Enhancing Conservation Reserve Program Outcomes Through Durability-Informed Enrollment Targeting

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Abstract

We evaluate the durability of conservation outcomes from the USDA Conservation Reserve Program (CRP), the largest payment for ecosystem services program in the United States. Program durability, as indicated by the longevity or persistence of perennial vegetative cover, is important given the ability of such conservation cover to provide and sustain key ecosystem services relative to croplands. We use point-level data on land use and land cover (NRI) to track outcomes over time. The data provides us with a unique long-term perspective into particularly the early entrants into the program, for which we are able to track post-CRP outcomes for 20 years. We find that the CRP has expanded conservation cover by incentivizing landowners to replace croplands with non-crop grass and tree cover. Average durability (survival time) of such conservation cover post-CRP is about 4.2 years, with most points in our sample reverting back to cropland within the first year. Factors such as location, biomass productivity, drought, proportion of irrigated areas in landscape, prevalence of land abandonment each contribute expected durability. We discuss implications for program design and highlight tradeoffs with additionality and program cost effectiveness when policymakers target durability.

Keywords: Agricultural policy

Introduction

Overview. With nearly 40 years of Conservation Reserve Program (CRP) history, we investigate the long-term persistence of CRP land covers and practices pre- and post-enrollment across different geographies, program eras, and economic conditions. Our research objectives are twofold: (1) to understand CRP durability across full CRP program lifespan and across the contiguous United States (CONUS) and (2) provide evidence-based guidance to improve prioritization and targeting within general CRP (e.g. adjusting environmental scoring for enrollments, updating priority zones), and inform post-CRP transitions to extend the durability of conservation cover. We leverage a long-term observational dataset on land use and land cover to build a CONUS-wide panel for quantifying the durability of CRP land covers and outcomes through space and time.

Why is durability important? Durability refers to sustaining conservation effort long enough to achieve desired environmental outcomes and the subsequent persistence of conservation outcomes. Durability can be thought of as a dimension of cost-effectiveness for conservation programs like CRP because greater durability beyond the time spent in the program translates to a reduced lifetime cost of cumulative benefits. Although the net public benefits of programs like CRP depend on the mix of enrolled fields and the performance of conservation practices implemented on them a critical step in understanding the program's effectiveness in conservation is to document temporal and spatial patterns of program enrollment, reenrollment, and land use outcomes upon program exit.

Background on the CRP. Conversion of grasslands to croplands may contribute to the loss or degradation of soil quality, wildlife habitat, agricultural production, and other natural resources, such that grassland conservation is needed to mitigate impacts and outcomes for water, climate, and wildlife. The CRP is one of the USDA's key voluntary conservation programs used for grassland conservation. Traditionally, it has been deployed as a cropland set-aside program, in which landowners could replace crop cover with perennial / grass or tree cover for a period of 10-15 years, in exchange for rental payments.

The Farm Service Agency (FSA) runs the CRP, one of the nation's two largest conservation programs by dollar outlay (about $2 billion as of 2021; the other is the *Environmental Quality Incentives Program,* or EQIP) (Stubbs, 2022). The CRP has three sub-programs; the general CRP, the continuous CRP, and the grasslands CRP. Landowners enrolled in the program receive a yearly rental payment, in exchange for implementing conservation practices and removing environmentally sensitive croplands from production (entirely, in case of general CRP).

Since its introduction in 1986, CRP has been amended to reflect the federal government's changing priorities for agricultural conservation. In recent years, it has become less reliant on land retirement (general CRP). General CRP acres were 35% of the total program acreage of about 23 million acres (2023). Also, the majority of general CRP contracts involve installing more resource-conserving alternative cover—like grasses (85% of acres). Meantime, the grassland CRP program, which offers lower rental payments for simply maintaining existing grass cover (over non-croplands), has grown quickly to represent 30% of the total program acres. Thus, combined, grassland practices represent nearly 60% of program acres, indicating a sharpening focus on grassland conservation.

Relevance and timeliness. This sharpening focus on grasslands coincides with rising societal concern over environmental degradation, particularly of biodiversity loss and climate change that are impacting grasslands, an overlooked biome. In their natural or semi-natural states grasslands are important sources of biodiversity and provide important ecosystem services such as water and nutrient cycling, climate regulation, provisioning, recreation, and biocontrol (Murray et al., 2012). Conversion into higher intensity agricultural use or urban uses, or land cover change (woody encroachment, or spread of invasive species like cheatgrass) are key concerns for grasslands because they reduce forage for livestock, reduce the quality of habitat for grassland-associated wildlife, and impact air and water quality. Once lost, grassland habitats are expensive and take time to restore. While grass cover can be replanted, other ecosystem components (forbs, vertebrate and invertebrate animals, and microorganisms in soil) cannot be easily restored (Török et al., 2021; Lark, 2020; Jones et al., 2018; Isbell et al., 2015; Claassen et al., 2011; Dodds et al., 2008; and Johnson, 1996). The alteration of grass cover can also have climate implications by initiating loss of stored carbon in soil (Sanderman et al., 2017), reducing the land's ability to absorb carbon dioxide from the atmosphere and may even result in more emissions per acre under higher intensity use. Consequently, the benefits--or at least, the avoided harm--of moving from annual crops to (perennial) grass cover could be large (Conant et al., 2017).

In the United States rangelands and pasture lands that primarily have grass cover, represent the largest private land use in the country (~520 million acres in 2017 based on NRI data). Despite their importance, grasslands in the United States remain under pressure from conversion to row crop production (Lark et al., 2015 and Spawn et al., 2019) and woody encroachment (Twidell et al., 2021 and Morford et al., 2022). Prior research also indicates, of the remaining U.S. grasslands, some areas appear to be more vulnerable to future change than others (Olimb and Robinson, 2019). Durability-guided targeting of conservation policy for grasslands is therefore crucial to ensure any environmental benefits (like carbon sequestration, reestablishment of species or habitat retention) can be realized consistent with biophysical timelines and the benefits are "retained" or are long-lasting, which can also improve program cost-effectiveness.

