicken populations . *Conservation Genetics* 7: 37-48.
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63. WHITTINGHAM, L.A., **P.O. DUNN**, & STAPLETON, M. 2006. Repeatability of extra-pair mate choice by female tree swallows. *Molecular Ecology* 15: 841-849.
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62. **DUNN, P.O.** & L. A. WHITTINGHAM. 2005. Radio-tracking of female tree swallows prior to egg-laying. *Journal of Field Ornithology* 76: 259-263
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61. NOOKER, J., **P. O. DUNN**, & L. A. WHITTINGHAM. 2005. Effects of food abundance, weather and female condition on reproduction in tree swallows. *The Auk* 122: 1225-1238
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60. TORTI, V. & **P.O. DUNN**. 2005. Variable effects of climate change on six species of North American birds. *Oecologia*. 145: 486-495.
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59. WHITTINGHAM, L.A., **P.O. DUNN**, & NOOKER, J. 2005. Maternal influences on brood sex ratios: an experimental study in tree swallows. *Proceedings of the Royal Society of London B* 272: 1775-1780.
58. TAROF, S., **P.O. DUNN** & L. A. WHITTINGHAM. 2005. Dual functions of a melanin-based ornament in the common yellowthroat. *Proceedings of the Royal Society of London B* 272: 1121-1127.
57. PITCHER, T., **P.O. DUNN**, & L.A. WHITTINGHAM. 2005. Sperm competition and the evolution of avian testes size. *Journal of Evolutionary Biology* 18: 557-567.
56. WHITTINGHAM, L.A. & **P.O. DUNN**. 2005. Effects of extra-pair and within-pair reproductive success on the opportunity for selection in birds. *Behavioral Ecology* 16: 138-144.
55. JOHNSON, J., R. BELLINGER, J. TOEPFER & **P.O. DUNN**. 2004. Temporal changes in allele frequencies and low effective population size in greater prairie-chickens. *Molecular Ecology* 13: 2617-2630.
54. POIRIER, N.E., L. A. WHITTINGHAM & **P.O. DUNN**. 2004. Males achieve greater reproductive success through multiple broods than through extra-pair mating in house wrens. *Animal Behaviour* 67: 1109-1116.
53. POIRIER, N.E., L. A. WHITTINGHAM & **P.O. DUNN**. 2003. Effects of paternity and mate availability on mate switching in house wrens. *The Condor* 105: 816-821.
52. JOHNSON, J., J. TOEPFER & **P.O. DUNN**. 2003. Contrasting patterns of mitochondrial and microsatellite population structure in fragmented populations of greater prairie-chickens. *Molecular Ecology* 12: 3335-3347.
51. WHITTINGHAM, L. A., **P.O. DUNN** & E. CLOTFELTER. 2003. Parental allocation of food to nestling tree swallows: the influence of nestling behavior, sex, and paternity. *Animal Behaviour* 65: 1203-1210.
50. GALEOTTI, P., D. RUBOLINI, **P.O. DUNN**, & M. FASOLA. 2003. Colour polymorphism in birds: causes and functions. *Journal of Evolutionary Biology* 16: 635-646.
49. BELLINGER, R., J. JOHNSON, J. TOEPFER, & **P.O. DUNN**. 2003. Loss of genetic variation in greater prairie chickens following a population bottleneck in Wisconsin, USA. *Conservation Biology* 17: 717-724.
48. WINKLER, D.W., **P.O. DUNN** & C.E. MCCULLOCH. 2002. Predicting the effects of climate change on avian life history traits. *Proceedings of the National Academy of Sciences, USA* 99: 13595-13599.
47. LIFJELD, J., **P.O. DUNN**, & L.A. WHITTINGHAM. 2002. Energetic stress, immunosuppression and parental effort in tree swallows. *Oecologia* 130: 185-190.
46. WHITTINGHAM, L. A. & **P. O. DUNN**. 2001. Paternity and male parental care in birds. *Current Ornithology* 16: 257-298.
45. WHITTINGHAM, L. A., S.M. VALKENAAR, N.E. POIRIER & **P.O. DUNN**. 2001. Maternal effects on nestling condition and sex ratio. *Auk* 119: 125-131.
44. BADYAEV, A.V., G.E. HILL, **P.O. DUNN**, & J.C. GLEN. 2001. Plumage color as a composite trait: functional integration of sexual ornamentation in the house finch. *American Naturalist* 158: 221-235.
43. STAPLETON, M., **P.O. DUNN**, J. McCARTY, A. SECORD & L.A. WHITTINGHAM. 2001. Polychlorinated Biphenyl contamination and minisatellite DNA mutation rates of tree swallows. *Environmental Toxicology and Chemistry* 20: 2263-2267.

