



# **Big or small? Which prairie wetlands support greater biodiversity?**

## **THE PRAIRIE POTHOLE REGION CASE STUDY**

The **Prairie Pothole Region** covers the northern extent of the largest expanse of grasslands in the world: the Great Plains of North America. This wetland-rich landscape provides the primary breeding range for approximately half of North America's breeding ducks as well as many wetland-dependent birds and other wildlife species. The remaining wetlands in this region are considered to be some of the most important and threatened waterfowl habitats on the continent.

More than 40 per cent of wetlands in the Prairie Pothole Region have been drained. Why? Minerals deposited by glaciers blended with decomposing vegetation to form fertile soils. As European settlers discovered more than 125 years ago, these rich soils made the region ideal for farming. Agriculture is an important way of life on the Prairies — and the pressure to drain wetlands to make room for production and development remains. As a result, more than 10,000 hectares of pothole wetlands continue to be lost each year in the Canadian prairies.

Ducks Unlimited Canada (DUC) and its partners are working together across North America to conserve these vital wetland ecosystems. DUC researchers at the [\*\*Institute for Wetland and Waterfowl Research \(IWWR\)\*\*](#) use science to identify the best ways to invest our resources to achieve maximum conservation benefits, while respecting the growing needs of agriculture.

DUC has strong partnerships with the agricultural community. We are proud to work alongside farmers and ranchers not only to benefit the crops and animals under their care, but to safeguard natural areas and the many benefits they provide all Canadians.



## TEACHER NOTES

In this case study, students are given a problem statement with two options to choose from. In Part 1, they are prompted with questions that guide them toward finding a solution. In Part 2 (once they've found an answer to Part 1), they are given new information that requires them to revisit their initial conclusion. In Part 3, students prepare a final recommendation and submit it on the Wetland Centres of Excellence hub. Once submitted, they gain access to the case study explanation video.

### Method

This case study is best completed in multiple small groups, each group assuming the same role and submitting one recommendation per group. The recommendation can be delivered as an oral presentation or written submission. **At the end of the case study, students will have learned about:**

- ⊕ The geographical area of the Prairie Pothole Region in Canada
- ⊕ The importance of biodiversity and conserving the wetlands that support biodiversity
- ⊕ Wetland ecosystems
- ⊕ Wetland values and benefits to humans and wildlife
- ⊕ Best practices to conserve biodiversity
- ⊕ Human impacts on biodiversity
- ⊕ Ducks Unlimited Canada's conservation work
- ⊕ Careers in science and conservation
- ⊕ How to research, interpret, summarize and communicate scientific knowledge

### Material

- ⊕ Access to the Internet
- ⊕ Access to a library

### Related Links

These links vary from plain-language articles to peer-reviewed articles. These are suggested readings to assist students' research. **Because these articles vary in complexity, make sure to direct your students to the most appropriate articles for their level.**

### Website Articles

- ⊕ Ducks Unlimited Canada: Prairie Pothole Region  
<https://www.ducks.ca/places/prairie-pothole-region/>
- ⊕ Ducks Unlimited Canada: Seasonal ponds support wildlife  
<https://www.ducks.ca/stories/waterfowl/seasonal-ponds-support-wildlife/>
- ⊕ Environment Canada and Climate Change: Region 11: Prairie Potholes  
<http://www.ec.gc.ca/mbc-com/default.asp?lang=En&n=47D1FA51-16pedisable=true>



- ⊕ Texas A&M AgriLife Extension: Prairie Pothole and Marsh Wetlands  
<https://texaswetlands.org/wetland-types/prairie-pothole-and-marsh-wetlands/>
- ⊕ The National Wildlife Federation  
<https://www.nwf.org/Home/Educational-Resources/Wildlife-Guide/Wild-Places/Prairie-Potholes>
- ⊕ The Wisconsin Wetland Association  
<https://wisconsinwetlands.org/updates/small-wetlands-make-big-impact/>

### Peer-reviewed articles: Information for Part 1 of case study

Peer-reviewed articles are written by experts in the field and reviewed by professionals to ensure their quality. For your student, we recommend only reading the Abstract section, which is a summary of the whole article. Additionally, reading the introduction section can give important contextual information. Refrain from asking them to read the whole article, it is a daunting task even for university students and graduates.

- ⊕ Doherty, K.E., D.W. Howerter, J.H. Devries, and J. Walker. 2018. Prairie Pothole Region of North America. Pages 679-688 in C.M. Finlayson, G.R. Milton, R.C. Prentice, and N.C. Davidson, editors. The wetland book, volume II: Distribution, description, and conservation, Springer, New York, New York, USA.  
[https://link.springer.com/referenceworkentry/10.1007/978-94-007-4001-3\\_15](https://link.springer.com/referenceworkentry/10.1007/978-94-007-4001-3_15)
- ⊕ Bartzen, B., K.W. Dufour, M.T. Bidwell, M.D. Watmough, and R.G. Clark. 2017. Relationships between abundances of breeding ducks and attributes of Canadian prairie wetlands. Wildlife Society Bulletin 41:416-423.  
<https://wildlife.onlinelibrary.wiley.com/doi/abs/10.1002/wsb.794>

### Peer-reviewed articles: Information for Part 2 of case study

- ⊕ Niemuth, N.D., K.K. Fleming, and R.E. Reynolds. 2014. Waterfowl conservation in the US Prairie Pothole Region: Confronting the complexities of climate change. PLoS ONE 9:e100034.  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0100034>
- ⊕ Adamus, P. 2013. Wetland functions: Not only about size. National Wetlands Newsletter, September-October: 18-19, 25.  
[http://people.oregonstate.edu/~adamusp/MiscPublications/Adamus2013\\_SLOSS.pdf](http://people.oregonstate.edu/~adamusp/MiscPublications/Adamus2013_SLOSS.pdf)

**Did you enjoy this case study?** Try it again but with a twist. Include other peoples' perspective in the decision-making process. How can you reach a solution that works for farmers, citizens, scientists and business owners?