Research objectives. Assess how the U.S. Department of Agriculture's (USDA) Conservation Reserve Program (CRP) can be deployed more strategically to further conservation objectives. Investigate the trade-offs associated with achieving (or increasing) durability in conservation outcomes, cost-effectiveness of program, and scale. Some specific research questions we aim to address are:

- What is the durability of conservation cover outcomes for croplands enrolled in the CRP program?
- Do durability of CRP outcomes vary in space? If yes, how do areas of high vs. low durability differ?
- What do the dimensions associated with variation in durability suggest in terms extending durability?
- What are the implications of prioritizing enrollments with respect to durability?

Data and Methods

We estimate the durability of outcomes for general CRP contracts over a multi-decadal time frame. We develop a predictive (hazard) model of durability. To develop durability variables and metrics, we use the National Resources Inventory (NRI) a plot-level, longitudinal statistical survey from the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) from 1987 to 2017 (31 years). The NRI contains detailed information on land use and land cover nationally and it also has tracked general CRP as a separate land use class over time, allowing us to observe the land use / land cover outcomes for enrollments in the general CRP program starting from its inception in 1986. Typically, CRP contracts span 10 to 15 years.

We assess and model durability using a time-to-event approach. Enrollment into CRP is the conceptual analog of "treatment" or "trial". The survival period corresponds to program evaluation period. It starts at the end of CRP contract (post-CRP). This is when land cover outcomes are not crop cultivation and ends when conversion back into crop cultivation occurs. Thus, any conversion back to crop cultivation post-CRP is the *event* of interest and the length of time that conversion does not occur constitutes durability.

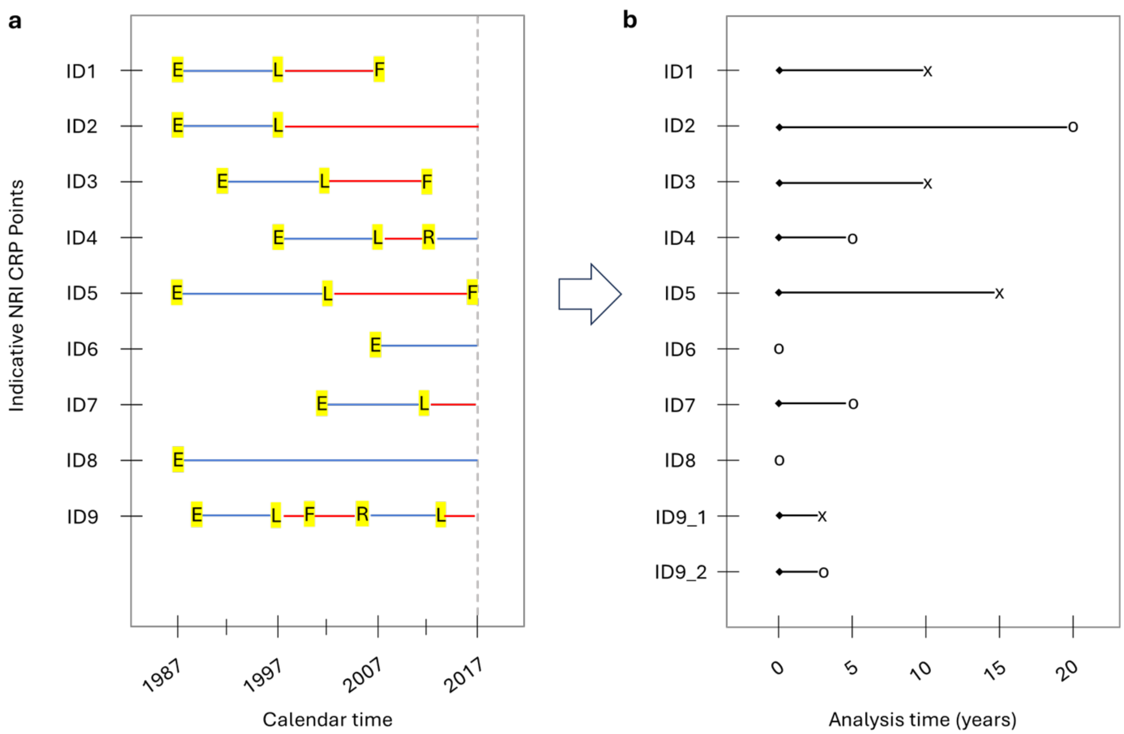

Figure 1. Illustrates how data organized in calendar time (panel a) translates into to time-to-event format for analysis (panel b). In panel a, the dashed vertical line indicates the last year of observation (that corresponds to the last period of available NRI data). E=enter program (CRP), L=Leave CRP, F=Failure, representing conversion event after CRP (as defined in text), R=reenroll into CRP. Blue lines indicate time in CRP, and red lines indicate the assessment period after CRP (or time between two enrollments). In panel b, we use information from panel a to measure analysis time. For points with failure event (F), analysis time is the time elapsed between L and F; i.e. time to conversion after leaving the CRP (lines marked x at the end). Points that do not fail (survive) experience no conversion event. For those, the analysis time is measured as from T to end of NRI data (lines marked o at the end; right censored). Note point "ID" that enters and leaves the program twice (panel a) is identified as a multiple-record ID variable in the data transformed for analysis (panel b).

In this analysis, the length of survival is defined as the observed land cover of an NRI point staying in grass (range or pasture) or forest cover following exit from the CRP, whereas failure is defined as the land cover reverting back to crop cover (as all general CRP enrollees have crop cover prior to CRP) following exit from CRP. Note that we our use of the term "exit" signifies that in the NRI data we cannot distinguish CRP contract expirations but rather observe land cover changing to and from CRP for a given point. For inclusion in survival analysis, it is necessary that a point enrolls (enters) in CRP and also exits the program. Below in Figure 2 we summarize our sample data in terms of exits that is used for survival analysis. In the "No" (exits) branch, we show two subgroups that are not part of the survival analysis. The first are points that enroll (enter) in CRP toward the end of our sample period, and as of 2017 remain enrolled ("Still enrolled"). Next, points that have enrolled in CRP at the time of the program's inception through 2017 are marked as "Always in CRP".

