



# **Ducks Unlimited Science Publications**

**2021**

- Ballard, B.M., C.L. Lange, **J.D. James**, B.C. Wilson, D.P. Collins, and J.A. Vonbank. 2021. Prioritizing conservation of coastal ponds for wintering redheads. [Journal of Wildlife Management 85:803–812](#).
- Bushaw, J.D., **C.V. Terry**, K.M. Ringelman, M.K. Johnson, **K.M. Kemink**, and F.C. Rohwer. 2021. Application of unmanned aerial vehicles and thermal imaging cameras to conduct duck brood surveys. [Wildlife Society Bulletin 45:274–281](#).
- Duran Vinent, O., **E.R. Herbert**, D.J. Coleman, J.D. Himmelstein, and M.L. Kirwan. 2021. Onset of runaway fragmentation of salt marshes. [One Earth 4:506–516](#).
- Farley, E.B.**, M.L. Schummer, D.J. Leopold, **J.M. Coluccy**, and D.C. Tozer. 2022. Influence of water level management on vegetation and bird use of restored wetlands in the Montezuma Wetlands Complex. [Wildlife Biology 2022: e01016](#). (early online in 2021)
- Fournier, A.M.V., **J.D. Lancaster**, A.P. Yetter, C.S. Hine, T. Beckerman, J. Figge, A. Gioe, M. Greider-Wagner, D. Jen, C. Johnson, M. R. Larreur, A. Shaw, K. Wolter, M. Wood, D.K. Wu, B.J. O’Neal, and H.M. Hagy. 2021. Nest success and nest site selection of wetland birds in a restored wetland system. [Avian Conservation and Ecology 16:6](#).
- Gilbert, A.D., C.N. Jacques, **J.D. Lancaster**, A.P. Yetter, and H.M. Hagy. 2021. Visibility bias of waterbirds during aerial surveys in the nonbreeding season. [Wildlife Society Bulletin 45:6–15](#).
- Herbert, E.R.**, L. Windham-Myers, and M.L. Kirwan. 2021. Sea-level rise enhances carbon accumulation in United States tidal wetlands. [One Earth 4:425–433](#).
- Hitchcock, Jr., A.N., R. Schultheis, J.N. Straub, **J.M. Coluccy**, M.W. Eichholz, and **T. Yerkes**. 2021. Variation in the diet of ducks during spring migration. [Journal of Wildlife Management 85:1601–1615](#).
- Kemink, K.M.**, V.M. Adams, and R.L. Pressey. 2021. Integrating dynamic processes into waterfowl conservation prioritization tools. [Diversity and Distributions 27:585–601](#).
- Kemink, K.M.**, V.M. Adams, R.L. Pressey, and **J.A. Walker**. 2021. A synthesis of knowledge about motives for participation in perpetual conservation easements. [Conservation Science and Practice 3:e323](#).
- Krainyk, A., J.E. Lyons, M.B. Rice, K.A. Fowler, G.J. Soulliere, **M.G. Brasher**, **D.D. Humburg**, and **J.M. Coluccy**. 2021. Multicriteria decisions and portfolio analysis: land acquisition for biological and social objectives. [Ecological Applications 31:e02420](#).
- Livolsi, M.C., C.K. Williams, **J.M. Coluccy**, and M.T. Dibona. 2021. The impact of sea level rise on dabbling duck energetic carrying capacity. [Journal of Wildlife Management 85:686–695](#).
- Loesch, C.T., **K.M. Kemink**, **R.L. Cressey-Smith**, **C.T. Gue**, **M.L. Sieges**, and M.L. Szymanski. 2021. Oil and gas development does not reduce duck pair abundance in the Prairie Pothole Region. [Ornithological Applications 123:1–14](#).
- MacFaden, S.W., **P.A. Raney**, and J. O’Neil-Dunne. 2021. LiDAR-aided hydrogeologic modeling and object-based wetland mapping approach for Pennsylvania. [Journal of Applied Remote Sensing 15:026503](#).
- Moon, J.A., S.E. Lehnen, K.L. Metzger, M.A. Squires, **M.G. Brasher**, B.C. Wilson, W.C. Conway, D.A. Haukos, B.E. Davis, F.C. Rohwer, E.M. Wehland, and B.M. Ballard. 2021. Projected impact of sea-level rise and urbanization on mottled duck (*Anas fulvigula*) habitat along the Gulf Coast of Louisiana and Texas through 2100. [Ecological Indicators 132:108276](#).

