

Landowners and the Conservation Reserve Program: Understanding motivations and needs to cultivate participation, retention, and ongoing stewardship behavior

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Photo by Ally Steinmetz



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Executive Summary

Introduction

The Conservation Reserve Program (CRP) is the largest private lands conservation program in the United States, covering almost 22.5 million acres across the country as of October 2018. Although CRP has been in place for over 30 years, the enrollment capacity, soil rental rates, and requirements of the program have changed with each federal farm bill. Demand for participation in CRP among landowners has also fluctuated over time with shifting commodity prices. In 2016, just 22% of the acres offered for enrollment in the general sign-up were accepted into CRP (Johnson, 2017). The decrease in CRP coverage over the past decade, combined with the vulnerability of grasslands to conversion to agricultural or developed uses, has raised concerns about the ephemeral nature of financial incentive programs and the likely loss of conservation benefits when financial incentives to continue these land management practices end (Dayer et al., 2018). **Enrollment in CRP, which fields are enrolled, and whether or not CRP land management practices are continued after contracts expire are social phenomena, contingent upon choices made by landowners.** Thus, in order to develop effective programs that deliver enduring conservation benefits, it is important to understand landowner decision-making, specifically, what promotes continued conservation behaviors – or *persistence* – after financial incentives end (Dayer et al., 2018).

This study explored the persistence of CRP grasslands, as opposed to reversion to agricultural production, on fields currently or previously enrolled in CRP in the western Great Plains. This region contains counties that represent a spectrum of CRP enrollment; enrollment is very high in some counties and very low in others. The western Great Plains also provides an important context in which to understand CRP and conservation persistence due to the large number of CRP contracts nearing expiration in the region and the importance of CRP in the conservation of grassland bird habitat in the area. We studied the persistence intentions of decision-makers for fields currently enrolled in the program, as well as reported persistence among decision-makers for expired fields. Our study focused on 34 counties situated over the Ogallala Aquifer in Kansas, New Mexico, Colorado, Oklahoma, and Texas.

In order to understand what would help catalyze the persistence of CRP grasslands after contracts end, we focused on four research questions:

- RQ1.** Why do landowners participate in CRP?
- RQ2.** To what extent are CRP landowners interested in and able to re-enroll in the program?
- RQ3.** To what extent do landowners continue, or intend to continue, to keep their field in grass once their CRP contracts expire?
- RQ4.** If landowners continue, or intend to continue, to keep their field in grass after their CRP contracts expire, what factors predict this behavior?

Methods

This mixed-methods social science study employed both qualitative and quantitative methods for data collection and analysis, capitalizing on the strengths of both approaches. In the summer of 2017, project personnel performed **interviews** and **participant observation** with landowners in southwestern Kansas and southeastern Colorado with varying histories with CRP; overall, 27 landowners were interviewed, and 18 landowners were observed on their properties. We also held

three **focus groups** with a total of 27 landowners in locations across the study region. These interactions provided in-depth insight into landowner perceptions of CRP and motivations for participating in the program and allowed landowners to describe the program and their experiences in their own words.

Informed by this qualitative data, we developed **two mail surveys**, one for landowners responsible for fields currently enrolled in CRP (hereafter “current participants”) and another for landowners who owned fields that were previously in CRP but whose contracts expired between 2011 and 2017 (hereafter “past participants”). These surveys consisted primarily of closed-ended questions that asked respondents to reflect on their experiences with CRP and their post-CRP land management plans or actions in relation to a particular field. We also asked survey respondents about their perspectives on the relationship between agriculture and the environment and their interest in potential changes to CRP.

Analysis of these surveys allowed us to explore the resonance of perspectives from the study’s qualitative phase among a broader sample of landowners in the Playa Lakes region. We evaluated basic frequencies for responses to all closed-ended survey questions. For survey items related to RQ1 and RQ2, we also performed t-tests to identify significant differences between response items, and for RQ3, we used the likelihood ratio Chi-square test to describe patterns in persistence over time. To identify factors related to intended and actual persistence under RQ4, we used point biserial correlations (r_{pb}) which allowed us to measure the strength and direction of relationships between a dichotomous variable (persistence vs. reversion) and a variety of continuous variables.

Results

We received a total of **700 completed surveys** (overall response rate = 24.2%); 363 surveys were completed by landowners with fields currently enrolled in CRP (response rate = 32.3%) and 337 were completed by landowners with expired CRP fields (response rate = 19.1%). The majority of respondents were either fully retired (37%) or full-time agricultural producers (28%), and our sample was predominantly male (72%). Almost 57% of respondents own or operate another CRP field, in addition to the current or expired CRP field that was referenced in the survey they received. Landowner age, tenure in farming, and operation size varied widely. The average age of respondents in our sample was 71 years old, but ages ranged from 30 to 101. Respondents reported being involved in farming or ranching for an average of 38 years, and on average, operated under 2,000 acres (although some were responsible for up to 90,000 acres).

RQ1: Understanding CRP participation

Both our qualitative and quantitative data collection aimed to understand why landowners enroll (and re-enroll) in CRP and the perceived benefits of program participation. Interests in soil conservation, financial stability, and improving wildlife habitat were each important factors in CRP enrollment for over 75% of the current CRP participants in our survey sample. The landowners we surveyed and interacted with through our qualitative research most often focused on the importance of **preventing soil erosion** and saw CRP as a mechanism for retiring marginal lands and restoring environmental stability, both on individual parcels and across the regional landscape. CRP participation is also heavily motivated by an interest in **financial stability**, and CRP rental payments serve a variety of functions. For some landowners, these payments are essential to keep their operations afloat, while for others, the additional income provides leverage for growing their operations; and while some landowners enroll in CRP in order to keep farming in the family, others use the program as a means to retire from farming altogether. Our qualitative data also adds

important nuance to landowner interest in **improving wildlife habitat**; while many landowners in the western Great Plains want to increase the abundance of vegetative cover and wildlife on their property, our focus group and interview participants were primarily concerned with improving habitat for game species. Additionally, to many landowners these benefits are often seen as a spillover effect of stabilizing the soil. Many of the landowners we interacted with maintain a cattle-centric view of plant varieties and management; consequently, they consider many of the native forb species mandated by CRP to be “weeds.”

We also explored perceived disadvantages of CRP enrollment and the factors that motivate landowners to remove a field from the program. In our survey, past CRP participants who did not attempt to re-enroll their parcel in CRP most often reported that their decision was motivated by the **limited profitability** of keeping the field in CRP. This was consistent with what we heard in interviews and focus groups about the ways in which current CRP participants weigh CRP rental payments against current crop and livestock prices and make land management decisions that maximize productivity and profitability. Inconsistencies between CRP rules and landowner needs or knowledge, particularly related to **restrictions on haying or grazing**, were also important to past participants in our survey and were prominent in our discussions with current landowners as well. The landowners we interacted with in interviews and focus groups described many CRP policies as cumbersome, inconsistently enforced, and at odds with the original intent of CRP, local ecology, and their own needs.

RQ2: Understanding re-enrollment in CRP

This study also aimed to understand landowners' interest in re-enrolling and their ability to do so. Current CRP landowners overwhelmingly reported being 'likely' or 'very likely' to re-enroll their field in CRP if they are able to, given the same rental payment. Although **interest in re-enrolling** in CRP was high among current program participants, many of the landowners we interacted with in focus groups and interviews were worried about qualifying for re-enrollment because the acreage cap for CRP had been reduced and competition for program slots had increased. This landowner concern over the ability to renew their CRP contracts for a subsequent term may be warranted. Of the past CRP participants that we surveyed, 52% (n=165) stated that they tried to re-enroll in the program but were not granted new contracts.

Our survey also asked current CRP landowners about their interest in a variety of **potential changes to CRP** that may influence program re-enrollment and management. Among these potential changes, participants most often reported being 'very interested' in an approach that would allow them to increase their chance of re-enrollment by agreeing to a post-CRP easement that permanently excludes agricultural production on the parcel (15%). However, compared to other potential changes, respondents were also most often 'very disinterested' in this kind of contract (20%), indicating strong, but divergent preferences among different groups of landowners. Just over half of respondents were 'very', 'moderately', or 'slightly' interested in agreeing to performing annual field-level environmental monitoring in order to improve their re-enrollment chances and in variable annual payments that reflect changing crop market conditions. Overall, the smallest percentage of landowners (38%) expressed interest in receiving a reduced annual payment instead of having to pay grass cover establishment and maintenance costs. Additionally, the majority of landowners (62%) prefer a non-competitive sign-up at a rate determined by FSA over a competitive sign-up at a rate determined by the landowner.

RQ3: Understanding post-CRP behavior

Given the inability of some CRP landowners to re-enroll in the program after their initial contracts expire(d), we sought to understand what landowners in this situation have done or are likely to do with their CRP land. Over 54% of current CRP participants reported that they would 'likely' or 'very likely' **keep their field in grass**, while 43% reported that they are 'likely' or 'very likely' to convert their CRP field to dryland crops. Almost 40% of current CRP landowners reported that they would be 'likely' or 'very likely' to enroll their lands in **another conservation program**, such as the Conservation Stewardship Program (CSP) or Environmental Quality Incentives Program (EQIP). However, only 5% of the expired fields included in our survey sample had actually been enrolled in these programs 1-7 years after their CRP contracts ended. The majority of past participants (62%) have kept their former CRP field in grass, while 28% have **reverted the field to crops** (almost exclusively dryland crops). Importantly, reversion appears to increase over time. Among past CRP participants who unsuccessfully tried to re-enroll their parcel in the program, the likelihood of persistence differs based on the number of years that the field has been out of CRP (Likelihood Ratio Chi-square = 130.049; $p = .042$). For example, while 80% of fields whose contracts expired in 2015 are still in grass, only 58% of fields whose contracts expired in 2011 are still in grass.

RQ4: Understanding conservation persistence

Dayer et al. (2018) previously identified **five pathways** that may facilitate the persistence of landowners' conservation behaviors following participation in incentive programs. These pathways relate to the influence of landowner cognitions, resources, motivations, habits (adapted for this study to include status quo bias), and social influences on their decisions and behaviors. Our surveys included questions intended to evaluate the relationship between each of these factors and post-CRP land management.

Landowner **cognitions**, including an individual's attitudes and perceptions related to the environment, conservation practices, or the conservation program, shape the perceived feasibility and desirability of persistence (Dayer et al., 2018). All landowners, regardless of post-CRP behavior, reported having positive experiences with CRP and affiliated personnel, primarily including USDA FSA and NRCS staff. Among current CRP participants, being likely to persist with the maintenance of grasslands after participation in CRP ends is significantly and positively associated with overall positive experiences with the program ($r_{pb} = 0.136$) and affiliated staff ($r_{pb} = 0.135$). For these landowners, persistence is also significantly related to a belief that farming and environmental protection are tightly linked ($r_{pb} = 0.202$). On the other hand, persistence of grasslands on past CRP fields is significantly, but negatively associated with agreement with three belief statements that express the importance of agriculture over environmental protection ($r_{pb} = -0.146$, -0.135 , and -0.148). Compared to past participants who have reverted their field to crops, those who persisted in grass less often reported agreement with these business orientation attitudes.

The physical and financial **resources** available to landowners, including the equipment needed to keep the land in grass or convert it to crops; regional weather; access to water; the soil fertility and physical features of the field; and the availability of conservation technical assistance, are collectively and significantly related to persistence among past CRP participants ($r_{pb} = 0.193$). Past CRP landowners who persisted with grass after leaving the program most often reported that their decisions were driven by physical, landscape-level factors, especially weather patterns and water access. The relationship between resources and persistence was not significant for current participants; however, our interactions with current landowners provided insight into the importance of the physical characteristics of individual parcels in post-CRP behavior. The

landowners we talked to explained how reversion to crops is hardly an option on highly erodible, marginal land and often the only option on land without access to water for irrigation or cattle.

The **motivations** that underlie land management decisions may influence the likelihood of persistence after CRP (Dayer et al., 2018). For both past and current CRP participants, persistence in grass after the expiration of a CRP contract is positively and significantly correlated with a variety of motivations, including the level of importance landowners attribute to improving forage quality ($r_{pb} = 0.376$ and 0.221 , respectively), preventing soil erosion ($r_{pb} = 0.319$ and 0.183), improving water quality and/or availability ($r_{pb} = 0.138$ and 0.164), improving wildlife habitat for both huntable ($r_{pb} = 0.240$ and 0.190) and non-huntable species ($r_{pb} = 0.291$ and 0.238), increasing field beauty ($r_{pb} = 0.268$ and 0.120), and increasing grazing land ($r_{pb} = 0.432$ and 0.233). Participants who are likely to persist or have persisted with grasslands were most often motivated to enroll in CRP for these reasons. For past participants only, persistence is also significantly, but negatively associated with the desire to maximize profits ($r_{pb} = -0.261$). Among current CRP participants, being likely to persist with grass is significantly and positively related to the importance of retiring from farming in a landowner's post-CRP land management decisions ($r_{pb} = 0.113$).

The **status quo bias**, which refers to a preference for behaviors that have already been chosen and require little or no change, has been suggested as a factor in landowner behavior (e.g. Telesetsky, 2017). Our qualitative and quantitative data indicate that the perceived ease and desirability of maintaining the status quo of a CRP field (i.e. grass cover) play important roles in the persistence of grass after CRP contracts end. Among current CRP participants, the belief that it would be easiest to continue to maintain grass on the parcel and wanting to do so were both significantly associated with being likely to persist in grass when the financial incentive to do so ends ($r_{pb} = 0.267$ and 0.448 , respectively).

Social influences, including broad cultural norms and familial expectations, are known to be important drivers of conservation behaviors (e.g. Kuhfuss et al., 2015). For both past and current CRP participants, persistence in the maintenance of grass is significantly and positively related to a landowner's perception that it is common in their area to maintain grass on expired CRP fields ($r_{pb} = 0.205$ and 0.178 , respectively).

Discussion

CRP enrollment and post-CRP land management are **multi-dimensional decisions**, rooted in the financial, familial, and biophysical conditions that characterize a landowner's operation. In a context in which land is an asset used to generate income and sustain ways of life, these conditions are tightly linked and difficult to understand in isolation. Enrollment in CRP helps landowners in the western Great Plains balance their sometimes competing needs for **soil stabilization and short-term financial return**, and thus allows them to maximize the productivity of their land -- in terms of both revenue and biomass -- over the long-term. Exit from CRP is primarily a financial decision for many landowners; they do not attempt to re-enroll their fields in the program if other uses of the land promise to be more productive and lucrative. CRP rules, particularly restrictions on the timing, duration, and intensity of haying and grazing, are perceived by many landowners as hindrances to both **productivity and autonomy**.

In spite of any perceived limitations of the program, **interest in re-enrolling in CRP is high** among current participants. However, over half of past CRP participants in our survey sample unsuccessfully attempted to re-enroll their land in the program after their initial contracts expired.

We did not determine why these fields were not granted new contracts; they may have been unable to be re-enrolled because they did not meet qualifying criteria or were not ranked highly enough, or they may have been excluded due to the enrollment cap. The most recent farm bill, passed in December 2018, raised the enrollment cap for CRP by 3 million acres across the nation, perhaps alleviating some of this re-enrollment problem. Yet, the 2018 farm bill also lowered rental rates for enrolled parcels. Our survey only asked respondents about their interest in re-enrolling *given the same rental payment* and did not evaluate whether a reduced rate would impact landowner decision-making. Still, combined with increasing commodity prices and based on historical trends (e.g. Hellerstein and Malcolm, 2010), it is likely that reduced rental payments will dampen landowner demand for re-enrollment. As our assessment of current CRP landowner interest in potential changes to CRP indicates, participants were least receptive to approaches that reduce their annual payments.

Over half of current CRP participants reported being likely to persist with grasslands on their CRP parcels if they are not re-enrolled, and the reported rate of persistence on expired fields in our survey sample is even higher, around 62%. These landowner intentions and behaviors are promising for the establishment of enduring conservation benefits associated with CRP. Still, past participants reported converting over a quarter of the expired fields included in our survey sample to crops since their CRP contracts ended; this represents a loss of approximately 19,000 acres of former grassland habitat on just over 100 former CRP fields in our study area alone. Given that the likelihood of **reversion changes over time**, identifying strategies for increasing grassland persistence on expired CRP land is critical.

We found that each of the five pathways described by Dayer et al. (2018) -- cognitions, resources, motivations, habits (or status quo bias), and social influences -- predict persistence (i.e., keeping land in grass as opposed to reverting to crops) to some extent. Among current CRP participants, **persistence intentions** are related to positive experiences with the program; attitudes about agriculture that are environmentally-oriented; a variety of motivations; the perceived ease and desirability of maintaining the status quo of a CRP field; and the precedent established by other landowners in the area whose CRP fields have expired. These relationships provide multiple mechanisms through which ongoing conservation behavior might be promoted. **Reported grassland persistence** among past participants is predicted by many of the same motivations, but is negatively associated with an interest in maximizing profits. This is consistent with our understanding that many landowners do not re-enroll in CRP in order to pursue other opportunities that are more lucrative or productive. Although current CRP participants attributed less importance to resource considerations as they contemplated their future land management decisions, reported grassland persistence was contingent on physical resources, especially weather and water, that characterized a field.

Overall, many of the landowners we studied expressed a desire for CRP management that allows them to make **informed decisions** and respond to **changing economic conditions** in order to maximize the productivity of their land. For marginal lands, a CRP rental payment is often optimal, facilitating the “production” of grassland and a financial return on otherwise less productive acreage. In these cases the persistence of grass after CRP may be the best or only option. For higher quality parcels, CRP and the persistence of grass after contract expiration must make sense relative to opportunities in agricultural or livestock production. The landowners we studied are interested in CRP land management options that are **reliable**, but also **flexible and farm-specific**, accommodating **local site conditions** and **producer knowledge**.

Recommendations

This study was motivated by an interest in identifying strategies for promoting landowner participation in CRP and grassland persistence after CRP contracts end. The research team met with project partners, who are involved in private lands conservation at the regional level, to co-produce the following recommendations.

- ***Incorporate local-level and landowner feedback and preferences into CRP rule-making.*** FSA could review existing mechanisms for responding to local feedback on CRP and consider their accessibility and relevance for landowners. Opportunities for feedback should allow local-level input on decisions that are meaningful to landowners, about which they have both sufficient interest and information, perhaps including program roll-out and payment structure. Rule-making could also respond to general landowner preferences documented in this study, including landowner interest in grass varieties that are palatable for livestock.
- ***Increase support for sustainable haying and grazing.*** The 2018 farm bill gives landowners the option to graze CRP land as a component of mid-contract management without a reduction in rental rate. Private lands biologists and other technical experts to support the use of sustainable grazing by landowners might be increased. Helping landowners establish both a pattern of sustainable grazing and positive relationships with technical experts may promote the persistence of grass after CRP participation ends.
- ***Include measures of water availability or quantity as CRP ranking criteria.*** Landowner decisions about CRP enrollment and grassland persistence are constrained by biophysical characteristics, especially water availability. The addition of water availability as a CRP selection criterion may improve the ability of FSA to conduct accurate cost-benefit analyses and enroll lands likely to generate lasting environmental benefits.
- ***Align outreach and messaging with landowner motivations.*** Many landowners are principally concerned with soil conservation, motivated by their interest in productivity and the sustainability of farming in their communities and families. CRP messaging should communicate the benefits of the program and grassland persistence for stabilizing soils and the relationship between soil conservation and the conservation of wildlife habitat.
- ***Aid the transition to other conservation programs.*** The barriers to this transition from CRP to other programs should be explored. In the meantime, private lands biologists could inform landowners about other conservation programs for which they qualify and help them transition into these programs before their CRP contracts expire. Because many of these programs are managed by NRCS, enhanced coordination between FSA and NRCS may improve this transition. This coordination would also ensure consistent messaging and leverage their combined technical support resources.
- ***Conduct further research.*** Research could be designed to understand how changes made to CRP management under the 2018 farm bill will impact landowner decision-making. Findings from the present study could serve as a baseline for this future research. Additionally, the dataset from this study provides opportunities for developing typologies of CRP landowners, which would be useful in identifying groups that are likely to participate in habitat conservation without financial incentives and for developing targeted strategies to promote grassland persistence.

Next Steps

Members of the research team, in collaboration with study partners, will prepare manuscripts for peer-reviewed publication that communicate study findings and their broader relevance for habitat conservation incentive programs. Opportunities for presenting findings through national conferences, webinars, and partner networks will also be explored. To ensure that this study shapes conservation practice on the ground, the research team from Virginia Tech, in collaboration with partners from FSA, NRCS, Bird Conservancy of the Rockies and Playa Lakes Joint Venture, will be planning in-person work sessions in each state where research was conducted and in the FSA national office. These sessions will consist of presentations and facilitated discussions that help apply study results to local CRP implementation. We expect to generate more specific, tangible recommendations with state- and local-level personnel at these workshops. Additionally, findings from this research will be shared in media formats that are accessible to landowners.

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Introduction

The Conservation Reserve Program (CRP) is the largest private lands conservation program in the United States, covering approximately 22.5 million acres across the country as of October 2018. In 2015, CRP celebrated its 30th anniversary of successfully working with landowners to balance agricultural production with natural resource conservation. Through CRP contracts, landowners receive a yearly rental payment for removing environmentally sensitive land from agricultural production and planting vegetation that will improve environmental quality (Farm Service Agency, 2018). Biophysical assessments have shown that CRP enhances wildlife habitat, improves water quality, sequesters carbon, and enhances soil productivity, among other ecological benefits (Allen and Vandever, 2012). For example, in 2010, CRP was linked with a net carbon reduction of 52 million metric tons (USDA Farm Service Agency, 2011). The economic impacts of CRP are also substantial; the program distributes over \$1.8 billion in rental payments to landowners annually (USDA Farm Service Agency, 2018a).

As a component of the omnibus farm bill, funding for CRP, as well as limits on the number of acres that can be enrolled and soil rental rates, are subject to change each time the farm bill is renegotiated by the U.S. Congress, roughly every five years. The program's total enrollment cap dropped from 32 million acres under the 2008 farm bill to 24 million acres under the 2014 farm bill. In the most recent farm bill, passed in December 2018, the enrollment cap was increased to 27 million acres, but rental payments were reduced. These changes are related to landowner demand for participation in the program and global demand for agricultural commodities (Coppess, 2017). As the demand and price for corn or soybeans has increased, landowners have been drawn away from the program by the potential to generate greater income by returning retired lands to active production. Recent drops in commodity prices have once again increased interest in CRP among landowners (Politsch, 2016). However, enrollment in the program is not guaranteed; in 2016, just 22% of the acres offered for enrollment in the general sign-up were accepted into CRP (Johnson, 2017). The enrollment cap affects current program participants and new applicants alike; current CRP participants must re-apply, often under different program rules and ranking criteria, once their initial ten- to fifteen-year contracts expire (Newton, 2017).

Since its peak in 2007, the number of acres enrolled in CRP has decreased from 37 million acres (Farm Service Agency, 2007) to 23 million acres in October 2018 (Farm Service Agency, 2018b). This decrease in CRP coverage raises concerns about the potentially ephemeral nature of financial incentive programs and the likely loss of conservation benefits when financial incentives to continue these land management practices end (Dayer et al., 2018). Grasslands, which provide essential habitat for migratory birds and other wildlife species, are particularly vulnerable to conversion to agricultural or developed uses without the continuation of landowners' conservation behaviors (Dayer et al., 2018). Thereby, the ecological benefits of CRP and the impact of a reduction in the number of acres covered under the program are mediated by social phenomena. Enrollment in CRP, which fields are enrolled, and whether or not CRP land management practices are continued after contracts and financial incentives expire are contingent upon choices made by landowners. Thus, understanding what drives landowner decision-making is critical for the maintenance of long-term landscape conservation and the future success of conservation programs on private lands (Sorice et al., 2014). While there is abundant research on CRP, the degree to which landowners maintain conservation practices on their fields after their participation in the program ends and why remain unclear.

In order to develop effective programs that deliver enduring conservation benefits, it is important to understand what promotes continued conservation behaviors in the absence of financial incentives. As it relates to conservation, Dayer et al. (2018) have referred to the “continuation of a course of action or behavior” as *persistence*. Following the end of an incentive program like CRP, landowners can either persist with the grasslands established during program participation or revert to previous agricultural uses of their fields (Dayer et al., 2018). As CRP hits its enrollment cap, persistence of conservation behavior could potentially sustain conservation benefits on CRP lands that are unable to be re-enrolled. Although there has been some research on intent to persist with conservation behaviors specific to CRP (i.e. Caldas et al., 2016; Gustafson and Hill, 1993; Janssen and Beutler, 1994; Johnson, 1993), research on reported behavioral persistence is very limited (Dayer et al., 2018); this gap is important because behavioral intentions do not necessarily predict behavior (Webb and Sheeran, 2006).

This study explored both behavioral intentions among private landowners currently enrolled in CRP and reported persistence behavior among those whose fields are no longer enrolled in the program. We further sought to understand how current and former participants view CRP and gain insights to improve the effectiveness of the program over the long term. In order to understand what would help catalyze the continued stewardship of grasslands after CRP contracts end, our data collection focused on the following research questions:

- RQ1. Why do landowners participate in CRP?
- RQ2. To what extent are CRP landowners interested in and able to re-enroll in the program?
- RQ3. To what extent do landowners continue, or intend to continue, to keep their field in grass once their CRP contracts expire?
- RQ4. If landowners continue, or intend to continue, to keep their field in grass after their CRP contracts expire, what factors predict this behavior?

