



TOOLS FOR CONSERVATION ON PRIVATE LANDS



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Introduction

A diverse conservation toolbox can access a wide range of financial incentives and target conservation efforts where they are needed.

Privately owned lands provide numerous benefits to people and nature – from scenic vistas to locally produced food to wildlife habitat. A national analysis of the United States showed that a majority of biodiversity is found on private lands, rather than formally protected areas or public lands. Yet, these lands face numerous challenges – including rapidly changing land-use and an aging population of land stewards. Notably, a recent study of land-use change in the West found that natural habitat equivalent to the size of a football field is lost every two and a half minutes with the majority of that loss occurring on privately owned lands.¹ Maintaining viable working lands is critical to ensuring that private lands in the United States continue to provide the many social and ecological benefits that define the country's natural and cultural heritage.

The challenge of maintaining working lands requires conservationists to increase the scale and impact of their efforts. To achieve this goal, a portfolio of tools and approaches is needed that meets diverse landowner objectives and ecological needs. In some cases, landowners need to extract as much economic benefit as possible from the underlying real estate value of a property, while in other cases, passing land to the next generation is a primary goal. On the ecological side, some conservation efforts are best pursued through permanent agreements while in other cases a conservation practice may only be needed during short windows, such as a critical migration or nesting period. A more diverse conservation toolbox can access a wider range of financial incentives and target conservation efforts where they are needed at different spatial and temporal scales.

Here we provide an overview of seven conservation tools and illustrate their use through specific examples. Included are summaries of findings from a survey of over 300 conservation professionals from across the country in which experts reflected on their experience implementing



Photo courtesy of Allan Strong

these tools. In particular, we asked about the conservation challenges the tools were best at addressing, the suitability of the tool in urban, exurban, and rural settings, and the most commonly used incentives associated with the tool.* We also provide a list of additional resources where interested readers can learn more about each tool and about specific projects where these tools have been applied.

Our goal is to broaden awareness of a wider range of conservation tools and approaches and diversify the private lands conservation toolbox. We note that this overview is not exhaustive. To supplement the seven tools highlighted in the report, we provide an appendix listing additional tools and resources. Finally, we emphasize that the highlighted tools are not mutually exclusive and in many cases should be layered together or used in tandem to best meet conservation and landowner objectives. We hope this report sparks interest in additional experimentation and innovation to advance conservation efforts on private lands.

*For full survey results, see Bennett et al. (2018). Using Practitioner Knowledge to Expand the Toolbox for Private Lands Conservation. *Biological Conservation*, 227: 152-159.



Photo courtesy of Kenton Rowe

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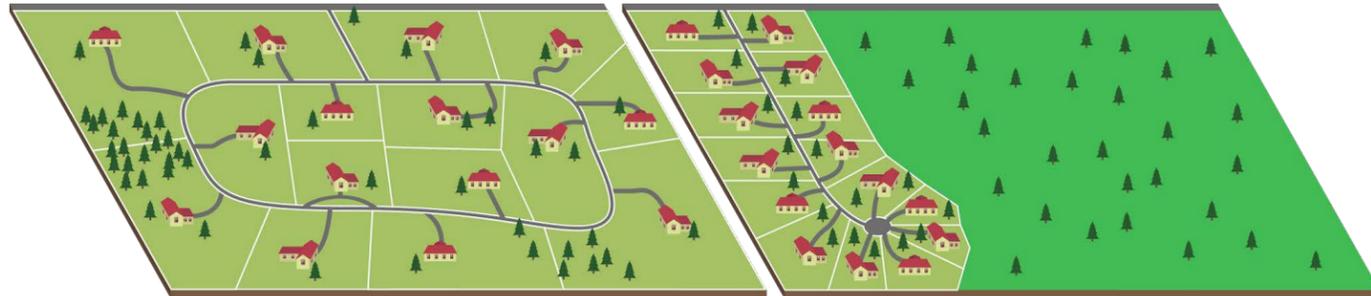
Funding for this study and report was provided by Dr. Skip Shelton, Robert L. Tate, Mike and Jan Bohart, the MacMillan Private Lands Stewardship Program in the Ruckelshaus Institute at the University of Wyoming, and the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2017-67012-26121.

September 2018

Conservation Developments

Prairie Crossing - Grayslake, Illinois

Conservation developments are projects that combine residential developments with conservation goals, such as setting aside a portion of the developed property as a conservation area.



A traditional real estate development (left) contrasted with a hypothetical conservation development (right). Figure by Sterling Moody.

In Grayslake, Illinois, the concept of maximizing conservation within residential development was put to the test in the construction of the Prairie Crossing subdivision. In the 1970s, the land that Prairie Crossing stands on was slated for conversion into 1,600 housing units on 675 acres. However, neighbors of the property had long held a deep love for the natural prairie in their backyard. When the property was acquired by George and Vicky Ranney, they envisioned building a community that prioritized conservation and the preservation of the Midwestern landscape.⁴ Their plans contained just 359 houses and a condominium in place of the originally planned 1,600 housing units. The master plan for Prairie Crossing also included a trail system, a 100-acre organic farm, a charter school, and two metro train stations.⁵



The native plants and flowers interspersed throughout the Prairie Crossing development. Photo courtesy of Liberty Prairie Foundation.

