



Heartland Waters Initiative

Advancing Precision Conservation in Agriculture



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New tools allow farmers to dramatically improve agricultural productivity and profitability, yet these advanced technologies often are not used to support conservation. The Heartland Waters Initiative promotes the use of these tools to improve farm profitability and conservation, particularly in regards to water quality.

The strategy calls for the use of precision conservation to target lands with the highest ecological value and marginal agricultural economic value. It will deliver a significant improvement in water quality and additional conservation and on-farm benefits. The goal is healthier water supplies for local communities and the nation and higher value for taxpayers.

Technology gives producers ways to choose which acres to manage most intensively. They also make it possible to identify marginal areas that are not economically efficient crop producers. These marginal lands often have poor soil quality or are subject to crop loss from flooding. Yet these same lands can be some of the most productive for clean abundant water and wildlife.

Precision conservation delivers a higher environmental return on investment by allowing better selection of the parcels and practices that best improve environmental quality. It enables more strategic and longer-term conservation management on the most important lands to improve water quality and biodiversity. Pollinators and wildlife will benefit tremendously.

For farmers, the Heartland Waters Initiative provides an incentive for implementing smart conservation on the most sensitive lands while protecting the family farm's viability. Farmers will benefit by having an economic option for managing these lands for purposes besides crop production. Taxpayers will be relieved of insurance costs and off-site environmental degradation while receiving better conservation results on their investment.

Identified on the next pages are nine distinct innovations to improve conservation strategies.

Other benefits and goals of the Heartland Waters Initiative

- Greater utilization of technology and the creation of a decision-support system to target specific, marginal lands for conservation practices that will enhance water quality and provide benefits for wildlife and ecosystems
- Using a site's potential to improve water quality as criteria for conservation enrollment
- Prioritization of sensitive areas such as riparian corridors and potholes
- Improved use of business management tools to prioritize conservation investment
- An innovative finance mechanism that fosters commerce in conservation and investment in farm conservation
- Allow stacking of multiple ecosystem services and distinct payments for each
- Align insurance rates and conservation benefits

I. Using Technology to Target Conservation Lands and Practices

PROBLEM: *Conservation investment is too scattered across the landscape to achieve needed results or efficiencies.*

POLICY SUGGESTION: *Build a new decision-support system for conservationists and farmers. This should focus investment on the right lands and practices to achieve objectives such as abundant clean water and biodiversity while enhancing farm economic viability.*

Today yield monitors tell farmers which parts of a field are most productive, while GPS assessments of inputs and yield can help calculate which parts of the field are profitable. This technology allows farmers to concentrate on the lands with the greatest potential.

These same tools should be adapted for conservation. By overlaying geographic field profitability data with conservation priorities, it is possible to identify high-priority water conservation areas that are marginal for farm profitability. With advanced understanding of the outcomes from specific conservation practices, it is possible to select conservation practices with higher potential return on conservation investments.

Technologies such as GPS, LiDAR, high resolution soil data, and profitability regression can identify the right practices for the right lands. We now have 30 years of data on the outcomes of conservation practices. While our information systems are not perfect, they are well advanced and will continue to improve.

Conservation should target lands with the highest conservation potential, just as producers target lands with the greatest profitability. We know that several classes of land, such as riparian

areas and potholes, are critical to protecting water quality and biodiversity. Targeting, installing and managing the right conservation practices on these and other priority conservation lands will be enhanced through the use of technology.

We also should adjust the economic incentives and terms of conservation programs to assure that the taxpayers' investment in conservation produces the desired results. For example, a parcel currently enrolled in a single practice, such as retirement through the Conservation Reserve, might more efficiently produce clean water and wildlife if additional practices were installed and operated within this footprint. In practice, a single parcel could benefit from additional dense vegetative cover selected to support wildlife and pollinators and water management actions to reduce nutrient loss. Multiple conservation benefits would be produced and could be better supported through such an innovative incentive structure.