42. THUSIUS, K., K. PETERSON, **P.O. DUNN**, & L.A. WHITTINGHAM. 2001. Male mask size is correlated with mating success in common yellowthroats. *Animal Behaviour* 62: 435-446.
41. THUSIUS, K., **P.O. DUNN**, K. PETERSON, & L.A. WHITTINGHAM. 2001. Extrapair paternity is influenced by breeding synchrony and density in the common yellowthroat. *Behavioral Ecology* 12: 633-639.
40. WHITTINGHAM, L. A. & **P. O. DUNN**. 2001. Survival of withinpair and extrapair young in tree swallows. *Behavioral Ecology* 12: 496-500.
39. PETERSON, K., K. THUSIUS, L.A. WHITTINGHAM, & **P.O. DUNN**. 2001. Allocation of male parental care in relation to paternity within and among broods of common yellowthroats. *Ethology* 107: 573-586.
38. **DUNN. P. O.**, L. A. WHITTINGHAM, & T. PITCHER. 2001. Mating systems, sperm competition and the evolution of sexual dimorphism in birds. *Evolution* 55: 161-175.
37. WHITTINGHAM, L. A. & **P. O. DUNN**. 2001. Female responses to intraspecific brood parasitism in the tree swallow. *Condor* 103: 166-170.
36. WHITTINGHAM, L. A. & **P. O. DUNN**. 2000. Offspring sex ratios in tree swallows: females in better condition produce more sons. *Molecular Ecology* 9: 1123-1129.
35. CLOTFELTER, E., L. A. WHITTINGHAM & **P. O. DUNN**. 2000. Laying order, hatching asynchrony, and nestling survival in tree swallows. *Journal of Avian Biology* 31: 329-334.
34. HEINSOHN, R., **P. O. DUNN**, S. LEGGE & M. DOUBLE. 2000. Coalitions of relatives and reproductive skew in cooperatively breeding white-winged choughs. *Proceedings of the Royal Society of London B* 267: 243-249.
33. **DUNN, P.O.**, K. THUSIUS, D. WINKLER, & K. KIMBER. 2000. Geographic and ecological variation in clutch size of tree swallows. *Auk* 117: 215-221.
32. **DUNN, P.O.**, & D. WINKLER. 1999. Climate change has affected the breeding date of tree swallows throughout North America. *Proceedings of the Royal Society of London B*. 266: 2487-2490.
31. HEINSOHN, R., S. LEGGE, & **P.O. DUNN**. 1999. Extreme reproductive skew in cooperatively-breeding birds: tests of theory in white-winged choughs. *Proceedings of the International Ornithological Congress*, Aug. 1998, Durban, South Africa.
30. **DUNN, P. O.**, & A. COCKBURN. 1999. Extra-pair mate choice and honest signaling in cooperatively-breeding superb fairy-wrens. *Evolution* 53: 938-946.
29. **DUNN, P.O.**, A. AFTON, M. GLOUTNEY, & R. T. ALISAUSKAS. 1999. Forced copulation results in few extra-pair fertilizations in Ross's and lesser snow geese. *Animal Behaviour* 57: 1071-1081.
28. WHITTINGHAM, L. A. & **P. O. DUNN**. 1998. Male parental effort and paternity in a variable mating system. *Animal Behaviour* 55: 629-640.
27. **DUNN, P. O.**, & A. COCKBURN. 1998. The costs and benefits of extra-group mating in superb fairy-wrens. Pages 147-162 in P. Parker, N. Burley (eds.), *Ornithological Monograph No. 49, Avian Reproductive Tactics: Female and Male Perspectives*. Amer. Ornithol. Union, Washington, D.C.
26. WHITTINGHAM, L.A., **P.O. DUNN**, & R. MAGRATH. 1997. Relatedness, polyandry and extra-group paternity in the cooperatively breeding white-browed scrubwren (*Sericornis frontalis*). *Behavioral Ecology and Sociobiology* 40: 261-270.
25. **DUNN, P. O.** & A. COCKBURN. 1996. Evolution of male parental care in a bird with almost complete cuckoldry. *Evolution* 50: 2542-2548.

