Wetland Restoration in Iowa

Challenges and Opportunities

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By William Crumpton, Arnold van der Valk, Will Hoyer and David Osterberg

Iowa was historically rich in wetlands, and in many areas, farming was made possible only as a result of extensive wetland drainage. In both of these respects, Iowa is quite typical of the most productive areas in the Midwestern Corn Belt. Wetland drainage made farming possible in much of Iowa, Illinois, Indiana and northwestern Ohio. In these states, 85 to 90 percent of native wetlands have been drained and the land is now mostly planted to corn and soybeans. We have come to recognize the important functions that wetlands had served in this landscape, and there is considerable interest in recovering these lost functions. Since the mid-1980s, a variety of state and federal programs have been used to promote wetland restoration in the region, and over the next few years, many thousands of wetland acres will be restored.

This report looks at the history of wetlands in Iowa, their importance to the state, and current regulatory programs. It also looks at several case studies of wetland restorations of various kinds and evaluates their success. It concludes with a set of policy recommendations.

Drainage, land use and water quality

At the time of statehood in 1846, Iowa was a land rich in wetlands. The majority of its wetlands were found on the Des Moines Lobe with other significant wetlands associated with the floodplains of major rivers. As the state was settled, wetlands were serious impediments to development. They made travel physically difficult and, because of the flies and mosquitoes, extremely unpleasant and unhealthy. Wetlands were feared by early settlers because they were associated with diseases, including malaria. Drainage of wetlands began in the 1870s and 1880s and the number of reported deaths due to malaria was significantly reduced by the 1890s. Artificial drainage quickly turned wetlands into some of the country’s most productive farm fields and allowed mechanized farming to take hold.

Land owners who initially acquired some of this swampland tried to drain it using ditches but this proved impractical in many cases because there was often no place to outlet these ditches that did not result in the flooding of neighbors’ land. In 1872, Iowa passed a law setting up public drainage enterprises, or drainage districts. These drainage districts, which had the right of eminent domain and to levy taxes, both provided the legal authority and funding mechanism to implement large-scale drainage systems draining entire catchments. By the 1890s, production of corn tripled on drained land, and this largely paid for costs of draining the land. Today, these drainage districts, which continue to make it possible to farm much of the Des Moines Lobe, number over 3,000, and all public policies dealing with wetlands in Iowa have to take them into account.

By the mid-1970s, tile drainage had reduced the total area of wetlands on the Des Moines Lobe by nearly 99 percent, from about 3.5 million acres to about 30,000 acres. At this time, many people began to recognize the important roles that wetlands played in this landscape and a variety of restoration programs were developed starting in the 1980s in an effort to recover lost wetland functions such as
wildlife habitat, flood storage, nutrient removal, and recreation. By the early 1990s, thousands of wetlands had been restored in Iowa and adjacent states and restoration efforts continue today.\(^5\) Contemporary estimates of the area of wetlands on the Des Moines Lobe, where most wetland restorations in Iowa have occurred, range from 94,000 to 143,000 acres.\(^6\) However, despite an increase in the area of wetlands in the last 40 years, the Des Moines Lobe today has only 3 to 4 percent of the wetlands that it had prior to European settlement and remaining wetlands, as well as grasslands, are again threatened as farmers seek to maximize the number of acres planted in row crops.\(^7\)

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While a huge amount of Iowa has become productive cropland as a result of draining wetlands, there have been significant consequences as well. One of these is the decline in waterfowl populations and waterfowl hunting opportunities. Wetlands in northwest Iowa supported a commercial waterfowl hunting industry until commercial hunting of game species was made illegal.\(^8\) It was the loss of wildlife, especially waterfowl, that supplied the first impetus for wetland restorations in Iowa by agencies such as the U.S. Fish and Wildlife Service and the Iowa Department of Natural Resources, and private groups such as Ducks Unlimited.\(^5\)

Another major impact of wetland drainage was a decline in lake and river water quality due to non-point source runoff. The impacts of drainage on water quality were not primarily the result of drainage per se but rather in combination with the land use changes that drainage enabled. While most drainage was completed in Iowa during the early 1900s, the most dramatic increases in nitrate loads to surface waters were not associated with the initial installation of drainage systems. Rather, those increases came with the major shifts in cropping systems and dramatic increases in fertilizer applications that occurred during the 1960s and 1970s. On an annual basis, non-point source contributions, especially those from agriculture, dominate nutrient loads to surface waters in Iowa and point sources contribute a relatively small fraction of total annual nutrient loads in Iowa’s rivers.\(^9\) However, point source loads can dominate the nutrient load of major rivers during critical low flow periods in summer and fall. In the case of Des Moines and Ames, nutrient loads associated with municipal wastewater can contribute more than half of the total load in the river during low flow periods lasting three to six months in most years.\(^10\)

### Wetland restoration and mitigation

For wetland protection, restoration and mitigation, it is important to recognize three categories of wetlands in Iowa today: (1) natural or extant wetlands that escaped drainage; (2) restored/created wetlands; and (3) cropped wetlands (prior converted and farmed) (Figure 1 and Appendix A).

**Natural or extant wetlands** have never been drained (sometimes called remnant wetlands) and their characteristics are reasonably well described in the published literature, especially the prairie potholes found on the Des Moines Lobe (see \(^{11,12,13}\) for reviews of the ecology of prairie potholes).

**Restored wetlands** are wetlands that are re-established in former wetland basins by modifying drainage in some way to restore wetland hydrology. Created wetlands are wetlands that are established by creating a basin and suitable hydrology in an area that was not formerly a wetland.
Cropped wetlands include two distinct categories of wetland defined by the USDA: prior converted cropland and farmed wetlands. The distinction between prior converted cropland and farmed wetlands is based on the frequency and duration of ponding or saturation and has important implications with respect to both wetland protection and agricultural production (Appendix A).

Natural/extant wetland (top and top left), restored/created wetland (middle right), and farmed wetland (bottom) showing ponding and crop loss in 2011.
Wildlife interests initially championed the restoration of wetlands in Iowa to replace lost habitat, especially for waterfowl. Starting in the 1970s, appreciation grew for the ability of wetlands to remove contaminants from polluted water passing through them. In 1981, the first long-term study documenting the effectiveness of an Iowa wetland for removing nutrients was published and more recent work has demonstrated the potential water quality benefits of targeted wetland restoration in agricultural watersheds. The growing appreciation of wetlands as nutrient sinks or traps stimulated even more interest in restoring wetlands in Iowa. Local, national and international events have expanded the interest in restoring wetlands in Iowa. These events include the extensive flooding in recent years, the increased concern about global climate changes and recognition that wetlands are potential sites for carbon sequestration, and especially the demonstration of a link between nutrients in agricultural runoff in the Upper Midwest and the hypoxic zone in the Gulf of Mexico.