Study area

This study focused on a region in the western Great Plains of the United States and covered portions of five states (Colorado, Kansas, New Mexico, Oklahoma, and Texas). This region includes the three states in the country with the most CRP acreage (Texas, Kansas, and Colorado) (USDA Farm Service Agency, 2016), and also contains areas in which CRP participation is very low. We selected 34 counties for this study that would represent this spectrum of CRP enrollment, including counties with the highest and lowest enrollment rates within the study area. Because water availability may play an important role in producer interest in certain farm bill practices such as CRP, we only included counties in which 40% of the land area is situated over the Ogallala Aquifer.

As of 2017, approximately 2.1 million acres across our study counties were enrolled in CRP (USDA Natural Resources Conservation Service, 2017). However, the CRP contracts on two-thirds of these acres are due to expire between 2020 and 2022, making it critical to understand what drives land management decisions on these fields if they are not re-enrolled in the program. Grasslands are highly susceptible to conversion to crops, development, and other land uses, creating the potential for substantial habitat loss for migratory birds and other species (McLachlan et al., 2007). For example, CRP acreage currently comprises almost 28% of Grasshopper Sparrow habitat and over 10% of the habitat of Lesser Prairie Chickens, two bird species that are conservation priorities in the region (McLachlan, 2009). Additionally, grasslands, especially comprised of native species, reduce sediment deposition and accumulation in playas (Daniel et al., 2014), which are shallow, temporary

wetlands that provide critical wildlife habitat, recharge the Ogallala Aquifer, and improve water quality throughout the region (Gurdak and Roe, 2010). Conversion of grasslands to cropland and other development can threaten playa function and quality, and, when it occurs on fields previously under CRP, result in the loss of the various ecosystem services these acres provide.

Methods

This comprehensive social science study explored the research questions listed above using both qualitative and quantitative methods for data collection and analysis. This kind of mixed-methods research capitalizes on the strengths of both approaches, achieving depth of understanding through qualitative research and generalizability through quantitative research. Combining methodologies in this way results in a more thorough understanding of the research problem and more effectively challenges researcher assumptions and biases (Cresswell and Plano Clark, 2017).

The qualitative component of this study included interviews, through which a researcher had one-on-one, semi-structured conversations with landowners; participant observation, in which a researcher shadowed landowners as they went about daily operations on their land; and focus groups, in which a researcher facilitated discussions with a small group of landowners. Informed by this qualitative research, we developed mail surveys to identify generalizable thought patterns related to our research questions. By conducting these various approaches to data collection in the same geographic area (**Figure 1**), we were able to generate both detailed and broad understanding of landowner perspectives in the study area.

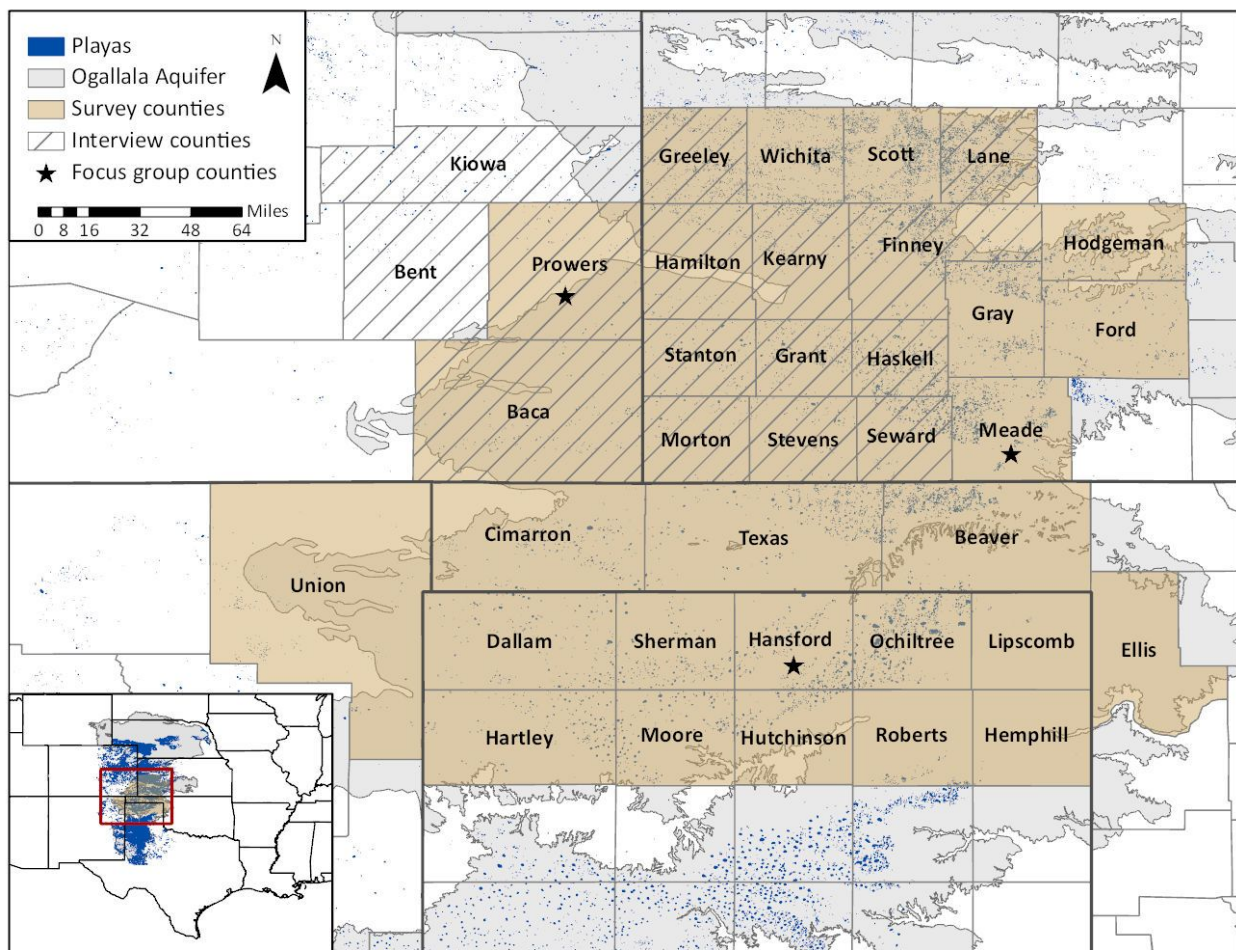


Figure 1. Map of the study area within the western Great Plains of the United States, indicating the counties in which data collection was conducted.

Interviews and participant observation

From June-October 2017, a member of the research team performed ethnographic field work with CRP participants and FSA and NRCS staff in their communities. The researcher spent three and half months based in Hamilton County (Syracuse, KS), a location that provided convenient access to landowners throughout southwestern KS and southeastern CO.

Research approach

In this component of our qualitative research, we sought to understand landowner perceptions of and experiences with CRP. Through interviews, we asked landowners to recount the reasons they initially enrolled in the program and to describe the factors that have influenced their re-enrollment, if applicable. We also asked landowners to describe what CRP means to them, as well as which program components they appreciate and which they find challenging (See **Appendix I** for a full list of interview questions). This approach allowed the interviewee to frame the issue from their own point of view, speak about it in a way that is meaningful to them, and express their views in detail (Marshall and Rossman 2015).

Participant observation, which involved shadowing landowners and touring their lands, provided insight into how CRP is used, facilitated discussion about enrollment of particular fields, and allowed landowners to demonstrate issues and concerns that may be more difficult to convey in formal interviews. Agency staff also provided tours and shadowing opportunities that allowed us to observe how landowners engaged with program staff both in the office and in the field. These activities included spending time in NRCS/FSA offices, attending county committee meetings, and participating in county tours, as well as participation in CRP spot-checks with agency staff.

Study participants

Participants for this portion of the study were selected through a combination of existing contacts of project partners, recommendations from FSA and NRCS staff, and the researcher's personal connections. We conducted interviews with 27 landowners and participant observation with 18 landowners. Among the landowners she met with, about half were active participants in CRP; some of these landowners were new to the program, with lands enrolled for the first time, while others had re-enrolled their field for subsequent contracts. Our sample also included participants with contracts set to expire soon, who were weighing decisions on whether to re-enroll or take their land out of the program, as well as past CRP participants. Finally, we also interviewed or observed 4 landowners in the region who had never enrolled in CRP; their perspectives were important for understanding decisions to forgo participation in the program.

Data analysis

All interviews were audio recorded and transcribed to facilitate analysis. Atlas.ti, a software package for qualitative data analysis, was used to code interview transcripts and scanned field notes. Those codes were then used to identify themes or ideas commonly expressed by participants or observed by the researcher. Data collected during participant observation were recorded using field notes, which were digitally scanned to facilitate analysis (Emerson et al. 2011).

Focus groups

In August 2017, we conducted three focus groups with current CRP landowners in Lamar, CO (Prowers County); Meade, KS (Meade County); and Spearman, TX (Hansford County) (**Figure 1**). Locations were chosen on the basis of recommendations from practitioners in the area and logistics, as well as an attempt to include perspectives from landowners across the study region who differ in

terms of the availability of water on their lands. Focus group participants were recruited through a mailing that was sent to all current CRP landowners in the county in which the focus group was sited. Participants from Ochiltree County were also invited to the focus group in Hansford County due to low numbers and responses of participants. There were 11 participants in the Lamar, CO focus group, 7 in the Meade, KS focus group, and 9 in the Spearman, TX focus group, for a total of 27 landowners. Focus group conversations, which were semi-structured, focused on why participants enrolled in CRP; perceived benefits, drawbacks, and outcomes of the program; intentions and motivations to re-enroll; and post-CRP behaviors. Participants also discussed the changes they would like to see in the program (see **Appendix II** for full list of focus group questions). The sessions were audio recorded and later transcribed. Transcripts were analyzed by question using broad thematic analysis, with emergent themes identified by the research team.

Mail surveys

Insights from our qualitative data collection (interviews, participant observation, and focus groups) were used to inform the development of mail surveys, which were distributed to a broader sample of landowners in the study area. This approach to survey design ensures that survey questions and response options are salient for the target audience (Dillman, 2009).

Survey instrument

We developed two survey instruments: one for current CRP participants (see **Appendix III** for final survey) and another for landowners who had previously participated in CRP, but whose contracts expired without renewal between 2011 and 2017 (see **Appendix IV** for final survey). These surveys consisted primarily of closed-ended questions that asked respondents about a specific CRP field.

Questions for current CRP participants focused on:

- the history of the field and its enrollment in CRP
- considerations that were important in the decision to enroll in CRP
- experiences with the program and CRP-related personnel
- current perceptions of the aesthetic and biophysical qualities of the field
- plans for and experiences with re-enrollment
- the likelihood of a variety of post-CRP management actions on the field and factors that are likely to shape that decision
- perspectives on the relationship between agriculture and the environment
- interest in potential changes to CRP

With a few exceptions, surveys for past participants included versions of the same questions.

Landowners who voluntarily removed their fields from CRP (i.e. did not attempt to re-enroll them in the program) were also asked about the considerations that drove that decision.

Sampling scheme

The unit of selection and analysis for our survey was the field level. We first identified fields within our study area that are currently or had previously been enrolled in the following CRP grassed practices: cp1, cp2, cp4, cp10, cp23, cp25, cp33, cp38, and cp42 (and all variants of these grassed practices) (see **Appendix V** for a description of these CRP categories). Fields were then randomly selected using a randomizing program; these samples were stratified by state based on the number of CRP fields that fell within each state in our study area (see **Appendix VI**). Surveys were sent to the person who received the largest portion of the CRP payment; some of these individuals owned the field in question, while others were only responsible for managing it (however, for simplicity, we refer to all of these individuals as “landowners” throughout the rest of this report). Although some landowners are responsible for multiple CRP fields and may be the decision-maker for fields that are

both currently in CRP and fields whose CRP contracts have expired, our sampling procedure ensured that no person was sent more than one survey. Landowners who were chosen to receive a survey regarding a past CRP field were removed from the survey sample for current CRP fields before that sample was drawn. We randomly selected current and past CRP fields with a goal of achieving 400 complete responses in each sample, assuming a 25% response rate for current participants and a 20% response rate for past participants. Surveys were sent to 1614 current and 2155 past CRP participants.

Survey administration

Drafts of the survey were also reviewed by project and local partners and pre-tested with 13 current CRP participants in the region. We then contracted with the Survey Research Institute at Cornell University to layout, mail, and perform data entry for our surveys. Surveys were administered between April and June 2018. We used a modified Dillman approach to survey administration, which consists of two survey mailings and a reminder postcard (Dillman et al. 2009). The first round of mailings consisted of a cover letter and a paper questionnaire booklet, which also served as a postage-paid self-addressed return envelope. Everyone in the original sample was sent a reminder postcard two weeks later encouraging them to participate. Non-respondents were mailed a second copy of the questionnaire one month after the initial invitations were sent.

Survey analysis

Analysis of survey responses allowed us to explore the resonance of perspectives from the study's qualitative phase among a broader sample of landowners in the study area. We evaluated basic frequencies for responses to all closed-ended survey questions. For survey items related to RQ1 and RQ2, we also performed t-tests to identify significant differences between response items, and for RQ3, we used a likelihood ratio test to evaluate differences in persistence over time. This test was used due to the small number of responses within each category (persistence and reversion) for some years (McHugh, 2013). As we examined factors that predict intended and reported persistence under RQ4, we used point biserial correlations (r_{pb}) which allowed us to measure the strength and direction of relationships between a dichotomous variable (persistence vs. reversion) and a variety of continuous variables.

Report organization

In the following sections, we have integrated data from our qualitative and quantitative research to present insight into the factors that drive participation in CRP (RQ1); landowner interest in re-enrolling in CRP (RQ2); the extent to which landowners persist with grass on their fields if they do not or cannot re-enroll (RQ3); and the factors that predict the persistence of conservation practices after CRP payments end (RQ4).

Survey analyses refer to different portions of our study sample. For RQ1 and RQ2, we are primarily concerned with all current or past CRP participant respondents. For RQ3 and RQ4, however, we have created subgroups of respondents on the basis of their likely or reported post-CRP land management behavior. Among past CRP participants, we compared those who reported keeping their former CRP fields in grass to those who reverted these fields to crops after their CRP contract ended. These groups were established based on responses to one survey question that asked about post-CRP land management. "Persistence" behavior included those who reported keeping the majority of their field in grass or enrolling the majority of their field in another (non-CRP) conservation program (e.g. CSP or EQIP). "Reversion" behavior included those who reported converting the majority of their field to crops, either dryland or irrigated.

Among current CRP participants, we were interested in comparing those who are likely to persist with grasslands to those who are likely to revert to crops. Our survey for current CRP participants asked respondents to rate the likelihood of five different post-CRP management approaches on a 5-point scale, with 1 being 'very unlikely' and 5 'very likely' to employ that land management approach. In order to create persistence and reversion categories, we calculated a likelihood score for both behaviors based on each respondent's responses to this survey question. Their persistence score was calculated as the average of how likely each landowner thought they would be to keep their field in grass and to enroll the field in another conservation program, while their reversion score reflected the average of their likelihood to convert their field to irrigated crops and to dryland crops. For each current CRP respondent, if their persistence score was greater than 4 (with 4 being 'likely' to persist) and greater than their reversion score, we classified them as likely to persist. If those two conditions were not met, we classified them as likely to revert to crops.

We have employed the following symbols to clarify which groups are referenced in the figures below:



All landowners responsible for fields **currently** in CRP
hereafter: current CRP participants



All landowners responsible for fields **previously** in CRP that expired from 2011 to 2017
hereafter: past CRP participants



Current CRP landowners who are likely to persist with **grass** on their field after CRP



Past CRP landowners who persisted with **grass** on their field after CRP



Current landowners who are likely to revert their field to **crops** after CRP



Past CRP landowners who reverted their field to **crops** after CRP

Results

Survey response

We received 700 completed surveys. After correcting for non-deliverable surveys and deceased or ineligible respondents, this represents an overall response rate of 24.2%. We received 363 surveys from current CRP participants (response rate = 32.3%) and 337 from past CRP participants (response rate = 19.1%).

Respondent demographics

The majority of respondents were either fully retired (37%) or full-time agricultural producers (28%). Compared to past CRP participants, current participants more often identified as fully retired (44% vs. 29% of past participants) and less often identified as full-time agricultural producers (21% vs. 37% of past participants). Other respondents were 'part-time agricultural producers' (14%) or 'retired, but working a non-agriculture job' (5%) or had some 'other' employment status (15%). Our sample was predominantly male (72%), and the average age of respondents was 71 years old, with ages ranging from 30 to 101.

Over 91% of survey respondents owned the current or expired CRP field that was referenced in the survey they received, and almost 57% of respondents owned or operated another CRP field as well. Landowner tenure in farming, and operation size varied widely. Respondents reported being involved in farming or ranching for an average of 38 years, and on average, operated under 2,000 acres (although some were responsible for up to 90,000 acres).

Nonresponse vs. response comparison

We conducted a non-response analysis to determine whether or not survey respondents differed significantly from landowners who received a survey but did not complete it. This comparison relied on three field characteristics that were included in the data provided to us by FSA for survey sampling. For current CRP participants, we compared 363 respondents to 887 non-respondents, and for past CRP participants, we compared 337 respondents to 1400 non-respondents (**Appendix VII**). For both current and past CRP participants, there were no significant differences between respondents and non-respondents in terms of the acreage of their fields (Appendix VII, Table 1) or whether or not their fields had been re-enrolled in CRP after an initial contract term (Appendix VII, Table 2). However, for past CRP participants, the year in which their contracts expired differed significantly between respondents and non-respondents. Compared to non-respondents, more respondents had CRP fields that expired in 2016 or 2017 and fewer respondents had CRP fields that expired in 2012 (Appendix VII, Table 3). There was no significant differences in distribution between respondent and non-respondent landowners of current fields by expiration year (Appendix VII, Table 4).

RQ1: Why do landowners participate in CRP?

Important factors in CRP enrollment

Interviews, focus groups, and survey questions with current CRP participants aimed to understand why landowners enroll in CRP and what benefits landowners perceive to be associated with CRP enrollment. Our survey asked current CRP participants to rank the importance of a variety of considerations in their decision to participate in the program. Specifically, we asked landowners the extent to which improving soil health, water quality and availability, and wildlife habitat on their land, preventing soil erosion, and maximizing profits motivated their decision to enroll or re-enroll in CRP. With the exception of water quality and availability, each of these factors were considered to be 'important' or 'very important' for over 75% of respondents (**Figure 2**). Below, we describe these survey results in more detail, combined with insights gleaned from ethnographic field work.

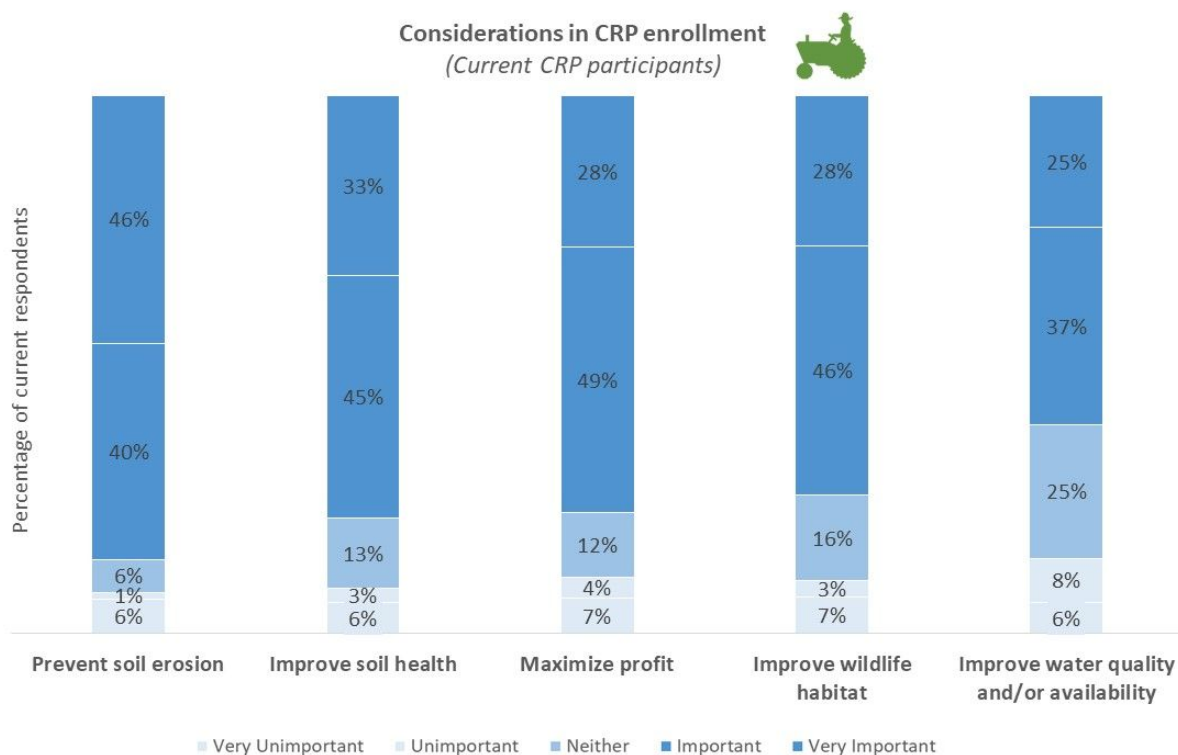


Figure 2. How important were the following considerations in your decision to enroll/re-enroll this field in CRP?

Soil conservation

CRP enrollment is heavily motivated by a concern for soil stabilization and improvement. Preventing soil erosion and improving soil health were considered 'important' or 'very important' reasons to participate in the program by 86% and 78% of respondents, respectively (**Figure 2**). While 46% of landowners surveyed considered preventing erosion as a 'very important' reason to participate in CRP, only 33% of respondents were equally as concerned with improving soil health. Interviewees and focus group participants likewise focused on reducing soil erosion as a key reason for enrolling in CRP and an important factor in their overall land management decisions. Producers we met with talked at length about how CRP has helped reduce erosion and how having grass cover on CRP fields prevents soil from blowing away. In a focus group, one landowner from Meade, KS said: "Well, I don't

have neighbors calling and saying, you know, 'you are blowing away,' so, you know, it [CRP] stabilizes the ground there." Additionally, the landowners we interviewed explained that maintaining cover on CRP acres breaks up contiguous farm ground and shields neighboring land from wind erosion. The program is an opportunity to restore environmental stability, both on individual parcels and across the landscape.

The landowners we interacted with also hoped that CRP would provide an opportunity to improve the overall health of their land. In particular, they saw enrolling in the program as a way to restore land that was inappropriate to farm and should never have been farmed or "broken out" in the first place due to environmental or resource considerations (i.e. the soil is too erodible or weather too dry). One focus group participant from Spearman, TX said: "The land here never should've been broke out from grass to begin with, so I plan on it staying in CRP as long as the program lives."

Financial considerations

Survey results indicate that economic considerations also drive CRP enrollment for many program participants in the study area. Over 77% of current landowners said 'maximizing profits' was either an 'important' or a 'very important' motivation for their participation in the program (**Figure 2**). Our interviews and focus groups likewise found that CRP enrollment is and has always been a financial decision; many of the landowners we interacted with have been primarily drawn to the program by the potential for an additional revenue stream. However, our ethnographic research adds some nuance to the understanding of financial motives. In addition to maximizing profits, landowners expressed a variety of ways that CRP provides financial support. In an interview, one landowner recounted CRP being promoted by bankers in the 1980s when landowners in the area were struggling to keep their farms and livelihoods: "Back in the 80s when we put this in, we were starving to death out here... It wasn't put in by the landowner's opinion to conserve anything, it was to survive." In fact, focus group participants commonly described enrolling in the program as a way to just break even financially and keep their land in the family. As a landowner from Meade, KS stated: "I'm hoping CRP and the grass program gives us a chance to keep it [our land] in the family many more generations."

But CRP serves more functions than to simply "save the farm." One landowner we interviewed described the range of uses of CRP like this: "Some people are like, 'Oh, got my CRP payment. I'm going to go on a vacation to Europe.' And others are like, 'Oh my gosh. I need my CRP payment. I've got to get the bank, or they're going to shut me down.' So, you see both spectrums." CRP payments variously serve the landowners we interacted with as supplemental income, as a financial cushion, or as leverage for growing their operations. Landowners we observed and interviewed explained how CRP participation diversifies their portfolios by putting some of their assets (their land) into growing grass for a guaranteed return. In addition to providing financial security, focus group participants mentioned that CRP fields provide an important source of hay in times of drought or emergency.

Landowners repeatedly stressed the need to "make everything, every little piece of land that you have, yield something." Entering a contract to "produce grassland" comports with this productivist agricultural value, while allowing landowners to shift their focus away from trying to manage marginal lands for crops or livestock – a potentially more lucrative, but also more volatile, venture. It is this "rough land" that cannot be put into production and other smaller parcels, such as unused land at the corners of center-pivot irrigation systems, which are typically enrolled in CRP. A focus group participant in Spearman, TX explained: "If we have a way of generating revenue off of our land

without having to do a whole lot of expense and upkeep and input, it just makes sense for us to do those things on the less productive ground.” CRP payments for these acres have enabled some of the landowners we interacted with to focus on purchasing or working their existing “good farm ground.” One interviewee recounted: “So my idea was to put some of this into CRP, free me up some cash and some time and rent some more ground to farm, so that’s why I put mine into it.” Focus group participants further explained that the program provides free time in addition to some financial freedom because CRP fields require less labor to manage.

