



2020
DUCKS UNLIMITED
SCIENCE PUBLICATIONS



PEER-REVIEWED ARTICLES BY DUI STAFF

- Blake-Bradshaw, A.G., **J.D. Lancaster**, J.R. O'Connell, J.W. Matthews, M.W. Eichholz, and H.M. Hagy. 2020. Suitability of wetlands for migrating and breeding waterbirds in Illinois. *Wetlands* 40:1993–2010.
- Bradshaw, T.M., A.G. Blake-Bradshaw, A.M.V. Fournier, **J.D. Lancaster**, J. O'Connell, C.N. Jacques, M.W. Eichholz, and H.M. Hagy. 2020. Marsh bird occupancy of wetlands managed for waterfowl in the Midwestern USA. *PLoS ONE* 15(2): e0228980.
- Coluccy, J.M., K.A. Anderson, T. Yerkes**, and J.L. Bowman. 2020. Migration routes and chronology of American black duck *Anas rubripes*. *Wildfowl* 70:148–166.
- Gilbert, A.D., C.N. Jacques, **J.D. Lancaster**, A.P. Yetter, and H.M. Hagy. 2020. Disturbance caused by aerial waterfowl surveys during the nonbreeding season. *Journal of Wildlife Management* 84:1063–1071.
- Gross, M.C., **J.D. Lancaster**, J.W. Simpson, B.T. Shirkey, S.E. McClain, C.N. Jacques, J.B. Davis, and H.M. Hagy. 2020. Energetic carrying capacity of submersed aquatic vegetation in semi-permanent wetlands important to waterfowl in the upper Midwest. *Wetlands* 40:491–501.
- Gross, M.C., S.E. McClain, **J.D. Lancaster**, C.N. Jacques, J.B. Davis, J.W. Simpson, A.P. Yetter, and H.M. Hagy. 2020. Variation in true metabolizable energy among aquatic vegetation and ducks. *Journal of Wildlife Management* 84:749–758.
- Herbert, E.R.**, J.P. Schubauer-Berigan, and C.B. Craft. 2020. Effects of 10 yr of nitrogen and phosphorus fertilization on carbon and nutrient cycling in a tidal freshwater marsh. *Limnology and Oceanography* doi:10.1002/lno.11411
- Klimas, S.T., J.M. Osborn, D.C. Osborne, **J.D. Lancaster**, C.N. Jacques, A.P. Yetter, and H.M. Hagy. 2020. Body condition of spring-migrating green-winged teal (*Anas crecca*). *Canadian Journal of Zoology* 98:96–104.
- Kneece, M.R., **J.D. Lancaster**, J.B. Davis, and D.E. Harrigal. 2020. Survival and recovery of mottled ducks in coastal South Carolina, 2008–2018. *Journal of The Southeastern Association of Fish and Wildlife Agencies* 7:189–194.
- Langston, A., O. Duran Vinent, **E.R. Herbert**, and M.L. Kirwan. 2020. Modeling long-term salt marsh response to sea level rise in the sediment-deficient Plum Island Estuary, MA. *Limnology and Oceanography* doi:10.1002/lno.11444
- Lindstrom, J.M.**, M.W. Eichholz, and A.C. Behney. 2020. Effect of habitat management on duck behavior and distribution during spring migration in Indiana. *Journal of Fish and Wildlife Management* 11:80–88.
- Marty, J.R., J.B. Davis, R.M. Kaminski, **M.G. Brasher**, and S.A. Rush. 2020. Gulf coast riceland seed biomass estimates for waterfowl habitat conservation. *Journal of Wildlife Management* 84:1315–1325
- Skaggs, C.G., K.M. Ringelman, C.R. Loesch, M.L. Szymanski, F.C. Rohwer, and **K.M. Kemink**. 2020. Proximity to oil wells in North Dakota does not impact nest success of ducks but lowers nest densities. *Condor* 122:1–15.
- Wells, J.V., N. Dawson, N. Culver, **F.A. Reid**, and S. Morgan Siegers. 2020. The state of conservation in North America's Boreal Forest: Issues and opportunities. *Frontiers in Forests and Global Change*, 30 July 2020. <https://doi.org/10.3389/ffgc.2020.00090>
- Williams, B.R., T.J. Benson, A.P. Yetter, **J.D. Lancaster**, and H.M. Hagy. 2020. Habitat use of spring migrating dabbling ducks in the Wabash River Valley, USA. *Condor* 122:1–11.



