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"Optimizing the Conservation Reserve Program for Wildlife and Other Values"

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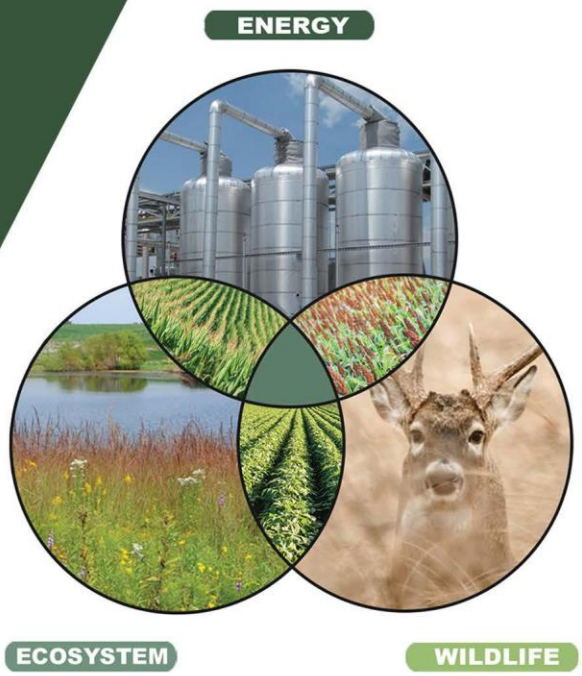

White paper: Optimizing the Conservation Reserve Program for Wildlife and Other Values

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1. Introduction

The Conservation Reserve Program (CRP) is a land conservation program administered by the Farm Service Agency (FSA) that was created by Congress in the 1985 Farm Bill to financially incentivize farmers and landowners to take highly erodible land out of crop production over a 10-15 year period and replace them with perennial vegetation. Although the program was originally designed to reduce soil erosion and support farm income, the program quickly demonstrated value for wildlife and fisheries as well as farmers (Field, 2022). At present, the CRP program provides important additional ecosystem services by improving soil health, reducing soil erosion and flood risk, enhancing wildlife and water quality, and increasing resilience of agricultural operations to seasonal climatic variability. The program offers several enrollment options, including a) General CRP, b) Grassland CRP, and c) Continuous CRP, which in turn includes sub-options like CLEAR30, State Acres for Wildlife Enhancement (SAFE), Conservation Reserve Enhancement Program (CREP), and Farmable Wetlands Program (USDA-FSA, 2024). According to official data, in 2023 US farmers enrolled 927,000 acres through the General CRP Signup, more than 2.3 million acres through Grassland CRP Signup, and 694,000 acres through the Continuous CRP Signup, bringing the current total of acres involved in CRP enrollments to 24.8 million (USDA-FSA, 2024).

In April 2021, the Biden Administration announced that it was broadening the purposes of CRP to include a more targeted focus in mitigating climate change by rewarding practices that increase carbon sequestration and reduce greenhouse gas (GHG) emissions. Additional steps to improve the program included higher payment rates, new incentives, and improvements to make the CREP program (Conservation Reserve Enhancement Program, a specific component of CRP that targets specific state, regional or nationally significant conservation concerns) more flexible and accessible among Tribal Nations (USDA-FSA, 2021). Although recent changes continued to increase the number of farmers enrolled in the program in the last few years, reduced rental rates, complicated application processes, and a lack of cost share flexibility has caused some landowners to avoid applying (Field, 2022). Moreover, the program is highly competitive, which avoided re-enrollment to more than half of the farmers who participated in previous years. Finally, while most fields (58%) remained out of agricultural production under perennial plantings after CRP program expiration in a recent study across six states, highest retention rates occurred in less productive lands. Conversely, the most productive lands more often returned to agricultural production following contract expiration (Sullins et al., 2021). As work on the 2024 Farm Bill intensifies, Congress has an exciting opportunity to make important improvements to the program to make CRP work better for America's wildlife and landowners, while revitalizing rural communities and improving America's energy independence.