Another priority is to establish conservation practices where they have the potential to intercept and treat nutrient-laden waters. This simple criterion is not widely used and can substantially improve water quality and reduce flooding while enhancing wildlife habitat.

II. Innovative Ag Conservation Financing Mechanism

PROBLEM: *There is not enough sustained funding to achieve water quality and other benefits such as reduced downstream flooding, habitat improvement and better soil health on agricultural lands. Even as the need grows, public funding is declining rather than increasing. Conservation demand vastly exceeds available funding. A finance mechanism that increases the amount of money available for conservation investment will broaden participation and enhance*

farm viability. We should move beyond government subsidies and enable large-scale investments from multiple sectors. Permit holders outside agriculture such as wastewater treatment facilities or industry can meet environmental performance requirements at lower cost. Larger-scale benefits will accrue at lower cost to the taxpayer.

POLICY SUGGESTION: *Authorize mechanisms to bring new sources of funding to agriculture conservation, particularly from private and new public sources. Fundamentally, this mechanism could leverage public dollars by a significant multiple to scale conservation efforts and make the most of limited taxpayer dollars. This mechanism could include several elements such as:*

- A revolving loan fund
- Bonding authority
- Loan guarantees
- Pay for Performance, and Performance Contracting
- Performance surety and other vehicles that remove impediments to greater investment in agricultural conservation

This mechanism may be used to finance direct investment by agricultural producers or investments in watersheds with established water-quality strategies or regulatory structures developed pursuant to TMDL¹, or where NPDES² or MS4³ permit holders can more cost effectively meet requirements by investing in agricultural conservation and delivery of other conservation benefits. The fund may advance the installation of new practices as well as the upgrade of conservation capacity on existing lands set aside

¹ TMDL: Total Maximum Daily Load, a framework for setting limits on pollution loading to a watershed.

² NPDES: National Pollution Discharge Elimination System, used to regulate discharge from point sources through permitting.

³ MS4 is a regulatory system to reduce water contamination from storm water at urban and industrial sites.

for conservation. The provision reaffirms that off-site investments in green infrastructure, combined with gray infrastructure, that lead to water quality (and other) environmental improvements can be used to meet regulatory requirements in a cost-effective manner. The fund should facilitate commerce (“trading” and other actions) in conservation actions among agricultural producers and “point source” permit holders to more efficiently deliver improvements in environmental quality.

INNOVATIVE AGRICULTURAL CONSERVATION FUND: Capitalization for this revolving fund can be authorized through the Farm Bill. (The fund could be financed through the Commodity Credit Corporation to reduce scoring and appropriations impediments.) It could be a national fund to be drawn upon by states and made available through states to municipalities, agricultural institutions such as drainage districts, environmental utilities or assemblers of ecosystem services through exchanges.

Loan funds may be targeted to strategies that foster agricultural conservation practices to improve water quality on a watershed basis or deliver other ecosystem services. Priority should be given to practices that address nutrient loss, soil erosion, and crop yield reduction from inadequate water management capacity at the farm and watershed levels. Approved conservation practices that improve water quality that could receive financing through this mechanism include but are not limited to:

- Drainage water management systems that control storage and release of water in crop fields including edge-of-field practices such saturated buffers, bioreactors, water storage and treatment wetlands
 - Cover crops sustained for life of the loan
 - Storage practices for water and nutrient capture, and for recycled supplemental irrigation
- Debt service will occur through the savings associated with lower compliance costs achieved

through ecosystem service trading, increased profitability of farms or corporate priorities that support broader conservation adoption. For example, a permit holder may meet performance requirements at a fraction of the cost by buying credits from an agricultural producer than investing in expensive equipment. Likewise, an agricultural producer might be able to invest in more efficient equipment that improves conservation outcomes and profitability.

Loan proceeds would be returned to the fund for reinvestment. A portion of loan funds should be used for performance evaluation so that investments can be reviewed over time, ensuring that modeled practices perform as designed and projected water quality results are achieved.

