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Conservation Reserve Enhancement Program
FY2020 Annual Report

Iowa

The Conservation Reserve Enhancement Program (CREP) is a partnership between state agencies and the U.S. Department of Agriculture, Farm Service Agency. Through these partnerships, CREP provides financial incentives to farm landowners willing to voluntarily implement conservation measures on sensitive land in lieu of continued agricultural production. Conservation practices implemented under CREP (e.g., stream buffers, conservation plantings, restored wetlands) contribute to improved water quality, reduced water losses, increased water storage, and increased habitat quantity and quality for a variety of wildlife species; but are targeted towards specific State or nationally significant conservation concerns. Under the terms of CREP agreements, partners are required to submit annual reports that summarize progress towards meeting CREP agreement goals. This is the FY2020 report for the Iowa CREP.

Introduction

Iowa Conservation Reserve Enhancement Program

FY2020 Summary

CREP Acreage Cap: 9,000
Acres Re-enrolled in 2020: 0
New Acres Enrolled in 2020: 79
Total Acres Currently Enrolled: 3,678

Federal Commitments

Federal CRP Rental Payments: $1,138,489

Federal Signup Incentive Payments: $0

Federal Practice Incentive Payments: $88,146

Federal Cost-Share Payments: $200,074

Other Federal Incentive Payments: $0

Non-Federal Commitments

Iowa Department of Agriculture and Land Stewardship

Total Non-Federal Financial Commitments: $885,237

Non-Federal Financial Commitments Directly to CRP Participants: $2,578,918

Total Non-Federal In-kind Support: $0

Non-Federal In-kind Support Directly to CRP Participants: $0

Breakdown of Non-Federal In-kind Support

1: NA – $0

Other Non-Federal Commitments or Support:

Total Other Non-Federal Commitments or Support:

Other Non-Federal Commitments or Support Directly to CRP Participants:

GOALS

Goal 1: Annually, add the capacity to remove 300 to 600 tons of nitrate-nitrogen from agricultural tile drainage. Over the next ten years, this would add wetland capacity to annually remove 3000 to 6000 tons of nitrate nitrogen from agricultural tile drainage. Over a 60 year life, each wetland acre would remove approximately 20 to 40 tons of nitrate-nitrogen.

Progress: Seven wetlands were constructed in 2020 which remove an estimated 87.2 tons of nitrate-nitrogen. These wetlands will remove 1,143 tons of nitrate-nitrogen over their 150-year lifespan. Cumulatively, all the CREP wetlands constructed to date remove 754 tons per year of nitrate-nitrogen at a weighted average cost of $0.24 per pound of nitrogen.

Iowa State University monitors selected wetlands in Iowa as part of an ongoing monitoring effort associated with the Iowa Conservation Reserve Enhancement Program (CREP). The Iowa CREP is a targeted, performance-based strategy operated by the Iowa Department of Agriculture and Land Stewardship (IDALS) for nitrate reduction in tile-drained agricultural landscapes. The monitored wetlands are selected to span a wide range in wetland-to-watershed area ratio and inflow nitrate concentrations in order to ensure a broad range in hydraulic and nitrate loading rates. This allows the characterization of wetland performance across a wide range of conditions which provides information necessary to properly target new wetland locations and sizing wetlands to maximize nitrate loss.

Fourteen wetlands were monitored in 2020 (Figure 1), including 13 Iowa CREP wetlands and one mitigation wetland (DD15-N).

Wetland monitoring included measurements of wetland inflows, outflows, pool elevations and water temperature, and collection of weekly to biweekly water quality grab samples and daily samples. Daily samples were collected using automated samplers programmed to collect samples at wetland inflows and outflows when above freezing conditions allowed the equipment to function properly. Due to occasional equipment failure, some daily values may be missing. Figure 2 shows the measured nitrate concentrations and flow for the fourteen wetland monitored in 2020.

Mass balance analysis and modeling has been used to examine the long term variability in performance of CREP wetlands including the effects of spatial and temporal variability in temperature and loading patterns. The results of the mass balance calculations for the 2020 and prior monitoring years (2004 through 2019) is illustrated in Figure 3. The results demonstrate that hydraulic loading rate is clearly a major determinant of wetland nitrate removal performance.