What is a conservation development?

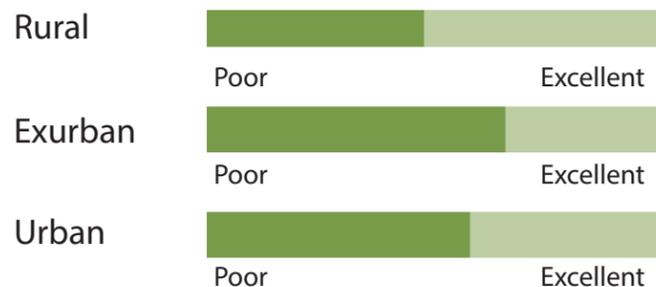
Conservation developments are a broad range of approaches to integrating conservation objectives into traditional real estate developments. Conservation developments target the design, construction, and stewardship of new developments and aim to keep a significant portion of the land in a natural state, while strategically clustering development on a smaller portion of the property.²

Conservation developments can take diverse forms at scales ranging from a small area with a handful of buildings on a single property, to conservation subdivisions, to entire communities. This tool has been applied widely since the 1990s,³ and there is increasing evidence that well-designed projects can achieve measurable benefits for people and nature.

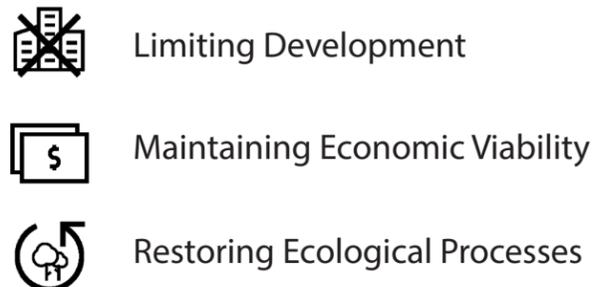
As the subdivision was constructed, great care was taken to integrate as much of the native prairie landscape as possible. Growth of native plants helped Prairie Crossing developers meet one of their goals: using native vegetation to mitigate flood and stormwater risks and act as a natural filtration system to maintain high water quality in the development's lake.⁶ By restoring native plants to the landscape, Prairie Crossing has also been successful in sustaining high-quality wildlife habitat; residents have observed up to 188 species of birds and mammals such as least weasel and mink.⁷ The development has also seen financial successes, with homes selling for 20 to 30 percent more than comparable homes in the area.⁸ By applying conservation principles, the Prairie Crossing subdivision has become a leading example for how to integrate natural amenities and agricultural uses with traditional residential development.

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?



“By restoring native plants to the landscape, Prairie Crossing has also been successful in sustaining high-quality wildlife habitat; residents have observed up to 188 species of birds and mammals.”

For more information

Pejchar et al. (2007). Evaluating the Potential for Conservation Development: Biophysical, Economic, and Institutional Perspectives. *Conservation Biology*, 21 (1): 69–78.

<http://www.landtrustalliance.org/news/protecting-land-through-conservation-development-lessons-land-trust-experience>

Conservation Easements

The Trampe Ranch - Crested Butte, Colorado

A conservation easement is a voluntary, legally binding agreement between a landowner and a conservation organization or government agency that limits uses of the land to achieve conservation goals.



Cows being moved on Trampe Ranch outside of Crested Butte, Colorado. Photo courtesy of Barbara East.

In the over 140,000 conservation easements that have been established in the United States,¹¹ there are scores of success stories. Among these, Trampe Ranch stands out. Located just outside the mountain resort community of Crested Butte, Colorado, the Trampe Ranch was founded in 1907. Its humble beginnings are rooted in a 160 acre potato farm that grew into a working ranch spanning thousands of acres.¹² In addition to sustaining an agricultural livelihood, the Trampe Ranch provides valuable wildlife habitat, including habitat for the Gunnison sage-grouse, a species federally listed as threatened,¹³ and a scenic backdrop to the famous resort town. Because of these benefits, and due to the rapid growth of residential development in the Crested Butte area, the Trampe family recognized the need to protect their land.



Trampe Ranch outside of Crested Butte, Colorado. Photo courtesy of Barbara East.

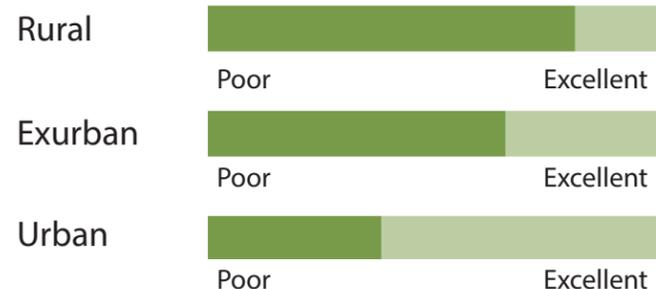
What is a conservation easement?

