



Status and Trends of Prairie Wetlands in the United States 1997 to 2009 Questions and Answers

What is this report?

The U.S. Fish and Wildlife Service (Service) analyzed the status and recent trends of wetland acreage in the Prairie Pothole Region (PPR) of the United States including portions of Montana, North Dakota, South Dakota, Minnesota and Iowa. Wetland trends were measured by the examination of high resolution imagery for 755 randomly selected sample plots.

Monitoring of wetland resources has been widely considered essential for identifying changes in wetlands community types, spatial extent and guiding additional research or management actions. This information, combined with historical perspectives, increase our understanding of landscape patterns and processes.

The results of this study state that wetland area in the PPR declined by an estimated 74,340 acres or 1.1 percent between 1997 and 2009.

The information presented provides data on the areal extent of wetlands, but does not assess wetland condition or other qualitative changes to PPR wetlands.

What is the Prairie Pothole Region?

The glaciated Prairie Region is an area of about 300,000 square miles located in the central portion of the North American Continent. In the United States, this region encompasses an area of about 150,930 mi² and extends from central Iowa north to the Canadian border and includes portions of the states of Iowa, Minnesota, North Dakota, South Dakota and Montana. The region is characterized by landscape depressions or basins resulting from the glaciers receding from this part of the continent. These small landscape depressions are termed "potholes", and they collect rainfall and snowmelt forming small shallow wetlands and ponds.

Why are wetlands of the Prairie Pothole Region important?

The PPR is a grassland ecoregion of regional and global importance for migratory birds and other animals. PPR wetlands include an array of temporary, seasonal and semi-permanently flooded marshes, sloughs, and swales as well as larger more permanent water bodies and relatively few wetland shrubs and wooded wetlands. At least fifteen duck species nest in the prairie region making it an extremely important region for waterfowl production. Wetlands are the cornerstone that support these species as well as other populations of North American water birds including Franklins Gull, Western Grebe, American Bittern, Black Tern, American White Pelican and Sandhill Cranes. Shorebirds such as long-billed Dowitchers, Stilt Sandpipers and Wilson Phalaropes utilize prairie wetlands as staging or stopover sites.

Despite their importance, comprehensive, scientifically sound data on the status of these wetland resources has not been summarized for this region as a whole. Continuing losses of PPR wetlands have direct costs for people and longer-term resource implications for fish, wildlife and other natural resources.

What are the findings of this report?

There were an estimated 6,427,350 acres of wetlands remaining in the PPR in 2009. This represented 5.8 percent of the total wetland area found in the conterminous U.S. in 2009. Between 1997 and 2009, the average annual rate of change was an estimated loss of 6,200 acres.

Wetlands and water bodies were distributed in 2,624,990 distinct basins throughout the PPR. There was considerable variation in the density of wetlands across the landscape of the PPR. The mean number of wetland/water basins found was 17.4 basins/mi². The mean size of these basins was 3.2 acres. Temporarily flooded emergent wetlands were the most numerous type composing almost half of all emergent wetland basins in the PPR. An estimated 41.7 percent of emergent basins were seasonally flooded, six percent were semi-permanently flooded and farmed wetlands made-up an estimated 2.4 percent of all emergent wetland basins in 2009. There were very few (0.2 percent) saturated emergent wetland basins in the PPR.

An estimated 94 percent of wetland was within or adjacent to agricultural lands or grassland. There were an estimated 21.1 million acres of grassland in the PPR in 2009. This represented a 3:1 ratio of grassland to wetland region-wide.

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What are the findings of this report? —continued

The number of wetland and open water basins (including lake basins) in the PPR declined between 1997 and 2009 by 107,177 or four percent. This was an average annual loss of 8,931 basins. Ninety six percent of the basins lost were temporarily flooded emergent wetlands as temporary basin numbers declined by 7.8 percent. Overall, wetland basins declined in every state in the PPR with the exception of Montana that experienced a gain in wetland basins of <1.0 percent. While North Dakota lost the largest number of wetland basins (51,780), Minnesota sustained the largest percentage loss of remaining wetland basins declining by over 18 percent. Iowa lost 14 percent of the remaining basin numbers and both North and South Dakota each lost 3 percent.

The largest percentage of the changes in area to emergent wetland were attributed to an increase in deepwater habitat. An estimated 40 percent (40,550 acres) of emergent wetland area was lost or converted to deepwater lake systems or open-water ponds. An additional 39,050 acres were lost to upland land-uses (agriculture and development) with 37,720 acres of that total being lost to agriculture. All of the net wetland losses to agriculture were farmed wetland or temporarily flooded wetlands.

What are Geospatially Isolated wetlands and why is this term important?