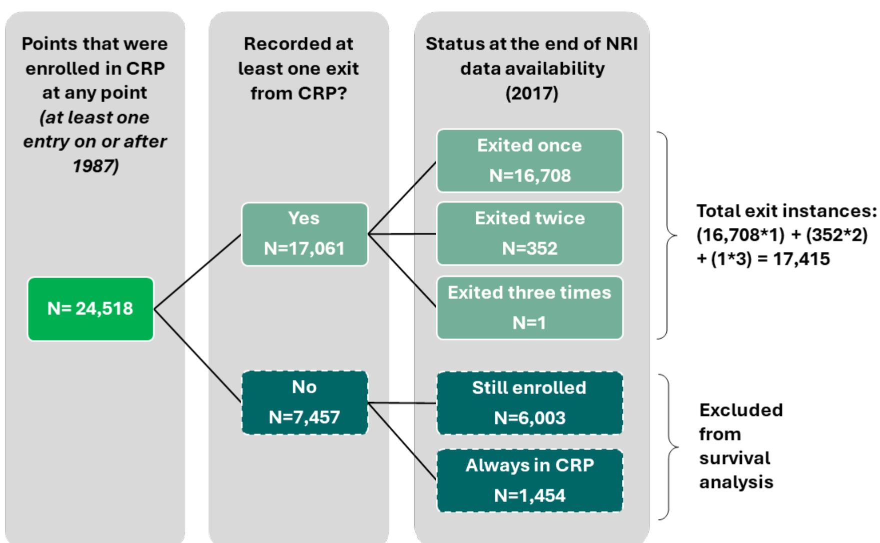

Figure 2. Sample for survival analysis.

Notably, the CRP is not a one-time trial or treatment, but a repeated one. In other words, new producers / acres can be enrolled into the program as prior CRP enrollments leave the program, subject to statutory limits set by the Farm Bill (like the national enrollment cap). For the general CRP, the FSA is supposed to hold annual enrollment events (dubbed “sign-ups”) but in practice sign-ups have occurred both more or less frequently than a year.

This feature, combined with the length of our dataset, allows constructing cohorts that represent different sign-ups / periods of enrollment. Here, we define different “cohorts” of CRP based on five-yearly enrollment periods. However, because the temporal coverage of our dataset ends in 2017, we can track outcomes for longer periods for CRP enrollments in the earlier years/cohorts than those in the later years/cohorts. For example, an NRI point indicated as being in CRP in 1987, will have exited in 1997. For this point, we can track outcomes from 1997-2017 (20 years). By contrast, a point that is marked as CRP in the NRI data for the first time in 2015 will still be in the program in 2017, when (our version of) the NRI data collection ends (comparable to the ending of a drug trial).

Next, we calculate simple durability metrics such as program-supported durability (time enrolled in CRP); post-program durability (persistence of conservation cover after exiting program); and their interactions (e.g. their sum, as total durability of grass cover and their ratio, as rate of post-program durability). Combined with indicative data on average CRP rental rates, we also estimate the relative cost of the program in achieving durable outcomes (Figure 4). Note that metrics that do not depend on years in program will be more precise. We also assess these durability metrics across space. We identify areas (county or state) to assess if there are areas where durability decays faster and map areas of high versus low average durability.

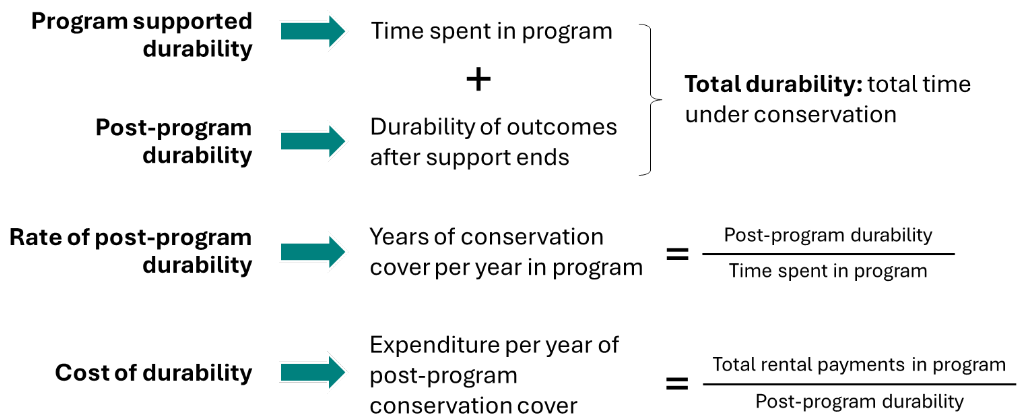

Figure 3. Indicative durability metrics

Another salient feature of the CRP is that it allows reenrollments. While we are not able to observe reenrollments at contract level in the NRI data, we can observe points that are identified as in CRP for more than one contract period with a break in between contract periods, allowing us to explore the influence of reenrollments on post-program durability. We also report on a special subset of points that appear enrolled in the CRP through the entire span of the NRI data, for which no durability metrics can be calculated since these points have never "exited" the program.

Our approach expands on prior assessments of CRP outcomes and their durability based on a single sign-up period, or a snapshot of CRP exits documented in a single year by collating multiple sign-up periods and associated CRP exits. In addition, our analysis permits distinguishing reenrollments into CRP after exit.

Next, we document durability using Kaplan-Meier curves that are commonly used to analyze time-to-event data. These curves serve as useful graphical representations of the survival function by plotting cumulative survival probabilities (y-axis) as a function of time (x-axis) (Figure 5). In the context of CRP, the relative steepness of slope captures a higher (lower) conversion rate back to crop cultivation, and therefore worse (better) survival of conservation cover. Sharp drops in the curve can indicate potential for regulatory intervention to support or improve durability, whereas plateaus along the curve can indicate survival reaching relative stability.