- Overton, C.T., A. Austen, E.P. James, R. Ahmadov, J.M. Eadie, F. McDuie, **M.J. Petrie**, C.A. Nicolai, M.L. Weaver, D.A. Skalos, S.M. Skalos, A.L. Mott, D.A. Mackell, A. Kennedy, E.L. Matchett, and M.L. Casazza. 2022. Megafires and thick smoke portend big problems for migratory birds. [Ecology 103:303552](#). (early online in 2021)
- Palumbo, M.D., J.N. Straub, M. Al-Saffar, G.J. Soulliere, J. Fleener, M. Bergeson, **J.M. Coluccy**, T. Finger, D.N. Fowler, **B. Glenzinski**, R. Griffin, S.E. Hygnstrom, G. Kidd, N. Miller, K. Van Horn, and K. Waterstradt. 2021. Multi-scale waterfowl habitat conservation planning in Wisconsin, USA. [Landscape Ecology 36:3207–3230](#).
- Rietl, A.J., J.P. Megonigal, **E.R. Herbert**, and M.L. Kirwan. 2021. Vegetation type and decomposition priming mediate brackish marsh carbon accumulation under interacting facets of global change. [Geophysical Research Letters 48:e2020GL092051](#).
- Schummer, M.L., K.M. Eason, T.J. Hodges, **E.B. Farley**, K.R. Sime, **J.M. Coluccy**, and D.C. Tozer. 2021. Response of aquatic macroinvertebrate density and diversity to wetland management and structure in the Montezuma Wetlands Complex, New York. [Journal of Great Lakes Research 47:875–883](#).
- Zinnert, J. C., J.B. Nippert, J.A. Rudgers, S.C. Pennings, G. González, M. Alber, S.G. Baer, J.M. Blair, A. Burd, S.L. Collins, C. Craft, D. Di Iorio, W.K. Dodds, P.M. Groffman, **E.R. Herbert**, C. Hladik, F. Li, M.E. Litvak, S. Newsome, J. O'Donnell, W.T. Pockman, J. Schalles, and D.R. Young. 2021. State changes: insights from the U.S. Long Term Ecological Research Network. [Ecosphere 12:e03433](#).



## PEER-REVIEWED ARTICLES FROM DUI-SUPPORTED RESEARCH

- Bonczek, E.S., and K.M. Ringelman. 2021. Breeding ecology of mottled ducks: a review. [Journal of Wildlife Management 85:825–837](#).



## TECHNICAL PLANS & REPORTS BY DUI STAFF

- Dugger, B., J. Eadie, **M. Petrie**, J. Fleskes, J. Vest, G. Yarris, S. Fogenburg, and R. Blenk. 2021. An integrated assessment of drought impacts on migratory waterbirds in key conservation regions of the western U.S. Final Report to U.S. Geological Survey National Climate Change Wildlife Science Center. 73pp.
- Lancaster, J.D.**, B.C. Wilson, and the Gulf Coast Joint Venture Waterfowl Working Group. 2021. Gulf Coast Joint Venture wintering waterfowl population and habitat objective model refinement 2021. Gulf Coast Joint Venture, Lafayette, Louisiana, USA. 75pp., + Appendices
- Petrie, M.** 2021. The effects of Biological Opinions for endangered fish species on waterfowl carrying capacity at the Lower Klamath and Tule Lake National Wildlife Refuges. Report to the U.S. Fish and Wildlife Service.



## POPULAR ARTICLES BY DUI STAFF

- Adair, S.**, and **B. Gascoigne**. 2021. 15 million acres and counting. DU Magazine. M/J.
- Brasher, M.** 2021. Drought, data, and duck seasons. DU Magazine. S/O.
- Brasher, M.**, J. Devries, **T. Moorman**, and **M. Petrie**. 2021. The pintail puzzle. DU Magazine. J/F.
- Humburg, D.**, **M. Petrie**, and G. Soulliere. 2021. The American duck hunter, then and now, part 2. DU Magazine. N/D.
- Osborn, J., A. Yetter, and **J. Lancaster**. 2021. Managing waterfowl sanctuary in Illinois. Outdoor Illinois. Nov.

Petrie, M., and V. Getz. 2021. The other drought. DU Magazine. S/O.

Petrie, M., D. Humburg, and G. Soulliere. 2021. The American duck hunter, then and now, part 1. DU Magazine. S/O.

