



Stimulating Grassland Conservation Through Greenhouse Gas Emissions Markets

USDA NRCS Conservation Innovation Grant R-228 (2015-2018)

Project Summary

This project aimed to expand adoption of grassland conservation by lowering the barriers to entry for landowners seeking to participate in greenhouse gas (GHG) emission markets.

Specific barriers include:

- Complexity and effort required for project development and verification
- Landowner education
- Lack of applied experience implementing projects
- Unavailability of tools to streamline credit generation

This project sought to address all four of these barriers in order to generate large reductions in GHG emissions as landowners chose to pursue long-term conservation of threatened grasslands. The following deliverables were identified as necessary to achieve this goal:

- Development of tools to reduce effort of project development and verification
- Outreach workshops to educate landowners and project developers
- Development of pilot projects to test the protocol and tools
- Updated protocol text to address lessons learned during the pilot

Project Partners

This project was a highly collaborative effort involving the following organizations.

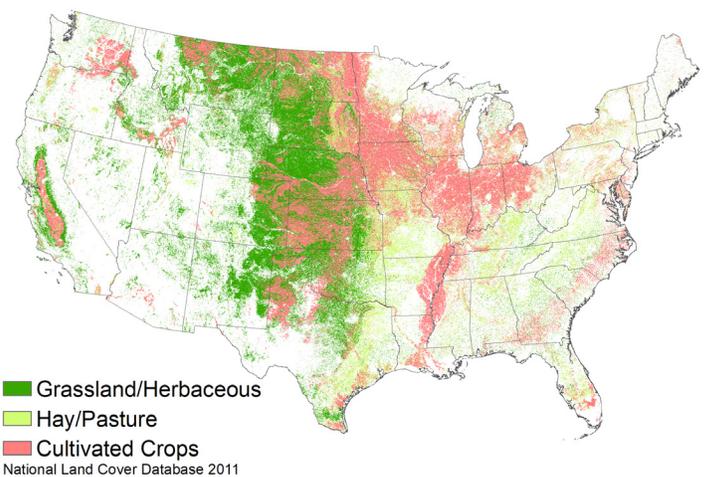


Benefits of Avoided Grassland Conversion

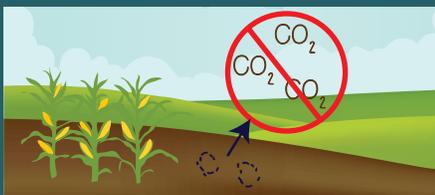
Land area devoted to the cultivation of crops for food and, more recently, fuel production comprises approximately 16% of the total land area in the conterminous United States.¹ While the impacts of crop cultivation on greenhouse gas (GHG) emissions are complex, it is clear that the conversion of natural grasslands to traditional crop cultivation can result in significant releases of the carbon that has been stored in the soil over decades by natural cycles of growth and decay. In addition to this loss of soil carbon, cultivation practices often have negative impacts on air, water, and habitat due to fossil fuel combustion, fertilizer application, irrigation, vegetation removal, damage to watercourses, and fencing.

Strong commodity prices along with increasing demand for biofuel feedstocks have resulted in increased pressure to expand the area of land used for crops, especially corn.² Of the existing uncultivated lands that are available for conversion to cultivation, grassland tends to be the prime target because the cost and effort of conversion is much lower for grassland than for forests or wetlands. Rates of conversion of grassland to

cropland have remained high in recent years, especially on grassland areas which would typically be considered unsuited for agriculture (Land Capability Classifications higher than four). Grasslands make up more than 14% of the land area of the conterminous U.S. They exist across several regions, but are mainly found between the Mississippi River and the Rocky Mountains, as well as in central California. These are the same regions where most of the cultivated land can be found (see below), leading to the conversion pressure caused by agricultural encroachment.



Benefits of Avoided Grassland Conversion



Avoid GHG emissions



Protect water quality



Protect soil health & avoid soil erosion



Protect air quality & habitat



Maintain productive land for grazing



Support recreational opportunities

¹ Jin, S., Yang, L., Danielson, P., Home, C., Fry, J., & Xian, G. (2013). A comprehensive change detection method for updating the National Land Cover Database to circa 2011. *Remote Sensing of Environment*, 132, 159-175.

² Lark, T. J., Salmon, M. J., & Gibbs, H. K. (2015). Cropland expansion outpaces agricultural and biofuel policies in the United States. *Environmental Research Letters*, 10.