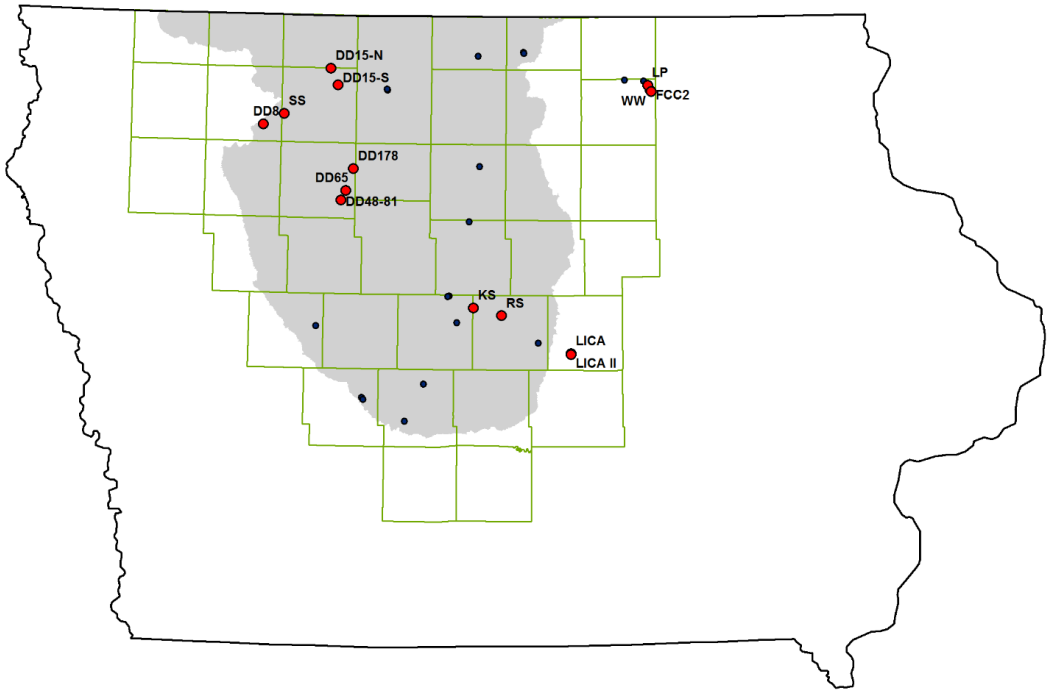

Figure 1. Wetlands monitored in 2020 (red circles, labeled) and additional wetlands monitored in prior years (blue dots). The gray shaded area represents the Des Moines Lobe in Iowa and counties approved for CREP wetlands are shown with green outline.