PEER-REVIEWED ARTICLES RESULTING FROM DUI-SUPPORTED RESEARCH

- Massey, E.R., L.G. Carlson, and D.C. Osborne. 2020. Temporal trends in body condition of arctic geese wintering in the Mississippi Alluvial Valley. *Journal of Fish and Wildlife Management* 11:11–21; e1944-687X. <https://doi.org/10.3996/jfw-047>
- Osario, R.J., A. Linhoss, and P. Dash. 2020. Evaluation of marsh terraces for wetland restoration: A remote sensing approach. *Water* 12, 336; doi:10.3390/w12020336



TECHNICAL PLANS AND REPORTS BY DUI STAFF

- Lowther, P.E., A.F. Poole, J.P. Gibbs, S.M. Melvin, and **F.A. Reid**. 2020. American Bittern (*Botaurus lentiginosus*). *Birds of the World* (A.F. Poole, Editor), Cornell Lab of Ornithology, Ithaca, New York, USA.
- Poole, A.F., P.E. Lowther, J.P. Gibbs, **F.A. Reid**, and S.M. Melvin. 2020. Least Bittern (*Ixobrychus exilis*). *Birds of the World* (A.F. Poole, Editor), Cornell Lab of Ornithology, Ithaca, New York, USA.



POPULAR ARTICLES BY DUI STAFF

- Adair, S.E.** 2020. The power of wetlands. *Wetlands America Magazine*.
- Brasher, M.,** J. B. Davis, and D. Osborne. 2020. Going home. *DU Magazine*. M/A.
- Brasher, M.,** and **E. Herbert.** 2020. Waterfowl and beyond. *DU Magazine*. J/A.
- Coluccy, J. M.** 2020. The stiff-tailed ducks. *DU Magazine*. S/O.
- James, J. D.** 2020. What's on the menu. *DU Magazine*. N/D.
- Kemink, K.** and **T. Gue.** 2020. Prairie potholes and breeding ducks. *DU Magazine*. J/A.
- Moorman, T.** 2020. Are waterfowl migrations changing? *DU Magazine*. M/A.
- Moorman, T.** 2020. More ducks for your dollars. *DU Magazine*. S/O.
- Moorman, T.** 2020. Vanishing wings. *Wetlands America Magazine*.
- Petrie, M.,** M. Casazza, C. Nicolai, and C. Feldheim. 2020. Snow storm. *DU Magazine*. J/F.
- Petrie, M.,** **A. Raquel,** and C. Colson. 2020. Riches to rags. *DU Magazine*. N/D.