Project Deliverables



Outreach workshops to educate landowners and project developers

Education & Outreach

- Workshop: Omaha, NE (April 2016)
- Workshop: Sacramento, CA (June 2016)
- Workshop: Pendleton, OR (May 2017)
- Additional conferences, webinars, and direct outreach (2016-2018)



Development of tools to reduce effort of project development and verification

Tools for Project Assessment & Implementation

- Updates to quantification tool (GrassTool)
- Economic feasibility tool to assess project-level costs and revenues
- Mapping tool to identify priority regions
- Online feasibility mapping portal (GrassMap)
- Verification training for SCS Global Services
- Template project monitoring plan
- Handbook for project development



Development of pilot projects to test the protocol and tools

Pilot Project Identification & Development

- Two ranches in southeastern Colorado, owned by the Southern Plains Land Trust
- Submitted in 2016, verified and credits issued in 2018



Updated protocol text to address lessons learned during the pilot

Protocol Update to Version 2.0

- Initiated in 2016
- Adopted January 2017



Education & Outreach

All partners in the CIG conducted outreach and education of ranchers. The objective of this outreach was twofold. First, we wanted to educate ranchers about the potential to generate a long-term revenue stream from preserving their land as grasslands. Second, we solicited ranchers to participate in a pilot project to test out the Climate Action Reserve's Grassland Project Protocol and identify opportunities for improvement. Our outreach consisted of two approaches: attending conferences targeting conservation-minded ranchers, and conducting targeted outreach to conservation organizations and government agencies with missions to conserve grassland. In total, we reached out to more than 62 conservation organizations, land trusts, agricultural organizations and government agencies, as well as approximately 40 individual landowners in 13 states. We had substantive follow-up conversations about participating in a pilot project with 29 organizations representing more than 10 million acres under conservation management. While only one organization decided to participate in our pilot project, the feedback from our outreach was overwhelmingly positive. These organizations and individuals are a strong pipeline for future projects as the land trusts acquire new land and ranchers consider their estate planning.



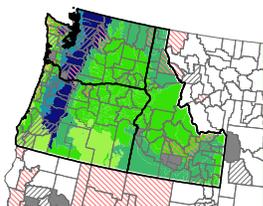
Educational workshop: Omaha, Nebraska April 2016

This half-day event included approximately 20 attendees, including land trusts, NGOs, government, and project developers. Several project partners presented information and led discussions with the group. Takeaways were that we need to work harder to connect with the landowners' perspectives on carbon projects.



Educational workshop: Sacramento, California June 2016

This lunch event involved several project partners presenting directly to the Board of Directors for the California Rangeland Trust. Information regarding the protocol and the CIG project was presented, followed by in depth discussion. Takeaways were that CA rangelands are highly varied in their eligibility and it will take time to identify potential properties which are not already protected.



Educational workshop: Pendleton, Oregon (NW Grazing Conference) May 2017

This full-day event involved an exhibit table as well as a full workshop session to present information and lead discussions with the group. Eastern Oregon and Washington are high priority areas for avoided grassland conversion, given the attractive baseline emission factors and the rapid encroachment of row crop cultivation in the context of a warming climate.



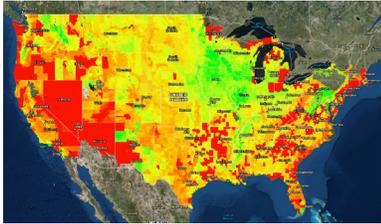
Other education & outreach events

- CA Rangeland Conservation Coalition (Feb 2016)
- Nebraska Board of Educational Lands and Funds (Apr 2016)
- Land Trust Alliance Rally (Oct 2016)
- Northern Plains Resource Council Soil Summit (Oct 2016)
- Webinar for CA land trusts (July 2017)
- Coalition on Agricultural Greenhouse Gases (2-3 meetings per year)
- A Community on Ecosystem Services (Dec 2018)
- America's Grasslands Conference (Nov 2017)



Tools for Project Assessment & Implementation

Project partners worked together to develop a suite of tools, including a mapping tool to focus outreach efforts, a financial forecasting tool to allow project developers to determine the revenue and expenses of potential projects, an update to the quantification tool (GrassTool), a handbook providing plain-language guidance for project development, and an online mapping tool (GrassMap) for assessing initial project feasibility.