Our qualitative research also revealed the role of CRP payments in the long-term financial stability of landowners and their communities. Producers we interviewed spoke of CRP being “a way out” for their parents who were close to retirement age and barely making ends meet, especially when wheat prices were low. Some of these landowners put all of their land into CRP and left farming completely. Focus group participants also viewed CRP as a means to both retire marginal ground from production when cropping it was not financially viable and to retire from farming altogether. Consequently, the program has earned the nickname among some landowners as the “Conservation Retirement Program.” The landowners we interacted with in focus groups explained the ability of CRP to provide an important source of income for the elderly as a community-level benefit of the program. These landowners, as well as those we interviewed, further described the importance of CRP payments, not just in their personal finances, but as an important boon to their local economies. They see the program as a means to keep farms in families and keep people in the community, an impact that they believe benefits banks, some small businesses, and schools as well.

Wildlife conservation

Over 74% of survey respondents reported that improving wildlife habitat on their property was an ‘important’ or ‘very important’ reason for enrolling or re-enrolling in CRP (**Figure 2**). This is only 3% less than the number of respondents that considered maximizing profits to be an ‘important’ or ‘very important’ consideration for participating in the program. Focus group participants also hoped that CRP enrollment would increase the abundance of wildlife on their land. However, our qualitative data from direct interactions with landowners in the study area indicate that, rather than CRP enrollment being explicitly motivated by wildlife conservation, these benefits are seen as a spillover effect of stabilizing the soil. Landowners we interviewed said that they tend to purposefully create wildlife-friendly habitat on their own, independent of participation in CRP, for example, by establishing food plots, cover, or water sources. One landowner we interviewed explained how he would leave weeds along fence-rows and field borders because he knew the quail used them.

This landowner communicated two perspectives that were consistently expressed by the landowners we interacted with in the study area. First, wildlife and pollinator-friendly forb species are often considered weeds, and second, landowners are primarily interested in improving habitat for game species. Because landowners generally equate “good land” with “good farm ground” that is best used for food production, growing forbs for the benefit of wildlife is perceived as “growing weeds.” One landowner we interviewed remarked: “When it [CRP] first started, if you had weeds growing in it [the field], you had to get rid of them, but now they want weeds grown in for wildlife.” Although another landowner recognized the importance of a mix of vegetation, he still referred to the additional plants as “weeds.” Additionally, the programmatic shift in the focus of CRP towards wildlife habitat conservation was not universally acceptable to the landowners we interviewed. When discussing the impact of CRP on wildlife, participants in our focus groups and interviews focused on the ability of the program to improve habitat for huntable species, such as pheasant and deer, rather than non-game species of conservation concern. They also emphasized the ability of

CRP management to establish cover on their properties, which creates opportunities to both hunt on the land and lease the land to others for hunting. These differences in perspective regarding desirable plant and wildlife species indicate tensions between the current focus of CRP and the interests of landowners.

Water quality and availability

Given the location of the study region over the Ogallala Aquifer and a regional history of drought (our study area encompasses the hardest hit area of the Dust Bowl of the 1930's), we also tried to understand the importance of water quality and availability in landowner decisions to participate in CRP. Focus group participants described reductions in water runoff and erosion as an environmental benefit they perceived from participation in the program. Among our larger survey sample, about 62% of respondents reported that water quality and availability were 'important' or 'very important' considerations for CRP participation, and an additional 25% reported that water quality was 'neither' important nor unimportant. In fact, there were more 'neither' responses for this factor than for any other factor in this question. Of the five motivating factors for CRP enrollment included in our survey question (see **Figure 2**), respondents were least likely to report that a desire to improve water quality or availability on their property influenced their decision to enroll in the program.

RQ2: To what extent are CRP landowners interested in and able to re-enroll in the program after their initial contracts expire?

In addition to understanding what motivates landowners to enroll in CRP, we also wanted to understand re-enrollment patterns. The following sections first describe interest in CRP re-enrollment and perceived ability to re-enroll among current CRP participants, and actual ability to re-enroll among past CRP participants. We then describe the reasons for which landowners decide not to re-enroll their fields in CRP after their initial contracts expire. Finally, we summarize landowner interest in a variety of potential changes to CRP that could influence program re-enrollment.

Interest in CRP re-enrollment

Over 83% of the landowners we surveyed with fields currently enrolled in CRP said that they would 'likely' or 'very likely' try to re-enroll their field into CRP if they received the same rental payment (**Figure 3**). Focus group participants were likewise very interested in re-enrolling in CRP; as one landowner in Colorado explained: "If there's going to be a re-enrollment, I'll sign ours up, because most everything we signed up benefited."

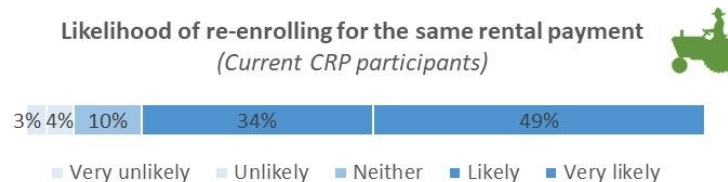


Figure 3. Assuming you can re-enroll your land if you want, how likely are you to re-enroll this field in CRP if you receive the same rental payment?

Ability to re-enroll

Although interest in re-enrolling in CRP is high among current program participants, many of the landowners we interacted with in focus groups and interviews were worried about qualifying for re-enrollment because the acreage cap for CRP had been reduced and competition for general CRP practices had increased. They described seeing their neighbors lose the ability to re-enroll, and some had experienced it themselves on other fields. As one focus group participant in Lamar, CO described: "The administration we have is cutting programs, and I'd say the chances of getting back in [to CRP] are nil." Another landowner in Meade, KS explained her interactions with local practitioners regarding the future of CRP: "They don't know anything yet – or they don't ever know anything until it's too late. I mean, I go around these local offices and their hands are tied, too." While concern over the potential inability to re-enroll was prominent among landowners in our focus groups and interviews, current landowners in our larger survey sample were more confident in their ability to re-enroll in the program if they wanted to (**Figure 4**).

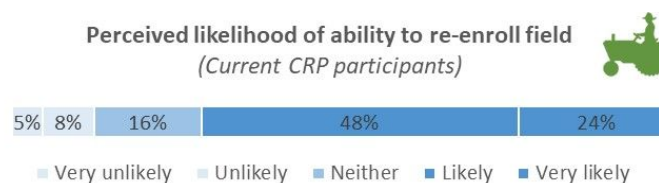


Figure 4. How likely do you think it is that you will be able to re-enroll this field in CRP if you want to?

Given changing evaluation and ranking criteria for general CRP sign-ups and the nationwide CRP acreage caps, landowner concern over the ability to renew their CRP contracts for a subsequent term may be warranted. Among the past CRP landowners that we surveyed, 52% (n=165) stated that they tried to re-enroll in the program but were not granted new contracts (**Figure 5**).

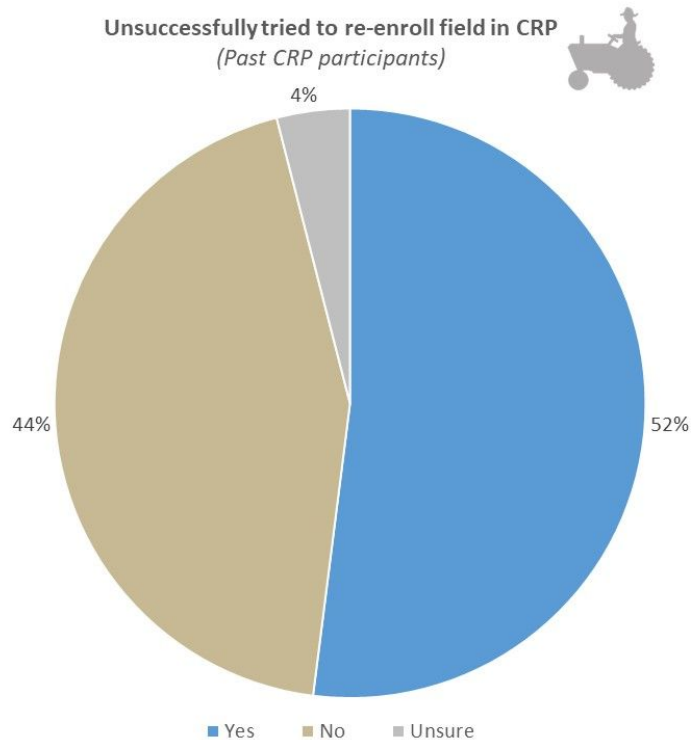


Figure 5. Did you try to re-enroll this field in CRP but were not able to?

Important factors in exiting CRP

This study also aimed to understand what motivates landowners to remove their properties from CRP, rather than re-enroll. These questions primarily pertain to the 44% of past CRP participants in Figure 7 who did not try to re-enroll their expired CRP field; however, we also gained insight into this question through our qualitative research with current CRP participants. Participant observation among landowners allowed researchers to understand some of the challenges associated with daily CRP management and the ways in which the details of the program are inconsistent with landowner needs or values. Interviews and focus group discussions also provided landowners an opportunity to describe drawbacks of the program in their own words. Informed by this qualitative research, our surveys specifically asked previous CRP participants which, of a variety of listed factors, were influential in their decision to take their field out of CRP. Among those past landowners who did not attempt to re-enroll in CRP (n = 138), respondents most often reported that their decision was motivated by the limited profitability of CRP fields (**Figure 6**). CRP rules, particularly restrictions on haying or grazing, were also important factors in the removal of these fields from the program. These landowners least often reported that concerns about damage due to fire, pests, or disease motivated their exit from the program. Below, we combine insights from our qualitative and quantitative data to describe these results in greater detail.

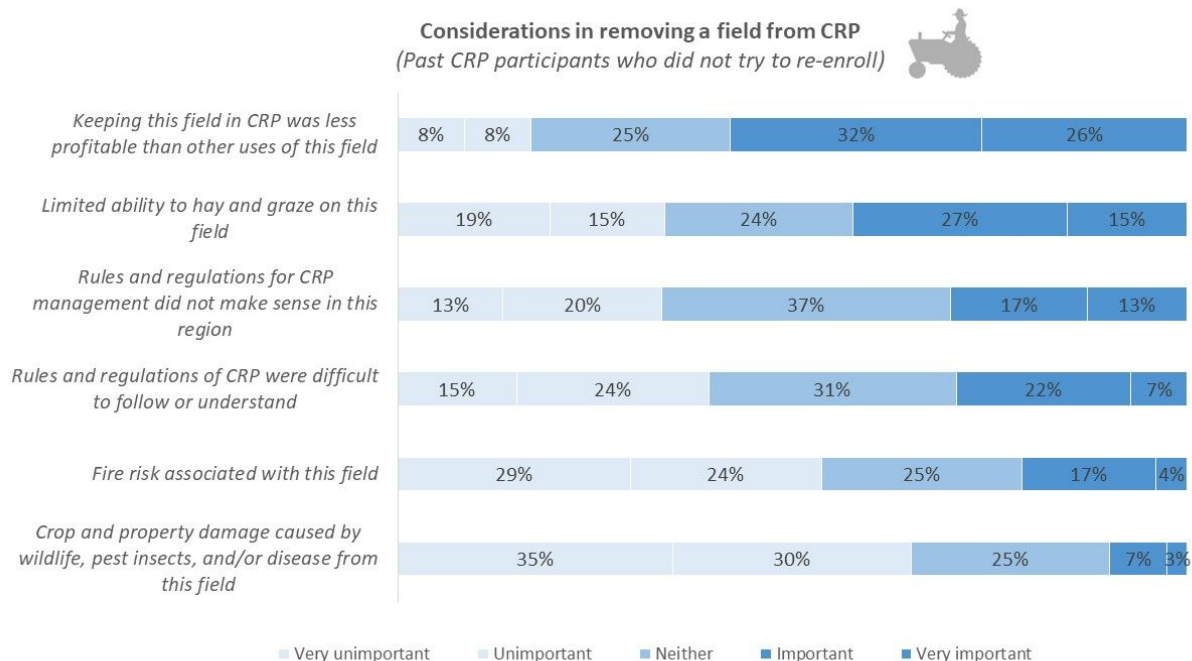


Figure 6. How important were the following considerations in your decision to take this field out of CRP?

Lower profit potential

Among past CRP participants who did not attempt to re-enroll in the program, 65% reported that generating less profit was either an ‘important’ or ‘very important’ reason for taking their field out of the program (**Figure 6**). Our qualitative research shows that the decision to re-enroll in CRP depends on how CRP fits into the overall economic portfolio of an operator. As described previously, the landowners we interacted with consistently expressed the need to garner some income from their land and make it “produce something.” These landowners consider CRP rental payments *vis a vis* current crop and livestock prices as they decide how to manage their acreage in a way that will keep their operations financially solvent. If CRP makes the most sense for their economic portfolio, they will stay in the program; if not, they will generate revenue from the land in some other way. For example, as one landowner in Lamar, CO described in a focus group: “The price of CRP has been going down... so, you know, we will have to look at that, too. It might come up where you just say it isn’t worth it.”

Restrictions on haying and grazing

Our qualitative research unearthed a great deal of insight into landowner perceptions of CRP implementation through rules and regulations. The landowners we studied mentioned CRP rules regarding grass mixes, establishment periods, land management practices, mid-contract management, native vegetation, and haying and grazing. In particular, the landowners we interacted with see many of these current CRP policies as cumbersome, inconsistently enforced, and at odds with the original intent of CRP, local ecology, and their own needs.

As currently structured, cattle are restricted from grazing on CRP land until July 15th of each year. In exchange for a 25% reduction in their annual rental payment, landowners can, in effect, buy back grazing rights at reduced stocking rates on their CRP field for 60 days. Other details of grazing allowances vary by location; while some states now allow landowners to graze a third of their CRP

acreage every year, others only allow grazing every few years. These limits emerged in our interviews and focus groups as an important drawback of CRP participation among current landowners, who overwhelmingly viewed grazing as a favorable and beneficial land management practice and a missed opportunity associated with CRP enrollment. This critique resonated with past CRP landowners in our survey sample as well; among respondents who did not try to re-enroll in CRP, 42% reported that grazing limitations were an 'important' or 'very important' factor in their decision (**Figure 6**).

Landowners explained that even if they do buy back some grazing rights, cattle can only be grazed on CRP land after the grassland bird nesting season is over, and by that time, they explained the grass is lower in forage quality and nutrient value; landowners we interviewed described it as "stemmy" and "filler." This nesting season exclusion rule requires landowners to watch as high-quality forage becomes senescent, something that sharply conflicts with their priority of utilizing productive land. While some of the landowners we interviewed and observed indicated that their livestock were able to gain weight while grazing CRP land, others said their cattle did not like being on CRP grass, but preferred native buffalo grass pastures. Ultimately, these landowners considered 25% of their annual contract price to be an overpayment for lower quality grass. One landowner we interviewed said, "The negative about grazing it is we have to give up 25% of the payment to graze it. Well, if you're giving up 25% of \$34 that's \$8.50. That's awful high rental rate for grass around here."

CRP rules inappropriate for the local context

In addition to restricting their use of productive land, the landowners we interacted with explained that the grazing limitations of CRP are inconsistent with how they understand the ecological and evolutionary dynamics between grass, grazers, and ground nesting birds in their region. Focus group participants and interviewees frequently expressed frustration with grazing regulations and other CRP rules that are inflexible, developed by regulators in federal and state offices and applied universally without considering local ecological, environmental, and economic conditions. As a focus group participant from Lamar, CO explained:

We cut our hay down one year and some guy in Washington state filed a lawsuit 'cause you can't cut it down after July the 4th because of the birds' eggs hatching, and we had our hay already cut down laying on the ground, and we had to wait until after the 4th of July to bale it, and that was ridiculous, you know... You're out here trying to make a living and some guy's a birdwatcher.

Around 30% of survey respondents who did not try to re-enroll in CRP considered this mismatch between CRP rules and local conditions to be an 'important' or 'very important' reason for removing their field from the program (**Figure 6**).

In particular, some of the landowners we interviewed view the required height of the grass on CRP acres as too tall for a region that evolved as a shortgrass prairie. Focus group participants also felt that the rule to remove trees from CRP fields was detrimental since there are so few trees on the landscape and trees are important for wildlife. Other landowners we interacted with contend that cattle and birds coexist, and several insisted that they had never seen a bird nest destroyed by cattle. Further, they argued that cattle can control undesirable vegetation and enhance seed establishment by pushing seeds into the ground through their hoof action. A focus group participant from Spearman, TX similarly argued for a longer grazing season based on its potential conservation benefits; he explained that "You have to have them [the cattle] off by the first of September. Sometimes you can run them through October and still help your grass out, you know."

The landowners we interacted with see themselves as good stewards of the land and feel that program rules leave little room for adaptation to local conditions or the integration of their local, place-based knowledge. Importantly, our interviews indicate that even rules generated at the state-level are often not local enough. One landowner we interviewed in southwest Kansas explained:

Because our state office or state committee a lot of times develops policies state-wide and...our state office is in the...Flint Hills, it's in the rainy area...a lot of the influence in the population is the eastern part of the state. And, so there's a lot more political pull maybe....So they dictate these policies for—CRP is a great example. And then it doesn't work across the state because the climate is so different, soil types are so different, environment is so different... But I think they need to stop looking at the state as one-shoe-fits-all.

CRP rules difficult to understand or follow

Among the previous CRP participants we surveyed who voluntarily removed their field from the program, 29% reported that program rules being either difficult to understand or difficult to follow were 'important' or 'very important' factors in their decision (**Figure 6**). Likewise, in our focus groups, many current CRP participants remarked that there were too many rules and regulations associated with the program and that many were confusing or difficult to follow and enforced inconsistently. Landowners in these focus groups reported that some CRP participants had been fined or removed from the program for rule violations, while others, sometimes in the same community, had not. One Lamar, CO participant wished the program was "not only consistent when you sign-up, but consistent during." Another participant reiterated this point stating: "I think the inconsistency is much bigger than you would dream of, in our area anyway."

Frustration over changes in the emphasis or focus of CRP (from soil conservation to wildlife conservation) was voiced by focus group participants, particularly among landowners who had been involved in CRP for many years. Several landowners felt that the program was moving too far away from its initial focus on preventing soil erosion, which they see as affecting the lands that are being enrolled. One participant in Meade, KS said: "That's another thing with this program I don't like: they're enrolling new land all the time that is not highly erodible, but the erodible land that is in there, they aren't renewing it."

The shift to a focus on wildlife conservation has left some landowners feeling left behind. Landowners we interviewed explained that in order to renew a contract, they may be required to tear up a field or part of a field to remove a dense grass monoculture that was previously acceptable under CRP; alternately, they may need to interseed an existing stand with different grass species in order to enhance diversity and gain points for general CRP qualification. These rule changes were perceived by those we interviewed to be disadvantageous to landowners who wanted to re-enroll their land. The landowners we interviewed explained that, while they can see the positive spillover to wildlife from a focus on rehabilitating marginal lands, they struggle more to understand the potential spillover to their operations from a focus on wildlife habitat. They tend to see the rules that benefit wildlife as overly restrictive, impinging on their productivity by requiring them to let good land go unused. Among those we interviewed, this complaint was most commonly associated with the inability to graze on CRP land until mid-July each year.

Risk of damage from fire, weeds, and pests

In our focus groups with landowners in the study area, participants mentioned the risk of wildfire as a key drawback of CRP for the environment. Landowners in our focus groups described the risk of fire spreading from CRP fields to surrounding homes and nearby crop and grass fields. A few focus group participants also thought that CRP fields spread noxious weeds and pest insects to adjacent fields. In our survey sample, fire risk and damage from pests and weeds were of relatively minor importance as motivations for exiting CRP; only 21% of past respondents who did not try to re-enroll considered fire risk an 'important' or 'very important' factor in their decision, and only 10% were motivated by damage from wildlife or pests (**Figure 6**).

Interest in potential changes to CRP

Our survey also asked current CRP landowners about their interest in a variety of potential changes to CRP that may influence program re-enrollment and management. The question clarified that while each of the listed changes were possible, none were currently being planned. Landowners most often reported being 'very interested' in an approach that would allow them to increase their chance of re-enrollment by agreeing to a post-CRP easement that permanently excludes agricultural production on the parcel (15%) (**Figure 7**). However, compared to other potential changes, respondents were also most often 'very disinterested' in this kind of contract (20%), indicating strong, but divergent preferences among different groups of landowners. Just over half of respondents were 'very', 'moderately', or 'slightly' interested in agreeing to perform annual field-level environmental monitoring in order to improve their re-enrollment chances and in variable annual payments that reflect changing crop market conditions. Overall, the smallest percentage of landowners (38%) expressed an interest in receiving a reduced annual payment instead of having to pay grass cover establishment and maintenance costs.

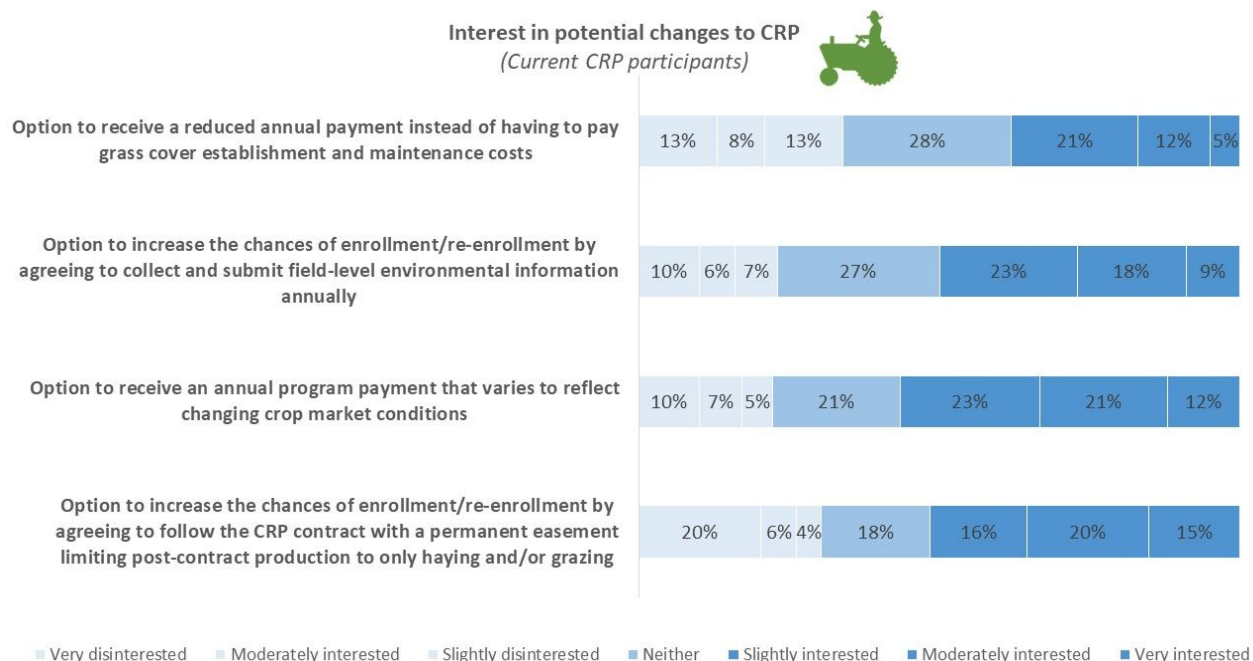


Figure 7. Please indicate how interested or disinterested you would be in the following ways CRP could change in the future.

Current CRP participants were also asked to indicate which type of CRP program sign-up they would prefer: a non-competitive sign-up at a rate determined by FSA at the national level, or a competitive sign-up at a rate determined by the landowner. The majority of landowners (62%) indicated that they would rather have a non-competitive sign-up at a rate determined by FSA.

RQ3: To what extent do landowners continue, or intend to continue, to keep their field in grass once their CRP contracts expire?

Given the inability of some CRP landowners to re-enroll in the program after their initial contracts expire, we sought to understand what landowners in this situation are likely to do with their CRP lands. Our survey asked current landowners how they would manage their fields if they do not or cannot re-enroll in CRP. Almost 55% of respondents reported that they would 'likely' or 'very likely' keep their field in grass, while 43% reported that they are 'likely' or 'very likely' to convert their CRP field to dryland crops (**Figure 8**). About 12% of current CRP landowners in our sample would consider selling the majority of the field if CRP participation was not an option, but very few would convert their field to irrigated crops (in fact, 80% of respondents reported that they would be 'very unlikely' to do so).