PEER-REVIEWED ARTICLES BY DUC STAFF

- Adde, A., **M. Darveau,** N. Barker, and S. Cumming. 2020. Predicting spatiotemporal abundance of breeding waterfowl across Canada: A Bayesian hierarchical modelling approach. *Diversity and Distributions* 26:1248–1263.
- Amani, M., B. Brisco, S. Mahdavi, A. Ghorbanian, A. Moghimi, E. DeLancey, **M. Merchant,** R. Jahncke, L. Fedorchuk, A. Mui, M. Grenier, T. Fiset, M. Kakooei, S. Ahmadi, B. Leblon, and A. Behnamian. 2020. Evaluation of the first Canadian wetland inventory map using multiple sources: Challenges of wetland classification using remote sensing. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 14:32–52.
- Buderman, F.E., **J.H. Devries,** and D.N. Koons. 2020. Changes in climate and land use interact to create an ecological trap in a migratory species. *Journal of Animal Ecology* 89:1961–1977.
- Chasmer, L., D. Cobbaert, C. Mahoney, K. Millard, D. Peters, K. Devito, B. Brisco, C. Hopkinson, **M. Merchant,** J. Montgomery, K. Nelson, and O. Niemann. 2020. Remote sensing of boreal wetlands 1: Data use for policy and management. *Remote Sensing* 12:1320.
- Chasmer, L., C. Mahoney, K. Millard, K. Nelson, D. Peters, **M. Merchant,** C. Hopkinson, B. Brisco, O. Niemann, J. Montgomery, K. Devito, and D. Cobbaert. 2020. Remote sensing of boreal wetlands 2: Methods for evaluating boreal wetland ecosystem state and drivers of change. *Remote Sensing*, 12:1321.
- Davis, S.K., D.A. Kirk, **L.M. Armstrong,** **J.H. Devries,** and R.J. Fisher. 2020. Shifting from spring wheat to winter wheat: A potential conservation strategy for grassland songbirds in cultivated landscapes? *Biological Conservation* 245:108530.
- Galpern, P., J. Vickruck, **J.H. Devries,** and M.P. Gavin. 2020. Landscape complexity is associated with crop yields across a large temperate grassland region. *Agriculture, Ecosystem & Environment* 290:106724.
- Jeffrey, J.D., H. Carlson, **D. Wrubleski,** E. Enders, J. Treberg, and K.M. Jeffries. 2020. Applying a gene-suite approach to examine the physiological status of wild-caught walleye (*Sander vitreus*). *Conservation Physiology* 8:coaa099.
- Landsman, S.J., **N.R. McLellan,** J. Platts, and M.R. van den Heuvel. 2020. Fishway effectiveness and upstream residency of three species at four fishways in Prince Edward Island, Canada. *Northeastern Naturalist* 27:48–76.
- Mahoney, C., **M. Merchant,** **L. Boychuk,** C. Hopkinson, and M. Brisco. 2020. Automated SAR image thresholds for water mask production in Alberta's Boreal Region. *Remote Sensing* 12:2223.
- Mallory, M.L., R.A. Ronconi, R.B. Allen, C. Dwyer, S. Lair, C.D. Mallory, **N.R. McLellan,** G.R. Milton, G.J. Parsons, L. Savoy, and M.D. Tomlik. 2020. Annual movement patterns of American eiders *Somateria mollissima dresseri*. *Wildlife Biology* 2020:665.
- Mattsson, B.J., **J.H. Devries,** J.A. Dubovsky, D. Semmens, W.E. Thogmartin, J.J. Derbridge, and L. Lopez-Hoffman. 2020. Linking landscape-scale conservation to regional and continental outcomes for a migratory species. *Scientific Reports* 10:4968.
- Mattsson, B.J., **J.H. Devries,** J.A. Dubovsky, D. Semmens, W.E. Thogmartin, J.J. Derbridge, and L. Lopez-Hoffman. 2020. Sources and dynamics of international funding for waterfowl conservation in the Prairie Pothole Region of North America. *Wildlife Research* 47:279–295.