A U.S. Supreme Court decision in 2001 had an important impact on jurisdiction to protect isolated wetlands. Until that ruling in *SWANCC (Solid Waste Agency of Northern Cook County) v U.S. Army Corps of Engineers* on January 9, 2001, prairie potholes were considered to be “waters of the United States.” The SWANCC decision removed isolated wetlands that were not directly connected to navigable waters from protection under Section 404 of the Clean Water Act (CWA). Under Section 404, the U.S. Army Corps of Engineers may issue permits for the discharge of dredge or fill material into the “waters of the United States.” In effect, after SWANCC, a Corps permit was no longer necessary to fill or drain most prairie pothole wetlands. Still, data for Iowa indicate that wetland acreage in the state has actually increased since the SWANCC decision.6 Although some wetlands in Iowa have been restored because of mitigation required to get a Section 404 permit, the total number of acres involved is small.

A much more important regulatory tool than Section 404 for protecting Iowa’s prairie potholes has been the Swampbuster provision of the Farm Bill and the Conservation Reserve Program (CRP) and subsequent USDA land set-aside programs. In addition, a number of USDA programs starting with the CRP that was part of the 1985 Farm Bill have provided funds to assist with the restoration of wetlands in Iowa as part of a policy initially designed to reduce soil erosion by taking highly erodible land out of crop production. The 1990 Farm Bill added the Wetland Reserve Program (WRP), which provided funds for permanent easements for restored wetlands. Thus, since 1985, the USDA has been one of the major sources of funding for wetland restorations in Iowa.

Despite, or perhaps because of, the considerable effort at wetland protection and restoration in Iowa over the last few decades, a number of unresolved issues associated with wetland restoration and farmed wetland protection have arisen. The most important of these are:

*The quality of restored wetlands:* State and federal agencies that oversaw restorations in Iowa generally assumed that vegetation resembling that of natural wetlands would develop in restored wetlands from relict seed banks. This is in spite of the fact that few if any propagules of wetland species persist in areas that have been drained and cultivated for more than 20 years. If restored, these wetlands do not typically develop vegetation comparable to that of natural wetlands but instead are quickly overrun by a small number of weedy species. Wetland restoration procedures need to be re-thought so that the re-establishment of wetland vegetation is not left to chance.

*Siting and design of wetland restoration for improving water quality:* A number of issues about where to site restored wetlands in order to maximize removal of nutrients have yet to be resolved. Many if not most siting decisions are driven more by economic and social factors than by technical issues. A survey of hundreds of wetlands that were restored in part to improve the water quality of the Iowa Great Lakes revealed that these wetlands intercepted only 15 percent of the farm runoff reaching the lakes. The wetlands had been established not where they were needed, but where
farmers were willing to participate in various set-aside programs and reflects the non-targeted nature of the USDA programs involved. Because of poor coordination among agencies and poor planning at the landscape level, wetland restorations have not always been as effective as they should be in improving water quality. A notable exception is the Iowa Conservation Reserve Enhancement Program (CREP), which specifically targets wetland restorations to intercept and reduce nitrate loads associated with agricultural drainage.25

**Mitigation for Farmed wetlands:** The inability of farmers to drain farmed wetlands without jeopardizing their access to farm programs has become an issue in Iowa both with farmers and within conservation and agricultural groups and agencies. Drainage of farmed wetlands is allowed if their loss is mitigated by wetland restoration elsewhere. The fundamental, unresolved question is what kind and acreage of restored or created wetland(s) would be suitable mitigation in exchange for the drainage of a farmed wetland? This would depend on the functions of farmed wetlands for wildlife habitat, flood storage, nutrient removal, and recreation when compared to those functions in the restored/created wetland. The merit of mitigating farmed wetlands using restored or constructed wetlands designed to reduce nutrient loads is hotly debated in Iowa.

Even though natural wetlands have not been directly drained, their hydrology and water chemistry can be affected by drainage within their watershed. In addition, the spread of invasive species in Iowa has altered the vegetation of many natural wetlands, which are now typically dominated by hybrid cattails, reed canary grass and occasionally other invasive species. Very little effort is made in Iowa to control the spread of invasive species in natural wetlands, where many native wetland species are still present, but often in reduced numbers and cover. Restored wetlands often do not resemble natural wetlands. Although they may have comparable hydrology, their vegetation is almost always dominated by invasive species and they typically lack many wetland species that are still common in natural wetlands. This is what we also found in the restored wetlands surveyed for this report (see Appendix B). The poor quality of the vegetation of restored wetlands is mostly a function of their isolation from seed sources. Cropped wetlands are areas in farm fields that are wet enough to cause some crop loss but they rarely have any wetland vegetation. When they have wetland vegetation, it is primarily weedy species like hybrid cattail and mud-flat annuals. Our field surveys of farmed wetlands (Appendix B) confirmed this.

**Case studies**

Relatively few studies of restored wetlands in Iowa have attempted to determine their success. Early studies focused primarily on vegetation and birds but more recent work has examined the hydrologic and water quality functions of restored wetlands. Studies of bird use of restored wetlands demonstrate that birds, including breeding birds, do utilize even recently restored wetlands but also conclude that the lack of typical wetland vegetation in restored wetlands resulted in less bird use than in comparably sized natural wetlands.26,27 The first detailed studies of the vegetation of restored wetlands in Iowa noted that the initial revegetation of restored wetlands was highly uneven among sites and often resulted in very sparse vegetation.28,29,30,31 Some vegetation types such as submerged aquatics, became rapidly established while others like wet or sedge meadow species did not. Two invasive species, *Typha glauca* (hybrid cattail) and *Phalaris arundinacea* (reed canary grass) were often among the first species to become established in restored wetlands. With one notable exception, studies of restored wetlands in Iowa have been short term, typically only a few years.