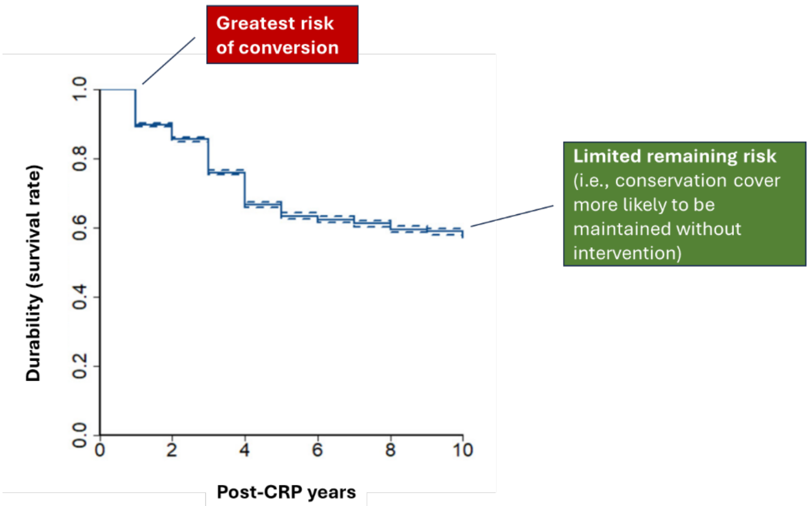

Figure 4. Illustrative Kaplan-Meier curve and its interpretation

We further relate these durability metrics to several factors such as biomass productivity, land quality and landscape composition (e.g., percent cropland in county) (Table 1). We illustrate the contributions of these factors (if any) to the durability of post-CRP outcomes via Kaplan-Meier curves (where informative) that also inform the subsequent hazard modeling. We convert these explanatory variables into categorical (time invariant) ones. For example, location, a continuous variable as geographic coordinates, is categorized as north/south (located north of the 40th parallel or south), or east/west (located to the west of the 100th meridian or east). The corresponding Kaplan-Meier curve contains multiple lines, each measuring the estimated survival rate for a group, revealing similarity or difference of survival rates across groups (parallel slopes indicate similarity, divergent slopes indicate difference). Using the non-parametric tests (like the log-rank or the Wilcoxon), we can ascertain if any of these group differences are statistically significant.

195 **Table 1. Factors evaluated for their potential contribution to durability**

Variable	Original spatial and temporal frequency	Derived categorical variable	Source
Biomass productivity ✓	RAP data, annual, 1986-2017, 30m	Average above ground biomass (lbs/acre) for 1987-2017 by grid cell corresponding to NRI point Split into "high" and "low" classes of productivity at grid cell value of 1,000 lbs/acre (approximate mean)	Jones, M.O., et al. 2021. Annual and 16-day rangeland production estimates for the western United States. Rangeland Ecology & Management 77:112–117. http://dx.doi.org/10.1016/j.rama.2021.04.003. Also see https://rangelands.app/products/.
Drought ✓	PDSI data, weekly, 1987-2017, 4km from GRIDMet / Drought indices dataset	Derive median PDSI over time by grid cell Group at median	Abatzoglou J. T. (2012) Development of gridded surface meteorological data for ecological applications and modelling, International Journal of Climatology. doi:10.1002/joc.3413
Irrigation ✓	Irrigated area layers from LANID, 30 m, annual 1997-2017	Estimate maximum irrigated area over time by grid cell Group at zero (never irrigated) which is approximately the median (49^{th} percentile)	Xie, Y. and Lark, T. (2021). LANID-US: Landsat-based Irrigation Dataset for the United States. https://doi.org/10.5281/zenodo.5548555.
Cropland abandonment ✓	Abandoned cropland area layers, 30 m, annual, 1990-2014	Average share of abandoned cropland (%) by county Group at median (7.5%)	Xie, Y. et al. (2024). Cropland abandonment between 1986 and 2018 across the United States: spatiotemporal patterns and current land uses. Environ. Res. Lett. https://doi.org/10.1088/1748-9326/ad2d12
Land quality ✓	Non-irrigated land capability class (LCC) index, 30 m, constant	Calculate average LCC by grid cell Group at breakpoint = 4 LCC >4 not suitable for cultivation LCC <=4 suitable for cultivation (median is 3.3)	Soil Survey Staff. Gridded Soil Survey Geographic (gSSURGO) Database for CONUS. USDA NRCS. https://gdg.sc.egov.usda.gov/ (2022 release).

Variable	**Original spatial and temporal frequency**	**Derived categorical variable**	**Source**
Location ✓	Latitude and longitude by point, constant	Split at 40 degrees N for North/South and at 97 degrees W for East/West	USDA. 2020. 2017 National Resources Inventory, NRCS, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. (not public).
Prime farmland status ✓	Farm Class, 90 m, constant string variable	Reclassify "Farm Class" to two main classes (prime and not prime; exclude null). Calculate prime share by grid cell Group at median share (58%)	Soil Survey Staff. Gridded Soil Survey Geographic (gSSURGO) Database for CONUS. USDA NRCS. https://gdg.sc.egov.usda.gov/ (2022 release).
Land use composition ✓	County level, yearly	Calculate average shares of cultivated; range; pasture; and forest by county	USDA. 2020. 2017 National Resources Inventory, NRCS, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. (not public).
Farm size ✓	U.S. Census of Agriculture, five yearly (1982 – 2017), county level data	Average farm size by county, group at median	LaMotte, A.E. (2015). Selected items from the Census of Agriculture at the county level for the conterminous United States, 1950-2012: U.S. Geological Survey data release, http://dx.doi.org/10.5066/F7H13016.
Crop insurance ✓	Average loss ratio, by county- year, 1990-2017	Calculate average loss ratio over time by county, group county averages at breakpoint = 1.0 (indemnities equal to premiums)	USDA RMA Summary of Business Reports, available at https://public-rma.fpac.usda.gov/apps/SummaryOfBusiness
Time in program ✓	Point level, measured as first year not CRP minus first year CRP	Total time spent in program, 1987 – 2017	USDA. 2020. 2017 National Resources Inventory, NRCS, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. (not public).