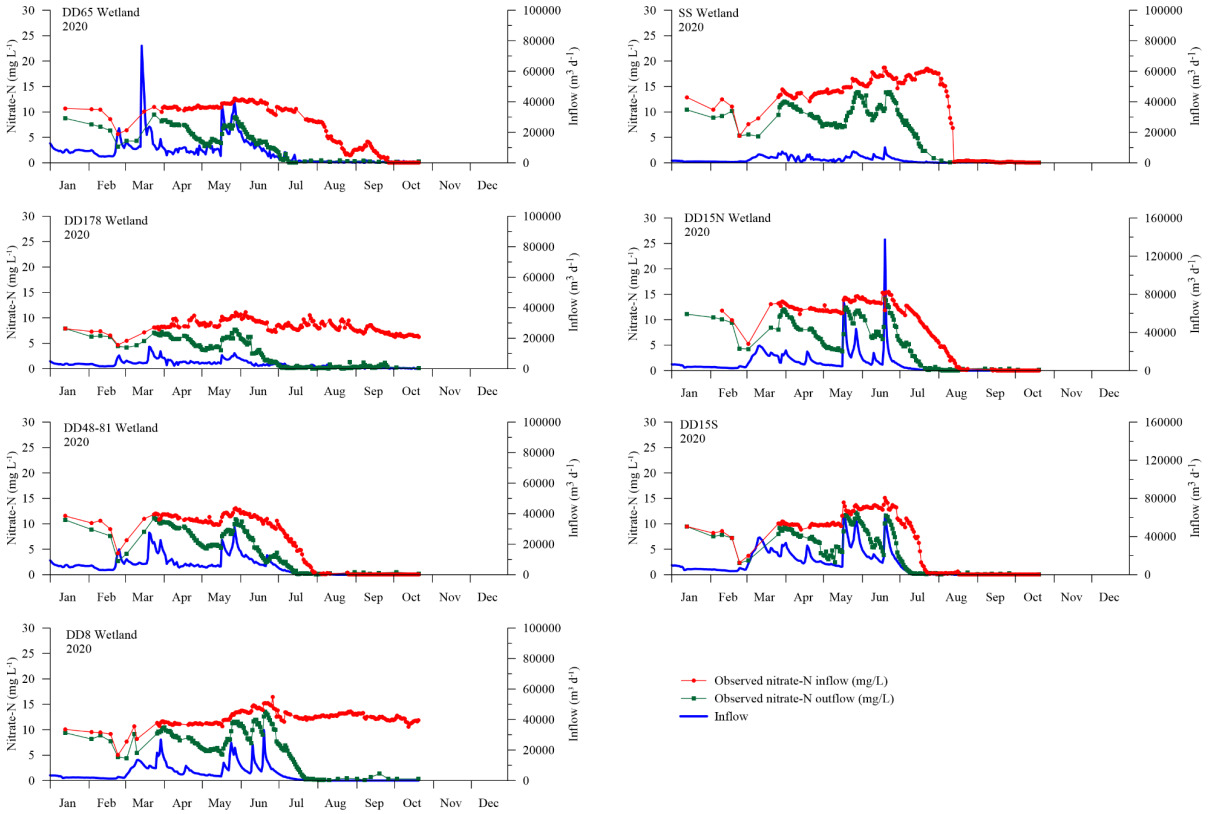

Figure 2. Measured nitrate concentrations and flows for northwest Iowa wetlands monitored during 2020.