24. GREEN, D., A. COCKBURN, M. HALL, H. OSMOND, & **P.O. DUNN**. 1995. The tradeoff between mating and parental effort in male superb fairy-wrens. *Proceedings of the Royal Society, London B*. 262:297-303.
23. **DUNN, P. O.**, A. COCKBURN, & R. A. MULDER. 1995. Fairy-wren helpers often care for young to which they are unrelated. *Proceedings of the Royal Society, London B*. 259: 339-343.
22. WHITTINGHAM, L. A., **P. O. DUNN**, & R. J. ROBERTSON. 1995. Testing the female mate guarding hypothesis. *Animal Behaviour* 50: 277-279.
21. **DUNN, P. O.**, R. J. ROBERTSON, D. MICHAUD-FREEMAN & P. T. BOAG. 1994. Extra-pair paternity in tree swallows: why do females mate with more than one male? *Behavioral Ecology and Sociobiology* 35: 273-281.
20. WHITTINGHAM, L. A., **P. O. DUNN**, & R. J. ROBERTSON. 1994. Female response to reduced male parental care in birds: an experiment in tree swallows. *Ethology* 96: 260-269.
19. LIFJELD, J. T., **P. O. DUNN**, & D. F. WESTNEAT. 1994. Sexual selection by sperm competition in birds: male-male competition or female choice? *Journal of Avian Biology* 25: 244-250.
18. **DUNN, P. O.**, L. A. WHITTINGHAM, J. T. LIFJELD, R. J. ROBERTSON, & P. T. BOAG. 1994. Effects of breeding density, synchrony and experience on extra-pair paternity in tree swallows. *Behavioral Ecology* 5: 123-129.
17. MULDER, R. A., **P. O. DUNN**, A. COCKBURN, K. LAZENBY-COHEN, & M. J. HOWELL. 1994. Helpers liberate female fairy-wrens from constraints on extra-pair mate choice. *Proceedings of the Royal Society, London B* 255: 223-229.
16. **DUNN, P. O.** & J. T. LIFJELD. 1994. Can extra-pair copulations be used to predict extra-pair paternity? *Animal Behaviour* 47: 983-985.
15. WHITTINGHAM, L. A., **P. O. DUNN**, & R. J. ROBERTSON. 1994. Do female tree swallows guard their mates by copulating frequently? *Animal Behaviour* 47: 994-997.
14. WHITTINGHAM, L. A., **P. O. DUNN**, & R. J. ROBERTSON. 1993. Confidence of paternity and male parental care: an experimental study in tree swallows. *Animal Behaviour* 46: 139-147.
13. LIFJELD, J. T., **P. O. DUNN**, R. J. ROBERTSON, & P. T. BOAG. 1993. Extra-pair paternity in monogamous tree swallows. *Animal Behaviour* 45: 213-229.
12. **DUNN, P. O.**, & R. J. ROBERTSON. 1993. Extra-pair paternity in polygynous tree swallows. *Animal Behaviour* 45: 231-239.
11. VENIER, L. A., **P. O. DUNN**, J. T. LIFJELD, & R. J. ROBERTSON. 1993. Behavioural patterns of extra-pair copulation in tree swallows. *Animal Behaviour* 45: 412-415.
10. **DUNN, P. O.**, & R. J. ROBERTSON. 1992. Geographic variation in the importance of male parental care and mating systems in tree swallows. *Behavioral Ecology* 3: 291-299.
9. **DUNN, P. O.**, & S. J. HANNON. 1992. The effects of food abundance and male parental care on reproductive success and monogamy in tree swallows. *Auk* 109: 488-499.
8. **DUNN, P.O.** 1992. Do male birds adjust territory size to the risk of cuckoldry? *Animal Behaviour* 43: 857-859.
7. **DUNN, P. O.**, & S. J. HANNON. 1991. Intraspecific competition and the maintenance of monogamy in tree swallows. *Behavioral Ecology* 2: 258-266.
6. **DUNN, P. O.**, & S. J. HANNON. 1989. Evidence for obligate male parental care in

