

CRS Report for Congress

Environmental Services Markets: Farm Bill Proposals

June 12, 2007

Renée Johnson
Analyst in Agricultural Economics
Resources, Science, and Industry Division



**Prepared for Members and
Committees of Congress**

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Summary

Environmental goods and services are the benefits society obtains from the environment and ecosystems, both natural and managed, such as water filtration, flood control, provision of habitat, carbon storage, and many others. Farmer participation in providing these types of goods and services began in earnest in the 1990s with the development of watershed approaches incorporating nutrient credit trading and wetlands mitigation banking, as well as the more recent development of voluntary carbon credit markets. These efforts have triggered further interest in the possibility of developing market and trading opportunities for farmers and landowners as a source of environmental offsets. These services would be in addition to the food and fiber services traditionally supplied by the agriculture and forestry sectors. Congress is expressing growing interest in developing such market-based approaches to complement existing federally supported programs that promote conservation in the farm and forestry sectors, as well as to complement existing and/or emerging environmental regulations or natural resource requirements that may affect the agriculture and forestry sectors.

In May 2007, the House Agriculture Committee released its proposal for the conservation title for the 2007 farm bill, which included draft language on market-based approaches to conservation. The Subcommittee on Conservation, Credit, Energy, and Research held a markup on these and other provisions on May 22, 2007. The committee's proposal would establish an Environmental Services Standards Board, chaired by USDA with the participation of other identified federal partners. This proposal would provide contracts, cooperative agreements, and grants to develop consistent standards and processes for quantifying environmental benefits from the farm and forestry sectors, thus facilitating the further development of private sector markets for environmental services from farmers and landowners. This proposal follows a similar recommendation by the Bush Administration included in its broader 2007 farm bill proposal, which would also establish a Standards Board and develop uniform standards for agriculture- and forestry-based environmental services. This provision is one of the main components of the Administration's overall recommendations for the conservation title of the 2007 farm bill, along with other proposals that seek to enhance conservation programs in the farm bill.

Among the possible questions that may emerge as this proposal becomes part of the 2007 farm bill debate are: Can agricultural interests effectively provide environmental services along with traditional food and forestry services? What is the role of the federal Standards Board and the role of the lead federal agency? How would collaboration work between various participating federal agencies? How would the agreed-upon decisions and standards set by the board work within existing regulatory authorities? Would uniform standards be national, regional, local, or site-specific in scope? How would uniform standards address differences within different production areas, types of resources, and ecosystems? Given the wide range in the types of environmental services, how would outcomes or benefits be measured and expressed as standards? What role should federal agencies play in establishing environmental services markets?

Contents

What Are Environmental Services Markets?	1
What Are the Benefits and Barriers?	4
What's in USDA's 2007 Farm Bill Proposal?	5
What Is the Recent Legislative Action?	6
What Are Some Possible Considerations?	7

List of Tables

Table 1. Possible Range of Services and Regulatory Driver	3
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Environmental Services Markets: Farm Bill Proposals

In May 2007, the House Agriculture Committee released its proposal for the conservation title for the 2007 farm bill, which included draft language on market-based approaches to conservation. The committee's proposal would establish an Environmental Services Standards Board, chaired by USDA with the participation of other identified federal partners. This proposal would provide contracts, cooperative agreements, and grants to develop consistent standards and processes for quantifying environmental benefits from the farm and forestry sectors. Among the underlying goals of the proposal is the further development of private sector markets for environmental services involving agriculture and forestry. The Subcommittee on Conservation, Credit, Energy, and Research held a markup on these and other provisions on May 22, 2007. This proposal follows a similar recommendation by the Bush Administration, as part of its 2007 farm bill proposal.

In part, congressional interest in this area has developed in response to increased attention to the agriculture and forestry sectors' contributions to some remaining environmental pollution and resource degradation concerns. For example, the U.S. Environmental Protection Agency (EPA) reports that agriculture is the leading source of water pollution in U.S. lakes and rivers, and a major contributor of pollution in U.S. estuaries. EPA also reports that agriculture contributes to an estimated 6% of all greenhouse gas emissions in the United States. At the same time, some in Congress are suggesting that U.S. farm support programs should do a better job promoting environmental benefits and also complying with domestic support constraints called for by the World Trade Organization.