The notable exception is the long-term study by Sue Galatowitsch of restored prairie potholes in Iowa and two adjacent states. She has conducted a series of studies on wetlands that were restored in 1988.28,29,32,33,34 The 64 wetlands that were selected initially were mostly established as part of the CRP. By the end of 1991, about 60 percent of the wetlands examined had their predicted or longer hydroperiods while 20 percent were judged to be hydrologic failures that never flooded or had serious
Most of the restored wetlands had an earthen dike with a spillway that was designed to increase their maximum depth of flooding. A ratio of watershed area to wetland surface area of 4:1 or greater resulted in a restored wetland reflooding while a ratio of 2.5:1 or less resulted in it failing to reflood. After three years, the vegetation of restored wetlands was still sparse with many of them having only the beginnings of one vegetation zone. Submerged and emergent vegetation were the most common zones found while not one wetland had wet prairie vegetation and only two had some assemblage of sedge meadow zones. Species diversity did increase during the first three years and wetlands that had been drained with ditches had more species than those drained with tiles (Figure 1). Seabloom and van der Valk studied vegetation development in 17 restored wetlands and nine natural wetlands in NW Iowa and reported similar results. Mulhouse and Galatowitsch resampled 41 of the original 64 wetlands 12 years later, in 2000. Nineteen restored wetlands had been returned to agricultural production and one had been dredged and turned into a fish pond. Three wetlands were eliminated from the resurvey because of access and other problems. On average, the restored wetlands had flooded in seven to nine years during the 12 years since they had been restored, but a few had never flooded. Species diversity had continued to increase, but two species — reed canary grass and hybrid cattail — now dominated the vegetation at nearly all the wetlands. Isolation from seed sources seemed to be responsible for the lower species diversity at some sites. Sedge meadows, which are the norm around natural prairie potholes, were either absent and showed no signs of developing or were only poorly formed. Although there was some convergence in the vegetation of restored wetlands toward that in natural wetlands, this was far from complete after 12 years of restoration. Mulhouse and Galatowitsch concluded many native wetland species would never recolonize restored wetlands and that they could only be established by seeding and planting them.

In 2007, 37 of the original 64 wetlands were resampled again. They were now 19 years old. By 2007, only 39 of the original 64 wetlands remained. Of the 41 sampled in 2000, two more had been converted to crop fields. In total, about one-third of the wetlands restored in 1988 had been reconverted to crop fields by 2007. The total number of species found in the restored wetlands continued to increase, but...
some species had been lost. The rate of colonization of new species had declined since 2000 from 14 species per year to only 1.6 species per year. Local extinction of species per year since 2000 was now greater for most wetlands than the rate of new colonization. Reed canary grass and hybrid cattail, which now dominate all sites, effectively are preventing colonization by new species and appear to be responsible for the loss of some species at most sites. Wet prairie and sedge meadow communities continue to be absent at most sites. Aronson and Galatowitsch point out that “isolation, infrequent flooding, and invasive species, are all factors that do not self-correct over time...[they] need to be addressed during planning by establishing sound practices for initial implementation and long-term vegetation management.” Seed rain studies of restored wetlands in northwest Iowa have recently confirmed that seed inputs into restored wetlands will not be adequate for the development of wet prairie and sedge meadow communities.

Although early studies of restored wetland success in Iowa focused primarily on vegetation and birds, there is growing interest in the water quality functions of restored wetlands. Recent studies in Iowa demonstrate the potential benefits and limitations of restored wetlands with respect to water quality improvement. Of more than 500 wetland restorations in the southern prairie pothole region surveyed by Galatowitsch, most drain very small areas and intercept insufficient contaminant loads to significantly affect water quality at the watershed scale. Van der Valk and Crumpton surveyed 278 restored wetlands in the Iowa Great Lakes watershed. With a few exceptions, the restored wetlands were small (ca. 1 to 3 acres) and did not intercept significant amounts of agricultural runoff. Although the wetlands may provide valuable habitat, their water quality benefits are obviously limited if they do not intercept contaminants.

Wetlands can have significant nutrient removal capacity but their effect is largely determined by the fraction of the watershed’s total nutrient load that the wetlands intercept. If not sited so as to intercept a significant fraction of the watershed load, restored wetlands have little effect on either nutrient concentrations or exported nutrient loads. Crumpton used simulation models to compare alternative wetland restoration scenarios in a tile-drained watershed in a 6,387-acre subwatershed of Walnut Creek in central Iowa. Results demonstrated that restoring smaller, isolated wetlands in the upper portion of the watershed would have very little effect on nitrate concentrations or load. In contrast, larger wetlands sited lower in the landscape so as to intercept significant amounts of tile drainage would substantially reduce nitrate concentrations and load (Figure 2).

Figure 2. Less Nitrate Exported in Watershed Approach to Siting Wetlands than in Conventional Approach
Crumpton et al subsequently examined the water quality performance of a series of wetlands receiving significant non-point source nutrient loads.\textsuperscript{18,19,37} The wetlands selected for monitoring included natural wetlands and wetlands restored under a variety of programs including CRP, WRP and CREP. The wetlands selected for monitoring spanned a wide range of wetland/watershed area ratios and a broad range of incoming nitrate nitrogen concentrations, from less than 10 mg/l to over 30 mg/l. The wetlands thus provide a broad spectrum of those factors most affecting wetland performance: hydraulic loading rates, residence times, nitrate concentrations and nitrate loading rates. Results demonstrate that restored wetlands can provide substantial nitrate reduction if the wetlands are positioned so as to intercept significant nitrate load and sized appropriately.\textsuperscript{18,19,37}

Performance expectations for wetlands must be adjusted for different landscape positions and geographic areas with different patterns of precipitation, volume and timing of surface and subsurface flow, nitrate loading, and temperature, all of which can vary tremendously. However, hydraulic loading rate alone explained 69 percent of the variability in percent nitrate mass removal for wetlands in Ohio, Illinois, and Iowa based on 34 “wetland years” of data.\textsuperscript{18, 19} More recent studies restricted to Iowa wetlands receiving tile drainage further demonstrate the importance of hydraulic loading rate on nitrate removal performance (Figure 3).\textsuperscript{37} (Hydraulic loading rate represents the volume of water delivered to a wetland per area of wetland and is inversely related to residence time. Residence time is shorter at higher hydraulic loading rates.)

\textbf{Figure 3. Larger Wetlands and Wetlands That Retain Water for Longer Periods of Time Remove More Nitrate}

![Diagram showing expected performance at different wetland to watershed area ratios](image)

\textit{Note: Percent nitrate mass loss vs. hydraulic load rate with estimated average response and approximate 95 percent prediction bands ($R^2 = 0.96$). The expected ranges for 0.5, 1, and 2 percent wetland to watershed area ratios are calculated based on a 25 cm/yr. water yield.}

In summary, although a large number of wetlands have been restored in Iowa, the habitat quality of these wetlands is typically poor when compared to that of undisturbed natural wetlands. Recently restored wetlands are used by birds, but they do not support the bird populations of natural wetlands because of poor vegetation development. The widespread assumption that vegetation comparable to that in natural wetlands will develop in restored wetlands without seeding is false. In most cases, restored wetlands do not have seed banks comparable to those of natural wetlands and their isolation, in most cases, from natural wetlands prevents seeds of most wetland species from reaching them, with the notable exception of some submerged aquatic species dispersed by waterfowl and some species dispersed by wind. Without active revegetation and vegetation management, the quality of existing restored wetlands will continue to decline and that of newly restored wetlands will almost never come to resemble that of natural wetlands.
With active revegetation, as has been the case with prairies, it is feasible to restore wetlands to conditions that are comparable to those of natural wetlands. When prairie restorations first began in Iowa, it was also believed that natural revegetation would be enough to restore them. Experience eventually demonstrated that this would not be the case. It was then realized that sowing prairie restoration sites with mixtures of seeds of native prairie species was the only cost effective way to restore them. As restored wetlands become more like natural wetlands, their value as habitat will increase significantly.