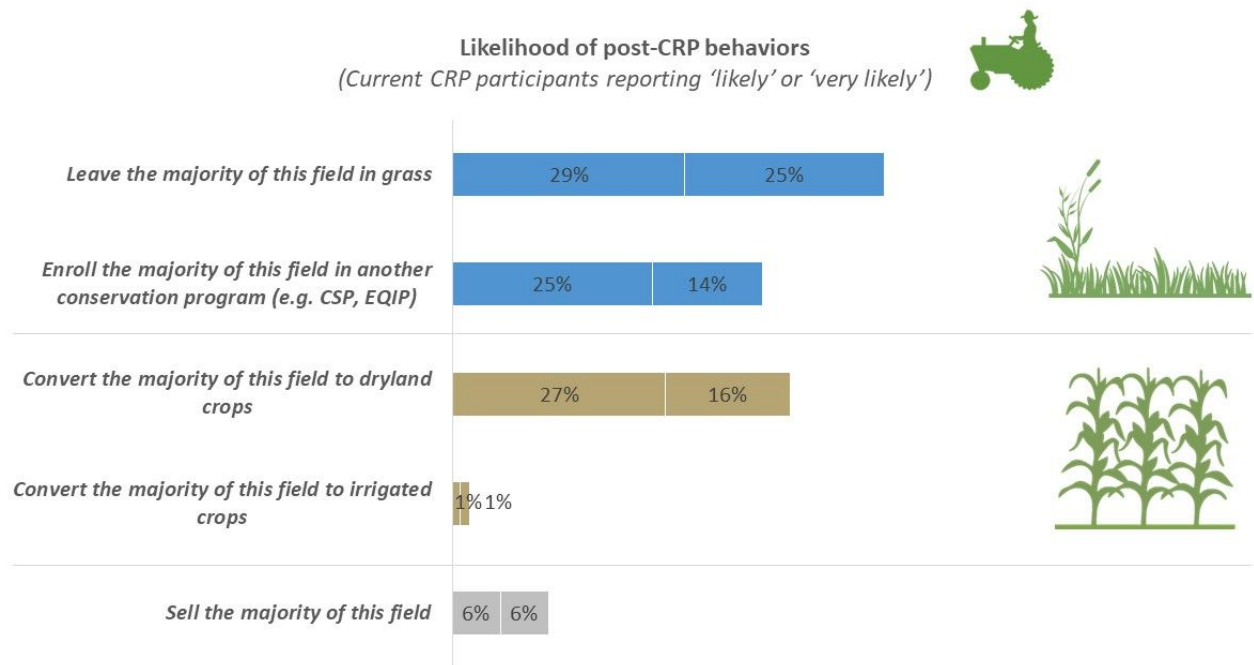


Figure 8. If you do not or cannot re-enroll this field in CRP, how likely are the following post-CRP actions to be employed on this field after your contract ends? *Note: Respondents were asked to evaluate the likelihood of each post-CRP action.

There are a number of differences between the behavioral intent of current CRP landowners and the reported behavior of landowners whose fields were previously enrolled in the program. We asked past CRP participants to select which, among the same five post-CRP actions offered to current landowners, had been applied to the majority of their previous CRP field. About 62% of past CRP landowners kept their former CRP field in grass, while 28% have converted the field to crops, almost exclusively dryland crops (**Figure 9**).

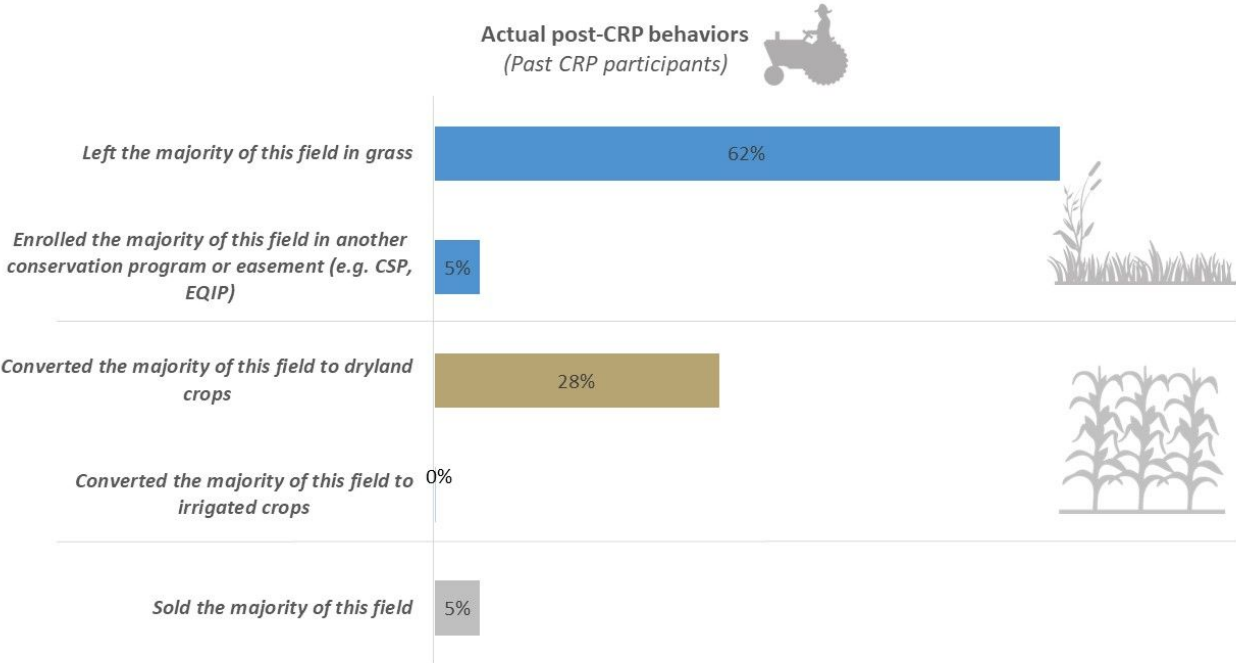


Figure 9. Which of the following post-CRP actions have been employed on this field that is no longer enrolled in CRP? *Note: Past CRP participants were asked to select only *one* action that applied to the majority of their previous CRP field.

Persistence of grass over time

Although persistence in grass is relatively high, we found that the likelihood of reversion to crops increases over time. Among past CRP participants who unsuccessfully tried to re-enroll their parcel in the program, the likelihood of persistence changes significantly depending on the number of years that the field has been out of CRP (Likelihood Ratio Chi-square = 130.049; $p = 0.042$) (**Table 1**). For example, while 80% of fields whose contracts expired in 2015 are still in grass, only 58% of fields whose contracts expired in 2011 are still in grass.

Table 1. Percent of past CRP participants (who tried to re-enroll but were not able to) that persisted in grass and reverted to crops by year of contract expiration.

Year	% persistence	% reversion
2011	58.3	41.7
2012	62.1	37.9
2013	66.7	33.3
2014	80.0	20.0
2015	80.0	20.0
2016	73.5	26.5
2017	93.8	6.3

RQ4: If landowners continue, or intend to continue, to keep their fields in grass after their CRP contracts expire, what factors predict this behavior?

Because the durability of the conservation benefits provided by CRP in the study area relies on the persistence of grasslands on the landscape, it is essential to understand the factors that contribute to grass persistence when the financial incentive associated with CRP participation ends. Dayer et al. (2018) previously identified five pathways that may facilitate the persistence of landowners' conservation behaviors following participation in incentive programs; these pathways relate to the influence of their resources, cognitions, motivations, habits (adapted here as status quo bias), and social influences on their decisions and behaviors (see Table 2 for definitions and examples).

Table 2. Descriptions of five pathways to conservation persistence (Adapted from Dayer et al., 2018).

Pathway	Definition	Example survey items
Cognitions	Cognitions refer to landowner attitudes and beliefs related to the environment, conservation practices, or the conservation program.	<i>Evaluation of CRP experience, trust, perception of risk, environmental attitudes</i>
Resources	Resources such as time, labor, knowledge, and finances must be sufficient to continue the conservation behavior. Other resources can include physical and environmental assets of a region.	<i>Equipment, technical assistance, regional weather, water for cattle, physical features</i>
Motivations	Motivations, or the reasons for which an individual engages in a conservation behavior, may include enjoyment of the behavior or its expected outcomes, or other benefits derived from the behavior.	<i>Maximize profit, prevent erosion, improve water quality, improve huntable habitat</i>
Status Quo Bias (Adapted from Habits)	The role of habits, understood here through the status quo bias, refers to a preference for behaviors that have already been chosen or implemented and thus require little or no change.	<i>Ease and desirability of keeping CRP fields in grass after contract expiration</i>
Social Influence	Social influences refer to an individual's beliefs about what other people in their community or social group are doing and what is acceptable or expected behavior.	<i>Desire to follow neighbor/family expectations</i>

We sought to understand how these five pathways differ among those who are likely to persist or have reported grassland persistence after the expiration of their CRP contracts and those who are likely to revert or have reportedly reverted their field to crops. In the following sections, our analyses focus on comparisons across these four groups of landowners from our survey sample. We

compare 1) current landowners who are likely to keep their field in grass if they do not or cannot re-enroll in CRP (n =115) to 2) current landowners who are likely to revert their CRP fields to crops if they do not or cannot re-enroll in CRP (n =216), and 3) past landowners who persisted with grass on their CRP fields after removing the field from the program (n = 106) to 4) past landowners who reverted their CRP fields to crops (n= 212). In the following sections, we refer to them simply as landowners who are likely to persist with grass on their field and landowners who are likely to convert their fields to crops after CRP (see **Methods** section for more detail on the creation of these variables).

Cognitions

Landowner cognitions are a broad category referring to landowner attitudes and beliefs related to the environment, conservation practices, or the conservation program. Attitudes and perceptions can play an important role in influencing land use decisions (Caldas et al., 2016) and may influence persistence behavior following CRP. Our survey explored landowner cognitions through questions that asked respondents about their overall experience in CRP; trust of CRP-related personnel; perceptions of risks and benefits associated with the program; and environmental attitudes.

Overall experience

CRP participants with expired fields overwhelmingly reported having a 'positive' or 'very positive' experience with the program, and this was consistent across groups with different post-CRP land management behaviors. Only 6% of previous participants who have reverted to crops and 5% of landowners who have persisted with grass considered their experience with CRP to be either 'negative' or 'very negative' (**Figure 10**).

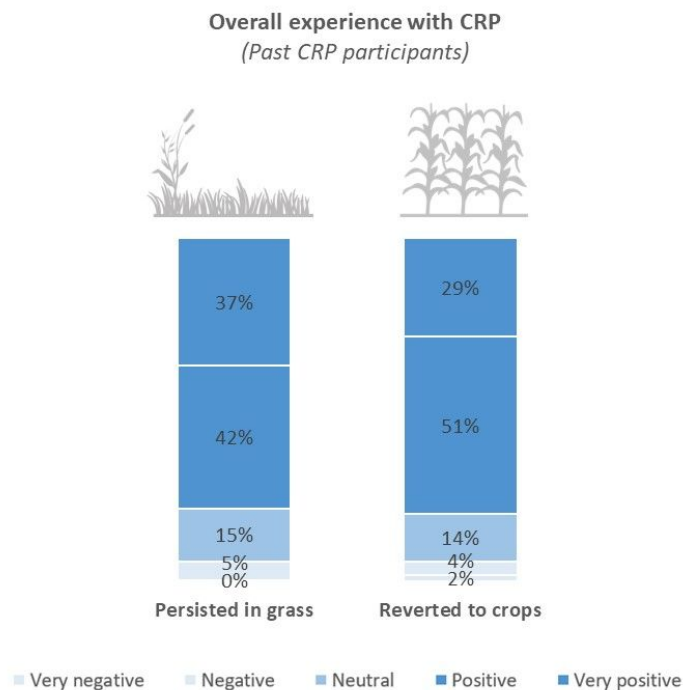


Figure 10. Please rate your overall past experience with CRP related to this field.

Current CRP participants were asked to rate their experience with various aspects of program enrollment and management, rather than to rate their overall experience with CRP. Over half of all survey respondents, both those who are likely to keep their field in grass and those who are not,

reported having a 'positive' or 'very positive' experience with each aspect of CRP (**Figure 11**). Current CRP landowners who are likely to keep their field in grass most commonly reported being happy with the enrollment process (84%), grass establishment (80%), the sign-up ranking process (79%), and the re-enrollment process (77%). In comparison, somewhat fewer current CRP landowners reported positive experiences with mid-contract management, including disking, burning, and interseeding (66%), and CRP rules and regulations (60%). Current landowners who are likely to revert their field to crops less frequently reported having 'positive' or 'very positive' experiences with each of these aspects of CRP.

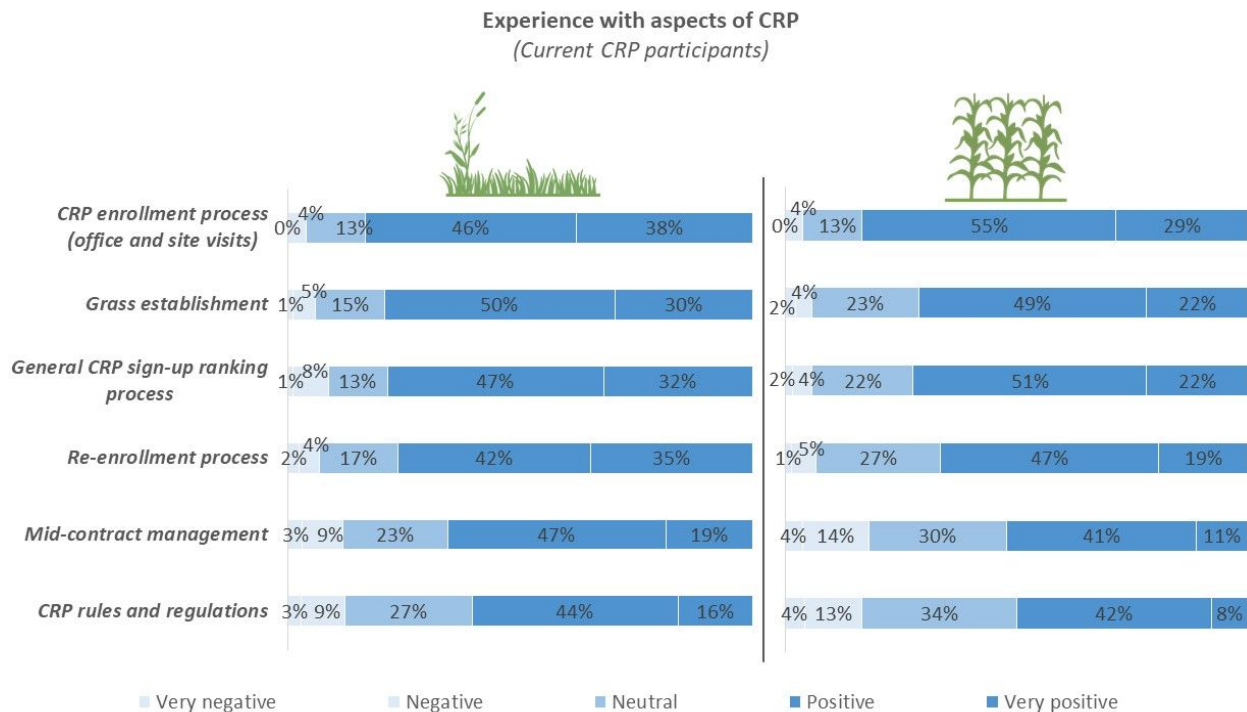


Figure 11. Please rate your experiences with the following aspects of CRP.

Trust in CRP-related personnel

In order to understand the role of trust in conservation persistence, our surveys also asked both current and past landowners about their experiences with CRP-related personnel during CRP enrollment, re-enrollment, and management. We first asked landowners to indicate who among a list of CRP-related personnel they interact(ed) with most frequently. A subsequent question asked respondents to think about the extent to which they shared values with that contact, trusted their expertise, and felt that they performed their CRP-related functions well. These survey items were developed based on Stern and Coleman’s (2015) description of different types of trust relevant to natural resource management. Survey respondents (including both past and current CRP participants) reported interacting most often with USDA Farm Service Agency (FSA) staff (67%). An additional 27.2% of respondents interacted most frequently with USDA Natural Resource Conservation Service (NRCS) staff.

Across all four landowner categories, over 70% of respondents ‘agreed’ or ‘strongly agreed’ that they trusted the expertise of their CRP contact to help them achieve their land management goals and believed that their contact properly informed them about CRP rules and regulations (**Figure 12a and 12b**). Landowners in all four categories less often ‘agreed’ or ‘strongly agreed’ that their CRP contact

shared similar values. Trust in CRP-related personnel was fairly uniform across past CRP participants with different post-CRP behaviors. Among current CRP participants, however, compared to those who are likely to revert to crops, landowners who are likely to persist in grass more often 'strongly agreed' with each of these statements.

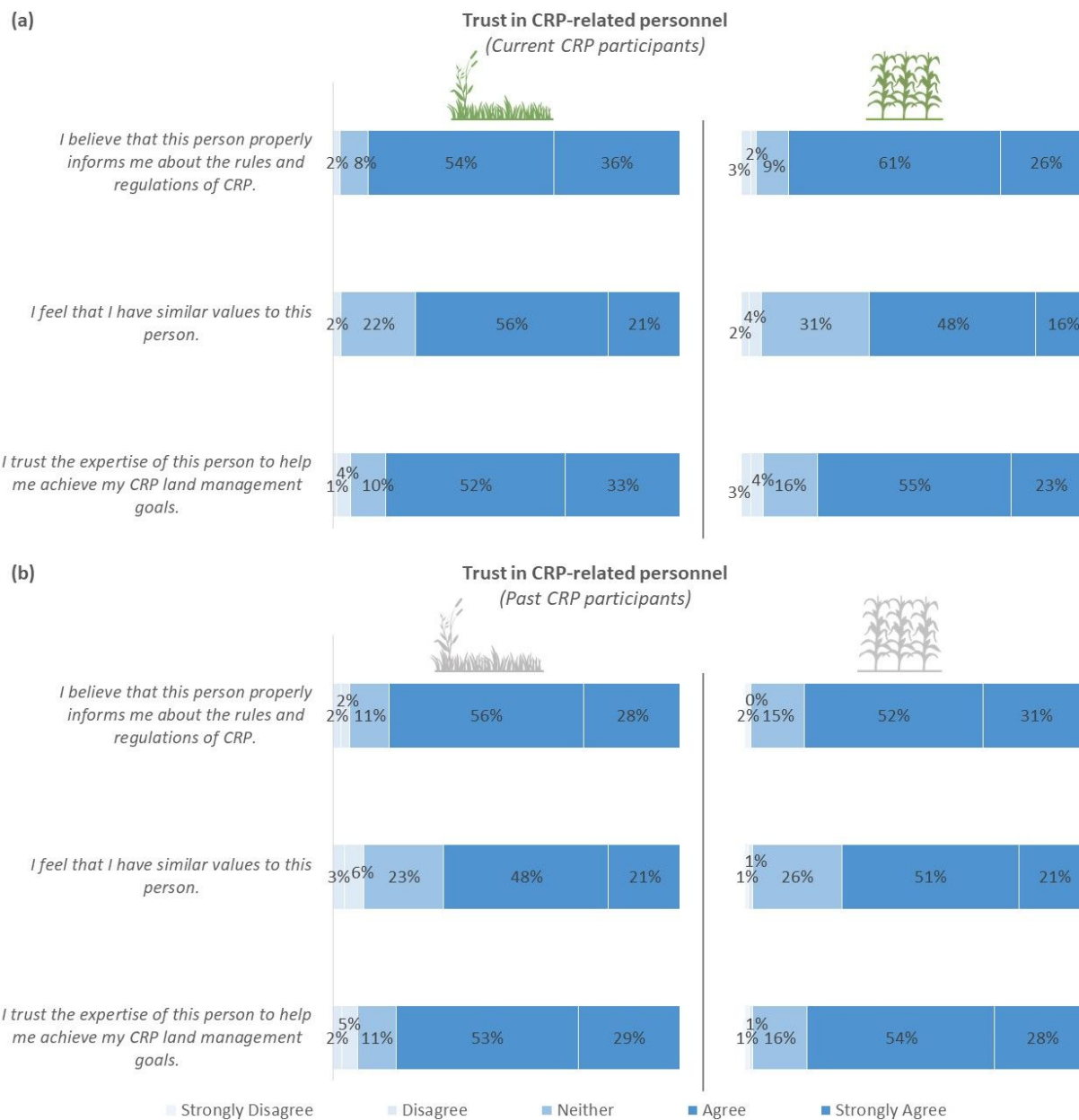


Figure 12 (a,b). To what extent do you agree or disagree with the following statements about your CRP-related experiences with the person you interact(ed) with most?

Perception of program benefits and risks

Perceptions of the risks and benefits associated with a given conservation behavior may influence whether or not individuals persist in that behavior after incentives end (Dayer et al., 2018). Focus group conversations illustrated that perceived positive impacts were important in CRP re-enrollment

decisions. Participants in all three focus groups described a variety of ecosystem services provided by their CRP fields. They most often focused on the ways in which the establishment of grass stabilized the soil on their land, reducing wind or water erosion and improving the air quality in their communities. Other focus group participants mentioned that they could tell CRP was having an impact because they saw more wildlife in their fields. A participant from Spearman, TX observed: “Yeah, it was a rare incident to see a deer in this country and now it’s... I don’t wanna say it’s common, but I’ve certainly seen more in the last 15 to 20 years than I did up until then.” This increase in the deer population was considered a good thing. Finally, focus group participants also described the tall, green grass of CRP as aesthetically pleasing.

In addition to exploring perceived benefits through qualitative data, our survey asked past and current CRP participants to rate the importance of risk avoidance in their post-CRP land management decisions. Specifically, we asked landowners the extent to which their decisions were influenced by an effort to minimize risk from pest insects or wildlife that eat or damage crops and to minimize wildfire risk. Overall, compared to past CRP participants, current CRP participants more often thought these risks would be ‘important’ or ‘very important’ in how they choose to manage their fields after their CRP contracts expire (**Figure 13**). Compared to all other groups, past CRP participants who reverted their former CRP field to crops more often reported that these risks were ‘unimportant’ or ‘very unimportant’ in their land management decisions.

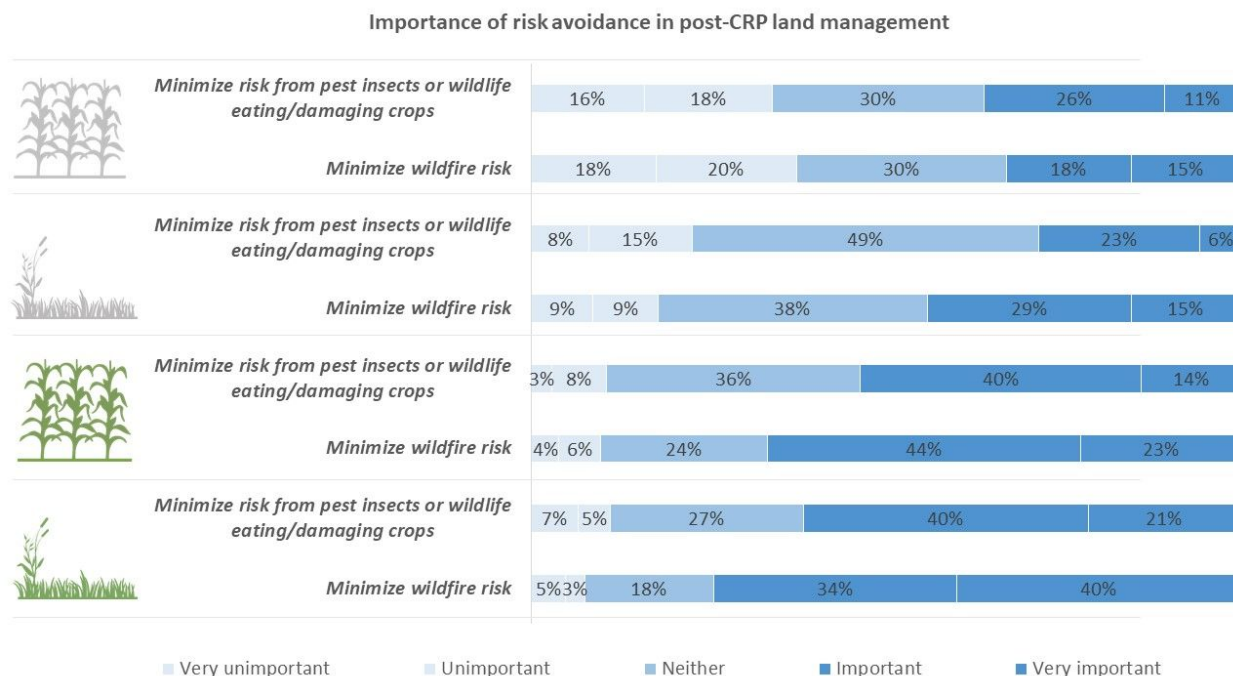


Figure 13. How important are each of the following considerations to your post-CRP decisions?

Environmental attitudes

To assess the impact of environmental attitudes on the persistence of grass after CRP enrollment ends, our surveys asked both current and past landowners the extent to which they agreed with a set of eight statements about the relationship between agriculture and the environment. These statements were adapted from survey questions developed and validated by Thompson, Reimer and Prokopy (2014) to evaluate competing environmental attitude frames among farmers. Four of these statements reflected an environmental orientation, and four reflected a business orientation.

Respondents in both groups of current CRP participants widely agreed with environmental attitude statements that “A successful landowner adjusts agricultural practices to protect the environment,” “Good farming means equally managing agricultural and natural areas,” and “Good farming requires using acreage efficiently” (Figures 14a and 14b). Compared to those who are likely to revert to crops, current landowners who are likely to persist more often ‘agree’ or ‘strongly agree’ with all four environmental attitude statements.