- black-billed magpies. *Auk* 106: 635-644.
5. DUNN, P. O., T. A. MAY, M. A. MCCOLLOUGH, & M. A. HOWE. 1988. Length of stay and fat content of migrant semipalmated sandpipers in eastern Maine. *Condor* 90: 824-835.
 4. DUNN, P. O., & C. E. BRAUN. 1986. Summer habitat use by adult female and juvenile sage grouse. *Journal of Wildlife Management* 50: 228-235.
 3. DUNN, P. O. & R. A. RYDER. 1986. Notes on the birds of Cold Spring Mountain, northwestern Colorado. *Great Basin Naturalist* 46: 651-655.
 2. DUNN, P. O., & C. E. BRAUN. 1986. Late summer-spring movements of juvenile sage grouse. *Wilson Bulletin* 98: 83-92.
 1. DUNN, P. O., & C. E. BRAUN. 1985. Natal dispersal and lek fidelity of sage grouse. *Auk* 102: 621-627.

External Grants, contracts and awards

PI: P.O. Dunn
Co-PIs: L.A. Whittingham, J. Bollmer (UWM); J. Johnson (Univ. North Texas)
Title: **Collaborative Research: Balancing selection and MHC variation in an endangered bird**
Agency: National Science Foundation, DEB-Evolutionary Genetics Program
Duration: 02/01/10-02/31/14
Amount: \$ 355,207 to UWM (\$621,117 total including UNT portion)

PI: R. Mulder (U. Melbourne)
Co-PI: P.O. Dunn
Title: **Conservation genetics of the endangered Malleefowl**
Agency: Australian Research Council
Duration: 07/01/07-07/31/10
Amount: Aus\$ 354,479

PI: P.O. Dunn
Co-PI: L.A. Whittingham
Title: **Collaborative Research: Sexual selection on male ornaments - RET supplement**
Agency: National Science Foundation
Duration: 07/01/07-07/31/08
Amount: \$ 8500

PI: P.O. Dunn
Co-PI: L.A. Whittingham
Title: **Collaborative Research: Sexual selection on male ornaments - REU supplement**
Agency: National Science Foundation
Duration: 08/01/05-07/31/06
Amount: \$ 8500

PI: P.O. Dunn
Co-PI: L.A. Whittingham, C. Freeman-Gallant (Skidmore College)
Title: **Collaborative Research: Sexual selection on male ornaments**
Agency: National Science Foundation
Duration: 08/01/04-07/31/08
Amount: \$ 102,773 to UWM

PI: P.O. Dunn
Co-PI: L.A. Whittingham
Title: **Sexual Dimorphism and UV signaling in birds - REU supplement**
Agency: National Science Foundation
Duration: 05/01/03-08/31/03
Amount: \$ 6,000

PI: P.O. Dunn
Co-PI: L.A. Whittingham
Title: **Sexual Dimorphism and UV signaling in birds**
Agency: National Science Foundation
Duration: 08/01/02-07/31/05
Amount: \$ 59,632

PIs: P.O. Dunn
Co-PI: J. Johnson
Title: **Dissertation Research: Phylogeography of the greater prairie chicken**
Agency: National Science Foundation
Duration: 7/01/02-6/30/03
Amount: \$ 9,458

PI: Reinartz, J.,
Co-PIs: P.O. Dunn, J. Karron, G. Meyer, L. Whittingham
Title: **Expansion of Laboratory Facilities at the University of Wisconsin – Milwaukee Field Station**
Agency: National Science Foundation, Field Station Program
Duration: 9/01/01-8/31/04
Amount: \$138,642

PIs: L.A. Whittingham
Co-PI: P.O. Dunn
Title: **PCB Contamination and Genetic Mutation Rates of Tree Swallows**
Agency: Hudson River Foundation
Duration: 6/98-5/01
Amount: \$53,163

Research in progress

1. Current research projects and status relative to publication

- i. **Sexual selection and extra-pair mating in birds.** Since 1997, I have been studying sexual selection and mate choice in both tree swallows and common yellowthroats (in collaboration with Dr. Linda Whittingham). Extra-pair mating has been an enigma in birds because females are socially monogamous, yet they mate with males on other territories, and these males only provide sperm – they do not help provide parental care. The problem is that the potential genetic benefits of sperm from another male are likely to be small, yet extra-pair mating is common in birds. We have been trying to determine what benefits females gain from this type of behavior and how it influences sexual selection.