It also should be noted that one-third of the restored wetlands in the Galatowitsch study have been reconverted to crop fields and that about 20 percent of the 64 wetlands restored in 1988 were failures that never developed wetland hydrology or wetland vegetation. Wetland restorations have been motivated primarily by concern over waterfowl habitat loss, and site selection criteria for wetland restorations have not primarily considered water quality functions. Of 778 wetland restorations surveyed in the southern prairie pothole region most drain very small areas and intercept insufficient contaminant loads to significantly affect water quality at the watershed scale. This does not lessen the promise of wetlands for water quality improvement in agricultural watersheds but rather underscores the need for explicitly considering watershed scale endpoints when planning wetland restorations. The effectiveness of restored wetlands for water quality improvement depends on two primary factors. First, wetlands must be positioned to intercept significant nutrient loads if they are to achieve significant load reductions. Second, wetlands must be of sufficient size to allow adequate residence time to treat the loads they receive. The shortcomings and problems with wetland restorations are generally overlooked by funding agencies and are rarely brought to the attention of policy makers.

**Policy issues**

**Background**

In Iowa, as noted previously, we have three kinds of wetlands: (1) natural wetlands, (2) restored/created wetlands and (3) cropped wetlands. Every effort should be made to conserve and protect the last remaining natural wetlands as well as restored wetlands in the state. As is spelled out in the 1990 Memorandum of Agreement between the Environmental Protection Agency (EPA) and the Department of Army, there is a three-part process, a “mitigation sequence,” designed to minimize adverse impacts on wetlands and to help guide decisions about the type and level of mitigation required under Clean Water Act Section 404 to offset any unavoidable adverse impacts on wetlands.

1. Avoid adverse impacts if there is a practicable alternative with less adverse impact.
2. If impacts cannot be avoided, minimize adverse impacts.
3. Compensatory mitigation is required for unavoidable adverse impacts that remain.

The Clean Water Act as applied to wetlands and subsequent regulatory rulemaking was designed to protect natural wetlands and restored wetlands, especially those restored to mitigate the loss of natural wetlands. How it should be applied to Iowa’s third, and by far most common, type of wetland, cropped wetlands, is currently a hotly debated topic. Cropped wetlands represent a different class of wetlands that are highly degraded because of drainage and because farmers regular crop these areas. Although they still are technically wetlands because of their hydrology and soils, they more closely resemble crop fields in appearance and function. We should carefully consider the best strategy to deal with cropped wetlands. Some would argue that cropped wetlands are sufficiently valuable that drainage should be opposed. Others would argue the cropped wetlands have such marginal value that drainage should be encouraged because the resulting mitigation wetlands would have much greater value. The traditional approaches used to protect natural and restored wetlands may not be relevant for cropped wetlands, especially the kind of mitigation required to replace cropped wetland services when cropped wetlands are drained.
Although several state agencies have programs and activities impacting wetlands, most notably the Departments of Natural Resources, Agriculture and Land Stewardship, and Transportation, the state of Iowa has no general wetland policy. Iowa passed wetlands protection in 1990 (The Iowa Wetlands Act or Protected Wetlands Act), which in theory would have protected some wetlands from drainage. However, the act has never been fully implemented and was not even mentioned in the 2010 “Wetland Action Plan for Iowa” which states “There is no Federal Wetlands Act or Iowa Wetlands Act. Rather, there is a collection of laws and regulations designed for a variety of other subjects that also have an impact on wetlands.” In addition, the act excludes wetlands within agricultural drainage districts and levee districts.

In practice, Iowa has largely relied upon the federal government for wetland protection. In the 1990s, all wetlands nationwide were considered to be jurisdictional wetlands under Section 404 of the Clean Water Act (CWA). After the SWANCC decision in 2001, which removed “isolated” wetlands from federal jurisdiction under Section 404, a number of states in the Midwest adopted legislation to protect isolated wetlands from drainage, but Iowa did not. Nor did Iowa fully implement its 1990 Protected Wetlands Act. Instead, most wetlands in Iowa after SWANCC were now solely protected by the Swampbuster Provision of the 1985 Farm Bill, or the Food Security Act (FSA). Because most remaining wetlands in Iowa are on farms, Swampbuster continued to provide significant protection from drainage for the state’s remaining wetlands. The 1985 FSA also created several new legal categories of wetlands, including prior converted cropland and farmed wetlands (two classes of cropped wetlands).

Current Challenges

(1) State Wetland Policy

Iowa needs a comprehensive wetland policy that deals with wetlands on public and private land and with the restoration/creation of wetlands. The policy should address wetland mitigation for both public and private wetlands. It should recognize the differences between drained agricultural wetlands (cropped wetlands) and intact wetlands. It should also outline how the state’s remaining and restored wetlands are to be evaluated. In short, the state needs to assert its authority over wetlands and provide clear guidelines for the protection, mitigation and restoration of wetlands.

(2) Cropped Wetlands

a) **FSA vs. CWA jurisdiction:** One of the most critical and far-reaching wetland policy issues in Iowa is how cropped wetlands (including both prior converted cropland and farmed wetlands) will be treated under potential changes to CWA jurisdiction. Currently, farmed wetlands are protected from further drainage by the FSA, but only if the landowner or operator participates in certain USDA programs. Under recent guidance from the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency, the Corps could regain CWA jurisdiction over cropped wetlands in Iowa that it lost in the SWANCC court decision. This has tremendous implications for agriculture and wetland regulation in Iowa, especially given differences in the treatment of cropped wetlands under the FSA and CWA.

b) **Lack of public information on cropped wetlands:** Because the USDA does not make the data public, very little information about cropped wetlands is available. USDA, the Corps, EPA and Interior Department coordinated wetland protection under a 1994 interagency agreement. USDA confidentiality, however, was one reason that agreement terminated. It is essential that these data be made public in order to assess the policy implications of various alternatives for dealing with cropped wetlands.
c) **Water quality standards:** It is uncertain how changes in CWA jurisdiction will affect the application of water quality standards to isolated wetlands including cropped wetlands. Because most isolated wetlands in Iowa receive agricultural inputs, any regulatory changes that address these inputs need careful consideration.

d) **Mitigation of cropped wetlands:** Problems arise with plans to improve the drainage of cropped wetlands. Because of the federal no-net-loss policy, improving the drainage of these types of wetlands requires mitigation. Few would argue that mitigation wetlands should be plowed and otherwise disturbed in order to maintain the unvegetated mudflats of farmed wetlands. Nevertheless, some have argued that mitigation wetlands should replace the specific habitat represented by these disturbed systems. Realistic, transparent and objective guidelines for mitigating the loss of cropped wetlands are needed and these policies should recognize the substantial differences between drained agricultural wetlands (cropped wetlands) and intact wetlands.