Results

Enrollment patterns

In our sample (NRI data), we are able to track 24,518 points, representing a total area of 50.2 million acres enrolled at any point in time. Our dataset shows new enrollments taper off over the years since reenrollments are permitted (Figure 5).

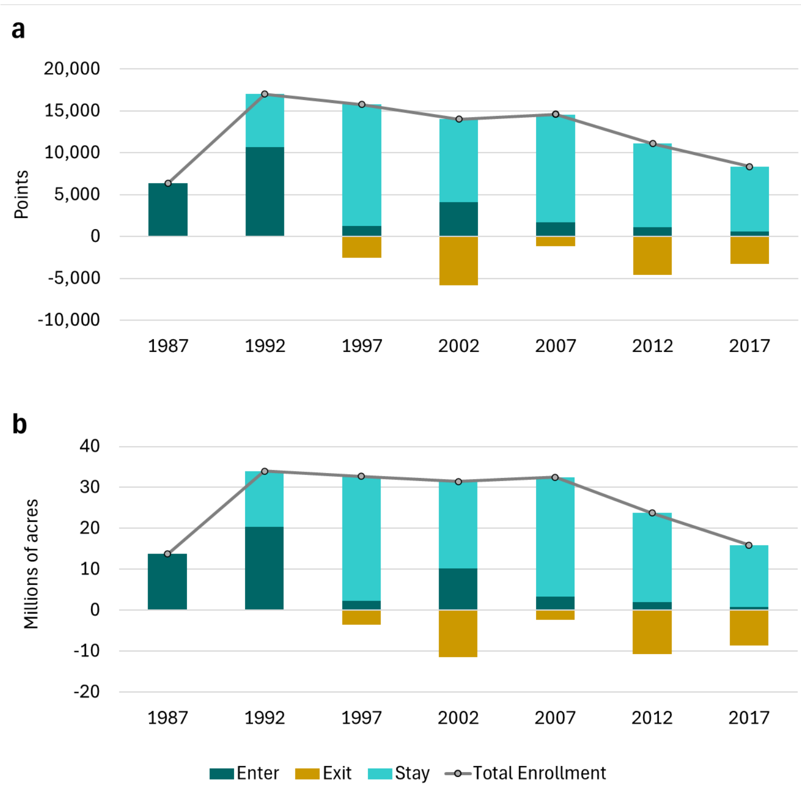

Figure 5. Cumulative CRP enrollment tracked in the NRI data (a) number of points and (b) millions of acres

Although CRP is a national program, enrollments skew toward larger states with eligible croplands (croplands with resource concerns that are prioritized by the program). We observe average enrollment (from 1986 to 2017) of greater than 1 million acres for 10 states, whose combined enrollment surpassed the remaining 33 states with any enrollment in our sample (Figure 6).

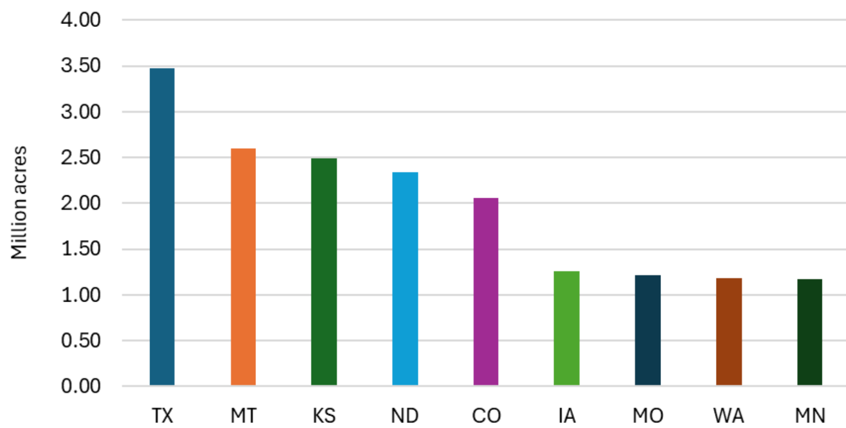

Figure 6. Average acres enrolled per NRI period by top ten states

Land use outcomes after leaving CRP

We find that the CRP program has had a transformational effect in encouraging conservation cover on croplands in the United States. Based on whole sample outcomes, we observe 40.3% of the acres that have enrolled in CRP at any point during 1986-2017 had reverted to cropland as of 2017. Of the 59.7% that were classified as non-cropland, 18.8% was in some type of grass (range) or pasture, and 5.5% was in forest cover (a combined 24.3%), and 1.3% in other uses (e.g., developed). Notably, 34.1% of these acres either remained or were reenrolled in CRP as of the end of the sample period (2017) (Figure 6a). We construct a simple counterfactual for land use outcomes, using cropland points that were never enrolled in CRP over the same period. We select these points from the top 20 states with the most CRP enrollments by area to be broadly comparable. More than 85% of croplands remain cropland in this counterfactual group, and share of grass or tree cover is 10.1% (Figure 6b). Even after we further exclude cropland points that are prime farmlands from the counterfactual (using a prime indicator available in the data), since prime farmlands are less likely to enroll in CRP, more than 83% of cropland acres remain cropped in 2017 (Figure 6c), with the proportion going into grass/pasture or tree cover is 13.3%.

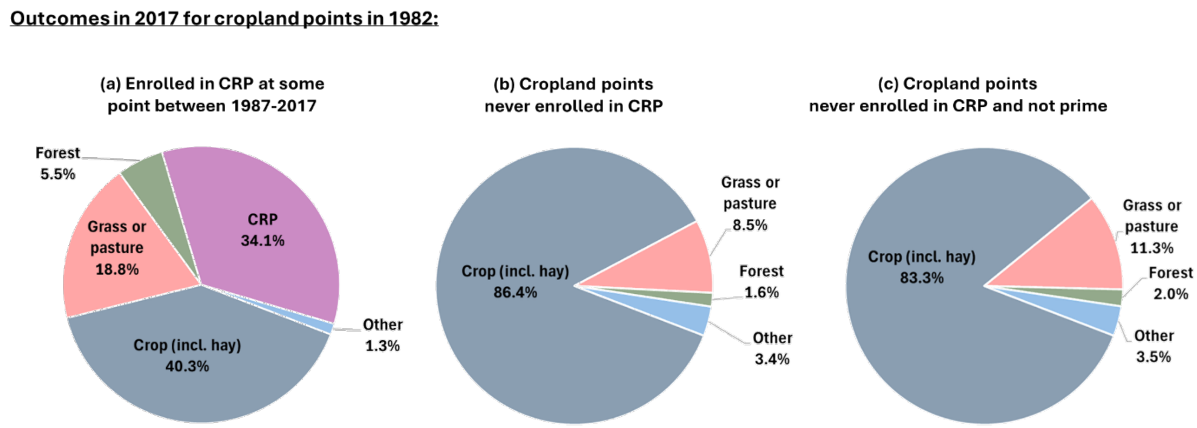

Figure 7. Outcomes in 2017 for cropland points in 1982 (share of acres)