A conservation easement is a voluntary legal agreement between a land trust or public agency and a landowner that limits development and conserves natural and agricultural land. The specific terms of an easement are negotiated between the parties but typically involve the transfer of certain property rights, such as development rights, to the land trust or public agency.⁹ The use of conservation easements grew rapidly in the United States beginning in the 1980s when federal tax incentives were established.¹⁰ Today, conservation easements are one of the principal tools for conservation efforts on private lands. An estimated 146,000 conservation easements have been implemented in the United States, resulting in over 25 million acres of land conserved.¹¹ These lands provide important benefits such as wildlife habitat, productive farmlands, and recreation opportunities across the United States.

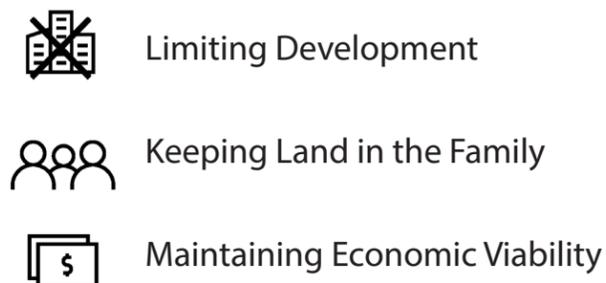
Several key partners - including The Trust for Public Land, The Nature Conservancy, Colorado Open Lands, Great Outdoors Colorado, and the Natural Resources Conservation Service - came together to conserve the Ranch in an impressive collaborative effort that collectively raised money to conserve 6,000 acres of the iconic ranch. The first phase was completed in 2017 when The Nature Conservancy entered into a nearly 1,500 acre conservation easement with the Trampe family to preserve the ranch operations and critical sage grouse habitat. Partners expect to complete remaining phases of the project by the end of 2018.¹³ The remarkable collaborative effort will ultimately result in a belt of conserved land in the iconic valley surrounding Crested Butte that maintains scenic vistas, wildlife habitat, and a working cattle ranch in the heart of the Colorado Rockies.

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?



“The remarkable collaborative effort will ultimately result in a belt of conserved land in the iconic valley surrounding Crested Butte that maintains scenic vistas, wildlife habitat, and a working cattle ranch in the heart of the Colorado Rockies.”

For more information

Rissman et al. (2007). Conservation Easements: Biodiversity Protection and Private Use. *Conservation Biology*, 21(3), 709-718.

<https://www.nature.org/about-us/private-lands-conservation/conservation-easements/what-are-conservation-easements>

Direct Payment Programs

Clean Water Services' Tualatin River Program and the Medford Water Quality Trading Program - Oregon

A direct payment program is a tool in which cash payment or another incentive is provided to landowners in exchange for a conservation outcome or land-use practice likely to produce an outcome.



An aerial view of the Rogue River Basin and the wastewater treatment plant near Medford, OR. Photo courtesy of The Freshwater Trust.

In some watersheds in the Pacific Northwest, landowners have the opportunity to receive payments for restoring forest along their properties' riverbanks. The goal of these programs is to provide shade to block the sun's warming effect on the river and offset impacts from warm water released by local wastewater treatment plants. The concept was originally developed in the Tualatin River Watershed outside of Portland, Oregon. Here, the local wastewater utility, Clean Water Services, faced the challenge of meeting regulatory obligations under the Clean Water Act in which temperature is a regulated pollutant because of the impact of elevated stream temperature on salmon and trout.¹⁷ To meet this challenge, Clean Water Services worked with the FSA and the local soil and water conservation district to modify the region's Conservation Reserve Enhancement Program and fund restoration projects that improved stream temperature.¹⁸ Landowners received lease payments for the restored area of their land and Clean Water Services received credits that they could use to mitigate the temperature impacts from their treatment plants.¹⁹



A man plants trees on the bank of the Rogue River for water quality credit trading program. Photo courtesy of The Freshwater Trust.

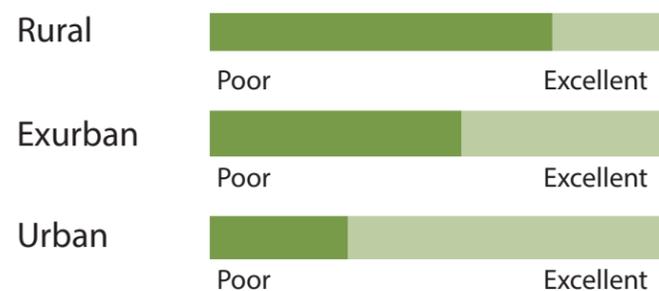
Working with the Oregon Department of Environmental Quality, The Freshwater Trust and The Willamette Partnership expanded on this concept to address stream temperature challenges in the Rogue River Basin where the city of Medford faced the same problem as Clean Water Services.²⁰ The collaborative effort funded the program through a \$6.5 million investment from the City of Medford,¹⁷ as well as a \$1.5 million dollar grant from the U.S. Department of Agriculture.²⁰ To date nearly four miles of streamside forests have been replanted and partners anticipate more than doubling that accomplishment in the coming years.¹⁷ Perhaps more importantly, by setting standards for thermal credits, this program hopes to influence state regulators so that similar programs can be expanded throughout the Northwest.²⁰ The Clean Water Services and Medford examples demonstrate how direct payment programs can provide incentives to landowners for taking conservation actions on their land.