(3) Restored Wetlands (including mitigation wetlands)

Over the past few decades, Iowa has had significant wetland acreage restored under a variety of state and federal programs. This experience has revealed a number of challenges facing wetland restoration in Iowa and suggests a need for more formal assessment of wetland restorations.

(a) **Poor development of vegetation:** Unlike for prairie restorations, no effort is typically made to seed wetland plant species when wetlands are restored. It has been recognized for many years that the vegetation that develops in restored wetlands is often lacking certain vegetation zones and is often dominated by a small number of invasive species.

(b) **Invasive species:** Many restored wetlands are dominated by invasive species, especially reed canary grass and hybrid cattail. Again, unlike in prairie restorations, little or no attempt is made to manage restored wetlands to prevent them from being taken over by invasive species. It is unclear how much can reasonably be done to address this problem.

(c) **Reversion to cropland:** Many wetlands restored under USDA short-term easements are drained and returned to crop production. It seems reasonable to assume even greater pressure to convert restored wetlands with current commodity prices and cropland values. Available funds for wetland restoration should be used only for permanent easements.

(d) **Evaluation:** Formal guidelines are inadequate for evaluating the success of restored or created wetlands including those being used to mitigate wetland losses in Iowa. Such guidelines are needed and the monitoring of restored wetlands should be required to ensure that they are, in fact, successful.

(e) **Restoration for mitigation:** The expectations and treatment of FSA and CWA mitigation sites in Iowa are unclear and mitigation guidelines seem to vary. A state wetland policy might help to identify and reconcile these differences.

(f) **Public liability:** Under what circumstances should the transfer of liability for mitigation banks to public entities be allowed?

(g) **Public information:** It is essential that information on all wetland restorations and mitigations be made public in order to assess the policy implications of various alternatives.

Wetlands were a defining feature of much of the Iowa landscape until the arrival of western settlers. Now only a very small percentage of wetlands remain and Iowans are recognizing the important roles that wetlands can and must play in improving water quality. Protecting the few remaining natural
wetlands the state has must of course be the priority, but restoring or creating new wetlands will have to be a part of any water quality strategy. As efforts to restore wetlands increase it is important that the state have in place means to ensure that restorations are as successful as possible and will remain in place long into the future. Iowa needs:

- A comprehensive state wetlands policy that deals with wetlands on both public and private land, including constructed and restored wetlands.

- Transparent, publicly available information for wetland projects using state and federal money so that USDA, other government agencies and researchers can evaluate and assess the effectiveness of wetland programs. A great deal of public money has gone into building or restoring wetlands through various programs, but there is little publicly available information accounting as to their cost, location and success.

- Consistent and clear expectations, guidelines and treatment of mitigation sites in Iowa under various state and federal policies. Formal guidelines are needed for evaluating the success of restored or created wetlands including those being used to mitigate wetland losses in Iowa.

- More public information about cropped wetlands and realistic, transparent and objective guidelines for mitigating the loss of cropped wetlands. Clarification is needed as to how cropped wetlands will be treated and under what legal jurisdiction. Policies should recognize the substantial differences between drained agricultural wetlands (cropped wetlands) and intact wetlands.

- Certainty as to how any changes in federal legal jurisdiction will affect the application of water quality standards to isolated wetlands including cropped wetlands.

If public and private dollars for wetlands are going to be spent wisely, Iowans should demand that the above needs be met and policy makers and administrators should work to meet those demands. Wetlands must play an important role in improving water quality in the state and there are many steps Iowa can and must take to help ensure that they will.
APPENDIX A

Iowa’s wetlands

The Des Moines Lobe of Iowa represents the southernmost extent of the Prairie Pothole Region, and prior to settlement included 3.5 million acres of wetlands. There were also riverine wetlands associated with Iowa’s major rivers and their tributaries, but the prairie pothole landscape of the Des Moines Lobe held most of the state’s wetlands. The wetlands of the Des Moines Lobe may best be described as depressional wetlands connected by wet meadows. Historically, these wet meadows, or wet flats, were the most common type of wetland in Iowa, accounting for more than 80 percent of the total wetland area on the Des Moines Lobe. In addition to surface runoff and overflow from depressions, these wet meadows and flats received groundwater and precipitation inputs that could be a dominant water source in very dry years. While it can take trained experts to distinguish between different types of wetlands, from a policy perspective it is useful to distinguish historic wetlands, cropped wetlands and restored/created wetlands.

Historic wetlands

Historic wetlands are those that have never been drained (sometimes called remnant wetlands) and their characteristics are reasonably well described in the published literature, especially the prairie potholes found on the Des Moines Lobe (see11,12,13 for reviews of the ecology of prairie potholes). While not directly drained, the hydrology, vegetation and animal communities of many of these historic wetlands have been altered by wide-scale drainage that has lowered regional groundwater tables, by the discharge of drainage tiles and ditches into them and by invasive species such as hybrid cattail and reed canary grass.

Cropped wetlands

Prior converted cropland and farmed wetlands are two distinct categories of wetland defined by the USDA that have important implications with respect to both wetland protection and agricultural production. The distinction between prior converted cropland and farmed wetlands is based on the frequency and duration of ponding or saturation. The 1985 Farm Bill established protections for wetlands that had not been “sufficiently” drained to remove wetland characteristics prior to December 23, 1985. The protections do not prohibit farming these wetlands but do restrict further drainage. Essentially, the protections establish the two categories of cropped wetlands, prior converted cropland and farmed wetlands.

Prior converted cropland: Wetlands that had been sufficiently drained prior to December 23, 1985, are referred to as prior converted cropland and are not treated as wetlands under the Swampbuster provisions of the 1985 Farm Bill. There are no USDA restrictions on further improving or enhancing drainage on prior converted cropland.

Farmed wetlands: Wetlands that had not been sufficiently drained prior to December 23, 1985, are referred to as farmed wetlands and are afforded protection under the Swampbuster provisions of the 1985 Farm Bill. There are restrictions on further improving or enhancing drainage on farmed wetlands. Farmers who improve the drainage of a farmed wetland beyond the “scope and effect of the original drainage” could lose all USDA program benefits or face penalties. These penalties or loss of benefits can cost landowners tens- or even hundreds of thousands of dollars.