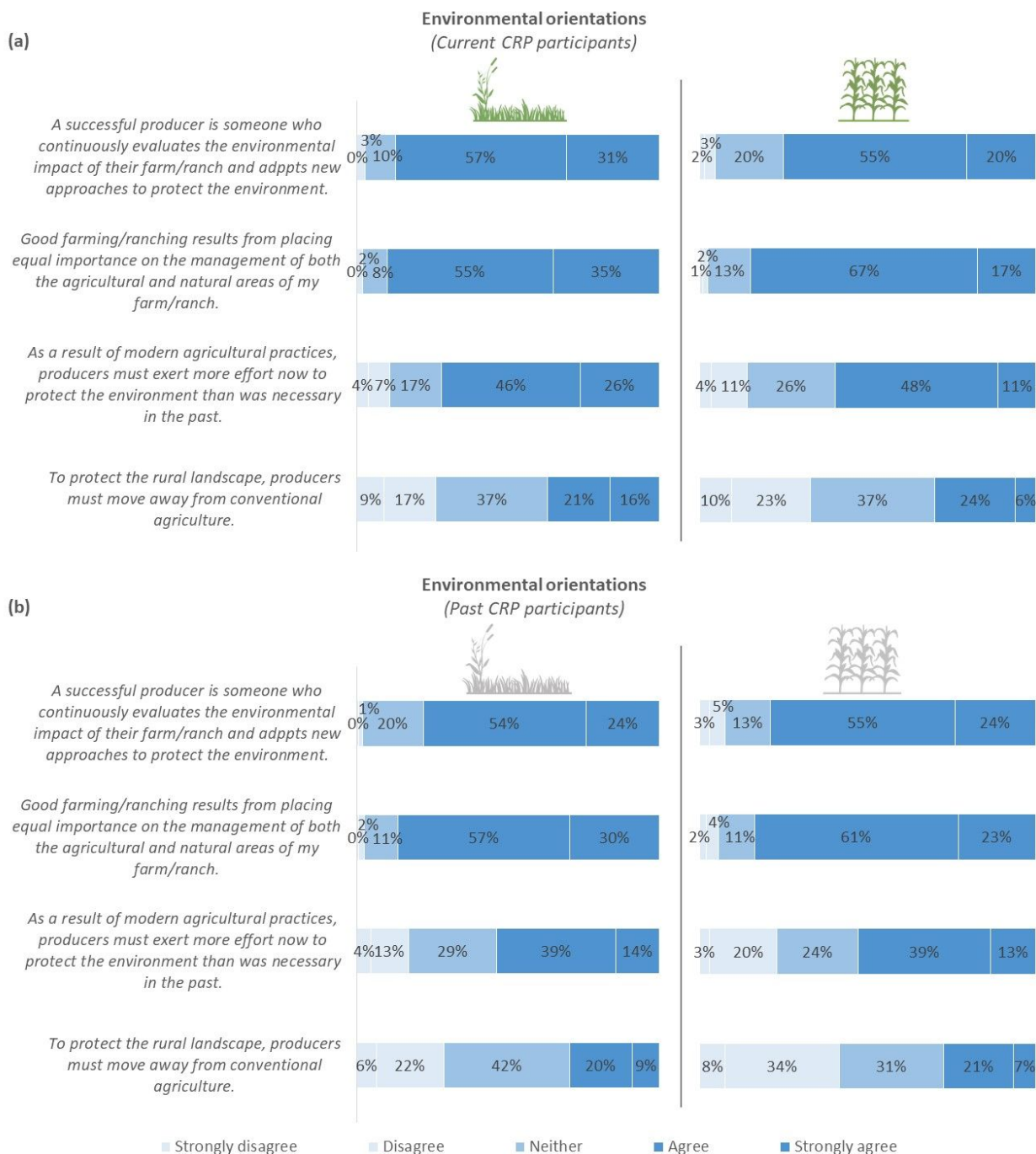


Figure 14 (a,b). To what extent do you agree or disagree with the following statements?

Past CRP landowners who converted their field to crops after they left the program more often agreed with the business orientation statements that “*Good farming/ranching requires using all available acreage as efficiently as possible to maximize yields*” and that “*Programs to protect soil and water resources should emphasize approaches that primarily benefit agricultural production*” (Figures 15a and 15b). Conversely, past landowners who have kept their previous CRP field in grass more often agreed that “*To protect the rural landscape, producers need to move away from conventional agriculture.*”.

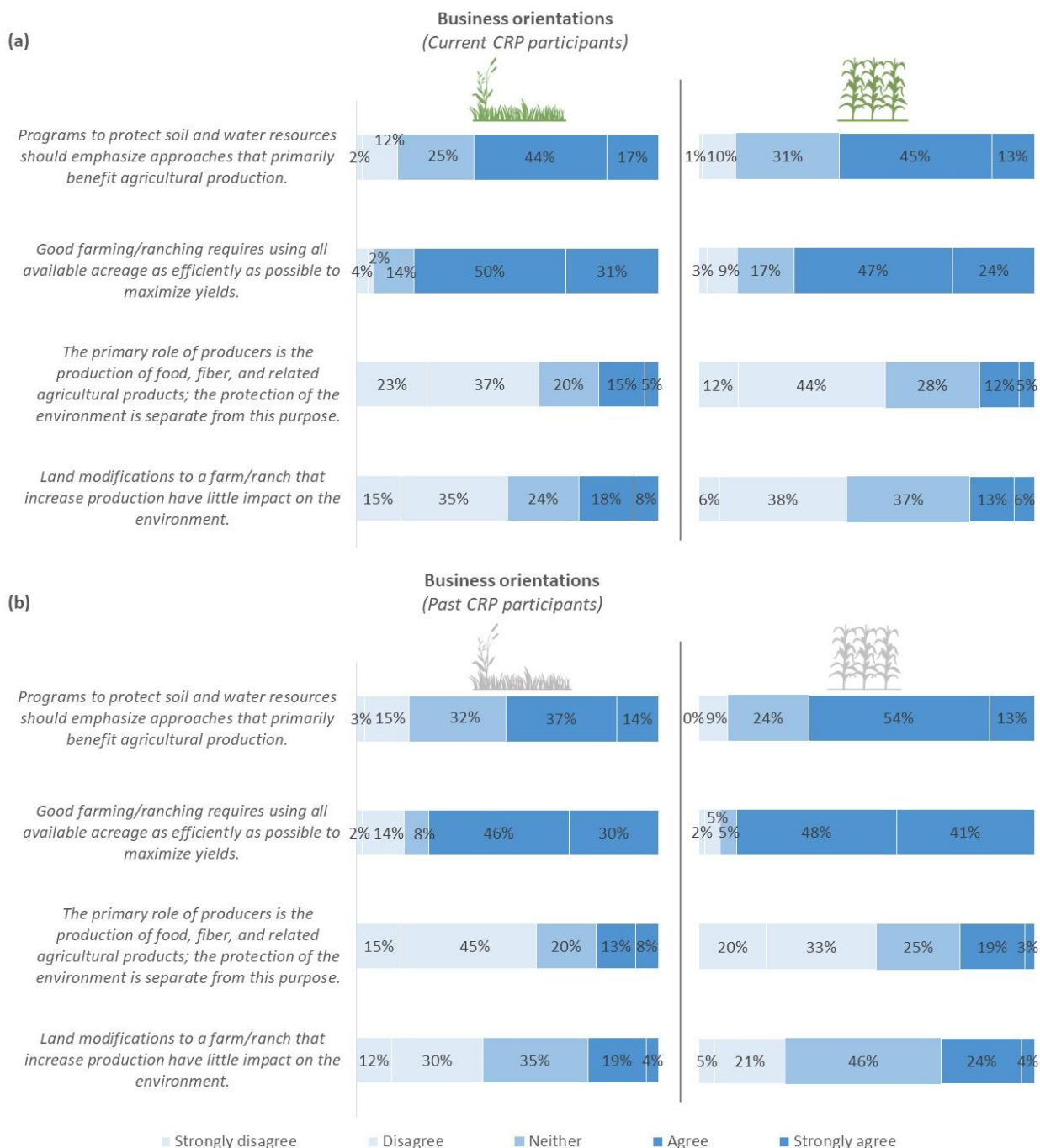




Figure 15 (a,b). To what extent do you agree or disagree with the following statements?

Landowner cognitions and persistence

We examined correlations between each of the landowner cognitions detailed above and intended or reported persistence behavior. These correlations are summarized in **Table 3** and described in further detail below.

Table 3. Summary of correlations between grassland persistence and measures of landowner cognitions. Significant correlations are indicated with asterisks (* $p < 0.05$, ** $p < 0.01$) and shaded boxes (green for current CRP participants; grey for past CRP participants).

	r_{pb}	
Overall experience	0.040	0.136*
Trust in CRP personnel	-0.036	0.135*
Perceived risk	0.107	0.103
Environmental beliefs	0.086	.202**
Business orientation beliefs		
<i>Good farming requires using acreage efficiently</i>	-0.146**	0.104
<i>Land modifications minimally impact environment</i>	-0.135*	-0.024
<i>Soil/water protection programs should benefit agriculture</i>	-0.148*	0.023
<i>Primary role of producers separate from environmental protection</i>	0.018	-0.06

The six aspects of landowner experience with CRP had high internal consistency so they were combined into one factor reflecting overall CRP experience. For current CRP participants, this overall experience variable was significantly and positively associated with being likely to persist in grass after contract expiration ($r_{pb} = 0.136$). For past participants, overall CRP experience was not correlated with persistence. As was the case for experiences with CRP enrollment, positive experiences with CRP-related personnel were highly correlated with each other; these three survey items were thus combined into one scale variable reflecting landowner trust in CRP-related personnel. For current CRP participants, trust in these CRP contacts was significantly and positively associated with being likely to persist in grass after contract expiration ($r_{pb} = 0.136$). In contrast, for past participants, level of trust in CRP personnel was not correlated with whether fields were kept in grass or reverted to crops.

The two measures of risk avoidance included in our survey -- the importance landowners attributed to minimizing wildfire risk and damage to crops from pests, wildlife, and weeds -- were highly correlated with each other, so a single risk scale variable was created. This risk perception variable was not correlated with persistence for past or current CRP participants.

The environmental attitude statements included in our survey also showed high internal consistency, so they were grouped together into one variable that reflects an environmental stewardship orientation. Among current CRP participants, this environmental stewardship orientation was significantly and positively associated with being likely to persist in grass after CRP

($r_{pb} = 0.202$). The business orientation statements did not have adequate internal consistency to warrant into a single scale. Individually, the items did not correlate with persistence intentions for current CRP participants. However, agreement with each of those three statements was significantly and negatively correlated with grassland persistence among past CRP participants.

In summary, among current CRP participants, overall experience in CRP, experiences with CRP personnel, and an environmental stewardship orientation are each correlated with a landowner's likelihood to persist with grass after their CRP contract ends. For past CRP participants, reported grass persistence on an expired CRP field is negatively correlated with a business orientation.

Resources

Resources such as time, labor, knowledge, and financial, physical, and environmental assets may be important in landowner post-CRP land use decisions. In particular, landowners who have access to these resources may be more likely to continue conservation behavior following the end of the program (Dayer et al., 2018). Our surveys asked both past and current CRP participants to rate the importance of a variety of resource considerations in their post-CRP land management decisions; these included the availability of equipment and technical assistance, weather and soil conditions, the geological characteristics of the land, and access to water. Past CRP landowners who reported grassland persistence after leaving the program most often reported that their decisions were driven by physical, landscape-level factors, especially weather patterns; 71% of these respondents reported that regional weather was an 'important' or 'very important' consideration in their post-CRP land management (**Figure 16b**). Soil fertility, the availability of water for irrigation or cattle, and physical features of their fields, such as slope, were also key considerations for the majority of past CRP participants. Similarly, well over half of current landowners who are likely to persist with grass if they do not or can not re-enroll in CRP reported that these physical features would be 'important' or 'very important' in their post-CRP land management decisions (**Figure 16a**).

Our qualitative data provide additional insight into the importance of the physical characteristics of individual lands in post-CRP behavior. Many landowners who participated in our focus groups explained that if they could not re-enroll in CRP, they would continue with grass but graze and/or hay it instead, largely because they felt that their CRP land should never have been cultivated in the first place. To avoid the risk of soil and water erosion associated with cropland reversion, these landowners said that they would try to keep the land in grass by some other means. As one landowner in Texas explained in a focus group: "I watch that [land] blow too many years. We're not gonna plow it up." However, these focus groups also shed light on how land management decisions are contingent upon the availability of resources, especially water, on a given property. For instance, one focus group participant in Lamar, CO explained, "On very little of it [my CRP land] I would have water to graze. I don't own cattle, I don't intend on cattle, and if I had to take it out [of CRP], it would have to go right back into crops because there is no water [for cattle]."

Current landowners who are likely to persist with grass most commonly reported that their post-CRP land management decisions would be shaped by the cost and availability of resources needed to keep the land in grass, such as cattle and the equipment needed for fencing and haying. Over 72% of these current landowners thought these operational resources would be 'important' or 'very important' factors (**Figure 16a**). As a current landowner from KS said in a focus group, "When you look at the average age of a landowner out there today, the cost of equipment – I bet a high, high percentage of them would leave it in [CRP] if they had the option."

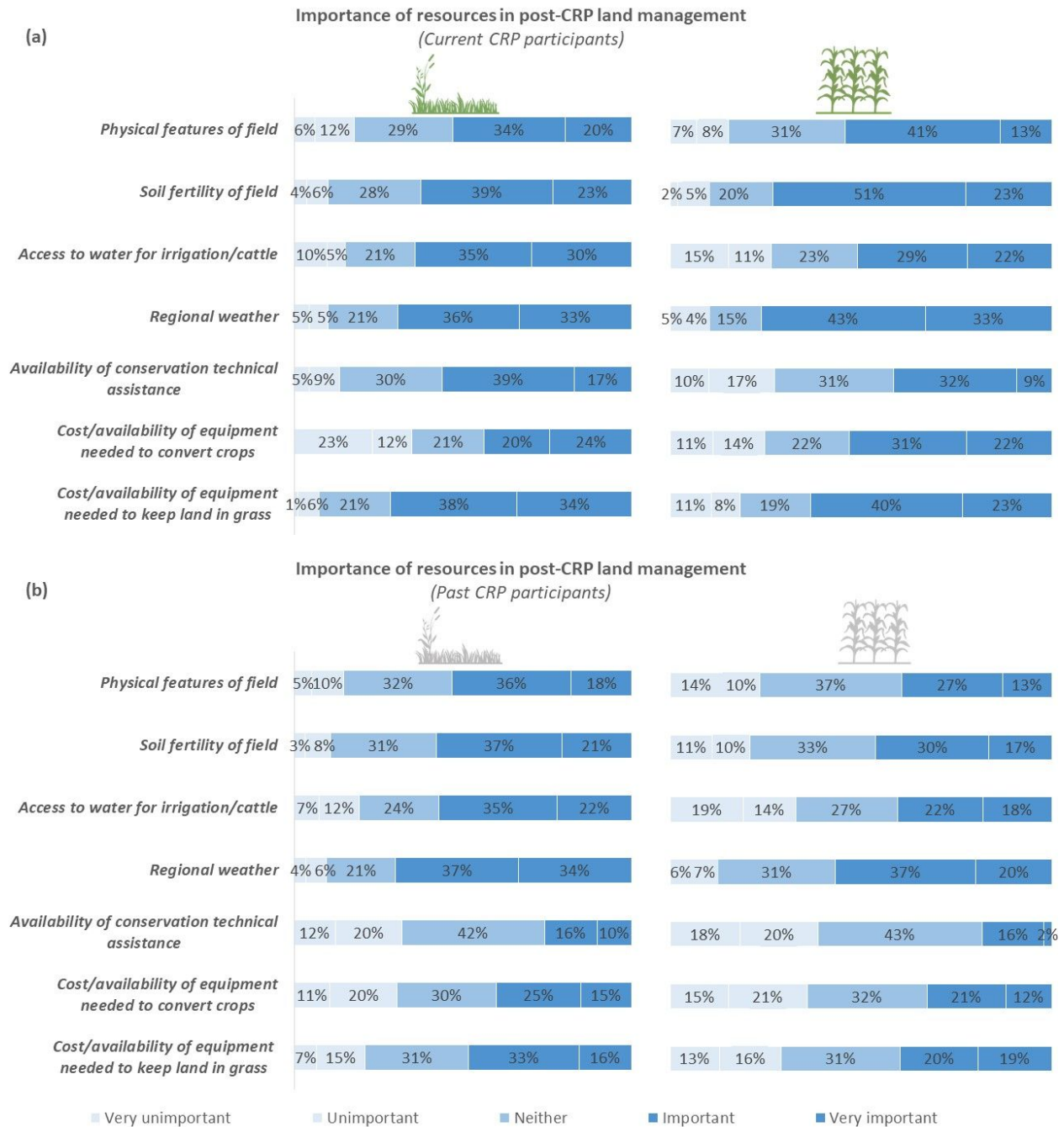


Figure 16 (a,b). [If you do not or cannot re-enroll this field in CRP] How important are each of the following financial and resource considerations to your post-CRP decisions?

Current landowners also expected the availability of technical assistance to contribute to their ability to continue to maintain grass on expired CRP fields: 56% of current respondents who likely to persist with grass reported that conservation technical assistance would be ‘important’ or ‘very important’ in their post-CRP land management decisions. Past landowners who have persisted with grass attributed less importance to both equipment and technical assistance; operational resources and conservation technical assistance were ‘important’ or ‘very important’ factors for 40% and 26% of

past landowners who kept their CRP field in grass, respectively. Another 42% reported that conservation technical assistance was ‘neither’ important nor unimportant.

Landowner resources and persistence

The levels of importance that landowners attributed to the physical resources included in our survey, including the equipment needed to keep the land in grass or convert it to crops; regional weather; access to water; the soil fertility and physical features of the field; and the availability of conservation technical assistance, were highly correlated with each other; these items were thus grouped into a single variable. This variable, which reflects the importance of resources in post-CRP land management, was significantly and positively related to persistence among past CRP participants ($r_{pb} = 0.193$). The relationship between resources and persistence was not significant for current participants.

Table 4. Correlation between grassland persistence and landowner perceptions of the importance of resources to their decisions. Significant correlations are indicated with asterisks (* $p < 0.05$, ** $p < 0.01$) and shaded boxes (green for current CRP participants; grey for past CRP participants).



	r_{pb}	
Importance of resource considerations	0.193**	0.068

Motivations

The motivations that underlie a given behavior can include various factors from enjoyment of the behavior or satisfaction with the result of the behavior and can promote persistence following CRP (De Snoo et al., 2013; Kwasnicka et al. 2016). Motivations are often considered *extrinsic* (based on external rewards) or *intrinsic* (based on internal satisfaction) motivations. It has been hypothesized that a landowner will be more likely to persist with a conservation behavior if their motivation goes beyond extrinsic financial incentives (Ryan & Deci, 2000).

To understand what motivates landowners to persist in grass when the financial incentive to do so ends, we asked current and past CRP participants to rate the importance of a variety of factors in their post-CRP land management decisions. These items included motivators such as improving field quality, habitat for game and non-game species, and financial stability. Among current CRP participants who are likely to keep their field in grass, the most important motivating factor was preventing soil erosion; 94% of respondents in this category consider this an ‘important’ or ‘very important’ motivator for their post-CRP land management (**Figure 17a**). Past CRP landowners who have actually kept their field in grass also most often reported that a concern for preventing soil erosion drove their post-CRP land management decisions; 86% of these survey respondents considered erosion an ‘important’ or ‘very important’ factor (**Figure 17b**). Improving general soil health was also important for over two-thirds of respondents who persisted in grass or are likely to do so. Keeping the field in the family was also an ‘important’ or ‘very important’ motivation for over two-thirds of respondents in this category.

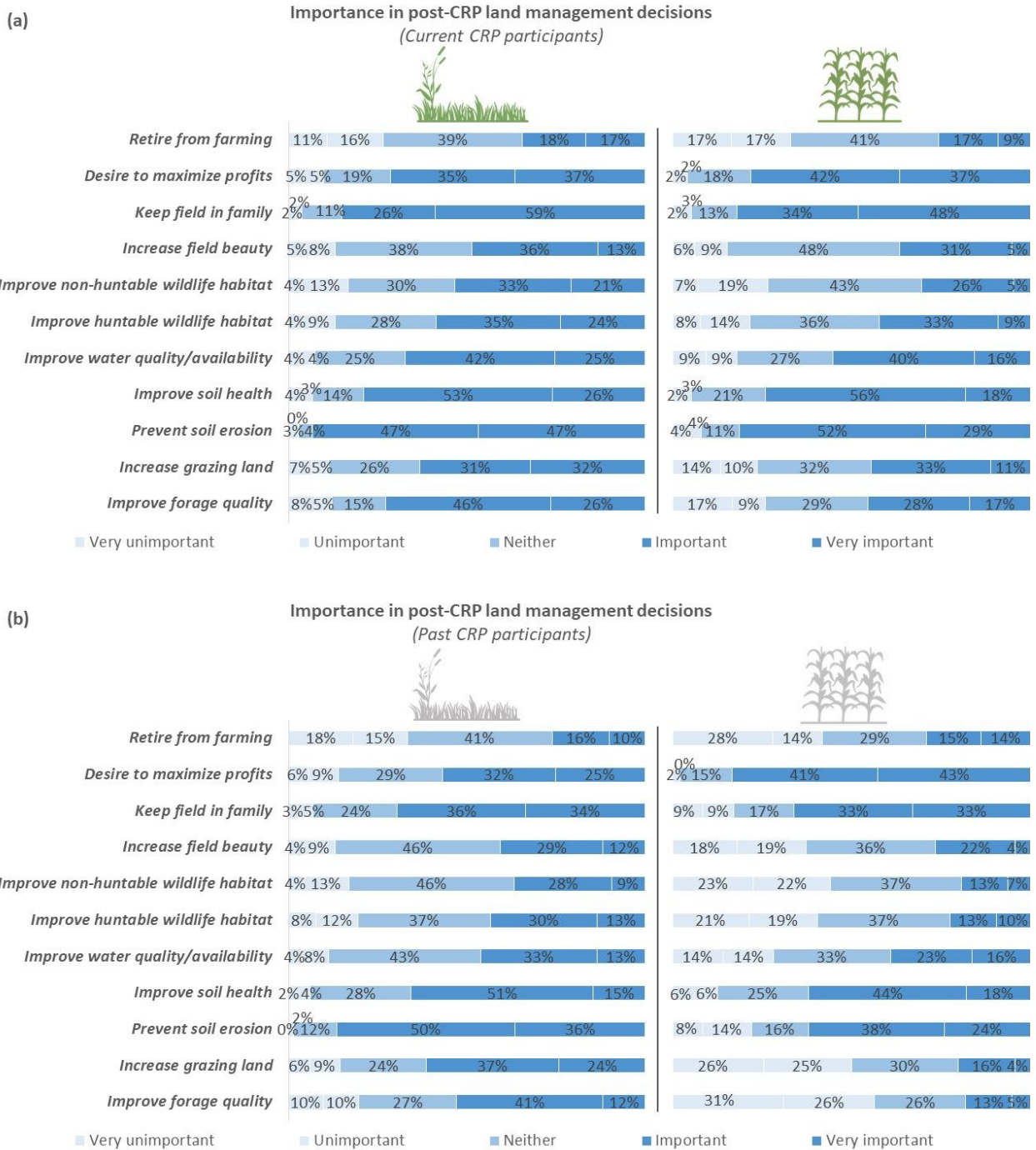


Figure 17 (a,b). How important are each of the following considerations to your post-CRP decisions?

Motivation to keep the field in the family was also ‘important’ or ‘very important’ for 85% of current landowners who are likely to persist in grass, with over 59% -- more than for any other survey item -- reporting that this was a ‘very important’ factor. A number of focus group participants described the importance of considering the next generation and making decisions based on what will keep farming in the community. A landowner in Colorado explained, “If I were doing it myself, there’d be

no question, but I have a 30-year-old son that I am trying to set up and a grandson coming on... I really think there are people in the U.S. that still want to farm.”

Additionally, 72% of current landowners who are likely to persist with grass after CRP reported that the desire to maximize profits or increase financial stability would shape their post-CRP decisions. As we described previously, the landowners we interacted with emphasized the importance of ensuring that all of their acreage is productive in some way. A focus group participant in Meade, KS explained: “The first thing I’d consider is my return on investment. If it doesn’t pay its way, give me a return, I can take that money and put it in mutual funds or some other kind (of investment).” Factors related to field quality, including increasing grazing land, improving soil health, water quality and availability, and forage quality, were also important motivating factors for current landowners who are likely to keep their land in grass.

Although we learned through our qualitative research that some landowners use CRP as a retirement program, persistence in grasslands without CRP payments is not generally motivated by an interest in retiring from farming among current or past CRP participants. In fact, among all motivations listed in this survey question, landowners who kept or are likely to keep grass were least likely to be motivated by an interest in retiring from farming.

Landowner motivations and persistence

For both past and current CRP participants, persistence in grass after the expiration of a CRP contract is positively and significantly correlated with a variety of motivations, including the level of importance landowners attribute to improving forage quality ($r_{pb} = 0.376$ and 0.221 , respectively), preventing soil erosion ($r_{pb} = 0.319$ and 0.183), improving water quality and/or availability ($r_{pb} = 0.138$ and 0.164), improving wildlife habitat for both huntable ($r_{pb} = 0.240$ and 0.190) and non-huntable species ($r_{pb} = 0.291$ and 0.238), increasing field beauty ($r_{pb} = 0.268$ and 0.120), and increasing grazing land ($r_{pb} = 0.432$ and 0.233) (**Table 5**). The post-CRP land management decisions of landowners who are likely to persist or have persisted with grassland maintenance were most often motivated by these considerations. For past participants only, persistence is also significantly, but negatively associated with the desire to maximize profits ($r_{pb} = -0.261$). Among current CRP participants only, being likely to persist with grass is significantly and positively related to the importance of retiring from farming ($r_{pb} = 0.113$).