2. CRP program: reach, scope, and challenges

The CRP benefits to wildlife are species-specific and location-specific, depending on factors such as vegetation structure, composition, size and shape of CRP contracts, and landscape context. CRP in the Midwest contributes to the conservation of many, but not all, grassland wildlife species (Farrand and Ryan, 2005). Traditionally, CRP has been managed primarily to benefit upland game birds, like Ring-necked Pheasants and Northern Bobwhite Quail, and other specialized grassland birds. In a recent study, Pavlacky Jr. et al. (2021) found that privately owned lands in Colorado, Kansas, Oklahoma, New Mexico, and Texas enrolled in CRP programs helped conserve breeding habitat for 4.5 million birds while also increasing population sizes of 16 species. Remarkably, the program helped conserve the most vulnerable and specialized grassland obligate species including Cassin's Sparrow, Grasshopper Sparrow, Eastern

Meadowlark, and Lark Bunting. However, species with affinity for highly modified agroecosystems, including Horned Lark, Red-winged Blackbird, Brown-headed Cowbird, Dickcissel, and Killdeer, had negative populations changes in this study, indicating that additional conservation practices are needed for species requiring heterogeneity in bare-ground and short-grass conditions (Pavlacky Jr. et al., 2021). While these mixed results pose doubts about the effectiveness of the program, we believe that inclusion of two minor policy changes will radically improve the reach and outcomes of CRP to benefit additional grassland bird species, neotropical migratory birds, monarch butterflies, other pollinators, and beneficial insects that increase agricultural productivity (Igl et al., 2023). Specifically, the two changes we propose are 1) allowing for limited harvesting during primary nesting and brood rearing season to mimic natural disturbance regimes, and 2) eliminating or capping the payment reduction penalty for managed haying and grazing. Changes to CRP to allow for harvesting of biomass for renewable energy would increase plant biodiversity, improving habitat for these other species, while providing additional revenue to American landowners, much needed economic development opportunities for rural communities, and improving America's energy independence.

3. The impacts of disturbance regimes in wildlife

3.1. Considerations across the US

The native grasses, forbs, sedges, and other plant species that are planted in CRP co-evolved with large mammals like bison, elk, and deer that regularly and intermittently grazed these plants, as well as naturally occurring and anthropogenic fire. These periodic disturbances recycle soil nutrients, facilitate seed dispersal and germination, and limit trees and shrubs encroachment (Dekeyser et al., 2013). Disturbance from grazing and fire promotes greater plant growth and productivity from native plant species that depend on such disturbances, helping maintain greater species diversity and overall plant productivity over time (Burkle et al., 2015; Haan and Landis, 2019). Similar to natural disturbances, haying or harvesting of these plant species is an important anthropogenic form of disturbance, especially where grazing or prescribed burning of CRP may not be practical. Research indicates that responsibly managed haying and grazing benefits wildlife, improves habitat through diversified covers, prevents establishment of less desirable plant species, including the encroachment of woody species and improves existing stands of CRP. Haying and grazing can be implemented to maintain a mosaic of undisturbed CRP grasslands, managed hayed and grazed grasslands currently in CRP, and post-CRP hayed and grazed grasslands. This would ensure some undisturbed nesting cover in the landscape to benefit some bird species as well as some disturbed grasslands that may benefit other species (Pavlacky Jr. et al., 2021; Igl et al., 2023). Such a mosaic of large and small, disturbed and undisturbed patches of CRP and post-CRP habitat could be managed to benefit both area-sensitive (typically rarer) species of grassland birds and edge-associated (typically more common) grassland bird species. Birds that utilize early successional grasslands such as Northern Bobwhite Quail benefit from regular, periodic disturbances (Riffell et al., 2010).

Targeted use of CRP can also provide critical habitat for species other than birds. For example, the SAFE program has been utilized to expand habitat for the US federally endangered Karner blue butterfly. Research indicates that while native grasslands offer more native blooming species than CRP SAFE habitat, and higher butterfly populations, species richness between native habitat and CRP SAFE is comparable, and CRP SAFE acres provide effective surrogate habitat for the Karner blue butterfly and many other grassland species (Grixti et al., 2009).