What is a direct payment program?

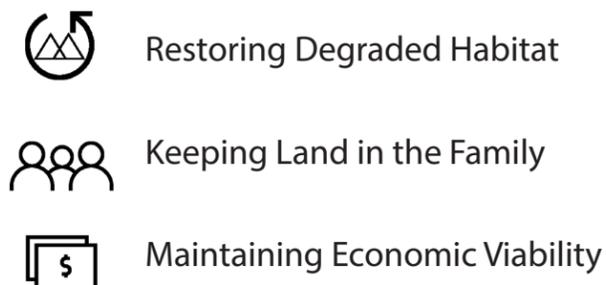
Direct payment programs offer landowners an incentive, such as a cash payment, in exchange for implementing specific conservation practices on their land.¹⁴ The concept originated after the Dust Bowl swept through the Great Plains during the Great Depression. The government established the Farm Security Administration (FSA) in 1937 for the purpose of promoting soil conservation and getting farmers back on their feet. Farmers were incentivized to try out new methods of farming in order to protect the soil from erosion in the future.¹⁵ These programs were the foundation for modern direct payment programs, such as the FSA's (renamed the Farm Service Agency in 1994) Conservation Reserve Program (CRP) and payments for ecosystem services programs that financially compensate landowners for managing their land to achieve specific outcomes.¹⁶

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?



“To date nearly four miles of streamside forests have been replanted, and partners anticipate more than doubling that accomplishment in the coming years.”

For more information

Kroeger and Casey. (2007). An assessment of market-based approaches to providing ecosystem services on agricultural lands. *Ecological Economics*, 64, 321-332.

<http://www.usda.gov/oce/environmental/markets/services.htm>

Forest and Rangeland Carbon Offsets

Forest or rangeland carbon offsets are projects that increase carbon sequestration or prevent emissions through changes in forest or rangeland management by a landowner to offset emissions produced by another entity.

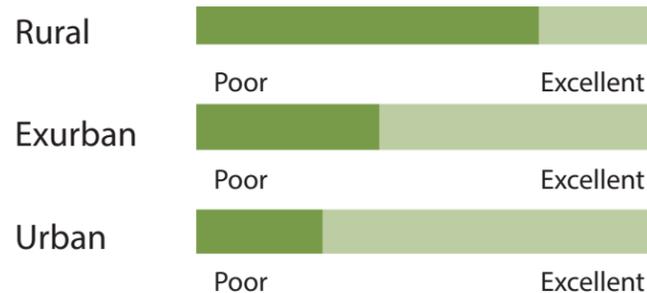


What are forest and rangeland carbon offsets?

Forest and rangeland carbon offsets mitigate greenhouse gas emissions by providing payments for activities that lead to the sequestration of carbon by natural vegetation.²¹ Carbon emitters pay landowners to harness the carbon sequestering properties of their land to offset emissions elsewhere. Forest carbon offsets were created in 1989, when an American company promised to plant millions of trees in Guatemala to offset the greenhouse gas emissions from their new factory.²² Since then, the concept has gained attention from conservation organizations, private companies, and governments around the world. Methods to offset carbon emissions include restoring vegetation, preventing the loss of vegetation, or prolonging the period between harvest. Credits generated from these activities can then be sold in compliance markets, or to individuals and companies in voluntary markets.²³

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?



North Dakota Prairie Pothole Project and the Pacific Forest Trust - North Dakota and California

Carbon offsets have been used in a range of environments, from the towering forests that span the West Coast to the grasslands of the Midwest's Prairie Pothole region. In the North Dakota Prairie Pothole Project, carbon offsets have been used to pay landowners to sequester carbon in grasslands.²⁴ Leveraging a \$161,000 grant from the USDA's Natural Resource Conservation Service,²⁴ The Climate Trust, the American Carbon Registry, The Nature Conservancy, Environmental Defense Fund, and Terra Global Capital came together in 2011 to design tools landowners could use to implement carbon offsets on their land. In order to qualify for financial compensation, grasslands on the farmers' properties had to remain untilled and thus continue to sequester carbon in the deep soils. These grasslands, however, could be grazed and therefore remain agriculturally productive.²⁵ The initial phase of this program aims to conserve up to 5,000 acres of conserved grasslands and wetlands. If the program is successful, it is estimated that it could lead to the conservation of 25,000 acres of grasslands through carbon offsets.²⁶ In addition to the economic benefits of carbon farming and financial compensation provided to participating farmers, the grasslands are important to wildlife - providing nesting habitat for millions of waterfowl each season.²⁵