- Merchant, M.** 2020. Classifying open water features using optical satellite imagery and an object-oriented convolutional neural network. *Remote Sensing Letters* 11:1127–1136.
- Merchant, M., C. Haas, J. Schroder, R. Warren, and R. Edwards.** 2020. High latitude wetland mapping using multi-date and multi-sensor earth observation data: A case study in the Northwest Territories. *Journal of Applied Remote Sensing* 14:034511.
- Purvis, E.N., J.L. Vickruck, L.R. Best, **J.H. Devries**, and P. Galpern. 2020. Wild bee community recovery in restored grassland-wetland complexes of prairie North America. *Biological Conservation* 252:108829.
- Singer, H.V., S.M. Slattery, L. Armstrong, and S. Witherly.** 2020. Assessing breeding duck population trends relative to anthropogenic disturbances across the Boreal Plains of Canada, 1960–2007. *Avian Conservation and Ecology* 15:1.
- Stralberg, D., D. Arseneault, J.L. Baltzer, Q.E. Barber, E.M. Bayne, Y. Boulanger, C.D. Brown, H.A. Cooke, K. Devito, J. Edwards, C.A. Estevo, N. Flynn, L.E. Frelich, E.H. Hogg, M. Johnston, T. Logan, S.M. Matsuoka, P. Moore, T.L. Morelli, J.L. Morissette, E.A. Nelson, H. Nenzén, S.E. Nielsen, M.-A. Parisien, J.H. Pedlar, D.T. Price, F.K.A. Schmiegelow, **S.M. Slattery**, O. Sonnetag, D.K. Thompson, and E. Whitman. 2020. Climate-change refugia in boreal North America: What, where, and for how long? *Frontiers in Ecology and Environment* 18:261–270.
- Tozer, D.C., R.L.M. Stewart, **O. Steele**, and **M. Gloutney.** 2020. Species-habitat relationships and priority areas for marsh-breeding birds in Ontario. *Journal of Wildlife Management* 84:786–801.
- Vilella, F., J.A. Cruz-Burgos, R.M. Kaminski, **H.R. Murkin**, J.B. Davis, S.L. Weitzel, and F. Vizcarra. 2020. Avian community responses to management of vegetation and water levels in restored wetlands at the Humacao Nature Reserve, Puerto Rico. *Caribbean Naturalist* 72:1–21.
- Virgin, S.D.S., A.D. Beck, L.K. Boone, A.K. Dykstra, J. Ollerhead, M.A. Barbeau, and **N.R. McLellan.** 2020. A managed realignment in the upper Bay of Fundy: Community dynamics during salt marsh restoration over 8 years in a megatidal, ice-influenced environment. *Ecological Engineering* 149:105713.
- Westwood, A.R., N.K. Barker, S. Grant, A.L. Amos, A.F. Camfield, K.L. Cooper, F.V. Dénes, F. Jean-Gagnon, **L. McBlane**, F.K.A. Schmiegelow, J.I. Simpson, **S.M. Slattery**, D.J.H. Sleep, S. Sliwa, J.V. Wells, and D.M. Whitaker. 2020. Toward actionable, coproduced research on boreal birds focused on building respectful partnerships. *Avian Conservation and Ecology* 15:26.
- Zhao, Q., T.W. Arnold, **J.H. Devries**, **D.W. Howerter**, R.G. Clark, and M.D. Weegman. 2020. Using integrated population models to prioritize region-specific conservation strategies under global change. *Biological Conservation* 252:108832.



PEER-REVIEWED ARTICLES RESULTING FROM DUC-SUPPORTED RESEARCH

- Fowler, D.N., E.B. Webb, and M.P. Vrtiska. 2020. Condition bias of decoy-harvested light geese during the conservation order. *Journal of Wildlife Management* 84:33–44.
- Hatvany, M.G. 2020. Wetlands and reclamation. *International Encyclopedia of Human Geography* 14:273–279.
- Nielsen, S.E., J.M. Dennett, and C.W. Bater. 2020. Landscape patterns of rare vascular plants in the Lower Athabasca Region of Alberta, Canada. *Forests* 11:699.
- Scrafford, M.A., B.R. Nobert, and M.S. Boyce. 2020. Beaver (*Castor canadensis*) use of borrow pits in an industrial landscape in northwestern Alberta. *Journal of Environmental Management* 269:110800.
- Zhang, Z., Y. Li, M. Barlage, F. Chen, G. Miguez-Macho, A. Ireson, and Z. Li. 2020. Modeling groundwater responses to climate change in the Prairie Pothole Region. *Hydrology and Earth System Sciences* 24:655–672.



TECHNICAL PLANS AND REPORTS BY DUC STAFF

- Page, B., P. Aminian, and O. Steele.** 2020. Determining the nutrient retention capacity of newly restored wetlands in southwestern Ontario. Ducks Unlimited Canada, Barrie, Ontario, Canada.



POPULAR ARTICLES BY DUC STAFF

- Bortolotti, L.** 2020. Why I belong to DUC (and so do you). *Conservator*. Ducks Unlimited Canada, Stonewall, Manitoba, Canada.