Table 5. Summary of correlations between grassland persistence and measures of landowner motivations. Significant correlations are indicated with asterisks (* $p < 0.05$, ** $p < 0.01$) and shaded boxes (green for current CRP participants; grey for past CRP participants).



Importance in post-CRP land management decisions	r_{pb}	
Improve forage quality	0.376**	0.221**
Increase grazing land	0.432**	0.233**
Prevent soil erosion	0.319**	0.183**
Improve soil health	0.057	0.052
Improve water quality/availability	0.138*	0.164**
Improve huntable wildlife habitat	0.240**	0.190**
Improve non-huntable wildlife habitat	0.291**	0.238**
Increase field beauty	0.268**	0.120*
Keep field in family	0.087	0.082
Desire to maximize profits	-0.261**	-0.074
Retire from farming	0.042	0.113*

Status quo bias

The formation of habits, or an “automated tendency to repeat a specific behavioral response” (Frey & Rogers, 2014), can play a role in natural resource conservation. For this study, we considered the influence of habits through two measures of the *status quo bias*, which refers to a preference for behaviors that have already been chosen and require little to no change (Telesetsky, 2017). For example, as it relates to grassland persistence, a focus group participant from Meade, KS explained that “if it [the land] ever came out [of CRP], it would be a way to just leave it [in grass] and already have some grass to utilize with the cow herd and pasture.”

Our surveys among landowners in the study area indicate that this bias towards the status quo plays an important role in the maintenance of grass among both past and current CRP participants. Landowners who have persisted in grass, or are likely to, more often agree with both of these statements. Over 92% of current CRP participants who are likely to keep their field in grass and 75% of past landowners who have persisted with grass ‘agree’ or ‘strongly agree’ that it would be or was easier to keep the field in grass than to convert it to crops (**Figure 18**). While 77% of past landowners who kept their field in grass either ‘agree’ or ‘strongly agree’ that they wanted to keep their CRP field “as is” after their contract ended, only 48% of current landowners who are likely to persist with grass felt similarly.

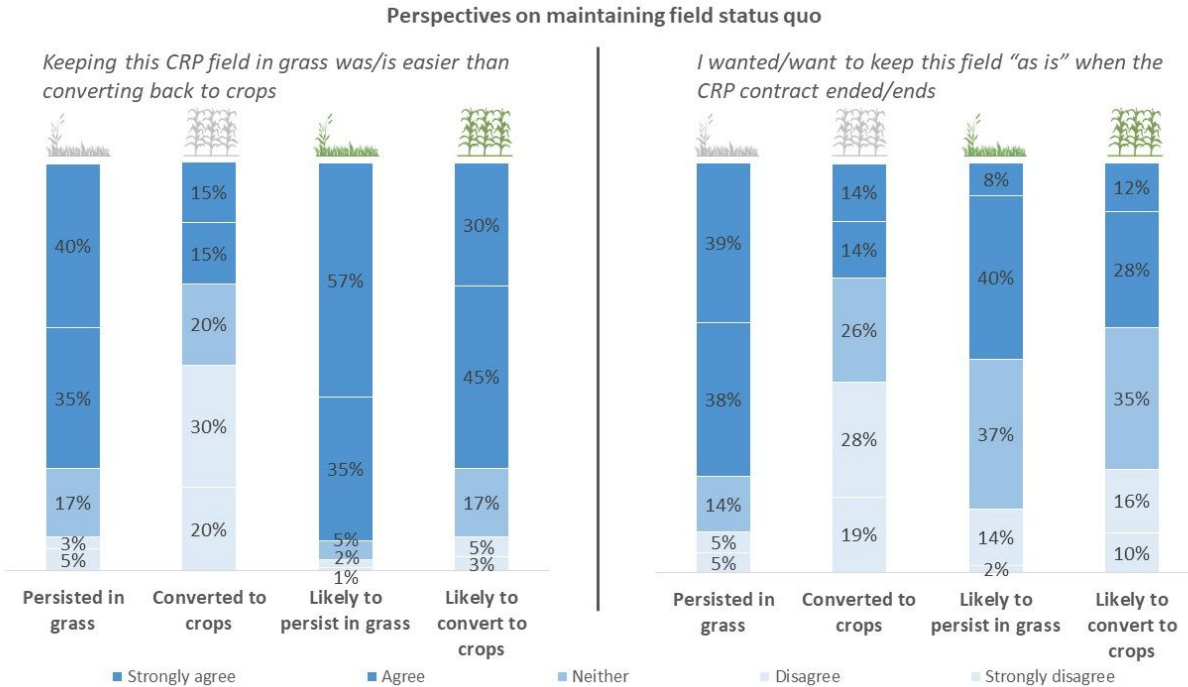


Figure 18. To what extent do you agree or disagree with the following statements regarding your post-CRP decisions for this field?

Status quo bias and persistence

For both current and past landowners, agreement with statements about the ease and desirability of continuing with the status quo predicts persistence. Believing that keeping a CRP field in grass is easier than converting back to crops and wanting to keep the field in grass were significantly and positively associated with being likely to persist in grass among both current CRP participants ($r_{pb} = 0.267$ and 0.448 , respectively) and past CRP participants ($r_{pb} = 0.171$ and 0.206 , respectively) (**Table 6**).

Table 6. Summary of correlations between grassland persistence and measures of landowner status quo bias. Significant correlations are indicated with asterisks (* $p < 0.05$, ** $p < 0.01$) and shaded boxes (green for current CRP participants; grey for past CRP participants).

	r_{pb}	
Keeping my field in grass is/was easier than converting back to crops	0.171**	0.267**
I want/ed to keep this field 'as is' when the CRP contract ends	0.206**	0.448**

Social Influences

Social influences, which refer to an individual's beliefs about what other people in their community or social group are doing and what is acceptable or expected behavior, can impact landowner decisions; conservation programs that are adapted to these social norms and pressures may be more effective in facilitating persistence (Dayer et al., 2018). For example, if aesthetic features of the landscape are important to a community, conservation efforts that provide visible benefits (e.g. meadow restoration) may be more impactful (Riley, 2016). Although research has found social norms to be a consideration in deciding to enroll in CRP (Force & Bills, 1989), their influence on the persistence of conservation behavior has not been explored.

Focus group participants reported knowing neighbors who were no longer in CRP who employed a variety of post-CRP management strategies, but that many had converted former CRP land to crops. One landowner in Kansas explained: "I think that a fairly large acreage back home went into cultivation -- a little wheat and dryland corn. Truthfully, they figure they can do the dryland corn thing back our way. They get their insurance money instead of a CRP payment." Focus group participants explained how their neighbors' decisions to "break out" former CRP land were based on overall land quality and economics; it paid more to grow crops on the field than to leave it in grass. One landowner in Texas explained his neighbor's decision: "Well, they had good land. It wasn't marginal land, it was good land." Other management actions in the area included selling the land and grazing it. Overall, if the land was not in CRP, there was a need to do something with it that would generate a financial return, whether through farming, grazing and haying, or selling the land.

In our surveys, compared to past landowners, current landowners more often felt that family and neighbor expectations would be an 'important' or 'very important' factor in their post-CRP land management decisions (**Figure 19**). However, perceptions of the importance of these expectations was relatively consistent across landowners with different post-CRP land management behaviors.

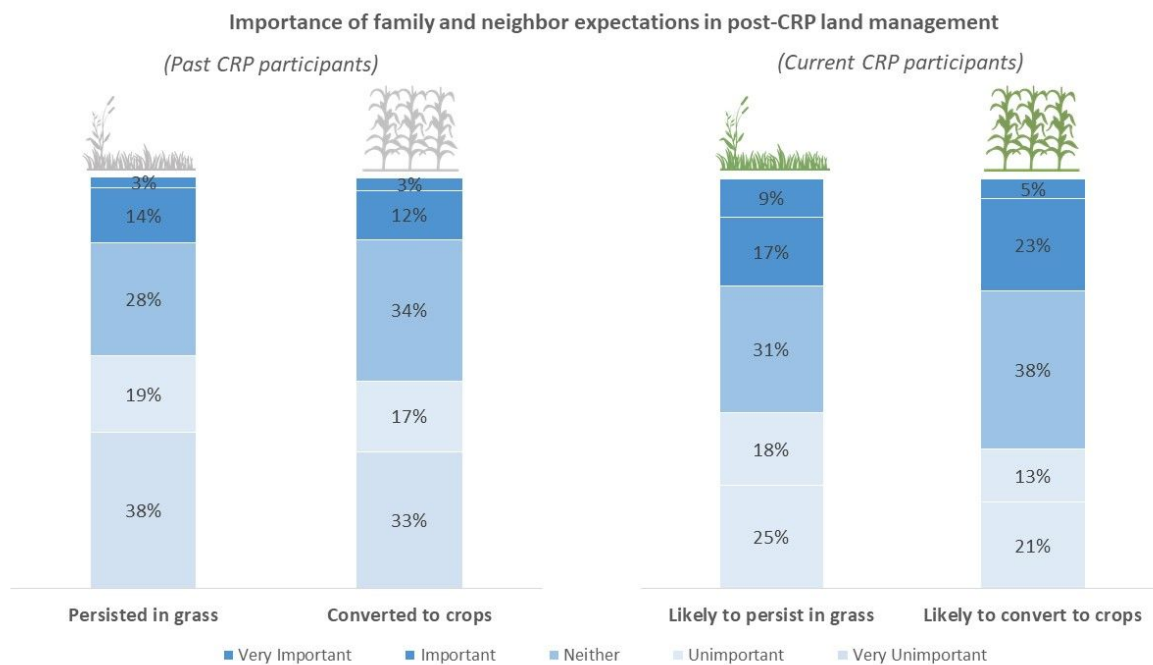


Figure 19. How important is 'following what my neighbors or family think I should do' to your post-CRP decisions?

While the importance of perceived family and neighbor expectations was not a good predictor of persistence, the differences between those who persisted (or are likely to persist) and those who reverted (or are likely to revert) were more substantial in terms of the example set by landowners in their region whose fields are no longer in CRP. Compared to those who reverted or are likely to revert their fields to crops, past CRP participants who kept their fields in grass and current CRP landowners who are likely to persist with grass more often reported that keeping CRP fields in grass after contract expiration is common in their area (**Figure 20**).

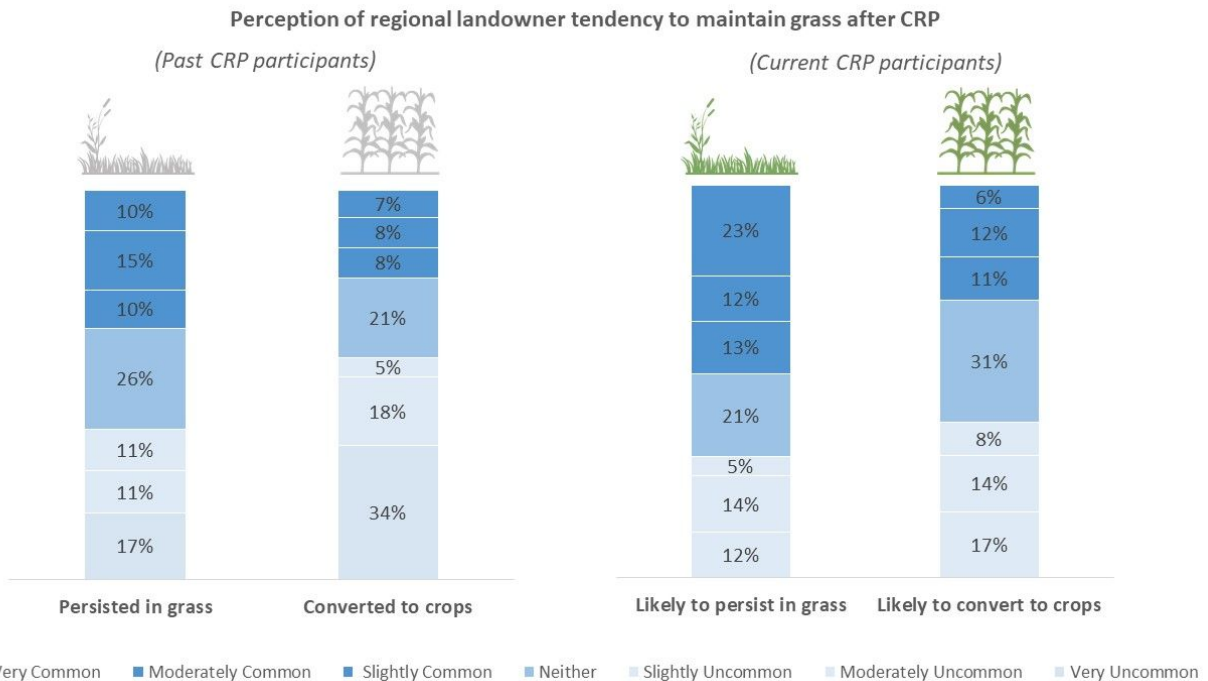


Figure 20. How common is it for other people in your area to keep their CRP land in grass when their CRP contracts end and the land is not re-enrolled?

Social influences and persistence

For both past and current CRP landowners, the persistence of grass was significantly and positively correlated with the perception that it is common in the area to continue with grass on expired CRP fields ($r_{pb} = 0.205$ and 0.178 , respectively). There was no significant correlation between the level of importance a landowner attributed to family expectations and persistence.

Table 7. Summary of correlations between grassland persistence and measures of landowner social influences. Significant correlations are indicated with asterisks (* $p < 0.05$, ** $p < 0.01$) and shaded boxes (green for current CRP participants; grey for past CRP participants).

	r_{pb}	
How important is <i>following what my neighbors and/or family think I should do</i> in your post-CRP decisions?	-0.042	-0.038
How common is it for other people in your area to keep their CRP land in grass when their CRP contracts end and the land is not re-enrolled?	0.205**	0.178**

Discussion

Understanding CRP participation

Both our qualitative and quantitative data collection aimed to understand why landowners enroll (and re-enroll) in CRP and the perceived benefits and drawbacks of program participation. The landowners we surveyed and interacted with through our qualitative research most often focused on the importance of preventing soil erosion and viewed CRP as a mechanism for retiring marginal lands and restoring environmental stability, both on individual fields and across the regional landscape. Given regional and programmatic history, this focus on soil stabilization is not surprising. Our study area contains the heart of the region impacted by the Dust Bowl of the 1930s, where severe dust storms and land degradation occurred due to a combination of drought and inadequate land management methods (Lee & Gill, 2015). Additionally, CRP was initially implemented as a mechanism to promote soil conservation, and until relatively recently, has continued to focus on improving soil quality (Hellerstein, 2017).

CRP continues to be recognized by landowners as a tool for soil conservation; however, it is increasingly being promoted for wildlife conservation. This shift creates tensions between the goals of CRP and landowner interests. While many landowners in the study area want to increase the abundance of cover and wildlife on their property, our qualitative data adds important nuance to landowner interest in improving wildlife habitat. Our focus group and interview participants were primarily concerned with improving habitat for game species, and many consider the benefits of CRP for wildlife to be a spillover effect of stabilizing soil. They explained that while the wildlife benefits of rehabilitating marginal lands are clear to them, the farming or ranching benefits derived from protecting wildlife habitat are more difficult to see. Additionally, many of the landowners we interacted with maintain a cattle-centric view of grass varieties and management; consequently, they consider the wildlife-friendly forb species mandated by CRP to be “weeds.”

In addition to an interest in soils and wildlife, CRP participation is also heavily motivated by an interest in financial stability. The role of CRP rental payments in a landowner’s overall economic portfolio varies widely. For some landowners, these payments are essential to keep their operations afloat, while for others, the additional income provides leverage for growing their operations. Further, while some landowners enroll in CRP in order to keep farming in the family, others use the program as a means to retire from farming altogether. Compared to soil and financial considerations, landowners less often reported that their CRP enrollment was related to an interest in improving water availability. However, the summer of 2017 was unusually wet, with levels of rainfall that essentially brought the region out of decade-long drought; this may have dampened the relative importance of water conditions for local landowners.

In sum, CRP enrollment is a multi-dimensional decision, rooted in the financial, familial, and biophysical conditions that characterize a landowner’s operation. In a context in which land is an asset used to generate income and sustain ways of life, these conditions are tightly linked and difficult to understand in isolation. Enrollment in CRP helps landowners in the study area balance their sometimes competing needs for soil stabilization and short-term financial return, and thus allows them to maximize the productivity of their land -- in terms of both revenue and biomass -- over the long-term. CRP serves an important financial function similar to what a bond provides an investor—it provides landowners with a largely guaranteed and stable annual return on their land. It

also fits landowners' desire to set aside marginal land, which can be difficult to do, given the predominant view that all available land should "yield something."

Understanding re-enrollment in CRP

This study also aimed to understand landowners' interest in re-enrolling in CRP and their ability to do so. Our surveys indicated that interest in re-enrolling in CRP is high among current participants; however, over half of past CRP participants in our survey sample unsuccessfully attempted to re-enroll their land in the program after their initial contracts expired. We did not determine why these fields were not granted new contracts; they may have been unable to be re-enrolled because they did not meet qualifying criteria or were not ranked highly enough, or they may have been excluded due to the enrollment cap. The most recent farm bill, passed in December 2018, raised the enrollment cap for CRP by 3 million acres across the nation, perhaps alleviating some of this problem. Yet, the 2018 farm bill also lowered rental rates for enrolled parcels. Our survey only asked respondents about their interest in re-enrolling *given the same rental payment* and did not evaluate whether a reduced rate would impact landowner decision-making. Still, combined with increasing commodity prices and based on historical trends (e.g. Hellerstein and Malcolm, 2010), it is likely that reduced rental payments will dampen landowner demand for re-enrollment.

In addition to exploring interest in re-enrollment, this study aimed to understand why landowners choose not to re-enroll their properties in the program. We explored this question through our survey of past CRP participants, as well as qualitative research on the perceived disadvantages of CRP enrollment among current CRP participants. In our survey, past CRP participants who did not attempt to re-enroll their parcel in CRP most often reported that their decision was motivated by the limited profitability of keeping the field in CRP. This was consistent with what we heard in interviews and focus groups about the ways in which current CRP participants weigh CRP rental payments against current crop and livestock prices and make land management decisions that maximize productivity and profitability. Inconsistencies between CRP rules and landowner needs or knowledge, particularly related to restrictions on haying or grazing, were also important to past participants in our survey and were prominent in our discussions with current landowners as well. The landowners we interacted with in interviews and focus groups described many CRP policies as cumbersome, inconsistently enforced, and at odds with the original intent of CRP, local ecology, and their own needs.

Our survey also asked current CRP landowners about their interest in a variety of potential changes to CRP that may influence program re-enrollment and management. Respondent preferences were divided in some cases, particularly related to an approach that would allow landowners to increase their chance of re-enrollment by agreeing to a post-CRP easement that permanently excludes agricultural production on the parcel. Overall, the smallest percentage of landowners expressed interest in receiving a reduced annual payment instead of having to pay grass cover establishment and maintenance costs. Additionally, the majority of landowners prefer a non-competitive sign-up at a rate determined by FSA over a competitive sign-up at a rate determined by the landowner. These preferences may reflect a need among landowners for CRP to be a stable option for land management that can be compared to other uses of their fields.

Understanding post-CRP behavior

Given the reported inability of some CRP landowners to re-enroll in the program after their initial contracts expire(d), we sought to understand what landowners in this situation have done or are likely to do with their CRP land. Over half of current CRP participants reported being likely to persist

with grasslands on their CRP fields if they can not re-enroll, and the reported rate of persistence on expired fields in our survey sample is even higher, around 62%. These landowner intentions and behaviors are promising for the establishment of enduring conservation benefits associated with CRP. Still, over a quarter of the expired parcels included in our survey sample have been converted to crops, almost exclusively dryland crops. Reversion appears to increase over time. Among past CRP participants who unsuccessfully tried to re-enroll their parcel in the program, the likelihood of persistence changes depending on the number of years that the field has been out of CRP.

In spite of landowner intentions, most of the acreage that comes out of CRP is not entering another land conservation program. Almost 40% of current CRP landowners reported that they would be 'likely' or 'very likely' to enroll their lands in another conservation program, such as the Conservation Stewardship Program (CSP) or Environmental Quality Incentives Program (EQIP). However, only 5% of the expired fields included in our survey sample had actually been enrolled in these programs 1-7 years after their CRP contracts ended. This may be due to limited opportunities for enrollment in another program for landowners if they cannot stay in CRP, or landowners may be unaware of available options or how to enroll in these programs. The barriers to this transition should be explored and addressed.

Understanding conservation persistence

We found that each of the five pathways described by Dayer et al. (2018) -- cognitions, resources, motivations, habits (or status quo bias), and social influences -- predict persistence (i.e., keeping land in grass as opposed to reverting to crops) to some extent. Among current CRP participants, persistence intentions are related to positive experiences with the program; attitudes about agriculture that are environmentally-oriented; the perceived ease and desirability of maintaining the status quo of a CRP field; and the norms established by other landowners in the area whose CRP fields have expired. Persistence intentions are also correlated with a variety of intrinsic motivations, including improving forage quality, preventing soil erosion, improving water quality and/or availability, improving wildlife habitat for both huntable and non-huntable species, increasing field beauty, and increasing grazing land. These relationships provide multiple mechanisms through which ongoing conservation behavior might be promoted. Among current CRP participants, being likely to persist with grass is significantly and positively related to the importance of retiring from farming in a landowner's post-CRP land management decisions.

Actual grassland persistence among past participants is predicted by the same intrinsic motivations associated with persistence intentions among current CRP participants, but is also negatively associated with an interest in maximizing profits. This is consistent with our understanding that many landowners do not re-enroll in CRP in order to pursue other opportunities that are more lucrative or productive. Although current CRP participants attributed less importance to resource considerations as they contemplated their future land management decisions, ultimately, reported grassland persistence was also contingent on the physical resources, especially weather and water, that characterized a field. Our interactions with current landowners provided insight into the importance of the physical characteristics of individual parcels in post-CRP behavior. The landowners we talked to explained how reversion to crops is hardly an option on highly erodible, marginal land and often the only option on land without access to water for irrigation or cattle.

Understanding landowners

Overall, many of the landowners we studied want CRP management that allows them to make informed decisions and respond to changing economic conditions in order to maximize the

productivity of their land. For marginal lands, a CRP rental payment is often optimal, facilitating the “production” of grassland and a financial return on otherwise less productive acreage, and the persistence of grass after CRP may be the best -- and in some cases, only -- option. For higher quality fields, however, CRP and the maintenance of grass after contract expiration have to make sense relative to opportunities in agricultural or livestock production. The landowners we studied are interested in CRP land management that is reliable, but also flexible and farm-specific, accommodating local site conditions and producer knowledge.

Recommendations

This study was motivated by an interest in identifying strategies for promoting landowner participation in CRP and grassland persistence after CRP contracts end. The research team met with project partners, who are involved in private lands conservation at the regional level, to co-produce the following recommendations.

Implications of study findings fell into three broad categories: implications for policy and program design; implications for program delivery; and future research that might build upon the dataset or baselines produced in the present study. Crosscutting many of these recommendations is the context of the recent passage of the 2018 farm bill, which provides a timely opportunity to integrate findings from this study into the design and delivery of CRP. In particular, as rule-making for the farm bill proceeds, insights into why landowners enroll in or leave the program and the factors that determine persistence in grass after CRP can be used to ensure that CRP implementation is consistent with landowner needs, interests, and motivations. Additionally, this study provides baseline information on reported rates of grassland persistence after CRP payments end that might be used by CRP program managers at state and national levels to set goals for grassland persistence.

Policy and program design

- ***Incorporate local-level and landowner feedback and preferences into CRP rule-making.*** Landowners in our study area commonly expressed frustration over CRP rules that they perceived to be cumbersome, inconsistent, or inappropriate for their local social, economic, or ecological context. We recommend consideration of whether and how CRP rules might be streamlined, simplified, and clarified, while also leaving room for flexibility at the local level and some degree of autonomy for individual landowners. FSA could review its existing mechanisms at national or state levels for responding to local feedback on CRP. How accessible are these mechanisms for landowners? Are there gaps in the coverage of or communication about these feedback mechanisms to landowners? How might these processes be used and enhanced to provide landowners with a sense of ownership over local program implementation? Opportunities for feedback should allow local-level input on decisions that are meaningful to landowners, about which they have both sufficient interest and information. For example, these choices might include how CRP payments and re-enrollment are structured. Rule-making could also respond to general landowner preferences documented in this study. For instance, landowners in the western Great Plains expressed a strong interest in grass varieties that are palatable for livestock. National-level rules for seed mix development could be changed to ensure that grass varieties used in CRP meet multiple objectives: these plants should establish well on target lands, stabilize soils, and also provide forage benefits for wildlife, game species, and domesticated livestock.
- ***Increase support for sustainable haying and grazing.*** Landowner dissatisfaction with CRP rules was particularly strong related to program restrictions on haying and grazing. The 2018 farm bill included several changes that increased opportunities for grazing on CRP acres; landowners now have the option to graze CRP land as a component of mid-contract management without a reduction in rental rate in order to encourage the establishment of healthy plant communities. This change is consistent with landowner perspectives on grazing and insistence that greater flexibility in grazing rules could yield benefits for both

landowners and wildlife. We suggest further consideration of how the capacity of private lands biologists and other technical experts to support the use of sustainable grazing by landowners might be increased. Helping landowners establish both a pattern of sustainable grazing and positive relationships with technical experts may promote the persistence of grass after CRP participation ends.

