



# ERS *Report Summary*

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## The Use of Markets To Increase Private Investment in Environmental Stewardship

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U.S. farmers and ranchers produce a wide variety of commodities for food, fuel, and fiber in response to market signals. Farms also contain significant amounts of natural resources that can provide a host of environmental services, including cleaner air and water, flood control, and improved wildlife habitat. Environmental services are often valued by society, but because they are a public good—that is, people can obtain them without paying for them—farmers and ranchers may not benefit financially from producing them. As a result, farmers and ranchers underprovide these services.

### *What Is the Issue?*

Farmers can provide environmental services by adopting conservation or production practices that improve the environment. Farmers often produce these services unintentionally, however, by maintaining grasslands, wetlands, or forests rather than converting them to cropland or by adopting practices that increase net returns but also improve environmental performance. Although society values these services, because of the services' public-goods nature, farmers usually cannot benefit financially by intentionally producing them. As a result, there are no naturally occurring markets for environmental services. If environmental services could be sold like other commodities, farmers would likely invest more to maintain wildlife habitat, woodlots, and wetlands. The U.S. Department of Agriculture (USDA) has expressed great interest in the creation of markets to provide environmental quality and other environmental services. Such markets would supplement existing conservation programs and provide an additional source of income for farmers.

### *What Did the Study Find?*

Markets for environmental services may fail to form or function properly for several reasons.

- The public-goods nature of most environmental services is the primary reason that markets for them do not naturally develop. In addition, environmental services, such as improved water quality and wildlife preservation, are unintended consequences of the primary production activities on the farm. These characteristics can limit potential suppliers' ability to benefit financially from providing environmental services.
- Uncertainty about the quantity and quality of services a farmer can produce is a common problem that often hinders market function. Environmental services are often difficult to observe, such as the nutrient-filtering capacity of wetlands or the sequestration (storing) of greenhouse gases from adopting conservation tillage. Farmers are reluctant to adopt management practices if potential returns are uncertain. Uncertain quality can also deter potential buyers from purchasing environmental services from farms.
- Environmental services are associated with the land and are not transportable to central markets. The costs of bringing buyers and sellers together may hinder the development of markets.
- Government conservation programs and markets for environmental services sometimes have common objectives and outcomes and may end up competing for the same land, the natural capital in the production of environmental services. Such competition could hinder the development of markets by driving up costs.

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The consequence of these limitations is that markets for environmental services are rare. Even though public demand for environmental services is strong, farmers are unable to benefit financially by providing them.

Barriers to market development and function can be overcome in a number of ways.

- In some cases, regulation can be used to create a private good, and the demand for that good, that is closely related to an environmental service. For example, the Federal Government places caps on pollutant discharges from regulated firms and issues discharge allowances to each firm, specifying how much pollution the firm can legally discharge. A firm may be able to discharge more pollution than its original allocation by purchasing allowances from other firms that have cut their own pollution discharges below their own allowances or from unregulated sources of pollution, such as agriculture. This transaction is known as a trade. Discharge allowances, therefore, have characteristics of a private good. Farmers are often able to provide discharge reductions at a lower unit cost than industry can and to profit from the exchange.
- Uncertainty over the performance of agricultural management practices for the production of environmental services can be reduced through education and research. USDA and State efforts can play an important role in both areas. Research at the Agricultural Research Service, USDA, and the Conservation Effects Assessment Project at the Natural Resources Conservation Service, USDA, are quantifying the performance of management practices in different settings, and State extension services can convey this information to farmers. In addition, validation and certification services can bolster consumer confidence that, when they purchase environmental services, they are getting the service for which they paid. USDA has played an important certification role in the organic market.
- Improved market design can reduce the search and bargaining costs of bringing buyers and sellers together. Government or other entities can play the role of an aggregator or clearinghouse in a market, making it easier for geographically dispersed market participants to find each other, thereby reducing bargaining costs.
- Coordinating conservation programs and environmental service markets can enhance the performance of both. Targeting conservation programs to producers who need to meet minimum performance standards to enter a market would likely increase the number of farmers willing to participate. Identifying program rules that prevent farmers from selling environmental services for which they have not received a government payment would also increase farmer interest in entering environmental service markets.

Creating markets for environmental services is not always possible or advisable. Transactions costs associated with reducing uncertainty may be greater than the benefits of creating a market. The public-goods nature of environmental services may also prevent markets from developing, despite research and education. Even though people may be willing to pay for environmental services, the ability to acquire these services without paying for them reduces the incentive for farmers to provide them. In these cases, regulation or direct financial assistance through government programs may be the most cost-effective options.

### *How Was the Study Conducted?*

The study used an extensive literature review and five case studies to explore important economic issues affecting the development of markets for environmental services. Because working markets for environmental services are rare, we used the literature to provide the reasons that markets are not developing and to provide insight into the role government might play in helping markets to form and to function.

We present case studies for environmental services for which attempts have been made to develop markets. These markets are as follows:

- Water quality trading—Firms with high pollution-control costs purchase pollution reductions from another source at lower cost.
- Carbon emissions trading—Same as water quality trading.
- Wetland mitigation—Loss in wetland services is offset by an improved wetland with similar services.
- Fee hunting—Hunters pay for access to land in order to hunt.
- Eco-labeling—Labels tout goods made in a way that avoids harming the environment.

These case studies provide a more detailed look at the issues surrounding markets for environmental services, as well as the steps that were taken to overcome market impediments. The findings of the case studies are used to identify some specific actions governments could take to support the creation and function of markets for environmental services. This report provides context for the actions USDA has recently taken to support markets for environmental services and for the Department's response to the Food, Conservation, and Energy Act of 2008.