A. Bonding authority: Designated parties would issue bonds backed by the fund. Proceeds would be non-federal in origin and would not carry the limitations placed on federal funding. (For example, they could be used to match federal funding.)

B. Loan guarantees: The fund may choose to guarantee any loans issued through this financing mechanism.

C. Performance surety: The contracted environmental performance financed through the fund may be supported through the establishment of trading ratio requirements. Trading ratios should be designed to help ensure the contracted environmental performance is actually delivered. Trading ratios also help ensure a net environmental benefit beyond simple permit fulfillment.

States or other institutions may subsidize the loan's interest (repayment) to provide further financial savings. In addition:

- Fund managers may determine subsidization rate and locations for loan distribution
- Municipalities, counties, watershed associations and other publicly chartered institutions may apply for loans from the state and contract with service providing agency that

will register practices with producers for tradable credit generation

- Farmers contract with service provider (i.e. county or regional soil and water conservation staff) and define the practice(s) they will employ
- Contracted service provider makes payments toward producers with trading contracts
- Payments for water quality nutrient reduction credits make loan payments based upon their trading contract

These parties may bundle or group contracts with multiple producers or for multiple practices to improve administrative efficiency.

III. Better Manage Water

PROBLEM: *An estimated 100 million acres of artificial drainage has the unintended consequence of increasing nutrient transport to surface waters. Structural drainage water management practices can offer a high return on investment to improve water quality.*

POLICY SUGGESTION: *Minimize unmanaged drainage and expand management; make better use of riparian and buffer areas; provide for conservation management on all easement lands. Steps should include the authorization of a water-management program designed to increase crop system resiliency and environmental performance from drained landscapes. This program would provide technical and financial assistance to farmers to address soil, water and plant resource concerns associated with subsurface drained lands.*

Resource concerns to be addressed include:

- The management of agricultural subsurface drainage to reduce loss and transport of nitrate and dissolved phosphorous to surface waters
- Improved water management to mitigate risks of both excess water and water deficits that may limit crop yield
- Management adaptations to increased climate variability

- The ability to reduce or mitigate flooding, loss of habitat and water impairment
- Technical and financial assistance provided to eligible farmers to design, install and operate advanced practices that address nutrient loss and crop yield reduction from inadequate water management capacity at the farm and field levels
- Practices to be installed in long-term conservation lands where practical. These would include: Drainage systems that control storage and release of water in crop fields; edge-of-field practices such saturated buffers, bioreactors and treatment wetlands; storage practices for water and nutrient capture and recycling for supplemental irrigation for increased yields and reduced nutrient loss; and automation of control systems

- Midterm signups for a practice — i.e., a 5-year signup to allow farmers to see benefits and become familiar with cover crops
- Flexible length of “easements” to allow adjustment as economic conditions change
- Make compatible economic use provisions explicit in conservation programs and supported in contracts for easements and management
- Allow and encourage adaptive management of easements
- Finance long-term management of conservation easements and practices

A. Long Term Signup Riparian/Fragile Areas: High-priority areas that merit long-term conservation should be eligible for an up-front “capital” payment and periodic management payments.

The capital payment should be treated as capital gains income. The payment will retire the production of commodity crops for the term of enrollment but will not preclude compatible economic use.

This program will focus on keeping continuous high value cover adjacent to waterways. Landowners may sign up for 30-year or permanent enrollment.

Preferential payments will be made for permanent conservation. Innovative price discovery such as reverse auctions may be used to assess landowner interest and conservation investment strategies.

