

IOWA'S WATER

Ambient Monitoring Program

Iowa Wetland Monitoring An Update on this New Program's Progress

In 2005, the Iowa Department of Natural Resources' (IDNR) Watershed Monitoring and Assessment Section began its wetland monitoring program in north-central Iowa, through grant funds provided by the U.S. Environmental Protection Agency. Wetlands provide many benefits for both water quality and wildlife, therefore, a statewide monitoring program is being developed to assess these valuable areas. Results from this monitoring will enable the IDNR to determine the ecological condition of wetlands while documenting the leading contaminants and stressors found in these systems. This information will help make informed decisions affecting the future of Iowa's wetlands. Currently, there are three projects in the wetland monitoring program: 1) monitoring of depressional permanent and semi-permanent wetlands in north-central Iowa, 2) development of a rapid assessment method for fen wetlands, and 3) monitoring of shallow lakes in northwest Iowa.



Iowa DNR's wetland monitoring staff perform an assessment in a north-central Iowa prairie pothole.

Depressional wetland monitoring in north-central Iowa

Beginning in 2005, 60 wetland sites (Figure 1) were sampled for chemical contaminants of which 22 were also surveyed for biological communities (fish, plants, and invertebrates). In 2006, monitoring was expanded to include 40 wetland sites in the subregion known as the Altamont Advance, an area in north-central Iowa covered by glacial ice approximately 13,500 years ago. Of the 40 new sites, 16 were also surveyed for fish and plants. To evaluate change over time, 32 of the sites from 2005 were resampled in 2006, and



Bullfrog at Ottosen Potholes, Humboldt County.

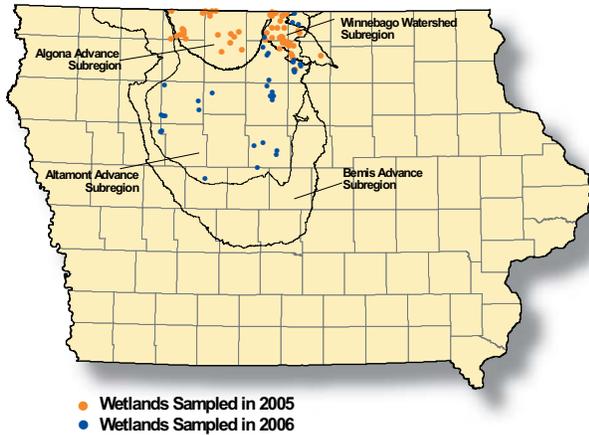


Figure 1. Wetland monitoring sites from 2005 and 2006 sampling.

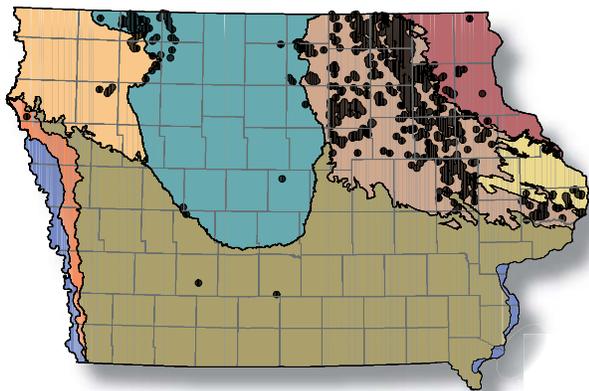


Figure 2. Locations of all known extant fens in Iowa in relation to Iowa's major landform regions (outlined).

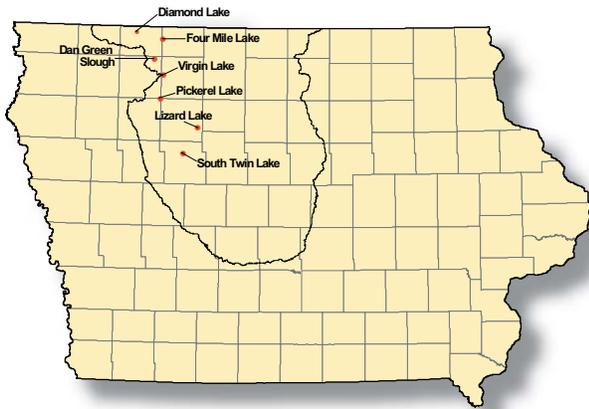


Figure 3. Shallow lakes monitoring sites from 2006.