In another example, landowners in the Pacific Northwest are working with the Pacific Forest Trust (PFT) to conserve the lush forests of the region. By encouraging delayed cutting of trees, restoring former forestland, and preventing conversion to exurban developments, the PFT is using established protocols to calculate the amount of additional carbon stored in the vast biomass of the forests as a result of the program. This additional carbon can then be used to mitigate the emissions of buyers in compliance and voluntary markets. In one example, PFT conserved the 2,200 van Eck Forest in Humboldt County, California using carbon offsets that prevented development of the property and limits timber harvests to less than the forest's growth. Since 2005, the van Eck Forest has sequestered an additional 405,503 tons of carbon compared to conventionally managed forests while still producing 13 million board feet of certified sustainable timber.²³ The similarities between the North Dakota Prairie Pothole Project and the Pacific Forest Trust's program illustrate the potential carbon offsets hold as a conservation tool to supplement landowners' income and provide ecological benefits from local to global scales.

"If the program is successful, it is estimated that it could lead to the conservation of 25,000 acres of grasslands through carbon offsets."

For more information

Galik and Jackson. (2009). Risks to Forest Carbon Offset Projects in a Changing Climate. *Forest Ecology and Management*, 257 (11), 2209-2216.

<https://climatetrust.org/forest-carbon-projects-faq/>

Grassbanking

Grassbanking is a tool where forage (i.e. grass) on one property is exchanged for conservation benefits on a neighboring property.



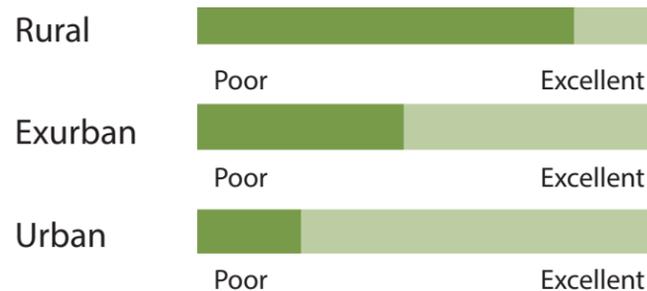
Cattle being herded through pasture on the Matador Ranch. Photo courtesy of Kenton Rowe.

What is grassbanking?

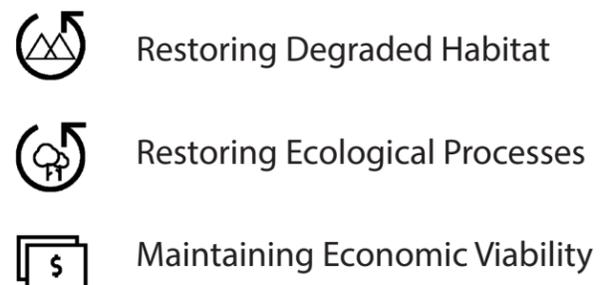
Grassbanking is a tool that incentivizes ranchers to adopt conservation practices on their property in exchange for grazing access on another property.²⁷ Qualifying conservation practices may include weed control, removal of fencing, restoring habitat for key species, and granting a conservation easement on their property. Grassbanks benefit ranchers by giving their own lands an opportunity to rest and improve forage quality while their cattle graze elsewhere. Since the Malpai Borderlands Group, a rancher lead collaborative in New Mexico and Arizona, invented the concept in the 1990s,²⁸ at least five additional grassbanks have been established in the western United States, and efforts to establish 17 others have been documented.²⁹ Although grassbanking has been successful in several situations, its widespread adoption has been constrained by high start-up and operating costs and challenges in quantifying the amount of forage that is provided in exchange for conservation practices.³⁰

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?



Matador Ranch Grassbank - Montana

When the Malpai Borderlands Group created the first grassbank on the 300,000 acre Gray Ranch, it was intended to help promote conservation of the Malpai Borderlands by working in partnership with the ranching community.³⁰ In exchange for granting a conservation easement on their own property, participating ranchers could graze their cattle on the Gray Ranch during periods of drought and allow their land to rest.²⁹ In 2002, The Nature Conservancy (TNC) borrowed the concept and developed a grassbank to engage ranchers in Montana in conservation efforts. After three years of drought, ranchers were struggling to find suitable areas to graze their cattle. Under a new grassbanking arrangement, these ranchers could graze their cattle on the 60,000-acre TNC-owned Matador Ranch at a reduced rate in exchange for adopting conservation practices on their own land. For instance, in 2013 the average lease for private grazing land in Montana was \$21 per month for each cow and calf pair, but participating ranchers paid as little as \$10.50 after taking deductions for specific conservation actions. Since this grassbank was developed, the Matador Ranch has accommodated about 1,000 yearlings and 860 cow-calf pairs annually. Throughout the entire process, ranchers were instrumental in establishing management plans for the grassbank.³¹



An American badger surfacing from a burrow on the Matador Ranch. Photo courtesy of Kenton Rowe.