The development of market-based approaches to farm conservation and land management might complement existing and/or emerging environmental regulations or natural resource requirements affecting the agriculture and forestry sectors, as well as complement existing federally supported programs that promote conservation in the farm and forestry sectors. Environmental goods and services from the agriculture and forestry sectors might also provide for environmental improvements and mitigation at a relatively lower cost, compared to mitigation in other sectors of the economy. Environmental services markets may also offer additional financial opportunities to farmers and landowners.

What Are Environmental Services Markets?

Environmental goods and services are the benefits society obtains from the environment and ecosystems, both natural and managed, such as water filtration,

flood control, provision of habitat, carbon storage, and many others (**Table 1**).¹ In most cases, these constitute “free services” since landowners and managers are not compensated in the marketplace. However, as many such services have become degraded over time, there is growing recognition that they should be sustained or substituted by market capital, similar to investing in water treatment plants and engineered flood control systems. One solution would be to create markets, often developed through regulation, so that providers of environmental services can be compensated in private markets for the services they provide. This could offer a potential business opportunity to the farm and forest sectors, which may be able to provide for such services and participate in the market, for example, by creating, restoring, preserving function and value in a natural resources area, or by capturing and storing carbon before gases that contribute to global climate change are released into the atmosphere. These services would be in addition to the food and fiber services traditionally supplied by the agriculture and forestry sectors.

The market for environmental goods and services involving the agricultural and forestry sectors began mostly through various pilot programs starting in the 1990s. The development of voluntary carbon credit markets and watershed approaches incorporating nutrient credit trading, along with wetlands mitigation banking, have involved the farm and forestry sectors. These programs provide a market for farmers to sell carbon or nutrient farm-based offsets to emitters/dischargers that are looking to buy offsets to mitigate their own emissions/discharges. These efforts have triggered interest in other types of tradeable permits and credits, including habitat credit trading and other types of conservation banking. USDA identifies environmental markets with relevance to the agriculture and forestry sectors to include water quality, air quality, wetlands, endangered species, greenhouse gases, and developmental rights.² Often the impetus for these efforts may be linked to a “regulatory driver” specific to an actual or anticipated environmental regulation or natural resource requirement, such as requirements in the Clean Water Act (CWA), Endangered Species Act (ESA), or other state or local regulation (see **Table 1**). Other incentives may include market drivers that make trading environmental services financially attractive, or the desire to cultivate community goodwill.

Farmer participation in voluntary carbon credit trading programs involves a reported 2,000 farmers across 15 states covering more than 1 million acres.³ Farm-based offsets are being developed for trading under programs operated by the Iowa Farm Bureau, the North Dakota Farmers Union, the Illinois Conservation and Climate Initiative, and the Environmental Credit Corporation in Indiana, among other farm-based groups.⁴ These programs cover some or all aspects of the following types

¹ These may also be referred to as ecosystems services. See, for example, World Resources Institute, *Millennium Ecosystem Assessment, Ecosystems and Human Well-being*, 2005.

² USDA, *2007 Farm Bill, Conservation and Environment Theme Paper*, June 2006, at [<http://www.usda.gov/documents/FarmBill07consenv.pdf>].

³ Information from the Iowa Farm Bureau and the American Farmland Trust.

⁴ See, for example, Iowa Farm Bureau [<http://www.iowafarmbureau.com/special/carbon/>]; North Dakota Farmers Union [<http://www.ndfu.org>]; Illinois Conservation and Climate (continued...)

of carbon capture and storage activities: sustainable agriculture practices (such as conservation tillage, grass seedlings, etc.); planting of unharvested grasslands or tree-plantings; methane capture/biogas production with manure digesters; wind, solar, or other renewable energy use; controlled grasslands or pasture management; and forest restoration.

Table 1. Possible Range of Services and Regulatory Driver

Tradeable Resource/Credit (Type of Service)	Regulatory Driver
Wetland, stream, aquifer recharge, forests, buffers, stormwater controls, habitat/biodiversity (e.g. habitat creation/preservation; water filtration; flood control and protection; water/air pollution controls; runoff reduction)	Federal and/or state
Nutrients (e.g. runoff reduction; water pollution controls)	State
Carbon/greenhouse gas (e.g., capture, storage/sequestration, methane destruction; air pollution controls)	State (and possibly federal)
Renewable energy (e.g., biofuel generation; fuel substitution)	State
Water and development rights (e.g., alternative land and natural resource preservation; habitat creation/preservation; aesthetic value; recreational use)	State, county, or local

Source: CRS, information from American Farmland Trust and World Resources Institute.