In the case of prairie potholes, wetlands are farmed wetlands if they have standing water for at least seven consecutive days or saturated soils for 14 consecutive days during the growing season in most years. This means there is a greater than 50 percent chance that a farmed wetland will have sufficient duration of standing water or saturated soil to meet the criteria in any given year. A depression that only
meets the criteria 45 percent of the time would be considered prior converted cropland and afforded no protection under the Farm Bill. Operationally, the determination of farmed wetlands is largely based on NRCS interpretation of aerial photographs for a combination of wet years, normal years and dry years around 1985. Crop failure in a wet or normal year might be interpreted as a result of sufficient excess moisture to reflect the required duration of ponding or saturation. A farmed wetland might thus be expected to have crop failure most years. On the Des Moines Lobe, farmed wetlands are cultivated most years and do not typically have wetland vegetation, but they do have wetland soils. Farmed wetlands have not been well studied and most of the information about them is anecdotal. Because farmed wetlands are located in farm fields and planted with crops, farmed wetlands are typically fertilized and sprayed annually with herbicides and pesticides. Because they typically have no drainage tile or ditch inputs, they may not be very important nutrient traps and may actually be sources rather than sinks for nutrients and pesticides in the landscape.

**Restored/created wetlands**

Restored wetlands are wetlands that are re-established in former wetland basins by modifying drainage in some way to restore wetland hydrology. Created wetlands are wetlands that are established by creating a basin and suitable hydrology in an area that was not formerly a wetland. Many of the restored/created wetlands in Iowa were the result of various kinds of wetland restoration projects funded by federal and state agencies and, to a lesser extent, conservation groups like Ducks Unlimited. However, a surprising number of wetlands that are mapped today on National Wetland Inventory maps are pseudo-restorations that seem to begin as farm or stock ponds and borrow pits. However, because of their vegetation and water depths, they are technically wetlands and are mapped as such. Although there is a technical distinction between restored and created wetlands, it is unknown whether in Iowa this distinction has much functional significance. It may well be a distinction without a difference and for the sake of brevity, restored and created wetlands will hereafter be referred to as restored wetlands. When restored wetlands receive agricultural runoff in the form of drainage tile and ditch inputs they can be effective at removing nutrients, especially nitrates, in agricultural runoff.

Studies of restored wetlands indicate that some are simply not sufficiently wet to support wetland vegetation and that frequently those that are do not develop vegetation that resembles that of historic wetlands. The main reason for this is dispersal limitations exacerbated by the isolation of most restored wetlands from seed sources. The invasion of restored wetlands by invasive species is also a major problem in Iowa. Two species have taken over many restored wetlands, reed canary grass (*Phalaris arundinacea*) and hybrid cattail (*Typha glauca*). These two species have also invaded many natural wetlands in Iowa and much of the Upper Midwest. In short, the vegetation of restored wetlands in Iowa is often significantly different from that of natural wetlands in composition or structure.

**Ecological services of wetlands**

Wetlands have many functions but three are generally considered to be the most important in prairie wetlands: waterfowl habitat, nutrient removal, and flood control.

The prairie pothole region has long been recognized as the “duck factory” of North America. Because most wetlands were drained in Iowa, waterfowl production in the last 100 years has plummeted in the state. Currently, Iowa’s prairie potholes are not nationally important as waterfowl breeding areas but these scarce resources are very important as waterfowl hunting areas.

Wetlands have been shown to be effective in removing a wide variety of water contaminants, including suspended solids, nitrogen (N), and phosphorous (P). Long-term, sustainable N retention by wetlands is due primarily to denitrification of nitrate. Long-term, sustainable P retention by wetlands is due almost
solely to the accumulation of bound inorganic P and unmineralized organic P associated with the formation and accretion of new sediments and soil. Studies of wetlands constructed to intercept non-point source nutrient loads confirm the importance of sediment accretion for P retention but also demonstrate the potential for remobilization of P if for example sediments are re-suspended. The potential importance of Iowa wetlands as nutrient traps was recognized in the 1970s and a pioneering study at Eagle Lake, Iowa demonstrated that natural wetlands can be effective at removing nitrogen and phosphorus from non-point source agricultural runoff. Subsequent field and experimental studies have demonstrated that restored wetlands can potentially be even more effective nutrient sinks because they can be targeted and designed to improve that function. The effectiveness of either natural or restored wetlands for water quality improvement depends on two primary factors. First, wetlands must be positioned to intercept significant nutrient loads if they are to achieve significant load reductions. Second, wetlands must be of sufficient size to allow adequate residence time to treat the loads they receive.

Although there is good evidence for the importance of prairie wetlands as waterfowl habitat and nutrient sinks, this is not true of their function for flood control. In reality, so few wetlands remain in Iowa that their capacity on a statewide basis to store water for flood control is minimal at best. Although it is widely believed that the drainage of prairie potholes has contributed to flooding problems in Iowa, such as the 1993 and 2008 floods, no studies support this conclusion. Some modeling done after the 1993 floods, suggested the restoring floodplain wetlands in the Upper Mississippi River catchment would reduce potential flooding by 10 to 20 percent, but only if the larger and deeper wetlands were restored. Restored floodplain wetlands, however, would be most effective during 25-year or less storm events. During exceptionally wet years when flooding occurs, prairie wetlands would likely already have been full of water and as a result, might have provided little flood storage capacity when it was needed. It is unclear how important flood storage in prairie potholes was and how the loss of this storage affected flooding. The overall landscape changes and channelization that accompanied wetland drainage may have been more important.

Because studies of wetland functions are costly and time-consuming, the functions of most types of wetlands remain poorly documented, and except as noted, this is true for most functions of prairie potholes. Restored wetlands in Iowa are used by waterfowl and are effective nitrate sinks. Other functions and values of restored wetlands remain largely undocumented. The best study of use of restored and natural prairie wetlands by waterfowl was done in North and South Dakota. That work concluded that restored wetlands had similar avian communities with equal or higher species abundances than natural wetlands. The ability of restored wetlands to remove nutrients is primarily a function of the wetland being large enough to handle the nutrient load and only secondarily a function of vegetation or other features. In other words, restored wetlands can function much like natural wetlands with respect to bird use and water quality. Nevertheless, because of problems with the re-establishment of certain types of vegetation, the vegetation of restored wetlands often is very different from that of natural wetlands.