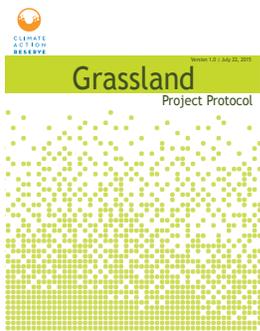


Map for targeted outreach

EDF developed an ArcGIS mapping tool to help prioritize areas with the highest potential for development of grassland projects. The map incorporates data on cropland premium, soil suitability for cultivation, and potential carbon abatement to produce a heat map designed. We used the tool to help pinpoint areas that had both high carbon abatement potential and eligibility for a project, identifying areas in IA, IL, CO, and NE as focal areas for our outreach. The map was helpful, but would need to incorporate additional parameters, such as existing conservation land, to avoid false positives.

Financial forecasting spreadsheet

The Climate Trust, with assistance from EDF and the Reserve, developed a financial forecasting tool for potential grassland projects, incorporating fees associated with the creation of a project (including a feasibility assessment, data collection, verification, and registry fees), along with key variables (such as project size, credits per acre, financial variables, grant support, offset prices, and maintenance costs) to determine the cost and revenue generated from grassland projects. The tool also allows for a calculation of the net present value (NPV) of the overall project. This tool may also be used for projects that do not receive financial support through the CIG, and has proven to be a helpful resource.



Grassland Project Protocol Version 2.0 (GPP v2.0)³

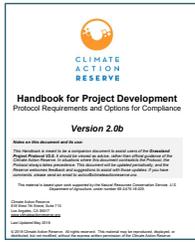
GPP v1.0 was originally adopted in July 2015, just before the award of this CIG and the development of any grassland projects. Since project implementation often leads to protocol changes, an update to v2.0 was planned in the CIG proposal. Changes included allowance for irrigation of the project area; removal of baseline shrub accounting; some terminology updates; new start date guidance; development of a default, MLRA-specific threshold for soil suitability; introduction of ecosystem health assessments; and removal of certain buffer pool contributions for accredited land trusts. In addition to the three projects submitted under the pilot, there have been seven other grassland projects listed in the Reserve's project registry.

Project Quantification Tool (GrassTool)⁴

The GrassTool was originally developed during the protocol v1.0 process. However, several updates were needed to enhance usability and adjust for the changes included in the protocol v2.0. Changes made include: expanding the number of strata which can be modeled in one project, fixed several minor errors, updating structure and formatting to enhance usability, adding automatic options for suitability, updating terminology to reflect GPP v2.0, and various other minor tweaks.

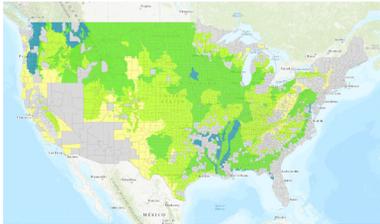
³ The GPP v2.0, GrassTool, Handbook for Project Development, and GrassMap may all be accessed at: <http://www.climateactionreserve.org/how/protocols/grassland/>. Other tools may be made available over time.

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Handbook for project development⁴

Offset protocols are highly technical documents, blending the style and language of government regulations with those of scientific texts. This is often a barrier to landowners, project developers, and verifiers, who need to have a clear, shared understanding. The handbook is meant to provide guidance in plain language, and is updated more regularly than the protocol.



Online mapping tool (GrassMap)⁴

Project partners designed the first map above for targeting outreach, but it is not particularly useful for project developers who have already identified a property of interest. GrassMap allows those users to quickly judge the financial eligibility and potential for baseline emission reductions of target areas. This map is not intended to be used for project stratification or quantification, but rather for quick, rough assessment of whether deeper analysis is worthwhile for a particular area. Users can view the county-level financial eligibility, as well as the baseline emission factors for different combinations of MLRA, soil texture, and land use history.

Pilot Project Identification & Development

In addition to outreach at conferences, project participants worked closely with land trusts across the country to identify potential projects. We conducted outreach to land trusts in California, Colorado, Montana, Nebraska, and Oregon. Of the 62 organizations contacted, we had substantive follow-up conversations with 29 about the potential development of a pilot project. Together, these 29 organizations represent over 10 million acres under conservation management. While only one of these organizations, the Southern Plains Land Trust (SPLT), undertook the development of a pilot project, most of the other organizations were simply limited by the timing of easements being placed on their lands.

CIG participants leveraged existing relationships with influential organizations, including the CA Council of Land Trusts (CCLT), CA Rangeland Trust (CRT), UC Cooperative Extension (UCCE), Trust for Public Land (TPL), Point Blue Conservation, World Wildlife Fund (WWF), and the NE Board of Educational Lands and Funds (BELF) to identify and pursue project opportunities. Despite several promising conversations, we were ultimately unable to secure a pilot project commitment. The CIG team also conducted extensive discussions on developing a pilot project with Nebraska BELF, including a presentation at their offices, but progress stalled when their internal project champion retired.