Tree swallows.-- We study tree swallows because they have one of the highest levels of extra-pair mating in the world (>80% of females have extra-pair young), and, even more surprisingly, we have recently found that individual females often mate with several different extra-pair males. In most other species it appears that there is just one extra-pair mate per brood. We have published 17 papers on the mating behavior and ecology of tree swallows, and we have one paper in *Molecular Ecology* that summarizes our understanding of extra-pair mating in this species. We conclude that extra-pair mating is primarily conducted by older females (who are better able to evade male attempts to prevent extra-pair matings) when they are closely related to their social mate. The percentage of eggs that hatch is higher when females avoid mating with social mates that are closely related. Thus, we have some evidence of inbreeding avoidance that leads to greater reproductive success. Currently, we are conducting experiments on male coloration to determine if females choose extra-pair mates based on plumage coloration. We also have a number of other papers planned that will be based on our 12 years of study at the UWM Field Station.

Common yellowthroats.— We have been studying this warbler at the UWM Field Station since 1988 and in upstate NY in collaboration with Dr. Corey Freeman-Gallant (Skidmore College) since 2004. In the WI population, we found that males with larger black facial masks are more likely to gain a mate as well as gain an extra-pair mating with females on other territories. There is no evidence that females prefer males with more yellow on their throat and breast (bib). In NY, however, the pattern of mate choice and male mating success is reversed: more successful males have larger yellow bibs and the size of the mask is only weakly related to mating success. We have conducted a thorough series of studies on this species using aviary mate choice experiments and radio-tracking to show that extra-pair mating is due to female preferences for males with larger masks or bibs. My latest paper (in *Functional Ecology*) shows that even though these two ornaments (mask and bib) are produced by different types of pigments (melanins & carotenoids) they signal similar aspects of male quality (immunoglobulin G level). It has often been suggested that carotenoid-based ornaments are more likely to be signals of male quality than melanin-based ornaments, and, hence, to be the target of female choice, but this study reveals that any ornament can be the subject of sexual selection, as long as it is revealing of male quality. We have published 13 papers from this work so far, and several more are in preparation, including a recent paper on MHC variation in *Journal of Heredity*. **The research comparing populations in NY and WI was funded by a collaborative NSF grant for which I was the lead PI (IBN-0416536; \$102,000 to UWM; 08/01/04-07/31/08). We submitted another NSF grant in July 2012 to continue this work.**

ii. **Effects of population declines on MHC variation.** Habitat loss and fragmentation often lead to reduced genetic variation in populations and increased inbreeding. However, there is mixed evidence that this loss of variation leads to lower fitness in natural populations. These mixed results have led to a long-running debate about the relative importance of genetic variation to fitness in small populations and, in particular, to immunity and disease. One of the limitations of most previous studies is that the loss of genetic variation is only measured at neutral genetic markers (e.g., microsatellites), and it is often unknown whether there is also a decline in variation at genes related to fitness, such as the Major Histocompatibility Complex (MHC), which plays a key role in disease resistance. If strong selection on MHC genes maintains their diversity, then they may not show a decrease in variation following population declines, and this could help to explain why fitness is not always negatively impacted. Since 2000 my lab has been studying the effects of severe population declines on genetic variation in the greater prairie-chicken, which is one of the most threatened species of bird in North America (we have published five papers on prairie-chickens and one is submitted). In Wisconsin, there were over 30,000 prairie chickens around 1930, but the population suffered a severe decline in the 1950s (due to hunting and habitat loss) and now there are only about 1200 individuals in a small isolated area in the central part of the state around Stevens Point. Using samples from before and after the decline, we have found that the population of prairie-chickens in Wisconsin lost genetic variation at neutral DNA markers (microsatellites mtDNA); however, it is not known if these specific regions of DNA are related to an individual's fitness. Using MHC primers developed from domestic chickens, we are testing whether genetic variation at the MHC has also declined at the same rate as the neutral markers. The MHC genes are related directly to fitness because they encode molecules that are critical in the initiation of an immune response. Increased susceptibility to disease is thought to be one of the major problems arising from inbreeding and decreased genetic variation. This is a unique opportunity to examine fitness related genes from samples before and after the decline of a threatened species. I currently have a post-doc, Dr. Jenny Bollmer, and PhD student, John Eimes, studying MHC variation in prairie-chickens. Our first general paper on prairie-chicken MHC has just been published in *Genetica* (Eimes et al. 2009). **We have recently been awarded a three-year NSF grant (\$355,207, DEB-0948695, 02/01/10-01/31/13, Dunn PI, Whittingham and Bollmer Co-PIs) to continue research in this area in collaboration with my former PhD student, Dr. Jeff Johnson, now an Assistant Professor at the University of North Texas (\$265,910, Jeff Johnson, Co-PI).**