Rush, K., and J.M. Coluccy. 2021. Super broods. DU Magazine. J/A.

Veon, J., and J.D. James. 2021. Survival of the fittest. DU Magazine. J/F.

Webb, L., and M. Brasher. 2021. Are waterfowl distributions changing? DU Magazine. N/D.



## PEER-REVIEWED ARTICLES BY DUC STAFF

Angoh, S.Y.J., J. Freeland, J.E. Paterson, P.A. Rupasinghe, and C.M. Davy. 2021. Effects of invasive wetland macrophytes on habitat selection and movement by freshwater turtles. [Biological Invasions 23:2271–2288](#).

Bansal, S., B.A. Tangen, R.A. Gleason, P. Badiou, and I.F. Creed. 2021. Land management strategies influence soil organic carbon stocks of prairie potholes of North America. Pages 273–285 in Z. Zhu, K.W. Krauss, C.L. Stagg, E.J. Ward, and V.L. Woltz, editors. [Wetland Carbon and Environmental Management, Geophysical Monograph Series, American Geophysical Union](#).

Buxton, R.T., J.R. Bennett, A.J. Reid, C. Shulman, S.J. Cooke, C.M. Francis, E.A. Nyboer, G. Pritchard, A.D. Binley, S. Avery-Gomm, N.C. Ban, K.F. Beazley, E. Bennett, L.K. Blight, L.E. Bortolotti, A.F. Camfield, F. Gadallah, A.L. Jacob, I. Naujokaitis-Lewis, C. Raudsepp-Hearne, D.G. Roche, F. Souldard, D. Strahlberg, K.D. Sadler, K.A. Solarik, C.D. Ziter, J. Brandt, C.W. McKindsey, D.A. Greenwood, P.C. Boxall, C.F. Ngolah, K.M.A. Chan, D. Lapen, S. Poser, J. Girard, C. DiBacco, S. Hayne, D. Orihel, D. Lewis, D. Littlechild, S.J. Marshall, L. McDermott, R. Whitlow, D. Browne, J. Sunday, and P.A. Smith. 2021. Key information needs to move from knowledge to action for biodiversity conservation in Canada. [Biological Conservation 256:108983](#).

Desjardins, E., L. Imbeau, M. Darveau, M.J. Mazerolle, and N.J. Fenton. 2021. Waterfowl use of mine tailing ponds in comparison with beaver ponds in boreal eastern Canada. [Avian Conservation and Ecology 16:24](#).

Drever, C.R., S.C. Cook-Patton, F. Akhter, P.H. Badiou, G.L. Chmura, S.J. Davidson, R.L. Desjardins, A. Dyk, J.E. Fargione, M. Fellows, B. Filewod, M. Hessing-Lewis, S. Jayasundara, W.S. Keeton, T. Kroeger, T.J. Lark, E. Le, S.M. Leavitt, M.-E. LeClerc, T.C. Lemprière, J. Metsaranta, B. McConkey, E. Neilson, G. Peterson St.-Laurent, D. Puric-Mladenovic, S. Rodrigue, R.Y. Soolanayakanahally, S.A. Spawn, M. Strack, C. Smyth, N. Thevathasan, M. Voicu, C.A. Williams, P.B. Woodbury, D.E. Worth, Z. Xu, S. Yeo, and W.A. Kurz. 2021. Natural climate solutions for Canada. [Science Advances 7:eabd6034](#).

Galpern, P., L.R. Best, J.H. Devries, and S.A. Johnson. 2021. Wild bee responses to cropland landscape complexity are temporally variable and taxon-specific: Evidence from a highly replicated pseudo-experiment. [Agriculture, Ecosystems and Environment 322:107652](#).

Giroux, J.-F., M. Patenaude-Monette, S.G. Gilliland, G.R. Milton, G.J. Parsons, M.L. Gloutney, K.R. Mehl, D.G. McAuley, E.T. Reed, and N.R. McLellan. 2021. Estimating population growth and recruitment rates across the range of American common eiders. [Journal of Wildlife Management 85:1646–1655](#).

Hammell, G.S., H.V. Singer, and L.M. Armstrong. 2021. Comparative reproductive parameters of sympatric lesser scaup (*Aythya affinis*) and ring-necked duck (*Aythya collaris*) in parkland Manitoba. [Canadian Field Naturalist 135:278–292](#).