In August 2016, EDF, in collaboration with the SPLT, submitted listing documents for the first pilot cooperative. EDF initially served as the Cooperative Developer of the project and SPLT served as the Project Owner. The cooperative covered two separate ranches at the outset, each under a conservation easement, totaling over 15,000 acres of native shortgrass prairie in southeastern Colorado. Project verification started in August 2017 and 4,787 credits were issued in July 2018, which were then sold to Microsoft. The sale was announced through a press release and blog, promoted through social media and featured in the Fall 2018 issue of EDF's Solutions magazine, which reaches more than 400,000 members, including environmental leaders in every state.

In August 2018, EDF transitioned its role as cooperative developer to SPLT. A third ranch in

Colorado, consisting of over 7,000 acres and owned by SPLT, was added to the pilot project in July 2018. All three properties started a second verification in July 2018. SPLT's success is proof that this protocol is easy enough to use that organizations without a deep background in the carbon market can develop projects.

Finally, this pilot project and related outreach helped encourage other landowners and developers to pursue the Grassland Project Protocol. As of December 2018, there were ten projects under development, which is significant because other agriculture based protocols, such as the Rice Cultivation Project Protocol and Nitrogen Management Project Protocol, do not have any projects Listed in the Reserve's project registry.



Challenges & Lessons Learned

While this CIG was ultimately successful, and achieved the goals and deliverables, it was not without its challenges. Especially difficult was identifying the pilot projects.

Easement Timing

The protocol requires that the project area is not already protected by a conservation easement, as that would violate the rules for additionality. There is flexibility, allowing for some delay between

establishing an easement and submitting the carbon project, but ultimately this protocol aims to drive new conservation easements. We found that it was much easier to identify land which was already protected than to identify properties which were not yet protected, but were being considered for protection. Even then, the lead time on negotiating and executing the easement is often more than a year, which is difficult in the context of a fixed grant period. As the protocol gains traction, we expect that



more conservation organizations will know about this tool and be able to identify potential projects more readily.

Land Suitability for Carbon Projects

In order to support the counterfactual baseline scenario of conversion to cultivation, the Reserve protocol requires the project area to be largely composed of soils that are highly suitable for crop cultivation. On top of this, the emission factor modeling showed that different areas would emit carbon at different rates following conversion. Lands in CA were especially variable in this regard. Finding properties that were considering conservation, while also meeting these other criteria, proved especially difficult. In response, the partners continued

refining and developing quick assessment tools to more easily consider the feasibility of potential properties.

Learning Curve

Grassland conservation projects target an audience that has little prior experience with the carbon markets. While some land trusts have gained experience with forest carbon projects, overall this sector has limited exposure to the processes and requirements related to developing carbon projects. Similarly, landowners, ranchers, and other project stakeholders needed time to be introduced to carbon markets, protocols, registries, and verification procedures.

Next Steps for Grassland Carbon

Although the grant period has concluded, the project partners will continue to push forward on grassland projects. The Reserve will work with SPLT to ensure a smooth transition of the project development activities away from EDF to ensure that the cooperative remains sustainable following the pilot phase. The pilot cooperative has completed the two verifications funded by the CIG, and will now determine the appropriate verification schedule going forward. The Climate Trust, with support from this and another CIG, is developing a cooperative of three grassland projects in Oregon through its pilot Working Lands Carbon Fund.

Project partners will continue to conduct outreach regarding the grassland protocol at meetings and conferences, engaging with interested stakeholders whenever possible.

Adoption of the Grassland Project Protocol by the California Air Resources Board (ARB) was another, unstated goal of this CIG. We endeavored to find a pilot project in the state, but were unable to identify a suitable property with an interested landowner and conservation organization. Such a demonstration project would undoubtedly raise the profile of grassland projects with ARB. Under the auspices of another CIG (the Encourage Capital Working Lands Investment Fund, 2016), Reserve staff were able to have targeted meetings with ARB offsets staff, as well as CA legislative staff, to brief them on the opportunities for GHG reductions from grassland conservation in their state. We are optimistic that ARB will give serious consideration to this project type for inclusion in the offsets program of their economy-wide cap and trade system.

For More Information

- nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/
- climateactionreserve.org/how/protocols/grassland
- edf.org
- kcoe.com
- climatetrust.org
- c-agg.org
- scsglobalservices.com
- southernplains.org