- Priority will be given lands that intercept and treat water (i.e. nutrient reduction, flood reduction etc.)
- These lands are eligible for enrollment in and payment for conservation program(s) that produce additional ecosystem services
- Income may be produced on these lands from compatible management options that protect the identified conservation objectives. For example, haying and or grazing may be allowed on one-half each year (outside of nesting/brood rearing period)

IV. Adjust Term of Conservation Action

PROBLEM: *The length of conservation enrollments often do not provide enough time to achieve desired environmental results. Other terms do not efficiently utilize scarce conservation dollars. Because commodity prices are cyclical, farmers may hesitate to put permanent or long-term restrictions on their operation. Producers and conservationists alike would be interested in enrolling some marginal land in a long-term easement program, and other sites in short-term programs that promote longer-term conservation. For example, sensitive areas could be enrolled in long-term conservation. In addition, some practices such as the use of cover crops may take several years to deliver results. Conservation strategies should allow such practices to be adopted as part of the farm business plan.*

POLICY SUGGESTION:

- Set terms to match desired outcome requirements
- Longer signups to protect riparian and fragile lands

- Utilization of ecosystem service markets and other strategies to encourage conservation investment are encouraged on these lands
- Prioritize site selections based on anticipated conservation performance
- Seek re-enrollment of priority lands or long-term strategy that maintain farm viability while restraining federal spending
- Authorize and make financing available to enhance existing conservation lands to upgrade ecosystem service production — i.e., manage wetlands previously established to provide enhanced water quality and wildlife benefits
- To be eligible, new enrollment must have been in production over the previous three years
- Remove incentives to return lands to row crop production as they come out of conservation or as a requirement for re-enrollment

B. Mid-Term Conservation Enrollment: Establish a mid-term or flexible-term “enrollment” program to encourage long-term adoption of advances in conservation implementation. New practices may take several years for producers to master and build into normal business operations.

Variabilities such as cover type, planting systems, removal for crop production, equipment innovation etc. make one-time payments for such conservation practices inefficient. Producers and service providers need time to adapt to local needs.

Many conservation practices have benefits to a producer, yet these benefits are not manifest from a single year of operation. Once established, producers do not need long-term assistance to continue.

This program targets innovation and provides for multiple-year support to adapt operations to incorporate the innovative practice.

- Minimum three years and maximum five years
- Annual payment
- Must be in production previous three years
- No penalty for early withdrawal
- Incorporate minimal and streamlined

standards for eligibility and simple sign-up procedures which would encourage participation

V. Better Use of Matching Dollars, Focused on Innovation and ROI

PROBLEM: *Existing matching grant programs favor large institutions and do not foster innovation. Leveraging federal funds is important, but smaller newer institutions are challenged to raise match requirements. Creating a class of small grants that targets highly innovative projects with high potential return on investment will produce a new class of highly innovative demonstrations. Increasing focus of grant programs to achieve specific objectives will improve their effectiveness.*

POLICY SUGGESTION: *The Secretary of Agriculture should be authorized to carry out a Targeted Conservation Investment Grant Program with states that have dedicated strategy and matching investments to assist farmers with implementing:*

- Precision conservation systems designed to improve business return on investment profiles within fields and conservation treatment units
- Programs to reduce nutrient loss from fields and conservation treatment units
- Programs to improve water and soil quality
- Programs to improve pollinator and wildlife habitat

States and other eligible entities/partners would receive a matching grant through application. States and large institutional partners would provide non-federal 50 percent match to achieve the above purposes. Small institutions with highly innovative programs would provide a 25 percent match.

Federal grant funds may be used to provide technical and financial assistance and to monitor and analyze the approach to achieve enhanced returns on investment and natural resource outcomes.