- ***Include measures of water availability or quantity as CRP ranking criteria.*** Landowner decisions about enrollment in CRP and grassland persistence after CRP participation ends are made in the context of other opportunities to generate revenue from the land, including agricultural production, crop insurance, and grazing. However, these choices are constrained by the physical characteristics of a given parcel of land, especially soil quality, weather conditions, and water availability. The selection criteria for offers to enroll fields in CRP currently include potential impacts on water quality, but water availability, in terms of quantity or accessibility, is not considered. The addition of this criterion may improve the ability of FSA to conduct accurate cost-benefit analyses and evaluate savings that accrue to other programs due to CRP enrollment. Additionally, consideration of water availability may facilitate the identification and enrollment of lands that are likely to be left in grass after CRP and generate lasting environmental benefits.

Program delivery

- ***Align outreach and messaging with landowner motivations.*** Study insights can also inform messaging about CRP. Program recruitment, retention, and conservation persistence may all be improved if the benefits of CRP and its grassland practices are communicated by FSA and other CRP-affiliated personnel in terms that resonate with landowners. While CRP enrollment and post-CRP land management are influenced by financial considerations, many landowners are motivated by a broader notion of productivity that includes using good land for food production and ensuring the sustainability of farming in communities and families. Landowners with concerns about the development of farmland can also be supported by the conservation community, given their shared interest in the long-term maintenance of undeveloped areas. Our study also highlighted the overriding importance of soil conditions in CRP enrollment and post-CRP land management, and identified a notable difference in the level of importance many landowners attribute to preventing erosion over improving soil health more generally. CRP messaging should thus focus on the benefits of the program and grassland persistence for stabilizing soils. Communicating with landowners about the relationship between soil conservation and the conservation of wildlife habitat may also enhance landowner support for wildlife-related program goals.
- ***Aid the transition to other conservation programs.*** Our results suggest that there is strong interest among landowners in enrolling in another conservation program if they cannot re-enroll in CRP. However, few expired CRP parcels are actually being enrolled in these programs. The barriers to this transition are unclear and should be explored. Consistent with this recommendation, the 2018 farm bill clarifies that landowners can enroll in the Environmental Quality Incentives Program (EQIP) or Conservation Stewardship Program (CSP) in the final year of their CRP contract. It may be that private lands biologists could play an important role in providing information to landowners about these and other conservation programs for which they qualify and helping them transition into these programs after their CRP contracts expire. Given that our preliminary analysis suggests expired CRP fields may be reverted to crops at a higher rate over time, those providing

technical assistance should engage with landowners both as their contracts near expiration and soon after contract expiration.

- **Increase coordination between FSA and NRCS.** Landowners report interacting most often with FSA staff; however, technical assistance is currently provided by NRCS. Enhanced coordination between the two agencies would ensure consistent messaging about the focus and benefits of CRP and could leverage additional technical support for landowners. Because many of the land conservation programs in which landowners may enroll after their CRP contracts expire are managed by NRCS (see above), coordination between these two agencies may also improve the transition of expired CRP fields into other conservation programs. More frequent combined training courses, for example in human dimensions or the wildlife benefits of CRP management, for both FSA and NRCS staff may be an effective means of enhancing understanding and strengthening relationships between the agencies.

Future research

- **Study natural experiments in CRP management.** A number of the changes made to CRP management under the 2018 farm bill will create opportunities for further understanding landowner needs, priorities, and decision-making under changing program provisions, and findings from the present study could serve as a baseline for this future research. For example, many of the current CRP participants we interacted with suggested that greater flexibility in haying and grazing restrictions would enhance program benefits for both landowners and wildlife. Research could be designed to understand how related changes in the new farm bill shape grassland persistence in the western Great Plains. In particular, the incorporation of penalty-free grazing in mid-contract management may make the transition to sustainable haying and grazing after CRP more efficient and more enduring.
- **Explore types of CRP landowners.** Many of our analyses point to heterogeneity among CRP participants. For example, while some landowners come from a legacy of farming and make decisions based on what will keep this heritage alive in their families and communities, others are newer to farming and may be more motivated by recreation and aesthetics. Our existing dataset provides opportunities for developing typologies of CRP landowners based on their demographic characteristics, size and nature of their operations, access to water resources, reasons for enrolling in CRP, perspectives on wildlife and soil stabilization, environmental attitudes, or land management preferences. A typology may provide a valuable reference for identifying groups that are likely to participate in habitat conservation without financial incentives and for developing targeted strategies to promote grassland persistence.

Next Steps

Publication of findings

Members of the research team, in collaboration with study partners, will prepare manuscripts for peer-reviewed publication that communicate study findings and their broader relevance for habitat conservation incentive programs. These papers will include an analysis of the factors that predict the persistence of conservation behavior after CRP participation ends and an analysis that pairs producer perceptions of CRP field quality with measurements of field quality produced by the United States Geological Survey. We will also explore opportunities for presenting findings in CRP sessions at the North American Wildlife and Natural Resources Conference; through national webinars; and with partners of the North American Bird Conservation Initiative.

Translation and implementation of research

To ensure that this study shapes conservation practice on the ground, the research team from Virginia Tech, in collaboration with partners from FSA, NRCS, Bird Conservancy of the Rockies and Playa Lakes Joint Venture, will be planning in-person work sessions in each state where research was conducted and in the FSA national office. These sessions will consist of presentations and facilitated discussions that help apply study results to local CRP implementation. We expect to generate more specific, tangible recommendations with state- and local-level personnel at these workshops. Additionally, findings from this research will be shared in media formats that are accessible to landowners.

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Appendices

Appendix I Interview Script

SECTION I- INTRODUCTION

I am a student working on a project with Virginia Tech. As I mentioned on the information sheet, my project focuses on Conservation Reserve Program (CRP). I am interested in learning more about why producers may or may not participate in CRP. I am curious to learn about what you think about CRP, and how it may or may not fit in with your farm and land management goals. But first, I'm really interested in knowing more about your place, your operation and your history on the land.

Ice Breakers and Landowner Demographics:

1) How long have you been on this land? (How long has it been in your family? Did you grow up on a farm/ranch?)

In family since _____

Lived on it since _____

Owned or operated since _____

Describe your experience on land & family history. How did you get into farming/ranching?

2) Acres

_____ acres owned

_____ acres leased-in (has leases on other people's land)

_____ acres leased out

Prompts:

Do you lease it out for hunting? _____ Yes _____ No

Do you have wind turbines on any of it? _____ Yes _____ No

Gas/oil wells? _____ Yes _____ No

3) What do you primarily use your land for? (farming, ranching, hunting, recreation, etc.)?

4) What would you consider to be your principal occupation?

a. Do you and/or your spouse work off farm/ranch?

5) What crops do you grow? Do you also raise livestock? (Note: make sure they characterize)

6) Why do you ranch/farm? (Prompts after their initial answer)

a. Is it all about earning a living?

b. Is it because others (e.g., family/friends) expected you to?

c. Is it because you felt it was the only thing available

d. Because you have a passion for it, etc.

e. Some landowners say "it's a way of life", what does that mean to you?

f. IF they **DO** mention being a steward of the land, follow up by asking them to describe further and define what it means to them. Ask them: "In what ways does this influence how you manage your land?"

g. IF they **DON'T** mention stewardship, ask: People that farm and ranch sometimes talk about being a "steward of the land." What does that mean to you? Ask them: "In what ways does this influence how you manage your land?"

- 7) What do you find most challenging about running your farm/ranch?
- 8) What comes easiest for you when running your farm/ranch?
- 9) What do you find to be the most rewarding part of running a ranch/farm?
- 10) I'm interested to know if your whole family helps run the place, and how.

SECTION II- INITIAL CRP ENROLLMENT

Ask only for those who are currently enrolled or who have dropped out)

In this next part, I'd like to ask you specifically about the Conservation Reserve Program and your involvement in it.

- 1) How many acres do you currently have enrolled in CRP?
 - a. Do you have more than one tract of land in CRP? IF YES, ask for a list/description of each tract
 - b. Are they all under the same CRP program/practices? IF NO, explain differences

- 2) Tell me about your first time enrolling in CRP (IF THEY DIDN'T ENROLL THEIR LAND (E.G., IT PREDATES THEM), SKIP TO QUESTION 3)
 - a. What year was that?
 - b. How did you first hear about it?
 - i. Do you remember what you thought about CRP the first time you learned about it?
 - ii. What made you finally decide to enroll that first time? (Note: They may get into this because of family or other connections. If so, explore the dynamics of that.)
 - c. Tell me what it was like to enroll that first piece of land in CRP
 - i. Make sure they describe:
 1. Their interaction with FSA
 2. Their interaction with NRCS
 3. What the actual process was back then
 - a. What can you remember about the actual steps you had to do to enroll that first piece of land?
 - b. What they remember being really frustrating
 - c. What they remember liking about the process
 - d. What they remember being easy about the process
 - d. Did you have to take crops out of production to enroll?
 - i. IF YES, What was it like to take crop land out of production?
 1. Prompt: How did it feel to have to do that?
 - ii. What did you think about the native grasses that were established?
 - e. Do you have any other thoughts or feelings about why you first chose to participate?

- 3) Why do you participate in CRP?
 - a. Is it all about the income?
 - b. Is it because others (e.g., family/friends) wanted or expected you to?
 - c. Is it because you felt it was the only thing available?
 - d. Because you have a passion for it?
 - e. Etc.?

IF Stewardship is mentioned ("right thing to do", "steward of the land", etc.) use the following:

- a. What do you mean by [insert phrase they used here]? Explain.
- b. Ask them: "In what ways does this influence how you manage your land?"

IF Stewardship not mentioned, use the following

- a. Some landowners say "it's the right thing to do", what do you think they mean by that?

SECTION III- ONGOING CRP, MID-CONTRACT MANAGEMENT, and RE-ENROLLMENT

1) How's it going with your currently enrolled land? (Note: general question to transition to this section)

2) First, tell me about the CRP practices you are doing on your land (If needed: clarify by telling them the definition of what a "practice" is and give an example).

- a. Make sure to get all of the practices and have them clarify what each practice requires (i.e., don't assume they accurately know the names)

3) Reflecting on your participation in CRP for [insert number] years, what do you particularly like about the **program**?

- a. What about the program itself works well? (Note: This is a focus on the program. Let them freelist and follow up on those)
- b. [For each item listed] What is particularly good about X?
 - i. Prompt for: Enrollment process, people involved, procedural stuff, monitoring/enforcement, site visits, mid-contract management, etc.

4) What do you particularly **dislike** about the **program**? That is, what do you find frustrating about the program itself?

- a. What about the program doesn't work well? Explain. [Prompt for other pinch points] (Let them freelist and follow up on those)
 - i. [For each item listed] How would you change or fix it?
 - 1. Prompt for: Enrollment process, people involved, procedural stuff like payments and flexibility, monitoring/enforcement, site visits, mid-contract management, etc.
- b. Is CRP creating problems for your land, family, or farm goals?
- c. Is there anything about CRP making your life worse than it needs to be?

5) There are a few other topics that you might think are good or bad about the program that I'd like to ask you about.

- a. First, tell me about interacting with FSA—what is good or bad about that?
- b. What about NRCS?
- c. Interactions with "partner biologists" [Define what you mean]
- d. What about the contract obligations?
- e. Mid-contract management
- f. Amount paid

6) Beneficial **OUTCOMES** of program (ecosystem services): Next I want to ask you about your view of the outcomes on your land as a result of having your land in CRP.

- a. Are there things that have gotten better with your land as a result of enrolling in CRP? How do you know if your land is getting healthier? What specific things do you look at?
- b. What has gotten worse as a result of enrolling?

7) Beneficial OUTCOMES for landowner: I also want to know how enrolling in CRP has affected you & your family personally. In what ways does having CRP land influence how you feel about being a landowner?

- a. *If they have trouble with this answer, here are some prompts: I'll say a few statements that you can agree or disagree with*
 - i. Being a part of the CRP program makes me feel good about myself
 - ii. Being a part of the CRP program prevents me from being able to accomplish what I want
 - iii. I am proud to tell others that I am a part of the CRP program
 - iv. Being in CRP has little effect on my personal satisfaction with my land

8) Next, I want to hear your thoughts on the management requirements related to CRP.

- a. For people who have done it (mid-contract management):
 - i. What is your experience with mid-contract management?
 - ii. Tell me about the process. What did you have to do? What was your overall feeling going into it? Why? How do you feel after going through it? How did you feel once it was over? Why?
 - iii. Prompts: Was it:
 1. Is it easy or difficult
 2. Simple or complex
 3. Confusing or straightforward
 4. Costly in time you had to be involved or relatively efficient
 5. Did CRP adequately cover the costs?
- b. For people yet to do it for the first time:
 - i. What have you heard about it?
 - ii. *Prompts: Do you expect it to be:*
 1. Easy or difficult
 2. Simple or complex
 3. Mysterious or straightforward
 4. Costly in time you had to be involved or relatively efficient
 5. Did CRP adequately cover the costs?

Only for people currently in a contract. Otherwise, skip to next section

9) When does your contract end? (or most recent contract, if they have multiple)

10) Have you given thought to whether or not you would re-enroll?

11) Could you list all of the reasons that you would not re-enroll?

Note: write down all of the reasons in the order he/she says them. Then for each prompt them to explain (if they haven't already).

12) What are all of the reasons you would enroll?

Note: write down all of the reasons in the order he/she says them. Then for each prompt them to explain (if they haven't already).

13) To sum up, what would you say are the main reasons that influence whether or not you plan to re-enroll?

14) It seems like participation in this program fluctuates. Sometimes you hear about the lack of participation and sometimes you hear that the program has a lot of people enrolled. What do you think are the reasons that other landowners do or do not participate?

Note: they will probably start with an answer about markets & income. If so, prompt them for more by asking:

The money involved is definitely important. Are there other reasons besides money that you think influence participation?

15) If you were in charge, what changes would you make to the program to make it more landowner-friendly?

SECTION IV- DROPPING OUT OF THE PROGRAM AND CONSERVATION PERSISTENCE

FOR landowners who are planning to drop out or have already dropped out

1) You [mentioned you are planning to drop out when your contract ends]/[used to be in the program but have not re-enrolled]. What are your thoughts on not continuing with the program?

2) If you were in charge, what changes would you make to the program to make it more producer-friendly?

3) What exactly would have to change about CRP to pique your interest in re-enrolling?

4) Think about the CRP that's no longer enrolled:

For those dropping out

- a. What are your plans for the CRP lands?
- b. What do you envision they might look like in 5 years?

For people who have already dropped out

- a. What have you done with it since you left CRP?
- b. What are your future plans for the land?

SECTION V- QUESTIONS FOR NRCS/FSA/PARTNER BIOLOGISTS

These questions pertain only to program providers, not landowners.

1) What is your primary role as a (NRCS/FSA staff person/partner biologist)? What are your main responsibilities on the job?

2) Tell me about your involvement with the CRP program

- a. How long have you been involved with CRP as part of your position?
- b. What type of involvement do you have?
 - i. What are your duties related to CRP?
 - ii. Between the administration, producer relations, and implementation, where do you work the most? *Note: these may have to be refined once we're in the field*
 - iii. What do you like about administering/promoting/implementing CRP?
 - iv. What is frustrating for you when it comes to administering/ promoting/implementing CRP?

3) What kinds of comments...

- a. For those who provide enrollment services:
 - i. What kinds of comments do producers make during the enrollment process?

- ii. What reasons bring producers into your office in the first place to enroll (are they sent promotion materials or come in on their own)?
 - iii. What are they most concerned about initially?
 - iv. What do they seem to like?
 - v. Where do they get frustrated in the process?
 - b. For those who do site visits to assess practice needs/feasibility or to develop conservation plans:
 - i. What kind of comments do landowners make during site visits?
 - ii. What are they most concerned about?
 - iii. What do they seem to like?
 - iv. What makes them feel encouraged about enrolling?
 - c. For those who deal with mid-contract management:
 - i. What kind of questions do producers ask as they are approaching the mid-contract management period?
 - ii. What are they most concerned about during this time?
 - 1. During the mid-contract process:
 - iii. What are their frustrations? What do they complain about?
 - iv. Are there things they seem to like?
 - d. For those who do deal with general calls from people currently enrolled:
 - i. What types of calls do you get from people who are enrolled?
 - ii. What are they most concerned about?
 - iii. What are their frustrations? What do they complain about?
 - iv. Do they ever call to tell you good things? What do they seem to like?
 - v. When you talk to them, what are the main reasons they say they participate?
 - vi. What are your personal thoughts on why producers participate in the program?
 - vii. What role does a desire to protect land or wildlife enter into a landowners' decision to participate in CRP in your opinion?
 - 1. Do you ever hear them mention those reasons?
- 4) How does a landowner decide on what practice/program to enroll their land in?
- a. What's your role in those decisions?
 - b. What do landowners struggle with when deciding to enroll in a practice?
- 5) Tell me about your experience with producers dropping out or choosing not to re-enroll
- a. Why do they say they're leaving the program?
 - b. Why do you think they're leaving?
 - c. What, if any, measures do you take when a landowner wants to leave?
 - d. When landowners leave CRP do you have a sense of how many of them continue to leave their land in grass vs. break it out? What about grazing?
 - e. Prompt: What do you think drives this decision?
- 6) Finally, because you've interacted with a lot of producers along the way, my guess is that you may have some ideas about how to better align the program to their needs. If you were in charge, what are some changes you would make?

Appendix II Focus Group Script

KS, CO, TX Focus Groups Draft Script

Focus Group Timing: 5:30-7:30 PM

Introduction

Welcome and thank you for coming to tonight's meeting. I'm Ashley Gramza, I am a researcher at Virginia Tech, a land-grant public university in SW Virginia. I'll be the facilitator for tonight's conversation.

I'm Mary Sketch, I am a graduate student at Virginia Tech working on this project for my Masters, and will be co-facilitating tonight.

Our plan for the evening is to have everyone get dinner now. In about 30 minutes, we'll give you background information about the meeting and its format while you enjoy your BBQ. Then we'll begin our conversation and you are welcome to continue eating while we chat.

After 30 minutes have passed....

As we mentioned in your invitation letter, Virginia Tech is conducting a study about the Conservation Reserve Program in Kansas, Colorado, Texas (change state depending on focus group). We're here to learn more about producers' experiences with and opinions about the Conservation Reserve Program (CRP).

We are collaborating with the Farm Service to help them understand how the Conservation Reserve Program works or doesn't work for producers.

Your responses today will inform how the Farm Service Agency administers the program, as well as provide useful insights to the natural resource and scientific communities. Although these items will contain your opinions, they will not be attached to your names in any way, so I encourage you to be honest and candid with your responses. As we mentioned in the consent form, we are audio recording the meeting to ensure we capture your comments correctly. Your responses will also help inform a survey sent to producers in the area; we value your help in ensuring that this survey is relevant to other producers.

In addition to being confidential, your participation in this meeting is voluntary. You can stop participating in the meeting at any time or choose not to answer any questions.

We want to know what *you* think and feel about the CRP program and your land that is enrolled in the program. Not everyone has the same experience with CRP so we appreciate hearing different opinions, even if they are in contrast with another person's thoughts.

In addition to Mary and myself, we have another graduate student from Virginia Tech joining us tonight who has been interviewing CRP participants in CO & KS. She will just be observing and writing notes. Ally, can you briefly introduce yourself?

Hi I'm Ally Steinmetz, I'm a grad student at Virginia Tech and writing my thesis on CRP and what producers think about it. I'm living in Syracuse, KS and interviewing producers in the region. Before this I worked for a collaborative forest group for several years in Central Oregon.

This meeting will last one and a half hours and the process is fairly straightforward—we have a set of questions we'd like your thoughts on, and we will guide you through them. Sometimes we'll ask for your thoughts or opinions one by one; other times, we'll ask a question and anyone can comment in any order. Either way, we hope to hear everyone's perspectives and encourage you to state your opinions and provide others with a chance to respond. But, of course, if you don't wish to answer something, that is fine as well.

There are a few guidelines that I ask everyone to follow.

Guidelines

- There are no right or wrong answers. We want to know your opinions and thoughts!
- Feel free to share any thoughts that you have and be honest.
- Please be respectful of the thoughts and opinions of others.
- Please do not use your cell phones as it is distracting to everyone. If you need to step out to deal with an emergency, we do understand. Just let Mary know that we can expect you back.
- Mary and I will watch the clock to make sure we get through everything in time. I apologize in advance if I have to interrupt anyone or move things along. We have a lot of material to cover and I need to make sure we get through it all in the one and a half hours we have.
- Mary and I will write down all additional CRP-related questions or topics outside of the scope of the meeting on the "Parking Lot" sign and address these topics at the end of the meeting.

Are there any questions about the process?

Participant Introductions

First, we'd like everyone to get to know each other a little better. Let's go around the circle so that everyone can tell us:

○ Your name

○ Where you live

○ Brief description of your farming/ranching operation (in a minute or less)

**Gramza will direct participants to this information written on a white board so that everyone can remember*

Facilitators will begin introductions...

I have formal training in both wildlife biology and social science and have been working with landowners in the High Plains and Midwest on conservation issues for almost 10 years.

(Mary Sketch) I have spent much time out West working with landowners, primarily in California and Montana on rural economic development and natural resource conservation.

Now, let's begin our discussion.

Questions

One thing to note as we get started, throughout this meeting we will be referring to the Conservation Reserve Program as CRP or simply “the program”.

1) Why did you enroll in the CRP initially?

Prompts (asked after participants' initial responses):

- What was attractive about it?
- [If they only mention monetary incentives] Was there anything else that factored in BESIDES the money?

2) What were you hoping CRP would accomplish on your land?

3) What are the benefits of the CRP program?

After participants have given their initial responses, dive deeper into the following benefits:

- To you
- To the surrounding landscape (land/wildlife/water)?
- To your community?

4) What are the drawbacks of the CRP program?

After participants have given their initial responses, dive deeper into the following drawbacks:

- To you
- To the surrounding landscape (land/wildlife/water)?
- To your community?

5) What do you see on your land that shows you that CRP is having impacts?

Prompt with environment-related items that came up in the benefits/drawbacks section above.

- How do you know that *blank (insert benefit from above)* is happening...
- How do you know that *items mentioned above* are good/bad or not?

Next, we're interested in your thoughts about re-enrollment in CRP once your current contracts end. We recognize that things may change, so we are interested in what you are thinking currently.

6) Are you likely to re-enroll? Why or why not? (Ask each person who responds about how long until their contract expires OR say their name so that we can look this up later).

Prompts

- What are the factors that you would weigh in this decision?

7) Do you know other people who have left the program? What are they doing with their land?

8) Were you not to re-enroll, what would you do with your land currently in CRP? Why?

For those of you who plan to re-enroll, pretend you were not to re-enroll either because it wasn't an option or you decided not to....

Prompts

- Convert to crops? Dryland farming? Irrigated farming?
- Leave in grass? (What do you mean by grass?)
- Grazing?

Follow up questions

- Do the benefits or drawbacks you gain from CRP participation now weigh into your decision? How??
- (If no one has mentioned grazing): what would it take for you to consider it? (If they have mentioned grazing): for others who didn't mention grazing what would it take for you to consider it?
- What would need to change in order for you to keep your CRP in grass?
- What sort of resources would you need to have to have to keep your land in grass? (e.g. equipment, money, time, labor)
- If you will keep it in grass (with or without grazing) will you continue manage the cover (e.g., haying, grazing, burning)?

IF TIME:

9) What would you want to see changed in CRP that would make it a better program for you to participate in?

Closing

That brings our meeting to a close. Thank you again for your participation.

(if there is still time): Does anyone have any final comments?

Over the next few months, Mary and I will be summarizing the results from the focus groups. As we mentioned at the beginning of the survey, these results will be shared with FSA and other local conservation organizations and will be used to inform a mail survey across SE CO, SW KS, NE NM, and the TX and OK panhandles. Your responses will not be associated with your name.

If you'd like to know the results from the focus groups and the rest of this research, please let us know (contact email address and phone number written on board). A report on the entire project will be available sometime at the end of 2018.

(if our time is up): Although our time is up, Mary and I will stay around if anyone has any final comments or questions.

Appendix III
Mail Survey of Current CRP Landowners



Fish and Wildlife Conservation
101 Cheatham Hall (MC0321)
310 West Campus Drive
Blacksburg, Virginia 24061
540-231-6845 Fax: 540-231-7580
www.fishwild.vt.edu

DATE _____

Dear [insert name],
As a person associated with land **currently** enrolled in the Conservation Reserve Program (CRP), your thoughts and opinions related to the program are important to help inform how the program operates in the future.

We want to better understand your opinions related to the CRP and the CRP land you own or manage. This information will be shared with the Farm Service Agency giving them an opportunity to hear from the ground level and help improve the CRP program in the future.

For most of this survey, we are interested in your thoughts and opinions associated with the **CRP field** of _____ acres under **contract # _____** in **county _____** located in the gray shaded region in the map to the right. We ask that a **decision maker** related to the contract take this survey. If you are not a decision maker for this contract, please pass this survey along to one.