15 sites were also surveyed for fish and plants. New contaminant sampling methods were also evaluated at 10 of these sites. For more information on monitoring methods, see our fact sheet "Iowa's Wetland Monitoring Program-2005" (Water Fact Sheet 2006-1).

Comparison of Results from 2005 and 2006

During 2005 and 2006 at each wetland site, both water and sediment samples were collected for analyses of chemical contaminants. Samples were analyzed for many parameters, including herbicides, insecticides, PCBs, heavy metals, nitrogen, phosphorous, and solids. This represents the most extensive sampling to date of contaminants in Iowa wetlands. During 2006, nutrient concentrations in wetlands were quite variable, as nitrogen (represented as nitrate + nitrite) levels ranged from 0.05 to 9 mg/L (mean = 3.55 mg/L). In 2006, total phosphorous levels varied from 0.05 to 3.1 mg/L (mean = 0.38 mg/L) and orthophosphorous levels ranged from 0.02 to 0.94 mg/L (mean = 0.11 mg/L).

In 2005, one or more pesticides were detected in water from 58 of 60 wetlands. Alachlor, acetochlor, atrazine, metolachlor, and their metabolites were among the most frequently detected contaminants. Results from water samples in 2006 illustrate that zinc was detected at 5 sites, lead at 1, selenium at 4, copper at 1, and arsenic at 9. It is important to note that arsenic was detected only in very small amounts and is likely from natural sources. For 2006, all wetlands contained at least one pesticide or pesticide metabolite.

Initial classification of wetlands based on biological health showed that wetlands categorized as "good" generally had plant communities with higher diversity; "poor" sites were dominated by



Vegetation monitoring protocols are being developed for Iowa's pothole wetlands and shallow lake systems.

one to three plant species, often reed canary grass or hybrid cattail. Fish and invertebrate data are still being analyzed for correlations with plant and contaminant data.

Development of a rapid assessment method for fen wetlands

During 2006, work began to develop a standardized method to rapidly evaluate the ecological quality of fen wetlands. Once complete, this method will allow resource managers to quickly assess the quality of fens with a statewide standardized protocol. Fens often support a variety of rare plant species and form when unique geological conditions make it possible for groundwater to discharge from the ground. In Iowa, most fens are located on private land and are usually quite small (1 – 3 acres). Little is known about the number of fens remaining or their condition in Iowa. To develop this method, IDNR staff created a statewide fen database which provides current information on fens such as known locations, size, surrounding landuse, and ownership (Figure 2). From this database, 30 sites were selected to develop the rapid assessment method. In order to help calibrate this rapid method, an in-depth plant inventory was also conducted at these sites by a botanist with fen expertise. For more information about fen wetlands and this project, see the fact sheet titled "Fens of Iowa" (Water Fact Sheet 2007-1).

Monitoring of shallow lakes in northwest Iowa

In 2006, wetland monitoring staff collaborated with the IDNR's wildlife and fisheries bureaus and Ducks Unlimited to collect baseline monitoring information from seven shallow lakes in northwest Iowa. These lakes are scheduled to be renovated over the next two years to improve their ecological quality for wildlife, fisheries, and recreational uses (Figure 3). Wetland monitoring staff sampled these lakes bi-monthly from May through September collecting chemical, physical and biological data in order to document their ecological condition prior to renovation.



Wetlands are critical habitat for migrating game and non-game birds. White-faced Ibis and Redheads (left) at Dewey's Pasture near Trumbull Lake, Clay Co. Trumpeter swans (above) are mounting a comeback. All of these birds depend on wetlands to survive.

What's Next?

For the summer 2007, wetland monitoring staff will continue to monitor wetlands in north-central Iowa. New sites will be sampled and sites from 2005 and 2006 will be re-sampled. Also, time will be devoted to continued methods evaluation and identification of the highest quality wetlands in Iowa. These high quality wetlands serve as a benchmark to compare to other, more degraded wetlands. In the future, we plan to expand such monitoring to areas across the state and to different types of wetlands. Other future plans include continued work with the fen rapid assessment method and assessment of recently restored wetlands.

For other wetland monitoring and water monitoring related fact sheets visit the IDNR's website <http://wqm.igsb.uiowa.edu> (click on Fact Sheets).

Acknowledgements

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Photos on page 1 by Vince Evelsizer (top) and Alissa Bosscher (bottom), page 3 by Vince Evelsizer, and page 4 photos by Matt Fisher (left) and Dave Hoffman (right).

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