Time spent in program

In our data, about 50% of the acres were enrolled into CRP longer than a typical contract (of 10 to 15 years), with an average duration of 15.9 years per acre enrolled. Spatially, we observe that longer times spent in the program broadly coincide with the counties that are outside of the traditional corn/soy belt, but not exclusively (Figure 8). As reenrollments into CRP are permitted, they do play a role in extending time in program. Nonetheless, the majority of the observations in our sample enter into CRP only once. In addition, a subset of points appear in CRP throughout the entire duration of the NRI data. Of the 24,518 points in our sample, we observe 1,454 points (3.2 million acres) enter at the time of inception of CRP and remain in CRP till the end of our observation period (2017). Although points in this group are found in all states with CRP enrollments, more than half (in terms area) are located in five states: Colorado, Texas, Kansas, Montana and Oregon. If we exclude this group, the average time in program adjusts downward to 14.4 years.

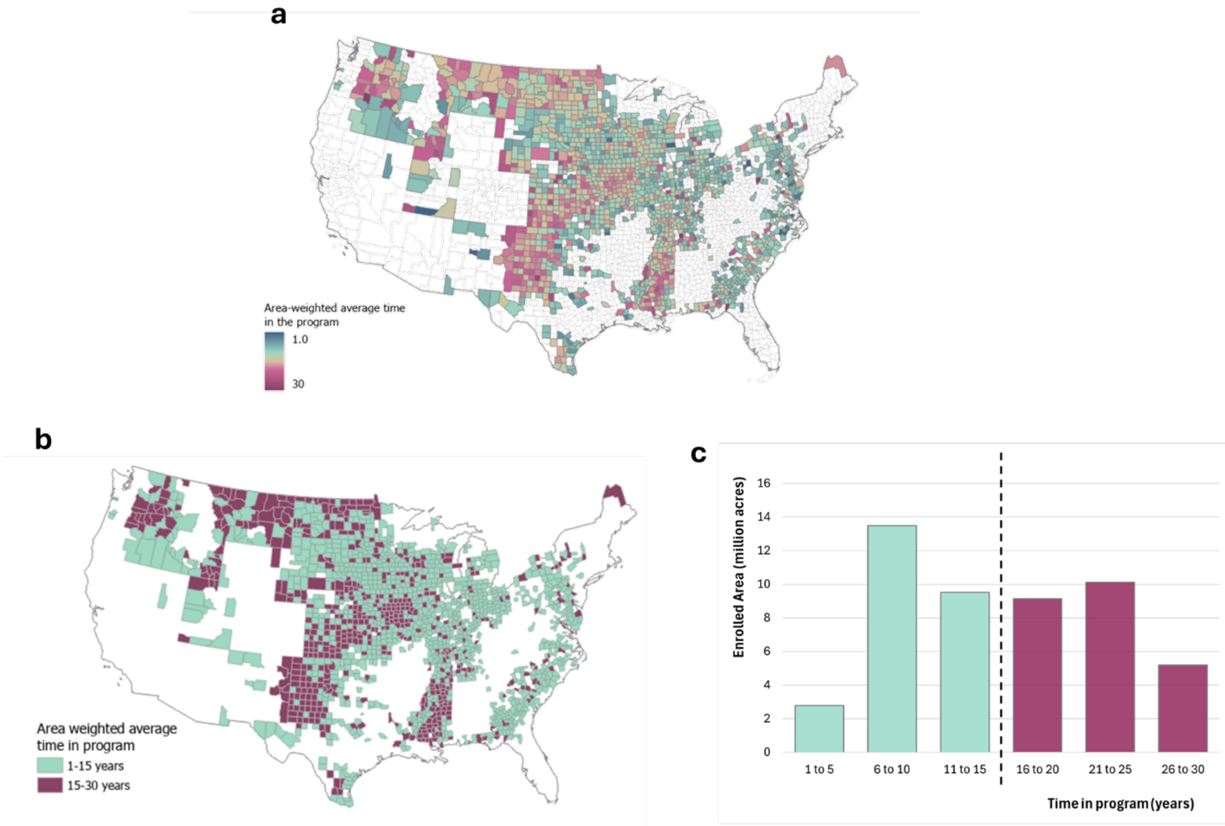

Figure 8. Time spent in program (years) for all points indicated as entering CRP at any time between 1986-2017. (a) Unclassed (b) Grouped in two, with 15 years set as cutoff (c) Frequency distribution of acres by time spent in CRP, bar colors corresponding to (b).

Time to conversion

For the subset of points that have enrolled in CRP and subsequently exited, we can track outcomes. For this group, the average survival time is 4.2 years. Still, we observe median survival is one year (also the mode). In other words, most reversions back to cropland (failures) occur in the first year after exiting the program. In Figure 9 below, we show the spatial distribution of average survival by county, and we find no evidence of clustering in space by survival time.