The purported functions and economic values of specific wetlands are typically inferred or estimated rather than measured directly. Economic benefits can accrue to the wetland owner, someone using the wetland or to society as a whole, for example as water quality improvements, carbon sequestration or flood protection. It can be very difficult to estimate the value of wetlands, in part because they are so diverse but one study has placed the average value of a wetland in the USA is between $1,630 and $1,700 per acre. Although many of the functions of wetlands were hard to value, the capitalized value of these wetlands in North Dakota’s prairie potholes has been estimated for three types of beneficiaries. For users, they ranged from $190 to $800 per acre. For owners, they ranged from $90 to $930 per acre. For society, it ranged from $370 to $1,730 per acre. In other words, the social value of
prairie wetlands to the public can be greater than their value to individual users and landowners. Although actual data on the value of wetlands are unavailable for Iowa, it is possible that some Iowa wetlands, both natural and restored, are more valuable as wetlands than as farmland. (All values above represent estimates in 2011 dollars using the CPI index to convert reported values in each study. They do not reflect increases in land values that have occurred.)
APPENDIX B

Evaluations of specific cases of farmed wetlands, CRP wetlands, CREP wetlands and mitigation wetlands

We evaluated the vegetation, hydrology, and potential water quality benefits of seven specific wetlands including two farmed wetlands, two CRP restorations, two Iowa CREP wetlands and one mitigation wetland. The mitigation bank (Coulter Marsh) is located Franklin County and all of the other wetlands evaluated were located within a 20-mile radius of each other in Palo Alto or southern Emmet County. The farmed wetlands, CRP wetlands and CREP wetlands selected ranged from 4.3 to about 15 acres in size and the mitigation wetland was considerably larger at about 60 acres.

Field surveys were conducted for all sites on October 23, 2011. Because of dry conditions for the preceding three months, most of the sites surveyed had little or no standing water so we were able to confirm the presence/absence of tile outlets and surface intakes. Because of the time of year, many of the species were going senescent or were already dead. Vegetation surveys focused on the most common species (dominant species) in each vegetation zone. Most depressional (pothole) wetlands in Iowa have three vegetation zones: open water dominated by submerged aquatics, emergent vegetation, and wet or sedge meadow vegetation. During extended dry periods, all three zones may lack standing water and the open water zone may consist of mudflats that are dominated by moist soil species (smartweeds, beggarticks, pigweed, yellow cress, dock, nutedges, barnyard grass, etc.), mostly annual species whose seeds can only germinate on wet soil.

Farmed wetlands

The two farmed wetlands evaluated were located in Palo Alto County and had recent certified determinations by NRCS. Farmed wetland 1 was a 12.2-acre site and farmed wetland 2 was a 4.3-acre site. Both of these wetlands were within organized drainage districts and apparently served by subsurface drainage tile but field surveys revealed no surface intakes in either wetland.

Since the farmed wetlands were cropped and received fertilizer inputs, we assumed no net effect on nitrate export. It is possible that farmed wetlands export more nitrate than normal cropland because of reduced plant uptake during wet years but it is also possible that denitrification losses in wet years could offset that effect. We estimated the net effect of farmed wetlands on nitrate export based on the nitrate export measured for cropland in Palo Alto County. Based on this approach, we estimate these farmed wetlands would export about 43 kg N/wetland ha/year.

Based on an examination of aerial photographs, it appears the two farmed wetlands evaluated are routinely planted to corn or soybeans but appear to have suffered significant crop failure in 2010 and 2011 due to extremely wet conditions (see photos, next page). Farmed wetland site 1 had been planted with corn and appeared to have been harvested on about half of the site. There was a very sparse cover of common weeds (smartweeds, pigweed) in areas were corn did not survive, but no wetland species were found. Farmed wetland site 2 had been planted to corn but the site had been plowed and disked and it was unclear what fraction might have supported a harvest. In a few spots there were stalks of cattail on the surface of the ground and remains of moist soil species.
The two CRP wetlands evaluated were located in Palo Alto County. CRP wetland 1 was approximately 15 acres and CRP wetland 2 was approximately 8 acres. Based on an examination of aerial photos, site 1 had apparently been restored for over 10 years and site 2 had been restored within the last two years. Certified determinations by NRCS had listed both sites as farmed wetlands. Both of these wetlands were within organized drainage districts but enrollment in CRP would presumably have required disabling any subsurface drainage tile serving these systems. Field surveys revealed no surface intakes and no tile outlets in either wetland.

The CRP wetlands received no tile flow but we assumed they exported no nitrate and estimated the net reduction compared to cropping these sites based on the nitrate export measured for cropped drainage systems in Palo Alto County. Based on this approach, we estimated that these CRP wetlands would effectively reduce nitrate export by about 43 kg N/wetland ha/year.

CRP wetland 1 was dominated by weeds (smartweeds, pigweed) with some patches of cattail, reed canary grass, and floating-leaved smartweed (*Polygonum amphibium*). CRP wetland 2 had been planted with prairie species and there were weedy annuals growing at this site, but no wetland species. There was no standing water in either wetland.

CRP sites 1 and 2 were somewhat effectively separated from road ditches. We also surveyed the vegetation in three additional, smaller CRP wetlands (less than 2 acres) in the same area that appeared to support more wetlands vegetation. These additional sites were much smaller and it appeared they would have been connected to each other through road ditches during wet periods. One of these sites had extensive emergent vegetation and muskrat lodges and it was apparent that portions of the site had not been cropped for many years. This was supported by an examination of aerial photographs for prior years. The site was positioned in the low corner of a field at a road intersection and would have been well connected to the road ditch during wet periods. The emergent zone was mostly dominated by cattail. In the sedge meadow zone, there were some patches of sedges (*Carex*), spikerush (*Eleocharis*), nutsedges, cord grass (*Spartina pectinata*), and a few patches of reed canary grass. A variety of forbs were also found in this zone. The two additional sites surveyed were along the same road ditch could have been connected during wet periods. At one of these sites, the dominant species was Great River Bulrush with patches of reed canary grass, cord grass, and spikerush along the edges. Moist soil annuals were also common. The vegetation at the final site was dominated by moist soil annuals, predominantly...
smartweeds. There were small patches of cattail and reed canary grass and some poplar (*Populus*) seedlings. Along the edges this site had been planted to a cover crop that had probably been used to establish prairie species in the adjacent upland.

**CREP wetlands**
The two CREP wetlands evaluated were located in southern Emmet County and had been restored about four years earlier. These wetlands were restored in series but their pools were separated at all times. The lower site (CREP site 1) had a pool area of 9.1 acres and the upper site (CREP site 2) had a pool area of 8.8 acres. These wetlands received inflows from large subsurface tile drainage systems and together captured drainage from just over 1300 acres of primarily cropland. Water levels were very low and both wetlands had extensive exposed mudflats.