Currently, about 300 farmers are participating in water quality trading programs across six states.⁵ These include initiatives such as those by the Southern Minnesota Beet Sugar Cooperative, the Grassland Areas Farmers (California), the Rahr Malting Company (Minnesota), the Great Miami River Watershed (Ohio), and the Red Cedar River (Wisconsin), among others. These programs cover some or all of the following types of nutrient runoff reduction activities: cover cropping; reduced fertilizer use; conservation tillage; tree-plantings; buffers; drainage management; and wetlands mitigation trading.⁶ Most water quality trading programs were initiated at the local or state level, often involving EPA. In 2006, EPA and USDA's Natural Resources

⁴ (...continued)

Initiative [<http://www.illinoisclimate.org>]; and Environmental Credit Corporation at [<http://www.envcc.com>]. See also CRS Report RL33898, *Climate Change: The Role of the U.S. Agriculture Sector*, by Renee Johnson.

⁵ Information from EPA. Does not include the Tar-Pamlico in North Carolina since not enforceable through a CWA permit.

⁶ H. L. Breetz et al., *Water Quality Trading and Offset Initiatives in the U.S.: A Comprehensive Study*, Dartmouth College, at [<http://www.dartmouth.edu/~kf/v/waterqualitytradingdatabase.pdf>]; and EPA's website at [<http://www.epa.gov/owow/watershed/trading.htm>]. Also see CRS Report RS21403, *EPA's Water Quality Trading Policy*, by Claudia Copeland.

Conservation Service (NRCS) signed a partnership agreement to establish uniform trading standards, along with supporting other collaborative efforts.⁷

The U.S. Fish and Wildlife Service, USDA's NRCS, and the Association of Fish and Wildlife Agencies signed a partnership agreement in April 2007 to promote habitat credits that could offer incentives to landowners who preserve and enhance the habitat of endangered or at-risk species. Among the stated objectives of this agreement is to develop and adopt common definitions, standards, and measurement protocols.⁸ Habitat credits or "conservation banking" act like a savings account, where credits are earned for land preservation of habitat and credits can then be sold to land use industries or others who are required to mitigate the loss of habitat under the ESA and other laws that restrict or prohibit development. This is conceptually similar to wetlands and stream mitigation banking, which allows for compensation of adverse impacts of development activities ("compensatory mitigation") to wetlands, streams, wildlife refuges, or other aquatic resources. Such allowances, whether through wetlands or conservation banking, typically involve creating, restoring, enhancing, or preserving function and value in a natural resources area, often within the context of meeting a federal, state, or local regulatory requirement.

The participation of agriculture and forestry in emerging environmental services markets is gaining wide support within the farm community and its supporting organizations and agencies, as well as among the regulatory agencies and some environmental groups.⁹ As part of its recommendations for the 2007 farm bill, the U.S. Department of Agriculture (USDA) has proposed to further facilitate the development of environmental services markets in ways that would more effectively involve the farm and forestry sectors. This proposal was modified in legislative language developed by the House Agriculture Committee and has been included as part of the conservation title in its 2007 farm bill.

What Are the Benefits and Barriers?

The development of market-based approaches has been widely touted as a possible source of additional farm income, whether through the sale of tradeable credits or from other types of payments, such as recreational use or hunting fees. This could offset or partially offset the costs of pollution abatement incurred by farmers who make environmental improvements on their farmlands. In some cases, adopting alternative production practices could also result in on-farm cost savings,

⁷ The agreement text can be found at [<http://www.epa.gov/owow/watershed/trading/mou061013.pdf>].

⁸ The agreement text can be found at [http://www.fws.gov/endangered/pdfs/Credit_Trading_MOU.pdf].