VI. Research on Performance Outcomes

PROBLEM: *We can increasingly anticipate the of management actions, but advancing this knowledge will continue to improve conservation implementation. A better understanding of the conservation outcomes of specific practices and the variables that affect performance can lead to more effective strategies.*

POLICY SUGGESTION: *Funded research should be defined by the following metrics under a competitive granting system:*

- The research clearly identifies a known, prioritized need
- It advances the science required to improve management practices
- The research has a clear link to management implications and improved practices
- Research should be done at the field scale (not plot scale)

The architects of this Farm Bill should consider focusing on core areas of improving the administration of applied research. This includes:

- Strict budget and performance reporting with incremental payments to be issued on performance and reporting throughout the project
- A use assessment to determine how information/products are being used
- A performance-based consideration in the grant awards metric that promotes top-performing researchers based on the previous two points
- Bipartisan and third-party stakeholder teams of five to seven members to prioritize research needs and establish quality baselines

VII. Outreach to renters and non-operating landowners

PROBLEM: *Non-resident heirs one to two*

generations removed from the farm and/or widowed landowner/operators are increasingly tasked with determining management practices on their lands. These changes are often abrupt and in the near term, leave landowners overwhelmed and under informed as to their options and how best to balance the extraction of existing value with long-term viability.

POLICY SUGGESTION: *Effective and targeted communications to these groups need to be established. These communications should:*

- Be user-specific to each identified group (non-resident landowner, absentee heir, family-operated non-operator trust, and widowed owner/now operator)
- Be designed to either inform early planning or identify pros and cons in a stepwise approach that helps individuals, families, and farm planning businesses
- Be supported and possibly administered through a trusted third-party agent
- Provide model leases that include requirements of specific conservation practices
- Allow longer-term leasing periods for tenants who implement conservation practices

VIII. “Countercyclical Payments” for Conservation

PROBLEM: *With commodity prices at a several-year low and with little hope for improvement, all forms of federal assistance and price support are in sharp focus. But waning public support for direct safety net assistance payments will make them more difficult to reauthorize. Taxpayers/consumers do not necessarily agree that federal farm safety net programs help keep food affordable. But they do appear to appreciate federal expenditures for programs that result in cleaner water, decreased soil erosion and other environmental improvements, especially in ecologically sensitive areas such as the Prairie Pothole Region and the Chesapeake Bay.*

POLICY SUGGESTION: *An alternative to direct subsidy payments could be payments/insurance reductions to participating producers that would:*

A. Improve soil health

- Increased financial assistance for no-till and minimum till
- Establish or increase financial assistance for cover crops
- Support applicable equipment purchases
- Stepped-up assistance for terracing, water management structures and tiling water management

B. Reduce nonpoint source pollution

- Establish or increase cost-sharing for precision agriculture equipment that strategically applies inputs such as fertilizer and chemicals
- Stepped up financial assistance for filter strips and water management structures and operation

Stepped-up assistance could be similar to what is provided in other oversubscribed conservation programs such EQIP and CSP, though financial assistance would be provided by funds otherwise paid as commodity title direct assistance.

IX. Recognize Risk Reduction Associated with Specific Conservation Actions

PROBLEM: *Actual Production History (APH) measures the productivity of a crop insurance unit. Current policy encourages the combination of marginal land and highly productive land in each unit, discouraging the application or implementation of conservation practices on less productive land.*

POLICY SUGGESTIONS:

- Revisit policy to allow for separating units by production levels
- Require APH recalculation based on implementation of precision conservation actions
- Higher APH for a unit should result in less expensive insurance premiums

The enrollment of the less-productive section of a unit into a conserving use program could result in even higher APH and even less expensive premiums in the higher producing section of the unit. This could result in less risk for indemnity and reduced taxpayer costs.



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About the McGraw Center for Conservation Leadership

The McGraw Center for Conservation Leadership is the nation's leading advocate for creative and entrepreneurial thought in conservation. Nonpartisan and not for profit, the Center's work enables informed strategic decisions rooted in economic efficiencies and science.

The Center was born from the realization that more than \$20 billion in taxpayer and private sector dollars set aside for conservation each year can be expended more efficiently.

It is a natural outgrowth of the Max McGraw Wildlife Foundation, created more than 50 years ago by the visionary conservationist Max McGraw, founder of McGraw-Edison Co. The Foundation, headquartered on 1,250 acres in Dundee, Illinois, aims to secure the future of hunting, fishing and land management through science, demonstration, education and communication.

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