POPULAR ARTICLES BY DUMAC STAFF

- Carrera, E.** 2020. News from the world of ducks for hunting season 2020–2021. DUMAC insert in DU Magazine. N/D.
- Cerón, J.** 2020. 25 years of mangrove restoration in the coastal zone of the Yucatan Peninsula. DUMAC insert in DU Magazine. S/O.
- Rangel, N., D. Sánchez, and G. De la Fuente.** 2020. Inventory and classification of wetlands in Mexico: An unprecedented management tool. DUMAC insert in DU Magazine. J/A.
- Soto, I., and E. Carrera.** 2020. DUMAC generates information for the management of migratory waterfowl in Mexico: National Waterfowl Monitoring. DUMAC insert in DU Magazine. M/A.



PEER-REVIEWED ARTICLES RESULTING FROM DU FELLOWSHIP SUPPORT

- Dyson, M.E., **S.M. Slattery**, and B.C. Fedy. 2020. Nest predators in the boreal forest. *Wildlife Society Bulletin* 44:631–639.
- Specht, H., V. St-Louis, C.L. Gratto-Trevor, N. Koper, C.G. Skaggs, T. Ronningen, and T.W. Arnold. 2020. Habitat selection and nest survival of two Great Plains shorebirds. *Avian Conservation and Ecology* 15:3.



THESES & DISSERTATIONS RESULTING FROM DU-SUPPORTED RESEARCH

- Dyson, M.E. 2020. Nesting ecology of ducks in the boreal forest. Dissertation, University of Waterloo, Waterloo, Ontario, Canada.
- Farley, E.** 2020. Influence of water level management on vegetation and bird use of restored wetlands in the Montezuma wetlands complex. Thesis, State University New York, Syracuse, USA.
- French, J.E. 2020. Optimization of marsh terracing as a wetland restoration technique: mitigation of cohesive sediment erosion by waves associated with frontal passage. Thesis, Mississippi State University, USA.
- Gallman, C.W.** 2020. Evaluation of fall-seeded cover crops for grassland nesting waterfowl in eastern South Dakota. Thesis, South Dakota State University, Brookings, South Dakota, USA.
- Glavonjic, M. 2020. Application of stable water isotopes to quantify the water balance of Delta Marsh. Thesis, University of Manitoba, Winnipeg, Manitoba, Canada.
- Hope, C.K. 2020. Historical loading and current sorption capacity of phosphorus in the sediments of Delta Marsh. Thesis, University of Manitoba, Winnipeg, Manitoba, Canada.
- Hunt, J. 2020. Marine nutrient transfer to three Atlantic Canadian lakes from the annual spawning migration of alewife (*Alosa pseudoharengus* Wilson, 1811). Thesis, Acadia University, Wolfville, Nova Scotia, Canada.
- Lawson, D.M. 2020. Nesting ecology and population genomics of American black ducks in North Carolina. Thesis, University of Delaware, Newark, USA.
- Linder, T. 2020. The role of the rice stewardship program in conservation practice adoption and waterfowl management in the southern United States. Thesis, University of Arkansas at Monticello, USA.
- Malachowski, C.P. 2020. Movement ecology and population dynamics of the endangered Hawaiian duck (*Anas wyvilliana*). Dissertation, Oregon State University, Corvallis, Oregon, USA.
- McLean, K. 2020. Effects of commercial forest harvesting on the distribution of the American black duck (*Anas rubripes*) during the breeding period in New Brunswick, Canada. Thesis, University of New Brunswick, Fredericton, New Brunswick, Canada.
- McPherson, J.W.** 2020. Estimating behavioral multipliers to American black duck and lesser scaup resting metabolic rate to better estimate daily energy expenditure and carrying capacity. Thesis, University of Delaware, Newark, USA.
- Muzak-Ruff, L. 2020. An applied paleolimnological assessment of the impacts of hydroelectrical 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.
- Navarre, K. 2020. Temporal demography of lesser scaup: A species in decline. Thesis, Colorado State University, Fort Collins, Colorado, USA.
- Riecke, T.V. 2020. Perturbations & heterogeneity: Estimating demographic rates of brant in western Alaska. Dissertation, University of Nevada-Reno, Reno, Nevada, USA.
- Smith, D.J. 2020. The effect of delayed spring drawdown on moist-soil seed production. Thesis, University of California-Davis, USA.