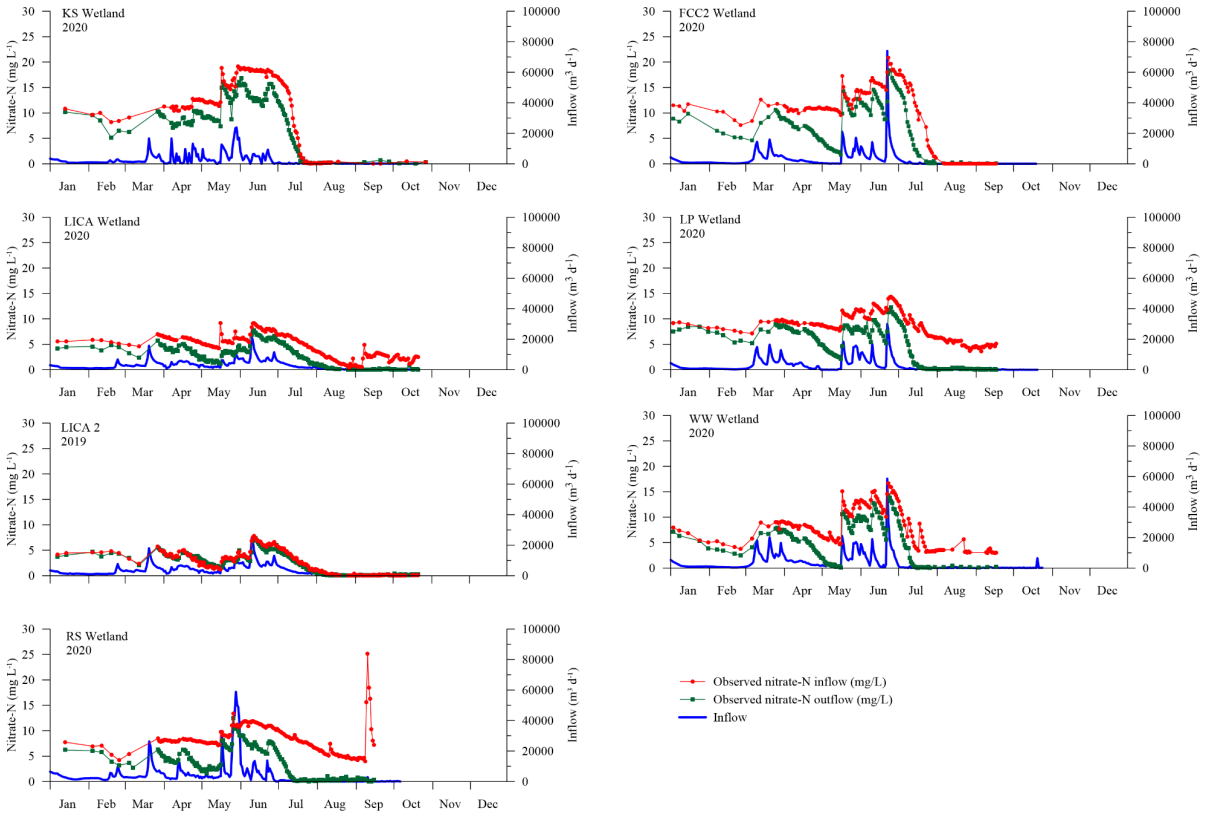

Figure 2 (Continued). Measured nitrate concentrations and flows for central and northeast Iowa wetlands monitored during 2020.

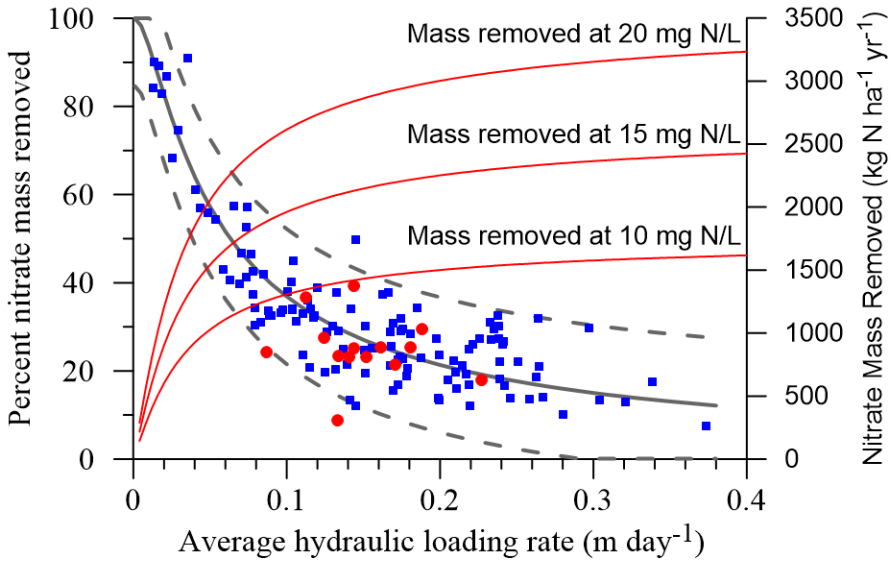

Figure 3. Percent nitrate removal performance for 2020 (red circles) and wetlands monitored during prior years (2004-2019, blue squares). The solid black line is the expected percent loss and the dashed gray lines indicate the range expected to contain 95% of similar wetlands in Iowa on the basis of the 2004 to 2015 monitored wetlands. The solid red lines (right y-axis) show the expected nitrate mass removal per ha of wetland for FWA concentrations of 10, 15, and 20 mg N L^{-1}.

Difficulties: The time it takes from initial landowner contact through project completion. A process flow chart is developed for ensuring all the action items and deliverables are achieved. Some action items can been worked on simultaneously such as requesting an NRCS certified wetland determination and completing an archeology investigation. However, some action items can only be completed sequentially such as a preliminary design is completed and approved by the landowner before an archeology investigation is completed and a legal survey is contracted. A final design is required before a Section 404 Permit and other permits can be approved.