Recognizing the potential for degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act (The 1977 amendments, the Clean Water Act of 1977 [P.L. 95-217]. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands. Under this legislation, jurisdictional waters and wetlands included traditional navigable waters of the U.S. and permanent non-navigable tributaries and the wetlands adjacent to these waters or their tributaries. Wetlands were regulated under this premise until 2001 when a U.S. Supreme Court decision (Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers) ("SWANCC") produced statutory and constitutional challenges to the assertion of CWA jurisdiction over isolated, non-navigable, intrastate waters used as habitat by migratory birds. In 2006, the Supreme Court again issued rulings (Rapanos v. United States and Carabell v. United States) that addressed the jurisdiction of waters of the U.S. under the CWA.

Federal legislation to reduce wetland destruction under the CWA has been subject to various interpretations as to its ability to include or exclude prairie pothole wetlands and the concept of what wetlands are considered "isolated" may be subject to both scientific and legal determination. Since the U.S. Supreme Court decision established a distinction between isolated wetlands and wetlands with connections to waterways for federal regulatory purposes, the importance of determining if wetlands are isolated has taken on added significance. Some studies have used the term "geographically isolated wetland" to describe wetlands not subject to federal regulation. This term ties the concept of isolation to geography – the science of dealing with topographic features (such as elements of climate, elevation, soil, vegetation, population, land use, etc.). In practice, studies attempting to determine the extent of isolated wetlands at the landscape, regional or national scale do not examine geography to determine isolation but rely on spatial distance to determine if a wetland is isolated from other surface waters. This is an important distinction and is more accurately described as geospatial isolation.

This study determined the number of wetlands that are "geospatially isolated" in the PPR of the U.S. by using a set spatial distance (not pertaining to geography) between wetland basins and other surface water features. By using this method, an estimated 88 percent of prairie pothole wetland basins were considered geospatially isolated.

What is the overall conclusion of the report?

Despite efforts to conserve and restore wetlands in the PPR these resources continue to decline in number, diversity and extent. This puts the future of wetlands and prairie ecosystems in-general in flux depending upon climatic shifts in temperature and precipitation with the compounding influences of anthropogenic alterations to local and regional land use and hydrology.

Long-term trends continue to change the complexion of prairie wetlands from one of diverse wetland sizes and types to fewer wetland basins characterized by longer periods of high water. Prolonged high water conditions are causing some small wetland basins that flooded and dried on an intermittent basis move toward becoming larger, more permanent wetland/water basins.

Climate change along with other stressors undoubtedly contribute to the overall landscape-level changes that influence wetland distribution and characteristics in the PPR. However, there are often multiple drivers of change and linking wetland changes to a definitive cause such as climate may not be straightforward.

There has always been a close correlation between declines in waterfowl population numbers and the decline in the number of wetland area in the PPR. In the U.S. the amount and quality of waterfowl habitat decreased substantially up until the early 1980s as wetland drainage, regionally dry conditions and the loss of grassland adversely affected the amount and quality of habitat. The continued loss and degradation of waterfowl habitat is one of the most serious threats facing waterfowl populations today. The loss of grassland in the PPR is particularly disturbing because this has been shown to seriously reduce bird populations and influence sedimentation rates and impair water quality in remaining wetlands and surface waters. Grassland conversion to other land-uses will further reduce bird diversity across this region and have other environmental effects.

How was this report created?

A: The Service has a statutory responsibility to measure and report on the status and trends of the Nation's wetlands in the conterminous United States. Through periodic scientific studies and reports on wetlands status and trends, the Service has documented the Nation's progress over decades in reducing high rates of wetlands losses. Wetland status and trends information for the PPR is of particular interest to the Service because of its importance to migratory waterfowl and water birds.

The Service undertook an effort to intensify and enhance the nationwide wetlands status and trends study and further analyze the data specifically for the PPR in the U.S. This report provides enhanced information on PPR wetlands by including wetland and water basin type descriptors, hydrologic descriptors and the addition of an upland grassland category to track changes in grassland area.

To estimate wetland extent and change, this study used randomly selected 4-square-mile (2,560 acre) sample plots and digital high-resolution imagery in combination with field verifications to identify change in wetlands, deepwater habitats and uplands. A total of 755 plots were used to sample the PPR and field verification was completed for 205 (27 percent) of the sample plots. Wetlands and deepwater habitats were described using the Service's biological definition of wetland and followed the procedural, quality control and analysis protocols as have been developed for the National Wetlands Status and Trends reporting conducted by the Service.

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Download the report

<http://www.fws.gov/wetlands/Documents/Status-and-Trends-of-Prairie-Wetlands-in-the-United-States-1997-to-2009.pdf>