Figure 1. Counties included in the study shaded in gray

This research is being conducted by Virginia Tech, with support from FSA. Your participation is voluntary and your identity will be kept confidential. Information collected by FSA partners about your CRP field including acreage enrolled, contract dates, practices implemented, and ecological characteristics will be included in this research with your survey responses.

Your answers or your participation will in no way affect your ability to re-enroll in CRP in the future. The results of the survey will be published in summary form; your responses will never be presented in a way that they can be individually identified. There are no known risks associated with this research. You may skip any questions you prefer not to answer.

The questionnaire should take you about 30 minutes to complete. Please complete it at your earliest convenience, seal it, and drop it in any mailbox; return postage has been provided.

For questions or concerns about this research, please contact Mary Sketch at mksketch2@vt.edu or (540) 231-8847. Should you have any questions or concerns about this study's conduct or your rights as a research subject, you may contact the Virginia Tech Institutional Review Board at irb@vt.edu or (540) 231-3732.

Thank you in advance for your help!

Mary Sketch, Graduate Student
Ashley Gramza, Research Associate
Dr. Ashley Dayer, Assistant Professor

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Thank you so much for taking this survey! As a person associated with land **currently** enrolled in the Conservation Reserve Program (CRP), your thoughts and opinions related to the program are important.

For most of this survey, we are interested in your thoughts and opinions associated with your CRP field of **[ACRES] acres** under **contract [CONTRACT] in [COUNTY] in the shaded region on the map below**. We ask that a decision maker related to the contract take this survey. If you are not a decision maker for this contract, please pass this survey along to one.

The questionnaire should take you about 20 minutes to complete. Please complete this questionnaire at your earliest convenience, seal it, and drop it in any mailbox; return postage has been provided.

Thank you again for your participation!

First, we would like to know about your land ownership, farming/ranching, and CRP enrollment history.

1. Are you a decision maker for the CRP field associated with the contract number listed on the inside cover of this survey?

- Yes No*

*IF NO, PLEASE PASS THIS SURVEY ON TO A DECISION MAKER FOR THIS FIELD.

2. What is your relationship to the CRP field associated with the contract number listed on the inside cover of this survey?

(Please fill in only one circle.)

- Owner
 Operator
 Owner-operator (both Owner & Operator)
 Other

Please check the box that best represents your answer to the questions in the table below (Please fill in only one circle for each row.)

	Yes	No	Unsure
3. Have you ever decided not to re-enroll any CRP land?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Have you ever tried to re-enroll CRP land but were not able	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Now, we would like to know more about the CRP field associated with the contract number listed on the inside cover.

5. Approximately how many years has your family owned this field? (Insert number of years to closest whole number.)

_____ years

This field is not in my (or my spouse's) extended family

6. Approximately how many years have you (or your spouse) owned this field? (Insert number of years to closest whole number.)

_____ years

My spouse or I do not own this field



7. How likely are you to pass this field on to a family member?
(Please fill in only one circle.)

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely	Not Applicable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. How was this CRP field enrolled or re-enrolled? Please refer to the most recent enrollment/re-enrollment of this field. *(Please fill in only one circle.)

- Enrolled (or re-enrolled) most recently by *yourself (or your spouse)*
- Enrolled (or re-enrolled) most recently by those *I bought the field from**
- Enrolled (or re-enrolled) most recently by those *I inherited the field from**
- Enrolled (or re-enrolled) most recently by *someone other than those mentioned above**

*If you (or your spouse) did not enroll/re-enroll this field yourself please SKIP TO QUESTION 10.

9. How important were the following considerations in your decision to enroll/re-enroll this field in CRP? Please refer to the most recent enrollment/re-enrollment of this field. (Please fill in only one circle for each row.)

Your desire to...	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
maximize profit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
prevent soil erosion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve wildlife habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve water quality and/or availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve soil health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Now we would like to know more about your experiences with CRP.
 For questions 10-12 please continue to refer to your experiences related to the specific CRP field identified on the inside cover.

10. Please rate your experiences with the following aspects of CRP.
 (Please fill in only one circle for each row.)

	Very Negative	Negative	Neutral	Positive	Very Positive	Not Applicable
General CRP sign-up ranking process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CRP enrollment process (office and site visits)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CRP rules and regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grass establishment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mid-contract management (disking, burning, interseeding, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Re-enrollment process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. With whom have you interacted with the most regarding this CRP field?

Please consider all components of CRP including enrollment, re-enrollment, and management. (Please fill in only one circle.)

- USDA Natural Resource Conservation Service (NRCS) staff
- Wildlife biologist working at USDA NRCS or state wildlife agency office
- USDA Farm Service Agency (FSA) staff
- Extension staff from a university
- Other, please list: _____
- I don't know the affiliation of the person I interact with most



12. To what extent do you agree or disagree with the following statements about your CRP-related experiences with the person you interact with most (*that you identified in question 11 above*)? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I trust the expertise of this person to help me achieve my CRP land management goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I have similar values to this person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that this person properly informs me about the rules and regulations of CRP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Are there playas (i.e., buffalo wallows, lagoons, mudholes) on this CRP field? (Please fill in only one circle.)

- Yes
- No
- Unsure



Now we would like to know more about your thoughts on the quality of your CRP field

14. We want to know your thoughts and opinions about the quality or relative amount of the following characteristics of this current CRP field over the last year. There are no right or wrong answers so even if you don't know much about these characteristics, please rate each. (Please fill in only one circle for each row.)

	Very Low	Somewhat Low	Neither Low nor High	Somewhat High	Very High
Amount of soil erosion occurrences (gullies, rills etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of blowing/drifted soil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of surface water (playas, buffalo wallows, streams, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large mammal habitat quality (deer, elk, antelope, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upland bird habitat quality (pheasants, quail, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waterfowl habitat quality (ducks, geese, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Songbird habitat quality (meadowlarks, sparrows, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pollinator habitat quality (butterflies, bees, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of pest insects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of weeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grass quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cattle forage quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beauty of field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Thinking of your assessments in the question above, how likely do you think it is that the quality of the above characteristics are due to this field being enrolled in CRP and its associated management? (Please fill in only one circle.)

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



In this section, we would like to know more about your plans for this field after the CRP contract has expired (contract # listed on inside cover).

16. How likely do you think it is that you will be able to re-enroll this field in CRP if you want to? (Please fill in only one circle.)

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Assuming you can re-enroll your land if you want, how likely are you to re-enroll this field in CRP if you receive the same rental payment? (Please fill in only one circle.)

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. If you do not or can not re-enroll this field in CRP, how likely are the following post-CRP actions to be employed on this field after your contract ends? (Please fill in only one circle for each row.)

	Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
Convert the majority of this field to dryland crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Convert the majority of this field to irrigated crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leave the majority of this field in grass	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enroll the majority of this field in another conservation program (e.g. CSP, EQIP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sell the majority of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



19. If you do not or can not re-enroll this field in CRP, how important are each of the following financial and resource considerations to your future post-CRP decisions? (Please fill in only one circle for each row.)

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Cost/availability of resources needed to keep land in grass (cattle, equipment to fence and hay, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost/availability of equipment needed to convert to crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of conservation technical assistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional weather (e.g., rainfall, temperature)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to water for irrigation/cattle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil fertility of field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical features of field (slope, terraces, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desire to maximize profits and/or increase financial stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



20. If you do not or can not re-enroll this field in CRP, how important are each of the following considerations to your future post-CRP decisions? (Please fill in only one circle for each row.)

Your desire to...	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
improve forage quality for haying/grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
prevent soil erosion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve water quality and/or availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve huntable wildlife habitat (for deer, pheasants, ducks, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve non-huntable wildlife habitat (for songbirds, small mammals, pollinators, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
keep this field in my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase the beauty of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase land available for grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve soil health of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
retire from farming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
minimize wildfire risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
minimize risk from pest insects or wildlife eating/damaging crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
follow what my neighbors and/or family think I should	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



21. To what extent do you agree or disagree with the following statements regarding your future post-CRP decisions for this field? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Keeping this CRP field in grass is easier than converting back to crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to keep this field "as is" when the CRP contract ends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. How common is it for other people in your area to keep their CRP land in grass when their CRP contracts ends and the land is not re-enrolled? (Please fill in only one circle.)

Very Uncommon	Moderately Uncommon	Slightly Uncommon	Neither Common nor Uncommon	Slightly Common	Moderately Common	Very Common
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this section, we would like to know your thoughts about some potential changes to CRP.

Please indicate how interested or disinterested you would be in the following ways CRP could change in the future. While each is possible, none are currently being planned. (Please fill in only one circle per question.)

23. The decision maker has the option to increase the chances of enrollment/re-enrollment by agreeing to follow the CRP contract up with a permanent easement (i.e. legally binding agreement) limiting post-contract production to only haying and/or grazing (i.e. no other crops).

Very Disinterested	Moderately Disinterested	Slightly Disinterested	Neither Disinterested nor Interested	Slightly Interested	Moderately Interested	Very Interested
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



24. The decision maker has the option to receive an annual program payment that varies to reflect changing crop market conditions (similar to variable rate mortgage).

Very Disinterested	Moderately Disinterested	Slightly Disinterested	Neither Disinterested nor Interested	Slightly Interested	Moderately Interested	Very Interested
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. The decision maker has the option to increase the chances of enrollment/re-enrollment by agreeing to collect and submit field-level environmental information annually (such as photos, soil samples, or wildlife counts) following directions provided by the agency.

Very Disinterested	Moderately Disinterested	Slightly Disinterested	Neither Disinterested nor Interested	Slightly Interested	Moderately Interested	Very Interested
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. The decision maker has the option to receive a reduced annual payment instead of having to pay grass cover establishment and maintenance costs.

Very Disinterested	Moderately Disinterested	Slightly Disinterested	Neither Disinterested nor Interested	Slightly Interested	Moderately Interested	Very Interested
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Which type of CRP program sign-up would you prefer? (Please fill in *only one* circle.)

- Non-competitive sign-up at a rate determined by the FSA at the national level
- Competitive sign-up at rate determined by landowner



Now, we would like to know more about your views on land management.

28. To what extent do you agree or disagree with the following statements? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Good farming/ranching requires using all available acreage as efficiently as possible to maximize yields.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To protect the rural landscape, producers must move away from conventional agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land modifications to a farm/ranch that increase production have little impact on the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programs to protect soil and water resources should emphasize approaches that primarily benefit agricultural production.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a result of modern agricultural practices, producers must exert more effort now to protect the environment than was necessary in the past.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The primary role of producers is the production of food, fiber, and related agricultural products; the protection of the environment is separate from this purpose.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good farming/ranching results from placing equal importance on the management of both the agricultural and natural areas of my farm/ranch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A successful producer is someone who continuously evaluates the environmental impact of their farm/ranch and adopts new approaches to protect the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Finally, please answer the following questions to help us better understand producers in the region.

29. In what year were you born? _____

30. Are you? (Please fill in only one circle.)

Male Female

31. What is your occupation? (Please fill in only one circle.)

Full-time agricultural producer

Part-time agricultural producer

Retired agricultural producer, but now working a non-agricultural full or part time job

Fully retired

Other

32. Approximately how many years have you been farming and/or ranching? (Insert number of years to closest whole number.)

_____ years

33. Approximately how many acres of land do you own and operate/rent in the region (see map on inside cover)? (Insert number of acres to closest whole number in each blank.)

_____ acres own _____ acres operate/rent

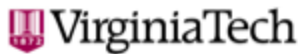
34. Approximately what percent of your gross household income (include you and your spouse) comes directly from *crop production* and what percent comes from *livestock production*? Do not include payments from CRP in this percentage. (Insert percent to closest whole number in each blank.)

_____ percent of income from *crop production*

_____ percent of income from *livestock production*



Appendix IV Mail Survey of Past CRP Landowners



College of Natural Resources
and Environment

Fish and Wildlife Conservation
101 Cheatham Hall (MC0321)
310 West Campus Drive
Blacksburg,
540-231-6844
www.fishwild

DATE

Dear [insert name],

As a person associated with land **formerly** enrolled in the Conservation Reserve Program (CRP), your thoughts and opinions related to the program are important to help inform how the program operates in the future.

We want to better understand why people no longer enroll land in CRP and what they are currently doing with former CRP land. This information will be shared with the Farm Service Agency – an opportunity for them to hear from the ground level and help improve the program in the future.

For most of this survey, we are interested in your thoughts and opinions associated with the **former CRP field of _____ acres under contract # _____ that expired in _____ in county _____** located in the gray shaded region in the map to the right. We ask that a **decision maker** related to the aforementioned contract take this survey. If you are/were not a decision maker for this contract, please pass this survey along to one.



Figure 1. Counties shaded dark gray above indicate the survey area.

This research is being conducted by Virginia Tech, with support from FSA. Your participation is voluntary and your identity will be kept confidential. Information collected by FSA partners about your CRP field including acreage enrolled, contract dates, practices implemented, and ecological characteristics will be included in this research with your survey responses.

Your answers or your participation will in no way affect your ability to enroll in CRP in the future. The results of the survey will be published in summary form; your responses will never be presented in a way that they can be individually identified. There are no known risks associated with this research. You may skip any questions you prefer not to answer.

The questionnaire should take you about 30 minutes to complete. Please complete this questionnaire at your earliest convenience, seal it, and drop it in any mailbox; return postage has been provided.

For questions or concerns about this research, please contact Mary Sketch at mksketch2@vt.edu or (540) 231-8847. Should you have any questions or concerns about this study's conduct or your rights as a research subject, you may contact the Virginia Tech Institutional Review Board at irb@vt.edu or (540) 231-3732.

Thank you in advance for your help!

Mary Sketch, Graduate Student
Ashley Gramza, Research Associate
Dr. Ashley Dayer, Assistant Professor

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Thank you so much for your help in taking this survey! As a person associated with land formerly enrolled in the Conservation Reserve Program (CRP), your thoughts and opinions related to the program are important.

For most of this survey, we are interested in your thoughts and opinions associated with your former CRP field of [ACRES] acres under contract [CONTRACT] in [COUNTY] County in the shaded region on the map below. We ask that a decision maker related to the contract take this survey. If you are not a decision maker for this contract, please pass this survey along to one.

The questionnaire should take you about 15 minutes to complete. Please complete this questionnaire at your earliest convenience, seal it, and drop it in any mailbox; return postage has been provided.

Thank you again for your participation!



First, we would like to know about the field that was formerly enrolled in CRP under the contract number listed on the inside cover

1. Are/were you a decision maker for the CRP field formerly associated with the contract number listed on the inside cover of this survey?
 Yes No*

**IF NO, PLEASE PASS THIS SURVEY ON TO A DECISION MAKER FOR THIS FIELD.*

2. What was your relationship to the CRP field formerly associated with the contract number listed on the inside cover of this survey? *(Please fill in only one circle.)*
- Owner
 - Operator
 - Owner-operator (both Owner & Operator)
 - Other

3. Approximately how many years has your family owned this field? *(Insert number of years to closest whole number.)*
- _____ years
- This field is not in my (or my spouse's) extended family

4. Approximately how many years have you (or your spouse) owned this field? *(Insert number of years to closest whole number.)*
- _____ years
- My spouse or I do not own this field

5. How likely are you to pass this field on to a family member? *(Please fill in only one circle.)*

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely	Not Applicable
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



6. How was this field enrolled or re-enrolled in CRP? Please refer to the most recent enrollment/re-enrollment of this field. We realize it is not currently enrolled in CRP. (Please fill in only one circle.)

- Enrolled (or re-enrolled) most recently by *yourself* (or your spouse)
- Enrolled (or re-enrolled) most recently by those *I bought* the field from
- Enrolled (or re-enrolled) most recently by those *I inherited* the field from
- Enrolled (or re-enrolled) most recently by *someone other than those mentioned above*

Now we would like to know more about your past experiences with CRP.

For questions 7-9 please continue to refer to your experiences related to the specific former CRP field identified on the inside cover.

7. Please rate your overall past experience with CRP related to this field. (Please fill in only one circle.)

Very Negative	Negative	Neutral	Positive	Very Positive
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Who did you interact with the most regarding this former CRP field?

Please consider all components of CRP including enrollment, re-enrollment, and management. (Please fill in only one circle.)

- USDA Natural Resource Conservation Service (NRCS) staff
- Wildlife biologist working at USDA NRCS or state wildlife agency office
- USDA Farm Service Agency (FSA) staff
- Extension staff from a university
- Other, please list: _____
- I don't know the affiliation of the person I interacted with most



9. To what extent do you agree or disagree with the following statements about your past CRP-related experiences with the person you interacted with most (that you identified in question 8 above)? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I trusted the expertise of this person to help me achieve my CRP land management goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I felt that I had similar values to this person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe that this person properly informed me about the rules and regulations of CRP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Are there playas (i.e., buffalo wallows, lagoons, mudholes) on this field that was formerly enrolled in CRP? (Please fill in only one circle.)

- Yes
- No
- Unsure



Now we would like to know more about your thoughts on the quality of your former CRP field associated with the contract number listed on the inside cover.

**11. We want to know *your* thoughts and opinions about the quality or relative amount of the following characteristics of this *former* CRP field over the last year. There are no right or wrong answers so even if you don't know much about these characteristics, please rate each.*
(Please fill in only one circle for each row.)**

**If you have sold this field within the last year, please answer this question based on its quality at the time of sale.*

***If you have sold this field longer than one year ago, please skip to question 13.*

	Very Low	Somewhat Low	Neither Low nor High	Somewhat High	Very High
Amount of soil erosion occurrences (gullies, rills etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of blowing/drifted soil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of surface water (playas, buffalo wallows, streams, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large mammal habitat quality (deer, elk, antelope, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Upland bird habitat quality (pheasants, quail, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Waterfowl habitat quality (ducks, geese, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Songbird habitat quality (meadowlarks, sparrows, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pollinator habitat quality (butterflies, bees, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of pest insects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of weeds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grass quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cattle forage quality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Beauty of field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



12. Thinking of your assessments in question 11, how likely do you think it is that the quality of the above characteristics are due to this field being formerly enrolled in CRP and its associated management?
 (Please fill in only one circle.)

Very Unlikely	Unlikely	Neither Likely nor Unlikely	Likely	Very Likely
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In this section, we would like to know more about your motivations to take this field out of CRP (contract # listed on inside cover).

13. Did you try to re-enroll this field in CRP but were not able to?
 (Please fill in only one circle.)

Yes* No Unsure

*IF YES, PLEASE SKIP TO QUESTION 15.

14. How important were the following considerations in your decision to take this field out of CRP? (Please fill in only one circle per row.)

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Fire risk associated with this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limited ability to hay and graze on this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop and property damage caused by wildlife, pest insects, and/or disease from this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rules and regulations of CRP were difficult to follow or understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rules and regulations for CRP management did not make sense in this region	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Keeping this field in CRP was less profitable than other uses of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



In this section, we would like to know more about your land management decisions on this field following the expiration of your CRP contract. (Contract number listed on inside cover.)

15. Which of the following post-CRP actions have been employed on this field (contract # listed on inside cover) that is no longer enrolled in CRP? (Please fill in only one circle.)

- Converted the majority of this field to dryland crops
- Converted the majority of this field to irrigated crops
- Left the majority of this field in grass
- Enrolled the majority of this field in another conservation program or easement (e.g. CSP, EQIP)
- Sold the majority of this field

16. If you kept this field in grass after your CRP contract ended, to what extent do you agree with the following statements (as identified in question 15)? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Not Applicable
Keeping my field in grass was easier than converting it back to crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wanted to keep this field "as is" when the CRP contract ended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. How common is it for other people in your area to keep their CRP land in grass when their CRP contracts ends and the land is not re-enrolled? (Please fill in only one circle.)

Very Uncommon	Moderately Uncommon	Slightly Uncommon	Neither Common nor Uncommon	Slightly Common	Moderately Common	Very Common
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



18. How important were each of the following **financial and resource** considerations in your post-CRP actions on this field? (Please fill in only one circle for each row.)

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Cost/availability of resources needed to keep land in grass (cattle, equipment to fence and hay, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cost/availability of equipment needed to convert to crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Availability of conservation technical assistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional weather (e.g., rainfall, temperature)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to water for irrigation/cattle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil fertility of field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical features of field (slope, terraces, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Desire to maximize profits and/or increase financial stability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



19. How important were each of the following considerations in your post-CRP actions on this field? (Please fill in only one circle for each row.)

Your desire to...	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
improve forage quality for haying/grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
prevent soil erosion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve water quality and/or availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve huntable wildlife habitat (for deer, pheasants, ducks, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve non-huntable wildlife habitat (for songbirds, small mammals, pollinators, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
keep this field in my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase the beauty of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase land available for grazing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
improve soil health of this field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
retire from farming	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
minimize wildfire risk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
minimize risk from pest insects or wildlife eating/damaging crops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
follow what my neighbors and/or family think I should	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Now, we would like to know more about your views on land management

20. To what extent do you agree or disagree with the following statements? (Please fill in only one circle for each row.)

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Good farming/ranching requires using all available acreage as efficiently as possible to maximize yields.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To protect the rural landscape, producers must move away from conventional agriculture.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Land modifications to a farm/ranch that increase production have little impact on the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programs to protect soil and water resources should emphasize approaches that primarily benefit agricultural production.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a result of modern agricultural practices, producers must exert more effort now to protect the environment than was necessary in the past.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The primary role of producers is the production of food, fiber, and related agricultural products; the protection of the environment is separate from this purpose.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Good farming/ranching results from placing equal importance on the management of both the agricultural and natural areas of my farm/ranch.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A successful producer is someone who continuously evaluates the environmental impact of their farm/ranch and adopts new approaches to protect the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Finally, please answer the following questions to help us better understand producers in the region.

21. In what year were you born? _____

22. Are you? (Please fill in only one circle.)

- Male Female

23. What is your occupation? (Please fill in only one circle.)

- Full-time agricultural producer
- Part-time agricultural producer
- Retired agricultural producer, but now working a non-agricultural full or part time job
- Fully retired
- Other

24. Approximately how many years have you been farming and/or ranching? (Insert number of years to closest whole number.)

_____ years

25. Do you own/operate other fields currently enrolled in CRP?

(Please fill in only one circle.)

- Yes No Unsure

26. Approximately how many acres of land do you own and operate/rent in the region (see map on inside cover)? (Insert number of acres to closest whole number in each blank.)

_____ acres own _____ acres operate/rent

27. Approximately what percent of your gross household income (include you and your spouse) comes directly from *crop production* and what percent comes from *livestock production*? Do not include payments from CRP in this percentage. (Insert percent to closest whole number in each blank.)

_____ percent of income from *crop production*

_____ percent of income from *livestock production*

Appendix V
CRP Practices Included in Sampling

Number	Name
CP1	Introduced Grass and Legume Establishment
CP2	Native Grass, Forb, and Legume Establishment
CP4	Wildlife Habitat Corridors, Permanent Wildlife Habitat
CP10	Grass Already Established
CP23/A	Wetland Restoration (Floodplain), Non-Floodplain Wetland Restoration
CP25	Rare and Declining Habitat
CP33	Upland Bird Habitat Bugger
CP38	State Acres for Wildlife Enhancement
CP42	Pollinator Habitat Establishment

For more information, see:

<https://www.fsa.usda.gov/programs-and-services/conservation-programs/crp-practices-library/index>

Appendix VI
CRP Acreage per State Within Study Region

State	2017 CRP acreage (our study region)
Kansas	818,569
Oklahoma	455,237
Colorado	413,842
Texas	308,316
New Mexico	19,549

Appendix VII
Respondent Versus Nonrespondent Comparison

The following comparisons were conducted using field-level data from FSA.

Table 1. Independent sample t-test comparing respondent and non-respondent landowners of past and current fields based on acreage of field.

Past	Mean	t-statistic	df	p-value
Respondent	155.2	0.975	1877	.330
Non-Respondent	145.4			
Current				
Respondent	123.6	1.389	1248	.165
Non-Respondent	112.8			

Table 2. Chi-square test comparing percent of respondent and non-respondent landowners of past and current fields based on whether they had previously re-enrolled the field or not.

Past	Re-enrolled	Not re-enrolled	Chi sq	p-value
Respondent	54.6	45.4	0.004	0.950
Non-Respondent	54.4	45.6		
Current	Re-enrolled	Not re-enrolled	0.094	0.759
Respondent	68.9	31.1		
Non-Respondent	68.0	32.0		

Table 3. Chi-square test comparing percent of respondent and non-respondent landowners by expiration year for the past participant sample.

	2011	2012	2013	2014	2015	2016	2017	Chi sq	p-value
Respondent	9.2	28.2	18.1	12.2	8.3	12.8	11.3	21.854	0.001
Non-Respondent	9.5	36.4	18.6	13.5	7.6	7.3	7.2		

Table 4. Chi-square test comparing percent of respondent and non-respondent landowners by expiration year for the current participant sample.

	2018	2019	2020	2021	2022	2023	2024	2025	Chi sq	p-value
Respondent	4.1	1.7	30.6	20.1	18.5	6.6	1.9	4.7	18.304	0.193
Non-Respondent	3.3	1.8	22.8	18.8	24.0	7.7	1.6	3.7		
	2026	2027	2028	2029	2030	2031	2032			
Respondent	4.1	2.2	0.8	0.3	0.8	2.8	0.8			
Non-Respondent	5.0	3.7	1.7	0.8	1.4	2.3	1.6			