Holgerson, M.A., R.A. Hovel, P.T. Kelly, L.E. Bortolotti, J.A. Brentrup, A.R. Bellamy, S.K. Oliver, and A.J. Reisinger. 2021. Integrating ecosystem metabolism and consumer allochthony reveals nonlinear drivers in lake organic matter processing. [Limnology & Oceanography](#). (early online)

- McGuire, H.E., D.W. Dunnington, A.L. Loder, I.S. Spooner, M.L. Mallory, **N.R. McLellan**, and C.-C. Su. 2021. Evaluating the multidecadal response of historic seawater incursion events and salinity-induced meromixis at Laytons Lake, Nova Scotia. [Lake and Reservoir Management 37:378–390](#).
- Noel, K., **N. McLellan**, S. Gilliland, K.A. Allard, B. Allen, S. Craik, A. Demagny, M.D. English, A. Diamond, J.-F. Giroux, A. Hanson, H.W. Heusmann, L.E. King, C. Lepage, H. Major, D. McAuley, D.E. Meattey, G.R. Milton, J. Osenkowski, A. Roberts, G.J. Robertson, M.-C. Roy, L. Savoy, K. Sullivan, and M.L. Mallory. 2021. Expert opinion on American common eiders in eastern North America: International information needs for future conservation. [Socio-Ecological Practice Research 3:153–166](#).
- Paterson, J.E.**, T. Pulfer, E. Horrigan, S. Sukumar, B.I. Vezina, R. Zimmerling, and C.M. Davy. 2021. Individual and synergistic effects of habitat loss and roads on reptile occupancy. [Global Ecology and Conservation 31:e01865](#).
- Stewart, S.I.D., A.D. Spares, J.L. Varela, **N.R. McLellan**, and M.J.W. Stokesbury. 2021. Running on empty? Freshwater feeding by spawning anadromous alewife *Alosa pseudoharengus*. [Journal of Fish Biology 99:1415–1429](#).
- Wasko, J.D., T.P. McGonigle, L.G. Goldsborough, **D.A. Wrubleski**, **P.H. Badiou**, and **L.M. Armstrong**. 2021. Use of shoot dimensions and microscopic analysis of leaves to distinguish *Typha latifolia*, *Typha angustifolia*, and their invasive hybrid *Typha xglauca*. [Wetlands Ecology and Management](#). (early online).
- Zhang, Z., **L.E. Bortolotti**, Z. Li, **L.M. Armstrong**, T.W. Bell, and Y. Li. 2021. Heterogeneous changes to wetlands in the Canadian prairies under future climate. [Water Resources Research 57:e2020WR028727](#).



## TECHNICAL PLANS & REPORTS BY DUC STAFF

- Canadian Intermountain Joint Venture. 2021. Canadian Intermountain Joint Venture implementation plan 2020–2030. Canadian Wildlife Service, Environment and Climate Change Canada, Delta, British Columbia, Canada.
- Ducks Unlimited Canada. 2021. Alberta wetland classification system field guide. Ducks Unlimited Canada, Edmonton, Alberta, Canada.
- Osnas, E.E., G.S. Boomer, **J.H. Devries**, and M.C. Runge. 2021. Decision-support framework for linking regional-scale management actions to continental-scale conservation of wide-ranging species. U.S. Geological Survey Open-File Report 2020–1084, Reston, Virginia, USA.
- Pacific Birds Habitat Joint Venture. 2021. Pacific Birds Habitat Joint Venture implementation plan 2020–2030. Canadian Wildlife Service, Environment and Climate Change Canada, Delta, British Columbia, Canada.
- Prairie Habitat Joint Venture. 2021. Prairie Habitat Joint Venture implementation plan 2021–2025: The Prairie Parklands. Report of the Prairie Habitat Joint Venture. Environment and Climate Change Canada, Edmonton, Alberta, Canada.
- Prairie Habitat Joint Venture. 2021. Prairie Habitat Joint Venture : The Western Boreal Forest implementation plan 2021–2025. Environment and Climate Change Canada, Edmonton, Alberta, Canada.



## POPULAR ARTICLES BY DUC STAFF

- Brasher, M., **J. Devries**, T. Moorman, and M. Petrie. 2021. The pintail puzzle. DU Magazine. J/F.