Goal 2: Reduce sediment entering surface waters in the Lake Panorama Watershed by 80,000 tons per year following filterstrip and riparian buffer establishment. This has the potential of significantly reducing total sediment accumulation into Lake Panorama.

Progress: Progress toward meeting Goal 2 has been very limited. While some landowners have installed grade control structures or filter strips using state cost-share programs in recent years, no landowners have signed up for the available CREP incentives in the watershed.

Difficulties: Landowner interest in CREP within the Lake Panorama watershed particularly for buffers has been nonexistent despite persistent outreach efforts. It is highly likely that these acres will not be subscribed under this agreement, although we will continue to make landowners aware of the program.

After initiating the CREP Agreement, it was determined that landowners would be required to sign easements for the CREP filterstrips and riparian buffers. This also required a plat survey being completed of the buffer area and recording of the easement on the property abstract. These conditions limit interest in this component of the program.

Goal 3: Reduce or maintain soil erosion on the agricultural land enrolled in the CREP to below the soil loss tolerance level for the soils present (2-5 tons per acre).

Progress: The wetland upland buffer seeding is required to be a CP-23 consisting of perennial native warm season grasses and native forbs. This perennial vegetation protects the soil and keeps soil erosion to a minimum. Soil erosion estimates made for these sites document that annual soil erosion rates are less than one ton per acre per year. Additionally, CREP sites are located in landscape positions dominated by low-gradient slopes. If the upland buffer area includes steeper slopes, these areas are generally small acreages and are also protected by the perennial vegetation and plant residues.

Difficulties: Native species generally are slow to establish and do not compete with other plants well in the seedling stage. The slower plant development and plant coverage of the soil could leave the site vulnerable to soil erosion. However, this vulnerable period is relatively short when compared to the perennial-ness of the permanent seeding. This period of soil exposure before the native seeding is established could be mitigated by the use of mulch and cover crops.

Goal 4: Demonstrate a variety of available wetlands technologies and their value for improving water quality.

Progress: Two types of wetland development technologies are being researched, evaluated and being demonstrated currently. The first technique is "Tile Zone Wetlands". The second technique is wetland development on floodplain landscapes.

"Tile Zone Wetlands" are being researched and implemented in field trials. This type of wetland is suited to pothole, low-gradient landscapes. To create a wetland using this design, existing tile lines are intercepted by a newly installed "interceptor" tile line which re-directs drainage water to surface outlet to a pothole lower in the landscape. After this drainage water is treated by flowing though the wetland, it is collected and re-deposited into the same tile line that it originated from further downslope in the landscape, or to another suitable outlet.

This type of wetland design has several advantages. First, the amount of surface water entering the wetland is greatly reduced since primarily only tile drainage water is directed to the wetland. Secondly, since the wetland is a naturally-formed pothole, the earthwork cost for a structure and berm are eliminated or minimal. Third, the easement area necessary for this type of wetland could be much smaller since the volume of water treated and size of the wetland would also be smaller. Researchers at Iowa State University are actively identifying sites which may work for this type of design.

One tile zone wetland meeting CREP was completed in 2020. Additional sites are being designed and implemented through the Water Quality Initiative. More sites that meet CREP criteria are in the design stage and scheduled for implementation in 2021.

The second wetland development technique is floodplain wetlands. In this technique, areas on existing floodplains are constructed with berms or excavation to create a depression or holding cell for tile to be directed into the wetland or have surface drainageways with tile-dominated baseflow re-directed into the wetland. This technique targets tile-drainage water like tile zone wetlands and may have the wetland inlet designed to allow the baseflow into the wetland while bypassing the high-volume surface runoff from storm events. A floodplain wetland meeting CREP criteria was constructed in 2020. Another floodplain site meeting CREP criteria is planned for construction in 2021.