The Matador Grassbank has achieved significant conservation results by extending its 60,000-acre footprint to influence over 220,000 acres in the region.³¹ Participating ranchers removed or altered 50 miles of fencing, controlled weeds on 200,000 acres, prohibited further ground breaking, and conserved tens of thousands of acres of Greater sage-grouse and prairie dog habitat.²⁸ In exchange, these ranches had a chance to recover without severely reducing profits during droughts.³¹ The Matador Ranch grassbank provides a concrete example of how this innovative conservation tool can benefit both agricultural livelihoods and ecosystem health.

“The Matador Ranch grassbank provides a concrete example of how this innovative conservation tool can benefit both agricultural livelihoods and ecosystem health.”

For more information

White and Conley. (2007). Grassbank 2.0: Building on what we have learned from the Valle Grande Grassbank. *Rangelands* 29 (3): 27–30.

<http://www.malpaiborderlandsgroup.org/?section=26>

Pop-Up Habitats

BirdReturns and Bobolink Project - Central Valley, California and New England

Pop-up habitats are tools that pay landowners to implement a short-term but high impact conservation practice (e.g. flooding fields during a critical bird migration period).



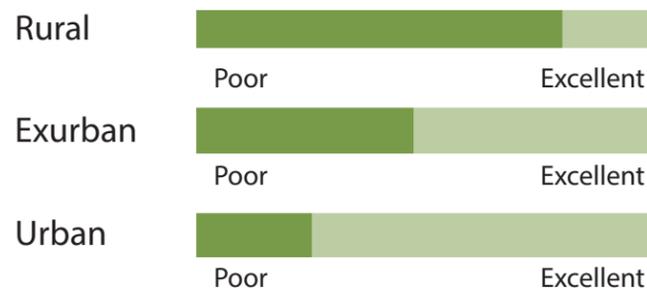
A field where a pop-up habitat for Bobolinks protection has been created. Photo courtesy of Allan Strong.

What are pop-up habitats?

Pop-up habitats incentivize short-term conservation practices that are only needed during a critical window of time, such as a migration or breeding period. Through a pilot program led by The Nature Conservancy in 2014, early efforts to implement the concept have focused on providing temporary wetland habitat for migratory birds – as wetland habitats have been severely reduced at key points along migration routes. Pop-up habitats may be more cost-efficient than permanent conservation efforts since they do not require the permanent acquisition of land rights.³²

Survey Findings

How well does it work in different settings?



What conservation challenges does it best address?

- Restoring Degraded Habitat
- Restoring Ecological Processes
- Maintaining Economic Viability

In many areas, migratory birds have lost crucial stopovers as their migratory paths have become interlaced with intensive agriculture and urban development. Pop-up habitats help mitigate these impacts. BirdReturns, a project created and funded by The Nature Conservancy (TNC), is establishing pop-up habitats in rice fields in the Central Valley of California to support migratory birds and local agricultural operations. In this program, established in 2014, rice farmers were paid by TNC to keep their fields flooded for several weeks during the window when the birds traditionally arrive during their migration.³² The payments received by farmers were determined by reverse auction, in which the lowest bidders won the lease.³³

In the first year of operation, 10,000 acres on 40 farms in the Central Valley were flooded for either four, six, or eight weeks.³⁴ Preliminary observations of flooding showed positive results; in the first year of operation, flooded fields attracted three times the number of shorebird species, and had a density of shorebirds five times greater than in nearby non-participating fields.³⁵ In addition, farmers who participated in BirdReturns had positive reflections on the process. The program allowed them to implement conservation practices on their land in a way that worked with their operation, and with sufficient compensation to make their involvement worth their while.³⁴ The Audubon Societies in Vermont and Rhode Island have taken a similar approach to bird conservation with a pop-up habitat program called The Bobolink Project. In this program, private donations compensate farmers who delay mowing schedules to provide nesting habitat for Bobolinks, a declining bird species. This conservation approach is a useful tool to incentivize farmers to alter the timing of agricultural operations to achieve impactful conservation outcomes.³⁶



A mature male Bobolink perched among flowers. Photo courtesy of Allan Strong

“In the first year of operation, flooded fields attracted three times the number of shorebird species, and had a density of shorebirds five times greater than in nearby non-participating fields.”

For more information

Reynolds et al. (2017). Dynamic conservation for migratory species. *Science Advances*, 3(8), e1700707.

<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/california/howwework/california-migratory-birds.xmlh>

Species Banking and Habitat Exchanges

Species banking and habitat exchanges are arrangements where landowners create, maintain, or improve habitat to earn credits that are purchased by another entity to mitigate impacts to habitat on another property.

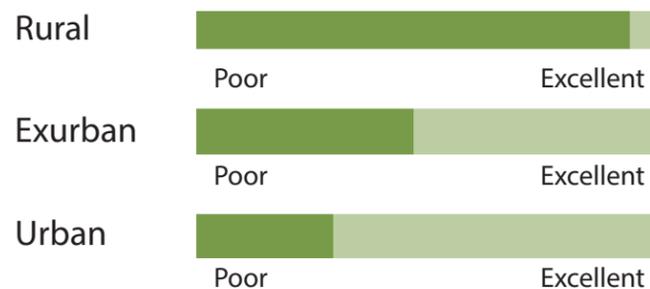


What are species banks and habitat exchanges?