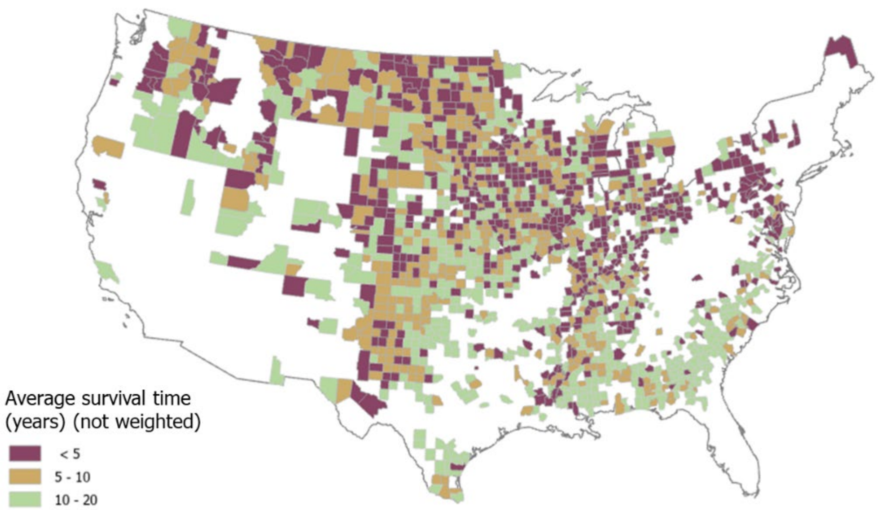

Figure 9. Average post-program durability by county (years). Not weighted by area. Classified in terciles.

Total durability and durability rate [*in progress*]

Durability appears linked to total time spent in the program. In Figure 10, we show land use / land cover outcomes observed at one and five years for the subset of points for which we can observe at least five yearly outcomes. The group with longer time spent in program appears to have lower initial rate of reversion back to cropping (comparing the 1-year outcomes in panel a vs. b). Also, the proportion that reverts back to cropland by year five is lower (48% vs. 57.7%) for the group with longer time spent in program. Still, regardless of time spent in program, at year 5, post-program durability converges to about 37% (sum of shares for grass or pasture and forest cover) for both groups, mainly due to reenrollments (see panel b, share going back into CRP).

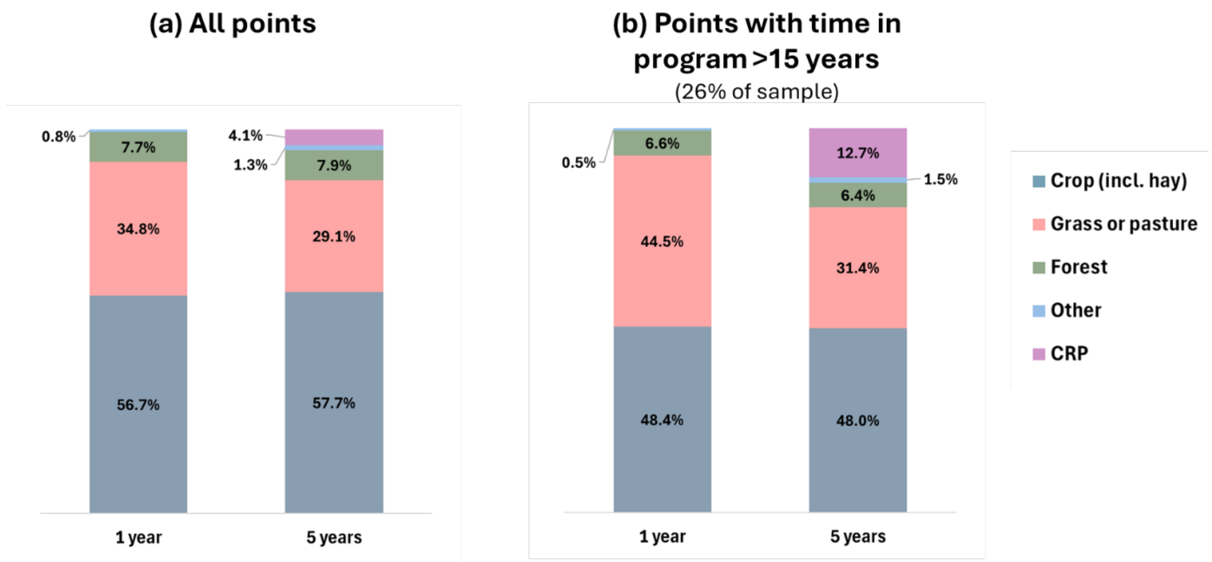

Figure 10. Outcomes as area shares by land use/land cover for (a) all points for which we can observe post-program outcomes for at least 5 years, (b) the subset whose time in program exceeds 15 years

Cost of durability [*in progress*]

In this indicative analysis, we use county average rental rates rather than specific contract rates to calculate the cost of post-program durability. Also, we assume away additional cost share payments made under CRP contracts, which may affect estimates.

Factors associated with durability [*in progress*]

Here we report on the expected contribution of the factors summarized in Table 1 accompanied by a column graph of statistical significance based on the log-rank test. The higher the χ^2 (or Z, if using Wilcoxon) test statistic, the more important the variable is expected to be in a multivariate hazard model. In that sense this is a nice segue to hazard modeling (for the next iteration). We will discuss the intuition behind the factors included and their influence on survival time.

Discussion

Contribution to literature

We build on previous work (Bigelow et al., 2020; Sullins et al., 2020; Hendricks and Er, 2018; Jones et al., 2013; Jacobson, 2014; Morefield et al., 2016; Hellerstein and Malcolm, 2011; and Roberts and Lubowski, 2007) that studied land use outcomes of CRP program either over shorter periods (sometimes involving a single cohort) and/or smaller geographic areas. Because our dataset spans 1986-2023 and covers entire CONUS, we improve on both the temporal and spatial coverage of CRP enrollments. By extending the data, we are also able to investigate durability trends (e.g., faster decay in the first 5 years post-CRP). In addition, for earlier cohorts we are able to track outcomes for 20 years or more.