At present, many landowners with CRP contracts provide regular disturbances through managed haying or grazing that mimic natural disturbance regimes by haying or grazing one-third of the land under CRP contracts each year, leaving intact the other two-thirds for wildlife habitat. However, landowners are currently disincentivized from managed haying and grazing since the FSA requires a 25% payment reduction penalty for this practice, based on Farm Bill requirements.

Landowners with CRP contracts should be incentivized to mimic natural disturbance regimes that promote better plant and wildlife productivity. Biomimicry of natural disturbance regimes and heterogeneity of harvest dates and stubble heights will fit the specific edaphoclimatic and biodiversity conditions of different agroecosystems in each state, which will result in greatest benefits for local plant and wildlife species, leading to greater biodiversity outcomes (Hanberry et al., 2021). CRP decision making should occur at state and local levels in close consultation with the U.S. Fish and Wildlife Service, state departments of natural resources, land grant universities, and other state and local wildlife managers to determine the most appropriate management practices for local wildlife. In doing so, CRP could be better managed as part of more targeted, regional conservation plans while advancing the water, soil, and wildlife conservation objectives of each state's respective State Wildlife Action Plan and improving conservation for priority wildlife species.

3.2. Considerations for Iowa and Missouri (Geographic Scope for Horizon II Project)

Iowa and Missouri are part of the Central Tallgrass Prairie biome, characterized with above average precipitation, and productive soils and native plant communities. In these and similar states, CRP contract holders could be incentivized to mimic natural disturbance regimes through managed haying and grazing by eliminating or capping the 25% payment reduction penalty currently in place. This would likely lead to improved ecological outcomes for species such as the monarch butterfly, a federal candidate species for the Threatened and Endangered Species List under the U.S. Endangered Species Act, or the US federally endangered rusty patched bumblebee. These species and other beneficial insects and pollinators rely on blooming forbs or flowers for forage and food. An estimated 40% of all pollinator species have declined globally during the past several decades due to habitat destruction and degradation, pesticides, disease, and climate change (Grixti et al., 2009).

In the Midwest, Monarch butterflies have declined due to loss of milkweeds in corn and soybean fields due to herbicide applications. On average, milkweed stems in agricultural fields host 3.9 times more monarch eggs than milkweed stems in non-agricultural habitats. Milkweed stems declined nearly 40% in the Midwest between 1999-2017, but capacity to support monarchs declined by an estimated 71% during the same period due to the significance of milkweed for monarchs in agricultural habitats (Pleasants, 2016). Common milkweed in Iowa crop fields declined even more, by about 90% between 1999 and 2009, due to an increase in the use of the dual technology glyphosate + genetically modified genotypes (Hartzler, 2010). An estimated increase of 1.3–1.6 billion new milkweed stems with a diversity of forbs in the Upper Midwest is needed to sustain the eastern North American monarch population. This goal can only be reached with substantial use of land in agricultural landscapes, including CRP (Grant et al., 2022). Monarchs are native to North America, with populations east and west of the Rocky Mountains. Eastern monarchs migrate from Canada and the U.S. in the fall to high elevation fir forests in Mexico (Grant et al., 2022). Stable isotope analyses indicate that 38-56% of overwintering monarchs originate in the North Central region of the United States (Wassenaar et al., 1998).

Recent research indicates that breeding adults in the Eastern population of monarchs in the Upper Midwest should be resilient to pesticide use and habitat fragmentation, so new monarch habitat should be effective even if it is near row crops treated with pesticides (Grant et al., 2022). This would suggest that CRP pollinator and prairie plantings with milkweed species could also be effective habitats for monarchs in modern agroecosystems.

These recent population declines provide an opportunity to reexamine CRP policies through the lens of rapidly declining species, to explore if CRP might be managed more effectively to increase milkweed, monarchs, other pollinator species of conservation concern, and grassland birds. One CRP policy that warrants closer scrutiny is the prohibition of disturbance during the primary nesting season, which is intended to benefit grassland birds such as Ring-necked Pheasants and Northern Bobwhite Quail. In Iowa and Missouri, grazing or haying CRP acres immediately after the end of the primary nesting season (August 1st in Iowa; July 15th in Missouri) may be advantageous for upland game birds but will likely not support monarch butterflies migrating through Missouri and Iowa in early fall, enroute to their winter habitat in Morelia, Mexico (Haan and Landis, 2019).