2. Future research projects

i. **Effects of population declines on MHC variation.** As mentioned above, we are currently studying the effects of long-term declines on MHC variation in prairie-chickens. We have recently been awarded (Nov 2009) an NSF grant to examine MHC and other disease-related genetic markers in populations of prairie-chickens throughout their range. Our approach is unique because we are using our existing samples from before and after declines in each population to detect the direct effect of demographic changes on genetic variation. Previous studies have only examined contemporary samples and made inferences about relative levels of variation by comparison with other populations (with potentially different demographic

histories) or different species. We are also involved in genetic monitoring of a translocation of prairie-chickens from Minnesota to Wisconsin. The objective of this project is to restore genetic variation in the Wisconsin population that was lost 50 years ago. Interestingly, we have found that malaria infection is more common in the Wisconsin (42%) than the Minnesota (21%) population, and it is associated with a gene (TAP2) involved in immune response. As a consequence of the on-going translocation, we can determine whether Minnesota birds with the most 'resistant' TAP2 genotype are less likely to become infected when moved to Wisconsin than birds with other genotypes. We will compare infection rates for the translocated Minnesota birds when initially translocated and, again, when recaptured 8-9 months after their release in WI (to replace their radio transmitters).

ii. Sexual selection and MHC variation. As mentioned above, we are currently studying sexual selection in the common yellowthroat. Linda Whittingham (Lead PI) and I were recently awarded an internal UWM grant (RGI; 7/1/09-9/01/10; \$ 39,824) to test the hypothesis that females choose mates based on MHC genotypes. The common yellowthroat is one of only a few avian species to date in which male ornament size is correlated positively with both body condition and immunoglobulin G level (Dunn et al. 2009), suggesting that male ornament size may be a signal of both better condition and immunity. Thus, a critical remaining question is whether the male's ornaments also signal genes for disease resistance to females, specifically the MHC. We are developing new MHC markers to determine if male ornaments signal MHC variation and whether extra-pair mating is related to indirect (genetic) benefits at the MHC, and, as mentioned above, we have one general paper about MHC class II variation submitted. This project is the focus of an NSF grant proposal to be submitted in July 2010.

SERVICE

University Service

A. Department of Biological Sciences Committees: Course and Curriculum Committee
(Chair 2011-2012), Space Committee (2010)

B. College of Letters and Sciences Committees:
Field Station Committee (2000- current)

C. University Service:
UWM Faculty Senator 2004-7

Professional Service

Editing of journals

I have been an Associate Editor for *Animal Behaviour* (Journal impact factor = 2.8) and *Evolution* (IF = 4.7). Both journals were recently voted among the top 100 most

influential journals in Biology and Medicine during the past century
(<http://units.sla.org/division/dbio/publications/resources/dbio100.html>)

Editor for *Animal Behaviour* (one of 17 editors worldwide), 2008-2011. Published jointly by the Assoc. for the Study of Animal Behaviour (UK) and the Animal Behavior Society (US). Handled 35-41 new manuscripts per year.

Associate Editor for *Evolution*, 2001-2003. Published by the Society for the Study of Evolution. Handled 17 -30 papers per year.

Community Service

Ornithological Consultant (1998-2009) and Data Analyst (2006-2009) for the *Bluebird Restoration Association of Wisconsin* (BRAW). Published two popular articles and four annual reports summarizing bluebird reproductive success for the newsletter, *Wisconsin Bluebird*.

Urban Ecology Center, Milwaukee.
Research Advisory Board member (2004-present).