⁹ See, for example, Ann Sorensen, "Ecosystem Service Markets in Agriculture," May 2007, at [<http://www.aftresearch.org/aaas/>]; presentations at USDA's Ag Outlook forum by Ginny Kibler, "Water Quality Trading Basics," and Carl Lucero, "USDA Farm Bill Conservation - Supply Side of Trading," March 2007 [<http://www.usda.gov/oce/forum/2007%20Speeches/index.htm>]; and presentation material distributed by staff at the Environmental Defense.

such as the use of renewable fuel generated on-farm. Market-based approaches are also often viewed as encompassing broader societal benefits by complementing existing farm conservation programs and evolving regulatory approaches intended to address environmental improvements in the farm and forestry sectors.

USDA reports that there are several existing barriers that may prevent the development of environmental goods and services markets involving the farm and forestry sectors.¹⁰ These include but may not be limited to:

- uncertainty quantifying, measuring, and valuing credits;
- low demand for or discounted value of credits from agricultural sources because of uncertainty about the measurement and value of these credits;
- low participation in the farm and forestry sectors due to uncertainty over the value of environmental credits compared to the cost of pollution abatement;
- reluctance by farmers and landowners to participate in a regulatory-based program;
- small quantity of benefits that can be provided by individual farmers or landowners;
- high transaction costs;
- performance risks and liability;
- lack of information about program benefits and how to participate;
- lack of monitoring and enforcement; and
- uncertainty about whether conservation and environmental improvements that were initially funded through other publicly funded programs, such as cost-share programs administered by USDA, will be allowed to be traded.

What's in USDA's 2007 Farm Bill Proposal?

In January 2007, the Administration released its recommendations for the 2007 farm bill, covering each title of current law. USDA subsequently released proposed legislative text for the conservation title of the farm bill. USDA's proposed text includes a provision that would facilitate the development of private sector markets for environmental services. Regarding its market-based approaches to conservation, USDA proposes to establish a Forest and Agriculture Environmental Services Standards Board to "develop uniform standards for quantifying environmental services from land management and agricultural activities in order to facilitate the

¹⁰ For more information, see USDA, *2007 Farm Bill, Conservation and Environment Theme Paper*, June 2006, at [<http://www.usda.gov/documents/FarmBill07consenv.pdf>]; and M. Ribaldo and C. Jones, "Environmental Credit Trading: Can Farming Benefit," *Amber Waves*, USDA's Economic Research Service, Feb. 2006.

development of credit markets for forest and agriculture based conservation and land management activities.”¹¹ In addition to developing uniform standards, USDA’s other stated objectives under this proposal are to establish market confidence and validity, as well as foster emerging markets for environmental goods and services produced by the agriculture and forestry sectors. This proposal is one of the four primary components of USDA’s overall proposal for the conservation title of the 2007 farm bill, along with other proposals that seek to improve existing conservation programs, provide “green payments” to enhance environmental benefits and provide farm income, and expand conservation compliance.¹²

The Standards Board would be designated by the President and would involve the participation of several federal partners, including the Departments of Agriculture, the Interior, Energy, Commerce, and Transportation, as well as EPA and the U.S. Army Corps of Engineers, among other possible representatives. In addition to developing “uniform standards,” the other stated functions include establishing reporting and credit registries, and promoting other actions that facilitate the development and functioning of environmental services markets that involve agriculture and forestry. Implementation would entail USDA research and analysis, as well as grant awards, contracts, and cooperative agreements in completing these expected functions. USDA’s proposal requests authorization of \$50 million in mandatory funding for these tasks.¹³

What Is the Recent Legislative Action?

In May 2007, the House Agriculture Committee released its proposal for the conservation title for the 2007 farm bill, which included draft language on market-based approaches to conservation. The Subcommittee on Conservation, Credit, Energy, and Research held a markup on these and other provisions on May 22, 2007. (The Senate Agriculture Committee is expected to release its consolidated farm bill in July.)

The House Agriculture Committee’s proposal would establish an Environmental Services Standards Board, chaired by USDA with the participation of other identified federal partners, similar to those in USDA’s proposal. The proposal would provide contracts, cooperative agreements, and grants for the purpose of “(1) promoting the development of consistent standards and processes for quantifying environmental benefits, including the creation of performance standards and baselines; (2) promoting the establishment of reporting and credit registries, including third party verification and certification; and (3) promoting actions that facilitate the development and functioning of private-sector market-based approaches for

¹¹ USDA, “Title II: Conservation,” at [http://www.usda.gov/documents/fbconservation_071.pdf].