Unlike the farmed wetlands and CRP wetlands we evaluated, the CREP wetlands received substantial tile flow and had the potential to remove nitrate associated with that tile flow. We estimated nitrate reduction in these wetlands based on measured performance of CREP wetlands and the predicted performance based on the observed hydrologic and nitrate export measured at nearby sites in Palo Alto County. Based on this approach, it is estimated that the CREP wetlands would reduce nitrate export by about 1400 kg N/wetland ha/year.

At CREP site 1, the emergent vegetation was dominated by great river bulrush, and bur reed (*Sparganium eurycarpum*). There were also patches of softstem bulrush and sedge. Reed canary grass was common along the upper edges. There was a sparse cover of moist soil species on mudflats. At CREP site 2, the dominant emergent species was cattail with some great river bulrush and softstem bulrush in places. Reed canary grass was the dominant in the wet meadow zone. Beggarticks were common on mudflats. Unlike these two sites, a great many CREP wetlands and WRP wetlands we have visited have sparse emergent zones and are dominated by submersed vegetation. It seems likely that this relates to limited propagule availability.

**Mitigation wetland**
The mitigation site (Coulter Marsh) was located in Franklin County and had been restored about ten years ago. A banking instrument for this site established an agreement among Iowa Wetland Mitigation Bank, Inc; NRCS, USACOE, USEPA, USFWS, and the Iowa DNR regarding the establishment, use, operation and maintenance of the mitigation site. Iowa Wetland Mitigation Bank, Inc. is an Iowa non-profit that is controlled and funded by the Iowa Farm Bureau. The banking instrument granted Iowa Wetland Mitigation Bank, Inc. rights to establish a wetland mitigation bank on a 186-acre parcel of land owned the Iowa DNR (Coulter Marsh Wildlife Area). This meant that we were no direct land costs to the bank when it was established. However, the bank was required to reimburse the DNR $1,414 for each acre that qualified for mitigation credit and for a buffer 50 feet wide around the wetland basins on the site. In addition, the bank was responsible for all costs associated with wetland restoration on the site.

The wetland has a full pool area of about 60 acres. It receives inflow from subsurface tile drainage systems and has a total catchment area of about 1,050 acres primarily in cropland. Water levels were very low and the wetland had extensive exposed mudflats. The wetland has two connected basins and outlets through a water level control structure.

Similar to the CREP wetlands we evaluated, the mitigation wetland received substantial tile flow and had the potential to remove nitrate associated with that tile flow. We estimated nitrate reduction in this wetland based on measured performance of CREP wetlands and the predicted performance based on the observed hydrologic and nitrate export measured at sites in Palo Alto County. Based on this approach, it is estimated that the mitigation wetland would reduce nitrate export by about 250 kg N/wetland ha/year.
The dominant emergent species were cattail (Typha) and great river bulrush (Scirpus fluviatilis) with patches of hardstem bulrush (Scirpus acutus), softstem bulrush (Scirpus validus) and horsetail (Equisetum). The wet meadow zone was dominated by reed canary grass (Phalaris arundinacea). Other widespread species found in the wet meadow zone were marsh milkweed (Asclepias incarnata) and nutsedges (Cyperus spp.). Mudflats were dominated by the typical assemblage of moist soil species (smartweeds, beggarticks, dock, yellow cress, water plantain, etc.) found in Iowa wetlands during drawdowns plus a terrestrial form of a pondweed (Potamogeton). Prior to restoration, this site had substantial areas of existing hydrophytic vegetation including green bulrush, hard stem bulrush, cattail, smartweeds, bidens, etc. that could have served as sources of propagules. Nonetheless, cattail and reed canary grass and cattail are now dominant or codominant species in the wet meadow and emergent zones, illustrating the pervasive and difficult problem presented by these aggressive invasive species.

Summary

Our evaluations of individual wetlands generally underscore previously identified issues related to the habitat and water quality functions of restored wetlands. The availability of propagules and the pervasiveness of invasive species are significant constraints on the quality of vegetation in restored wetlands. The water quality benefits of restored wetlands are largely determined by their opportunity to intercept contaminant loads.

10 Crumpton and Stenback unpublished analysis of data for waste water treatment plant effluent and riverine nitrate loads for the Des Moines River at Des Moines and South Skunk River at Ames.
The February 2005 joint guidance states that a certified PC determination by NRCS would remain valid unless there is change to agricultural use (other than minor change) or for a non-agricultural use at which time a new determination would be required for CWA. The document also states that specific guidance would be forthcoming addressing how the Corps would treat PC wetlands following a change from agricultural to non-agricultural use. In 2009, the USACE released an issue paper and memorandum (the “Stockton Rules”) suggesting that prior converted cropland would no longer be exempt from regulation under the CWA if land use changed. The USACE position was rejected by a ruling of the U.S. District Court for the Southern District of Florida in September, 2010 (New Hope Power case). It is not clear whether this case will be appealed or what the
implications are for cropped wetlands in Iowa. Based on the 2008 rules for “Compensatory mitigation for losses of aquatic resources” it might appear that prior converted cropland would not come under CWA jurisdiction. Those rules state that the definitions of “waters of the United States” are still provided by C.F.R. 328 which explicitly excludes prior converted cropland. However, there is considerable uncertainty over the policies governing cropped wetlands under either FSA or CWA and these policies have major implications for both agriculture and wetland resources in Iowa. Currently, it appears that some prior converted cropland in Iowa could be treated as jurisdictional under the CWA when there is a change from agricultural land use. If the site could be subject to CWA jurisdiction (i.e. could be considered “waters of the U.S.”) then the agricultural exemption would be lost with the change in land use and a new CWA wetland determination would be required. If the new determination found the site to be prior converted cropland, then it would not be jurisdictional. However, if the new determination finds the site to have sufficient wetland characteristics then it would be jurisdictional under CWA.

In addition to uncertainty concerning CWA jurisdiction over prior converted cropland following a change in use, the concept of abandonment does not apply to prior converted cropland protected under the FSA. Under the FSA, landowners are allowed to maintain or restore drainage improvements that were in place prior to 1985 even for prior converted cropland that has been allowed to revert to wetland conditions because drainage systems were not adequately maintained. In other words, prior converted cropland never regains wetland status under the FSA even if “abandoned” for years. In contrast, these sites could become jurisdictional under the CWA. This contrast between CWA and FSA treatment of abandonment was one of the primary reasons that the 1994 MOA was terminated in 2005. This has significant implications with respect to using previously restored wetlands as mitigation under the FSA and CWA. Under the FSA, a landowner could fully restore a wetland on a prior converted cropland site using private funds (e.g. without enrolling in any government program with an explicit right of reversion) and then at any time drain that wetland without restriction, even after five years or more. The landowner could apparently even sell mitigation credits for the restored wetland under the FSA and this is in fact being attempted in Iowa. This would not be allowed under the CWA since the site would be considered after five years, regardless of its prior determination.