Difficulties: Like other wetland types, landowners are concerned with maintaining drainage rights for themselves and their neighbors. Satisfying landowners that drainage rights are being maintained can be challenging, especially for tile zone sites, because the landowners can't "see" that the existing tile is flowing unimpeded. These sites may involve multiple landowners beyond the footprint of the planned wetland due to construction easements and other legal matters. Regulatory issues such as stream mitigation, floodplain permits, local floodplain ordinances and drainage district authority may add complexity to these types of wetland technologies.

Field Reviews

Field Reviews:

Boo822613A	6/26/2020	Review of crop damage due to construction
	9/17/2020	Final construction walk through
Boo842518D	7/14/2020	Checked condition of structure after complaint from neighbor received.
BV913529C	5/7/2020	Landowner meeting
BV933512D	4/17/2020	Inventory and evaluation
Car843325A	7/2/2020	Final post-construction walk-through
Cer952105A	10/28/2020	Final walk-thru prior to seeding
Cer972025CD	5/28/2020	Inventory and evaluation of structure and seeding
Cla943506C	4/17/2020	Inventory and evaluation
Cla963720D	6/29/2020	Inventory and evaluation
Cla973604DB	6/29/2020	Inventory and evaluation
Dal802806D	6/30/2020	Look at tile found during construction
	7/30/2020	Final walk-thru prior to seeding
Dic983729C	6/29/2020	Inventory and evaluation
Dic983735CD	6/29/2020	Inventory and evaluation
Emm983229C	4/16/2020	Inventory and evaluation
Emm983322A	4/16/2020	Inventory and evaluation
Emm983327B	4/16/2020	Inventory and evaluation
Emm983330B	7/27/2020	Inventory and evaluation
Flo941604D	6/8/2020	Final construction checkout
Flo961502B	7/8/2020	Inventory and evaluation
Flo961502D	7/8/2020	Inventory and evaluation
Flo961527B	7/24/2020	Inventory and evaluation
Flo961529D	8/20/2020	Inventory and evaluation
Flo961810A	5/8/2020	Neighboring property damage investigation
Flo961822D	11/14/2019	Tile investigation and wetland pool management
	5/28/2020	Inventory and evaluation.
Flo971521B	7/8/2020	Inventory and evaluation
Flo971736C	8/20/2020	Sink hole investigation
Gut813028D	11/16/2020	Landowner meeting
Har862018C	8/4/2020	Final construction walk through
Har872234B	9/24/2020	Final construction walk through
Har882204C	9/24/2020	Final construction walk through
Kos952829C	5/11/2020	Inventory and evaluation
Kos953011B	5/11/2020	Inventory and evaluation
Kos962802C	9/7/2020	Inventory and evaluation
Kos962903D	5/11/2020	Inventory and evaluation
Pal953418D	4/14/2020	Inventory and evaluation
Pal973203B	9/7/2020	Inventory and evaluation
Pal973205A	4/16/2020	Inventory and evaluation
Pal973236A	4/14/2020	Inventory and evaluation
Poc903105B	4/27/2020	Inventory and evaluation

Poc913121A	4/27/2020	Inventory and evaluation
	8/12/2020	Observe erosion immediately upstream of sheet pile
	9/16/2020	Observe repair of upstream erosion
Poc923113B	4/27/2020	Inventory and evaluation
Poc933406C	4/17/2020	Inventory and evaluation
Wri932534B	6/15/2020	Site visit for Monarch butterfly survey and inventory and evaluation

Field Review Findings:

Boo822613A Compensated landowner for crop damage and construction approved
Boo842518D No issues identified
BV913529C Updated landowners on construction progress
BV933512D No issues identified
Car843325A Construction complete and approved
Cer843325A Construction complete and approved
Cer972025CD No issues identified
Cla943506C No issues identified
Cla963720D Trash rack missing on drawdown pipe
Cla973604DB No issues identified
Dal802806D Tile outletted into wetland, construction complete and approved
Dic983729C No issues identified
Dic983735CD No issues identified
Emm983229C No issues identified
Emm983322A No issues identified
Emm983327B No issues identified
Emm983330B No issues identified
Flo941604D Construction complete and approved.
Flo961502B No issues identified
Flo961502D No issues identified
Flo961527B Volunteer trees encroaching. Notified landowner to remove them.
Flo961529D No issues identified
Flo961810A In arbitration with neighbor regarding potential property damage
Flo961822D Seeding acceptable. Landowner notified to remove volunteer trees.
Additional state conservation easement area added to accommodate landowner concerns.
Flo971521B Volunteer trees encroaching. Notified landowner to remove them.
Flo971736C Sink hole developed in pool area due to shallow bedrock and will not retain water.
Similar events have been repaired several times in the past.
Gut813028D Vegetation well established. Volunteer trees have been removed.
Har862018C Construction work complete and approved. Additional tile needed to maintain drainage to upstream landowners.
Har872234B Work approved and seeding will be completed spring 2021
Har882204C Wok completed and need to evaluate tile outlet west of site.
Kos952829C Volunteer trees near weir. Notified landowner to remove.
Kos953011B No issues identified
Kos962802C No issues identified
Kos962903D No issues identified

Pal953418D No issues identified. Volunteer trees have been cut.
Pal973203B No issues identified
Pal973205A No issues identified
Pal973236A No issues identified
Poc903105B No issues identified
Poc913121A Erosion upstream of sheet pile repaired with concrete placement.
Poc923113B Volunteer cedar trees growing on easement
Poc933406C No issues identified
Wri932534B Seeding is responding well to management. Draw down structure was damaged and is in process of being replaced.

Were Findings Reported to FSA? No

Outreach Activities

Outreach Activity 1: September 3, 2020--Har872234B—Field day. USDA Secretary Perdue, Iowa Senators, Iowa Governor Reynolds, Iowa Secretary of Agriculture Naig and other federal, state and local dignitaries and invited guests participated totally approximately 200. State wide media present. Newly-constructed CREP nutrient removal wetland was viewed and discussed how it improved water quality.

Outreach Activity 2: June 23, 2020—Flo941603B—newspaper feature article. Mason City Globe-Gazette. Newspaper reporter interviewed the landowner of the newly-constructed CREP wetland, and Jake Hansen, Water Resources Bureau Chief. The reporter also took pictures and a video of water flowing over the weir of the wetland structure. The article detailed why the landowner got involved with the program and the benefits he felt the wetland would provide.

Success Stories

In 2020, CREP site ID# Wri932534B was surveyed for pollinator habitat as part of the Monarch Joint Venture project. The site was surveyed June 16, 2020 using the Integrated Monarch Monitoring Protocol. The survey revealed 161.9 milkweed stems per acre. Overall milkweed frequency was calculated to be 3%. Milkweed plants were searched for Monarch larvae. Four larvae were found and calculated to be 0.035 Monarch eggs and larvae per plant searched. Collaboration between the CREP and the Monarch Joint Venture project programs documented the bio-diversity that CREP wetland sites add to the agricultural landscape and provide multiple benefits. These additional benefits, when properly documented, can garner additional support of other groups and the public for the CREP.

Challenges

CREP wetlands are often sited on drainageways which may fall under the regulatory authority of the Army Corps of Engineers (ACOE). This report year, several sites were developed through the final design stage and submitted, as required, for a Section 404 Clean Water Act permit through the ACOE. The ACOE determined these particular sites were perennial streams, rather than intermittent streams. This determination requires stream mitigation to be obtained by IDALS before a Section 404 permit would be issued. This perennial stream designation costs additional program funds and additional time to implement proposed CREP nutrient removal wetlands.

Future Actions

A process is developed to have the ACOE staff informally review potential CREP sites earlier in the wetland development process to check for regulatory requirements. This earlier informal review of sites will, a.) Allow CREP staff to prepare for streambank mitigation requirements if the decision is made to continue developing the site for CREP, or b.) Discontinue development of the site and look for an alternate site that might not require streambank mitigation. This action will minimize CREP program costs and staff time on sites that may prove too costly to meet regulatory requirements. This informal process may also reduce the time invested by ACOE staff relative to their formal site review.

Date Completed: 12/31/2020

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