## PEER-REVIEWED ARTICLES BY DUMAC STAFF

Donnelly, J.P., S.L. King, N.L. Silverman, D.P. Collins, **E.M. Carrera-Gonzalez**, A. Lafon-Terrazas, and J.N. Moore. 2020. Climate and human water use diminish wetland networks supporting continental waterbird migration. [Global Change Biology](#) 26:2042–2059. \*\*



## PEER-REVIEWED ARTICLES FROM DU FELLOWSHIP SUPPORT

Cunningham, S.A., Q. Zhao, and M.D. Weegman. 2021. Increased rice flooding during winter explains the recent increase in the Pacific Flyway white-fronted goose *Anser albifrons frontalis* population in North America. [Ibis](#) 163:231–246.

**Dyson, M.E., S.M. Slattery**, and B.C. Fedy. 2021. There and back again: Female mallard (*Anas platyrhynchos*) breeding season movement across the Boreal Forest and Prairie Potholes. [Wilson Journal of Ornithology](#) 132:441–447.

**Messmer, D.J.**, R.T. Alisauskas, H. Pöysä, P. Runko, and R.G. Clark. 2021. Plasticity in timing of avian breeding in response to spring temperature differs between early and late nesting species. [Scientific Reports](#) 11:5410.

**Messmer, D.J.**, J.M. Warren, C.E. Deane, and R.G. Clark, R. 2021. Prefledging growth and recruitment of female lesser scaup. [Journal of Wildlife Management](#) 85:740–750.



## THESES & DISSERTATIONS FROM DU-SUPPORTED RESEARCH

Beach, C.R. 2021. Evaluation of selected physiological responses to sub-lethal *Cyathocotyle bushiensis* and *Sphaeridiotrema* spp. experimental infections in captive lesser scaup (*Aythya affinis*). Thesis, Western Illinois University, Macomb, USA.

Boone, L.K. 2021. Ecology of salt marshes in Maritime Canada: Geographical differences in species interactions and ecosystem restoration dynamics. Dissertation, University of New Brunswick, Fredericton, Canada.

Brown, J.I. 2021. Landscape population and evolution genomics of several closely related species of mallard-like ducks. Dissertation, University of Texas El Paso, El Paso, USA.

Demers, J.A.S.D. 2021. Aquatic ecosystem senescence of wetland impoundments in the Upper Bay of Fundy, Atlantic Canada. Thesis, Mount Allison University, Sackville, New Brunswick, Canada.

Harding, H. 2021. Nesting habitat use and availability for cavity-nesting ducks in the lower Wolastoq (Saint John) River floodplain, New Brunswick. Thesis, University of New Brunswick, Fredericton, Canada.

Harms, T.M. 2021. Methods for surveying and estimating breeding waterfowl populations in the Prairie Pothole Region of Iowa. Dissertation, Iowa State University, Ames, USA.

Kucia, S.R. 2021. Natal origins and breeding habitat associations of the eastern mallard population. Thesis, State University of New York, Syracuse, USA.

Mitchell, B.J. 2021. Duck brood use of wetlands in crop-dominated landscapes within the United States Prairie Pothole Region. Thesis, Iowa State University, Ames, USA.

- Muzak Ruff, L.S. 2021. An applied paleolimnological assessment of the impacts of hydroelectric reservoir development, watershed disturbance and anadromous fish (*Alosa pseudoharengus*) visitation on productivity in Gaspereau Lake, Nova Scotia, Canada. Thesis, Acadia University, Wolfville, Nova Scotia, Canada.
- Osorio Morillo, R.J. 2021. Assessment and optimization of marsh terracing for wetland restoration in the northern Gulf of Mexico using remote sensing and a wave model approach. Dissertation, Mississippi State University, USA.
- Terry, C.V. 2021. Brood abundance and invertebrate availability in crop-dominated landscapes in the Prairie Pothole Region. Thesis, Louisiana State University, Baton Rouge, USA.
- Veon, J. 2021. Body mass and body condition variation of mallards (*Anas platyrhynchos*) within and among winters within the lower Mississippi Alluvial Valley. Thesis, University of Arkansas, Fayetteville, USA.
- Wagner, M.R. 2020. Montezuma Wetlands Complex land protection strategy. Technical report, State University of New York College of Environmental Science and Forestry, Syracuse, USA. [Non-thesis Professional Science Masters Program] \*\*
- Zhang, Z. 2021. Modeling land surface heterogeneity in land surface and regional climate models. Dissertation, University of Saskatchewan, Saskatoon, Canada.