¹² USDA, *2007 Farm Bill, Conservation and Environment Theme Paper*, June 2006, at [<http://www.usda.gov/documents/FarmBill07consenv.pdf>].

¹³ USDA, *USDA’s 2007 Farm Bill Proposals*, Jan. 31, 2007, at [<http://www.usda.gov/documents/07finalfbp.pdf>].

environmental goods and services involving agriculture and forestry.”¹⁴ The House Agriculture Committee’s proposal differs from the Administration’s proposal mostly in the addition of further clarifying language regarding performance standards and baselines, and also third party verification and certification. The House proposal would authorize \$50 million to be appropriated for this provision.

What Are Some Possible Considerations?

A principal question regarding the Administration’s or the House Agriculture Committee’s proposals is whether the agriculture and forestry sectors can effectively provide environmental goods and services along with the more traditional food, fiber, and other services these sectors already provide. Accordingly, several procedural questions might be raised as Congress debates these or similar proposals in the 2007 farm bill.

- **Standards-setting Board.** What are the advantages of establishing a USDA-led Standards Board, compared to other possible options such as a federal advisory committee, case-by-case partnership agreements, or memorandum of understanding, etc.?
- **Lead federal agency.** What are the advantages of establishing USDA as the lead role? What lead role would USDA play, given the mostly regulatory authority and statutory obligations of other likely participating federal agencies? Might putting USDA as the lead create conflict of interest as both the regulator and promoter of the standards? Are there jurisdictional issues, such that this provision needs to be referred to other authorizing congressional committees? How might existing state and local programs implemented by other agencies be affected?
- **Collaboration.** How would the collaborative effort between USDA and the other participating federal agencies be put into practice? How would disagreements be addressed and resolved among all federal partners?
- **Consistency with existing regulatory authorities.** Would the agreed-upon decisions and standards set by the board be binding among all federal agencies? What assurances are there that these decisions would not override the authorizing legislation regulating water and air quality, and wildlife habitat? Would regulatory agencies with authorizing legislation have the flexibility to not adopt the standards authorized by the board, if they violate the individual agencies’ authorizing statutes, or contain regulations, such as measurement protocols? What are the possible implications of the board’s decisions if they are inconsistent with other existing regulatory guidelines and authorities?

¹⁴ House Agriculture Committee, Title II: Conservation, at [<http://agriculture.house.gov/inside/Legislation/110/Title%20II—Conservation.pdf>].

- **Standards.** Would uniform standards be national, regional, local, or site-specific in scope? How would uniform standards address differences within different production areas, types of resources, and ecosystems? Would established protocols and management practices take into account these differences? Would these standards consist of an assigned value? Given the wide range in the types of environmental services, how would outcomes or benefits be measured and expressed as standards?
- **Federal versus marketplace functions.** What roles should government agencies play in actually establishing environmental services markets involving agriculture and forestry? What roles would be strictly within the purview of the private-sector and independent credit markets? Is there a federal role beyond developing the reporting and credit registries that would require the board to act as intermediary between sellers and buyers? Who would be responsible for oversight of third party verification and certification, and for assigning market value to tradeable credits within an environmental services market? Would the federal agencies play a role in market oversight, enforcement, risk management, and capital investment? What other types of federal assistance may be needed to further facilitate the development of environmental services markets involving agriculture and forestry?
- **Implementation.** How would the agreed-upon standards be implemented? Would there be penalties for non-compliance?
- **Congressional reporting/timeline.** How and when would the board be expected to report its accomplishments to Congress? What type of reports would be expected? How would the authorized monies be spent?
- **Market barriers.** How effectively do the current proposals address the types of barriers that have been identified by USDA and others that may prevent the development of environmental goods and services markets involving the farm and forestry sectors?
- **Possible unintended consequences.** Might establishing a market-based approach shift governmental and/or industry priorities away from addressing more serious environmental problems by allowing some industrial facilities to buy relatively lower-cost farm-based carbon credits rather than pay for on-site pollution abatement at the facility? Might a market-based program shift USDA resources away from established farm conservation programs?