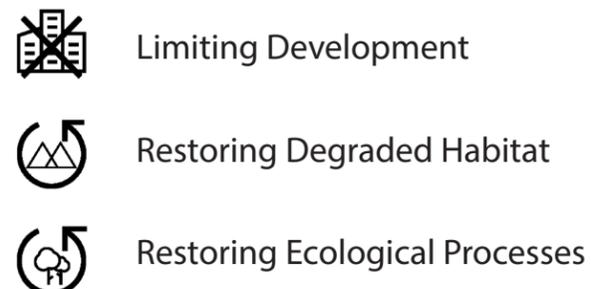
Species banking is an approach in which landowners earn credits for conserving habitat on their land for specific species of concern. These credits can then be sold to other landowners or organizations that need to mitigate negative impacts to habitat as a result of development or other activities. In most species banking arrangements, the landowner (or bank developer) negotiates directly with the credit buyer and regulators oversee the bank.³⁷ The first species banking policies were established over twenty years ago in California, and in 2003 the U.S. Fish and Wildlife Service created a guide for establishing and using species banks.³⁸ In a variation on species banking, habitat exchanges extend mitigation efforts to a broader landscape that allows multiple landowners to develop and sell credits to multiple buyers. An independent administrator then monitors and verifies the credits sold to ensure the integrity of the exchange.³⁹

Survey Findings

How well does it work in different settings?



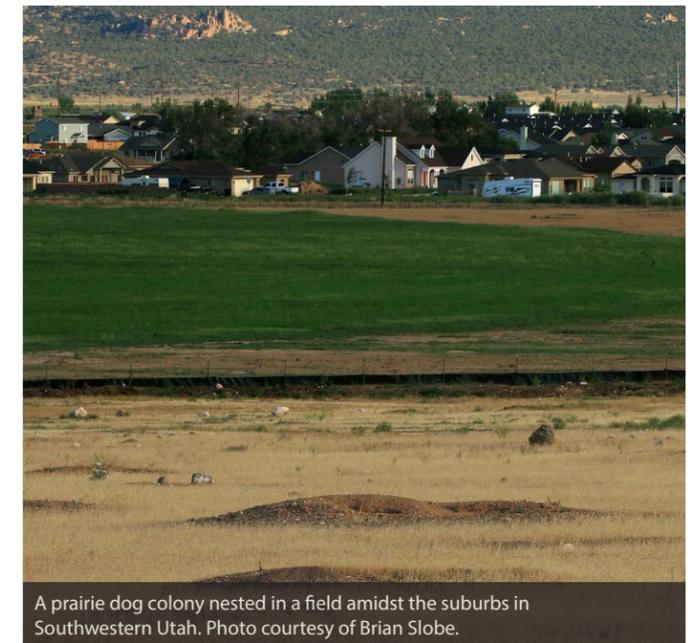
What conservation challenges does it best address?



The Utah Prairie Dog Habitat Credits Exchange - Utah

The habitat exchange concept was put to the test in southwest Utah in 2011. The Utah Prairie Dog Habitat Credits Exchange was established to preserve Utah prairie dog habitat, a species federally listed as “threatened.” Roughly 70% of remaining prairie dogs live on private land, so the goal was to work with landowners to compensate them to conserve already existing habitat. Initial funding came from the Natural Resource Conservation Service and the Panoramaland Resource Conservation and Development Council (PRCDC) serves as the administrator.

At the beginning of the program, landowners were paid from \$1,000-\$2,000 per acre to set aside at least forty acres with at least twenty prairie dogs on it. The number of credits created is calculated by considering the number of prairie dogs present and the quality of the habitat.⁴⁰ These credits can then be bought by developers to offset the loss of prairie dog habitat from their developments. In the first years of the program, prices ranged from \$4,800-\$8,000 per credit,³⁹ but were available in 2016 for \$800.⁴¹ Once the land is conserved in the program, biologists and farming experts advise landowners on the best management practices to ensure that the prairie dog habitat is properly maintained. PRCDC is responsible for monitoring agreements with landowners and ensuring that habitat is conserved. A key component of the program is that the exchange administrator serves as a broker, thus removing delays from permitting and the risks of negotiating the credits independently.³⁹ Species banking and habitat exchanges illustrate how conservation can incentivize the protection of threatened and endangered species on private lands.



“Species banking and habitat exchanges illustrate how conservation can incentivize the protection of threatened and endangered species on private lands.”

For more information

Carroll, Fox, and Bayon. (2008). Conservation and biodiversity banking: A guide for setting up and running biodiversity credit trading systems. Earthscan: London.

http://us.speciesbanking.com/pages/dynamic/key_resources.page.php?page_id=pub12&category_class=books_papers_reports

Conclusion



Photo courtesy of The Freshwater Trust

A key motivation for writing this report is our view that a portfolio of tools that meet landowner goals is necessary for addressing the multiple challenges facing private lands in the United States. In this report we illustrate how seven tools have been used in diverse social and environmental settings, while the appendix identifies several additional tools available to landowners. We hope these illustrations spark interest in experimenting and adapting these tools in innovative scenarios.