In previous work Sullins et al (2020) analyzed a single cohort of CRP program enrollments in a 6-state study area in the southern Great Plains of the US (NE, KS, CO, OK, NM, and TX). This cohort included parcels that exited CRP in 2007 (and not re-enrolled), meaning most entered the program no later than 1997. Tracking their land cover outcomes for the subsequent 10 years using CDL data, the authors found about 63% survival rate for grass cover at the 5-year mark. This survival rate remained at 58% at the end of the 10-year evaluation period. This indicated most loss of grass cover post-CRP took place in the first 5 years. The factor that affected durability most was tillage risk (varying in space but not in time). Durability estimates by state also indicated variability where NE and CO showing below average durability; NM, TX, OK showing above average durability; and KS representative of the overall durability trend.

We build on Sullins et al (2020) work. We improve on both the spatial and temporal coverage of CRP enrollments by using point-level data from the NRI for entire CONUS and for multiple CRP cohorts. Note that the NRI data is limited to General CRP program. Each cohort is defined by the enrollment year into CRP, and depending on the year can include one or more program “signups”.

Durability informed targeting and associated trade-offs

This is where we will present empirically supported exercises of targeting enrollment based on durability.

We will comment on the pros/cons of durability informed targeting, particularly in terms of program cost and additionality considerations.

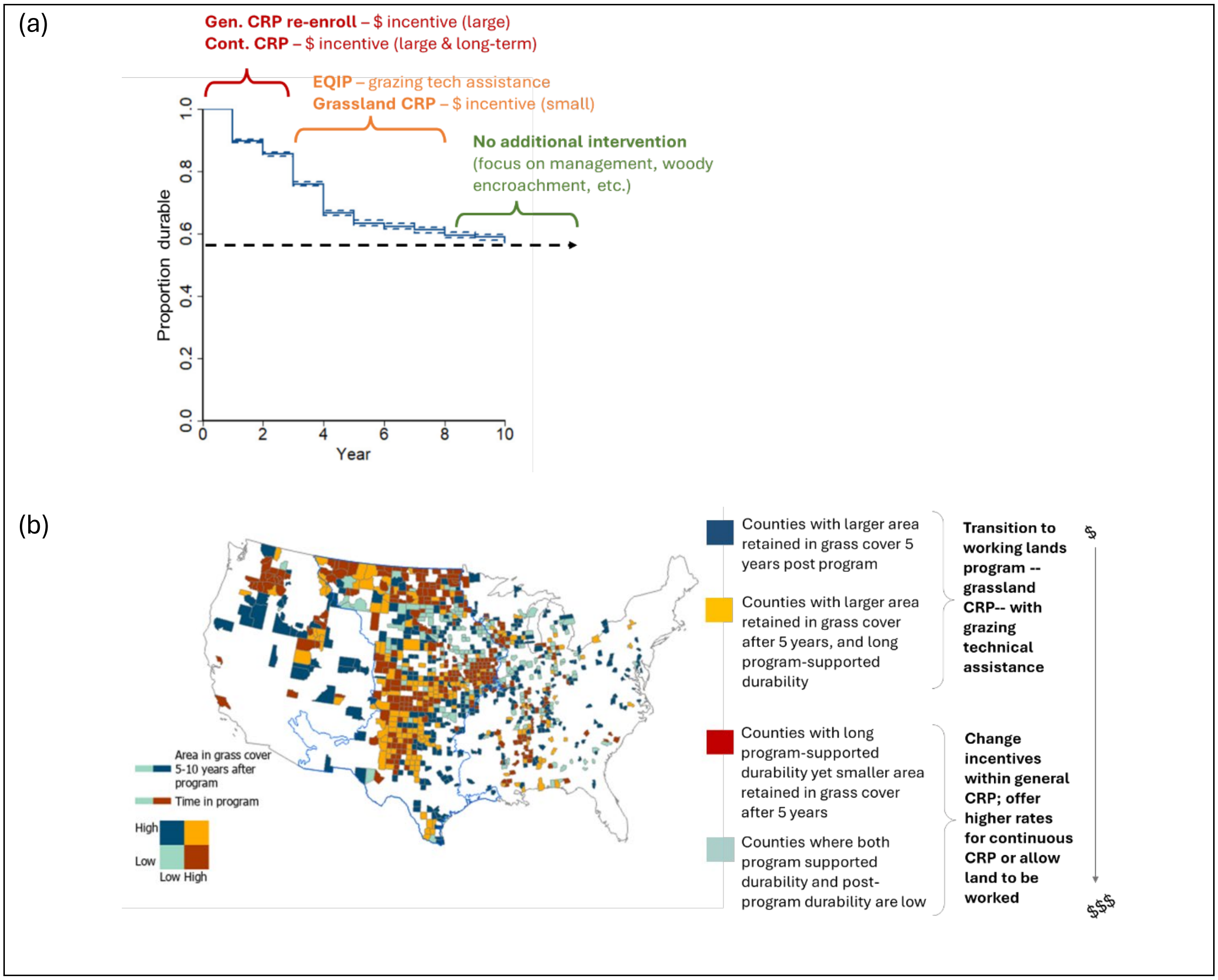

Figure 11. Durability informed targeting [preliminary / indicative]

What does a policy that targets areas are expected to have more durable conservation outcomes look like? Or should the goal be more about improving durability everywhere? What does an extra year of durability “buy” in terms of conservation outcomes?

Limitations and next steps / ongoing work

Limitation: right censored data. This is not unusual for survival analysis, but without the most recent NRI data we cannot extend our assessment window. We are considering using satellite-based data on land use/land cover, such as the USDA's Crop Data Layer. In subsequent iterations of this manuscript, we will add (time varying) covariates of net returns to alternative agricultural land uses (crop vs. non-crop, excluding urban) and program parameters (e.g., national enrollment cap) and extend univariate analyses presented here to develop a multivariate hazard model for prediction to evaluate prioritization with respect to durability.

Conclusion

Lasting conservation requires policies to be informed by durability of outcomes. We analyze the durability of grass cover associated with the general CRP since program inception and over entire CONUS to identify areas and the determinants of persistence. Based on these findings, we discuss what a spatiotemporal prioritization scheme for CRP could look like to extend conservation outcomes and implications for other program considerations like additionality and cost effectiveness. We will further inform this prioritization scheme with the results from the proposed hazard model (see next steps) that will explicitly incorporate economic variables like net returns.

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