



Scaling up to address new challenges to conservation on US farmland

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ARTICLE INFO

Article history:

Received 11 July 2011

Received in revised form 4 July 2012

Accepted 7 July 2012

Keywords:

Agriculture

Conservation

Water quality

Wildlife

Voluntary programs

Scale

ABSTRACT

Land used for agricultural production comprises a significant portion of the United States (US) land area and is increasingly the focus of conservation efforts. These efforts include programs to protect and improve the quality of water, soil, and wildlife habitat. Government conservation efforts in the US focus on voluntary conservation programs. As the success of these programs depends on the participation of agricultural producers, much research has examined factors influencing producer decision-making. This research has provided important insights regarding micro and meso-scale factors influencing participation, but has tended to overlook macro-scale political and economic factors that increasingly shape production decisions. We argue that researchers examining producer decision making need to scale up their analysis to include macro-scale factors, which pose increasing challenges to conservation efforts. We use two case studies, in California and Iowa, to illustrate scenarios where policy and market changes have led to a significant loss of participation in conservation efforts. Quantitative and qualitative methods were used in each case to examine how new political and economic conditions influence producer decision-making regarding conservation. In both cases new policies conflict with federal conservation initiatives, creating situations where producers feel they must abandon conservation practices. The emergence of these macro-scale challenges highlights the vulnerability of current voluntary approaches and indicates that alternative policy tools need to be explored. This discussion deserves immediate attention, given current proposals to cut funding for US conservation programs. New policy combinations should be explored that can effectively sustain producer participation in conservation efforts despite changes in policy and market conditions.

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Introduction

Close to half of the land area in the United States (US) is used for agricultural production (USDA Economic Research Service, 2012). Most of this land is privately owned and operated, including 99% of cropland and 61% of rangeland (Lubowski et al., 2006). Agricultural producers depend on this land for their livelihoods, but also make decisions that impact a large portion of the nation's natural resources. The collective decisions of individual landowners impact society's broader efforts to maintain soil, water, and habitat quality. While the US has a long history of excluding agriculture from environmental regulation (Browne, 1988; Browne et al., 1992), government agencies at multiple levels, as well as non-governmental organizations (NGOs), have developed a variety of voluntary environmental stewardship programs to educate private land managers and to provide support for conservation. As these efforts continue and evolve, it is critical to identify opportunities for supporting

these initiatives as well as how changing social, political, and economic contexts may impact participation.

This paper explores how current approaches to improve soil, water, and habitat quality on agricultural lands in the US can suffer major setbacks due to changes in agricultural policies, standards, and market conditions. While significant strides have been made in an attempt to increase the ecological benefits provided by agricultural landscapes, some of these gains may be short-lived. We focus on how macro-scale factors, including government policies and corporate production standards, shape producers' abilities and willingness to participate in voluntary stewardship efforts. Although much attention has been given to micro and meso-scale factors shaping producers' decisions to participate in conservation efforts (e.g., Napier et al., 1986, 1988; Morris et al., 2000; Rogers, 2003; Lubell and Fulton, 2008), this paper illustrates that in certain cases macro-scale influences can outweigh other factors and therefore should not be ignored. We use two case studies to demonstrate how current approaches to enhance conservation can suffer significant setbacks when confronted with powerful political and economic forces from within the agricultural sector. We explore current trends in California and Iowa and identify sources of conservation program vulnerability. While these cases are markedly

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different, they reveal similar patterns and outcomes and suggest that additional policy approaches are necessary to sustain long-term commitments to conservation on US agricultural lands. This paper empirically supports the argument that macro-scale factors, including policy and market conditions, have an increasingly important role in shaping producer decision-making regarding environmental stewardship (Atwell et al., 2009, 2010).

Agriculture and the environment

Intensive agricultural production contributes to significant environmental degradation in the US. According to the US Environmental Protection Agency (EPA), agriculture represents the largest source of non-point source water pollution, accounting for more than 45% of impaired lakes and 18% of impaired estuaries (Ribaud and Johansson, 2007). Agriculture remains the major source of nutrient deposition in the nation, contributing to the degradation of 60% of US coastal rivers and bays (Howarth et al., 2002). The largest-scale example of these ecological impacts remains the formation of a “dead zone” in the Gulf of Mexico: a consequence of nutrient pollution moving from Midwestern farms into the Mississippi River (Rabalais et al., 2002).

Intensive agricultural production also contributes to biodiversity loss (Mattison and Norris, 2005). Agriculture is cited as one of the primary causes of species endangerment in the Americas (Kerr and Deguise, 2004) and is responsible for the majority of species listed as federally threatened or endangered in the US (Cox, 2007 as cited in Batie, 2009). Intensive agricultural production in the US often relies on planting large fields with a single crop variety, reducing landscape diversity and habitat availability. Indiana, Illinois, and Iowa produce large quantities of commodity crops and also rank last among US states in terms of natural vegetation remaining (Klopatek et al., 1979 as cited in Santelmann et al., 2004). Wildlife species are also indirectly affected by increased chemical use, impaired water quality, and dramatic alterations in nutrient cycles (Pimentel et al., 1992; Vitousek et al., 1997). Aquatic organisms, even those located far from agricultural production, are negatively impacted due to soil erosion and chemical run-off (Richter et al., 1997).