Our survey results also provide initial insights into the effectiveness of the tools at meeting different conservation challenges and their suitability to different landscapes. In the survey, conservation professionals reflected on their experiences with these tools. Their observations show that there are significant differences among the tools at meeting conservation challenges. For instance, conservation easements were perceived as very effective at limiting residential development but less effective at influencing direct land management activities that would result in habitat restoration or mitigation of impacts from invasive species. Conversely, tools like habitat exchanges and pop-up habitats were not perceived as very effective at limiting the impacts of residential developments but were more effective at influencing management by restoring ecological processes and degraded habitat. These insights suggest that the tools can be best used in conjunction as complementary strategies for addressing multiple challenges.

Conservation professionals also recognized differences among the tools in their suitability to urban, suburban, and rural areas. In particular, all the tools except conservation developments were perceived as being well suited to rural settings. Conversely, only conservation developments were perceived as well suited to urban environments. This suggests a need to develop additional strategies to complement conservation developments in order to meet conservation goals in cities, especially as many regions of the country continue to rapidly urbanize.

Perhaps the most insightful findings from the survey relate to the high levels of education and experience that conservation professionals hold. For instance, over half of respondents hold a master's degree or higher (e.g., PhD or JD) and have 16.5 years of experience, on average, in the conservation field. Despite these high levels of professional capacity, the collective knowledge and experience of participants was highly concentrated on just two tools – conservation easements and direct payment programs, such as USDA's Conservation Reserve Program. However, participants expressed a strong interest in learning more about the tools included in the study and building their capacity to implement a broader portfolio of conservation projects. We hope this report helps broaden awareness of the multiple conservation tools for private lands, and that it encourages development of innovative ways to sustain the natural and cultural heritage found on the diverse private lands in the United States.

Additional Tools

Candidate conservation agreements with assurances (CCAAs):

CCAAs are voluntary agreements with the U.S. Fish and Wildlife Service that give private landowners incentives to work with federal agencies to proactively protect species of concern. If the landowners follow the terms of the agreement, they are free from additional regulatory restrictions under the Endangered Species Act should the species of concern become listed as threatened or endangered in the future.⁴²

Cost-share programs:

Cost-share programs help landowners mitigate the costs of implementing conservation practices on their land. Often, a percentage of the cost of implementing the practice is covered by a state or federal agency and in return the practices help improve water or soil quality or wildlife habitat. Cost-share programs can also provide technical assistance to help put the practices in place.⁴³

Fee title acquisition:

Also known as fee simple land acquisition, fee title acquisition is the transfer of full ownership and rights of a property. Landowners can sell or donate their land and, if donating their land, may be able to claim a federal income tax deduction. Often, government agencies, land trusts, or other conservation organizations acquire property through fee title acquisition for conservation purposes.⁴⁴

Option to purchase at agricultural value (OPAV):

OPAVs are voluntary legal agreements that intend to keep land in agriculture and limit the sale of the land to relatives or farmers. OPAVs make land more affordable for buyers such as new farmers by restricting the sale price to the agricultural value.⁴⁵

Purchase of development rights (PDR):

PDRs are voluntary transactions in which a public agency or land trust purchases the development rights from a parcel of land but the parcel remains in private ownership and management. The right to develop or subdivide is restricted on the parcel, typically through a conservation easement, but all other rights remain with the landowner.⁴⁶

Safe harbor agreements:

Safe harbor agreements are voluntary agreements between private landowners and the U.S. Fish and Wildlife Service. The agreements provide assurances to landowners that no additional restrictions will be placed on their land if they implement conservation practices that attract or maintain species listed as threatened or endangered under the Endangered Species Act.⁴⁷

Stream mitigation banking:

Stream mitigation banking is similar to the other varieties of resource banks, such as wetland mitigation banking. Individuals restore sections of stream and acquire credits. These credits are then bought by developers to offset impacts to streams on their property.⁴⁸

Technical assistance:

Technical assistance, or conservation technical assistance, is help given to landowners to increase conservation practices on private land and improve environmental quality. Technical assistance is provided by many state and federal natural resource agencies, such as the Natural Resources Conservation Service, and nonprofit organizations.⁴⁹

Transfer of development rights (TDRs):

TDRs are voluntary agreements that allow landowners to sell the development rights on their land to buyers, who can use the rights to increase the density of development on their properties. The seller's property is then limited from further development, often through an easement.⁵⁰

Wetland mitigation banking:

Wetland mitigation banking is the restoration or creation of wetlands in one location to offset degradation of wetlands in another location. A conservation easement then protects that wetland from development. Wetland mitigation banks are commonly used to offset effects from agriculture or development, in which the landowner or developer purchases credits from the mitigation bank to compensate for lost wetlands on their own property and meet regulatory compliance under the Clean Water Act.⁵¹

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