Overwintering adult monarchs in Mexico break reproductive diapause (a temporary non-reproductive state) in the late winter and spring, and migrate to Texas and Oklahoma, where they lay eggs and expire. Adults from this new generation migrate in late spring to the North Central and Northeast regions of the US and southern Canada. There are two to four nonmigratory breeding generations of monarchs in the summer. Adults that emerge from their larval state in mid to late August and September in Iowa, Missouri, and other states enter reproductive diapause and migrate to Mexico (Grant et al., 2022). Grazing and haying before mid-summer stimulates milkweed regrowth, increases egg-laying, and reduces the insect predators that feed on Monarch larvae (Knight et al., 2019), and is likely to benefit the reproductive diapause generation of monarchs, as compared to grazing and haying in August and September. Earlier harvesting of a limited amount of CRP acres, such as along the Interstate-35 Monarch Butterfly Corridor in Iowa, Missouri, and other states, could provide additional habitat and forage to support monarchs' migration (Knight et al., 2019), as compared to managed haying immediately after the primary nesting season. Conversely, more arid states with poorer soils and different climates and natural disturbances, such as Arizona and New Mexico, are less likely to support as frequent grazing and haying management practices and disturbances. These states and others may seek to incentivize different ecologically appropriate practices to maximize ecosystem services from CRP acres.

4. Horizon II Project

Iowa and Missouri are home to the Horizon II Partnership for Climate Smart Commodities project. Horizon II is part of Roeslein Alternative Energy founder Rudi Roeslein' s ambitious vision to restore 30 million acres of reconstructed prairies and drive adoption of an additional 100 million acres of cover crops in the Mississippi River Basin by expanding anerobic digesters that produce clean, renewable natural gas from manure and biomass generated from prairie strips and cover crops. Roeslein Alternative Energy seeks to optimize wildlife habitat, ecosystem services, and renewable energy through the Horizon II project, which will provide farmers with market prices for harvested biomass. Combining these market payments for harvested prairie biomass with CRP rental payments would expand landowner participation and maximize environmental benefits within the CRP program, substantially expanding habitat beyond the CRP program, and providing a win-win-win for biodiversity, renewable energy, and farm profitability.

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Roeslein Alternative Energy is interested in supporting NRCS and FSA in a CRP pilot project in Iowa and Missouri, in partnership with the U.S. Fish and Wildlife Service, Iowa Department of Natural Resources, and Missouri Department of Conservation, that would research, measure, and document potential wildlife impacts for harvesting CRP through managed haying and grazing in these states. The vast majority of CRP would be harvested outside of the primary nesting and brood rearing season dates in the proposed pilot, but there would be some harvesting within those dates to evaluate potential impacts for taxa beyond upland game birds, including other grassland birds, pollinators, beneficial insects, and monarch butterflies. Iowa State University could be the lead evaluator for wildlife outcomes. With sufficient funding, the pilot could also evaluate additional outcomes such as soil erosion, water quality, and carbon sequestration.

5. Conclusion: Congress has an opportunity in the 2024 Farm Bill to manage CRP more effectively for multiple plant, animal, and insect species of conservation concern, in addition to upland game birds. An important strategy to accomplish that is biomimicry of natural disturbance regimes. Landowners should be incentivized rather than penalized for managed haying and grazing that creates the disturbances necessary for more productive wildlife habitat. Congress should consider capping the payment reduction penalty at $25/acre or eliminating it altogether if FSA certifies (or landowners self-certify) that the biomass harvested from CRP will be used to produce renewable energy. In addition, Congress should direct USDA to reexamine how scientifically justified, limited, restricted haying and grazing disturbances during the primary nesting season might benefit targeted species of conservation concern, while leveraging CRP as an important component of broader, targeted, regional conservation programs. We strongly believe that these modest proposed policy changes can help to make CRP work better for America's farmers, landowners, and wildlife, while providing much needed economic development opportunities for rural communities and improving America's energy independence.

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