Although intensive agriculture has contributed to significant environmental degradation, there is a growing movement to re-define relationships between agriculture and conservation (Banks, 2004). Agricultural landscapes can provide important ecological benefits or “ecosystem services,” such as maintaining watershed functions, regulating water flow, protecting against floods, providing wildlife habitat, maintaining clean water supplies, and supporting aquatic ecosystems (Robertson and Swinton, 2005; Swinton et al., 2007; Scherr and McNeely, 2008). With increasing land conversion and development, conservation organizations are now turning towards agricultural landscapes to provide important wildlife habitat and connective landscapes for migration. A growing number of individuals, scientists, and organizations assert that in addition to providing food, agricultural producers have an important role as conservationists (Badgley, 2003). In this view, productive agricultural landscapes are “multifunctional,” providing economic, ecological, and social benefits (Boody et al., 2005; Jordan and Warner, 2010).

Despite growing movements to combine agricultural and environmental goals, weak environmental regulation of agriculture continues. The US has largely excluded agriculture from environmental regulation, regardless of obvious environmental damage associated with intensive production (Browne, 1988; Browne et al., 1992). For example, non-point source pollution from agriculture was almost entirely left out of the Clean Water Act. The EPA does regulate the largest confined livestock operations; however, many livestock producers required to have discharge permits have

failed to comply (Montpetit, 2002). Some states have taken certain actions to address non-point source pollution, using federal funding granted through an amendment to the Clean Water Act (Section 319). Overall, environmental regulation for agriculture remains very weak and difficult to implement and enforce in the US.

Voluntary approaches to conservation

Voluntary programs remain the preferred approach to enhancing conservation and environmental stewardship on US agricultural lands. The US Department of Agriculture’s (USDA) Natural Resource Conservation Service (NRCS) administers many of these programs. The NRCS was founded in 1933 in response to depressed agricultural economies and widespread soil erosion. It was then known as the Soil Erosion Service, and later the Soil Conservation Service. Today, NRCS programs continue to focus on soil erosion, as well as enhancing habitat and reducing nutrient and chemical pollution. Many NGOs also support conservation on agricultural lands, working closely with producers and government agencies to encourage environmental stewardship.

Voluntary approaches to conservation on agricultural lands primarily focus on taking eligible land out of production or reducing the impacts of land in production. Government agencies and NGOs encourage producers to “set aside” agricultural land from production activities to reduce erosion and provide wildlife habitat. Conservation programs also focus on improving ecological outcomes on “working lands” producing agricultural products. Working lands conservation practices include cover cropping, hedgerows, grassed waterways, filter strips, contour buffer strips, tailwater recovery systems, constructed wetlands, riparian zone restoration, and reducing chemical inputs (NRCS, 2011). Hedgerows and buffer strips, for example, provide habitat and filter nutrients out of agricultural run-off. Grassed waterways perform similar functions and slow runoff and reduce erosion. This practice-based approach allows flexibility for producers to adopt site appropriate practices that are most affordable for their situation (Gerowitt et al., 2003).

Since 1985, conservation programs through the NRCS have been growing in number and gaining support with increasing (but currently threatened) federal funding. In the Farm Security and Rural Investment Act of 2002 and the Food, Conservation, and Energy Act of 2008 (US farm bills), Congress significantly increased funding available for conservation titles and stewardship on working lands. Programs funded include the Environmental Quality Incentive Program, the Conservation Reserve Program, the Grassland Reserve Program, the Wetlands Reserve Program, the Wildlife Habitat Incentive Program, and the Conservation Stewardship Program (formerly the Conservation Security Program). NRCS employees, working out of offices in most US counties, are available to advise producers on program options and technical aspects of program participation and practice implementation. Other organizations, such as county Soil and Water Conservation Districts, Resource Conservation Districts, regional NGOs, and state-level agencies, work closely with producers to define conservation goals, encourage participation in programs, and share information about conservation practices.

We focus on two federal programs: the Conservation Reserve Program (CRP) and the Environmental Quality Incentive Program (EQIP). The CRP was established in 1985 to set aside sensitive lands from production through 10–15 year contracts. It provides acreage-based rental payments and cost-share assistance for producers to retire cropland and plant and maintain approved conservation ground cover (e.g., grasses and trees). EQIP was created in 1996 and offers financial incentives, including cost-sharing of up to 75%. While the majority of EQIP funds go to livestock operations, these

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