



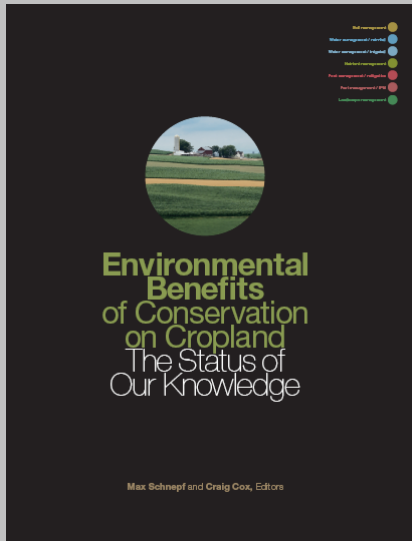
United States Department of Agriculture
Natural Resources Conservation Service

Helping People Help the Land

Conservation Effects Assessment Project CEAP Highlights

April 2007

New Release!



Excerpts from Craig Cox's Foreword...

- *It is clear from the book that we have in hand conservation practices and systems that, if applied effectively, produce real and meaningful environmental benefits. It is also clear that we know much more than we are using on a day-to-day basis to improve environmental quality in agricultural landscapes.*
- *The benefit of more precise targeting of conservation practices emerges from the pages as perhaps the biggest short-term opportunity to increase our effectiveness. Where conservation practices are placed on the landscape appears to be the primary determining factor in attaining significant environmental effects.*
- *Translating the existing knowledge summarized in the book into practice, as well as the new knowledge being generated on how to manage agricultural landscapes to improve environmental quality, remains one of the most important challenges facing the conservation community today.*

Cropland Literature Synthesis — A Valuable Field Tool

In conjunction with CEAP, the Soil and Water Conservation Society (SWCS) published a landmark synthesis of the current scientific literature on what is known and not known about the field-level effects of conservation practices applied to cropland. Entitled *Environmental Benefits of Conservation on Cropland — the Status of Our Knowledge*, the report addresses conservation practices for soil management, water management on rain-fed and irrigated cropland, nutrient management, pesticide mitigation, integrated pest management, and landscape management. This report is an important first step in CEAP's effort to build the science base for conservation.

Authored by leading experts, each chapter summarizes the practices currently in use, the documented environmental effects, key factors affecting environmental outcomes, practice interactions and management tradeoffs, and research priorities.

This report is a valuable tool for conservation professionals. An NRCS state technical leader summarized the report this way: "It is excellent, one-stop shopping for the latest research relating to our practices. I particularly like the tables that summarize research information. For example, in the chapter on soil management, Table 5 compares the effects of no-till and other tillage types on water quality; in the chapter on landscape management, Table 1 shows denitrification rates for riparian buffers under different soil drainage conditions. I foresee this document being readily used by state staff and partners to identify practices to best achieve resource needs. It will save me a lot of time that I otherwise would have to spend searching the internet to develop the rationale for project proposals, select cost shared practices for use in farm bill programs, and

assemble information for field offices to use in discussing practice options with producers."

Program leaders, policy makers, and researchers likewise will find this report essential reading to quickly grasp the state of the science of cropland conservation and understand the complexity involved in managing agricultural landscapes for environmental quality.

NRCS's Resources Inventory and Assessment Division is distributing its limited supply of courtesy copies to national technical leaders and one copy to each NRCS state office. Copies can be purchased directly through the SWCS website (www.swcs.org).

SWCS Annual Conference to be Major CEAP Forum

The 2007 annual conference of the Soil and Water Conservation Society (SWCS) will feature many presentations by CEAP scientists and by researchers engaged in CEAP-related studies. The conference — *Conservation Challenges in A Changing Landscape* — will be held in Tampa, Florida, July 21-25. CEAP topics will include —

Cropland — preliminary model results for onsite (field-level) effects of conservation practices currently in place on the landscape ... summary of how the cropland simulation models and input databases were constructed ... preliminary model results of offsite water quality effects of practices.

Wetlands — preliminary findings from regional investigations ... wetlands literature synthesis findings that address conservation practice effects on ecosystem services provided by Coastal Plain and Piedmont wetlands ... introduction to the national wetlands adaptive management approach under development ... symposium on *The Conservation Effects Assessment Project – Wetlands National Assessment Component: Is the investment in wetlands conservation on agri-*

cultural landscapes worth the ecological return?

Wildlife — significant findings on use of Doppler weather radar to determine bird use of restored wetlands ... program impacts on bird species ... use of indicators for modeling aquatic biota response to conservation practices ... evolution of the Conservation Reserve Program into a landscape level force for wildlife habitat ... national CP33 monitoring program preliminary results ... implications from Missouri's monitoring of Wetland Reserve Program easements ... findings from a decade of NRCS Agriculture Wildlife Conservation Center projects.

Grazing lands — overview of the draft work plan, especially the search for instrumented watersheds, the structure of interlocking models projected for use in predicting erosion, and regional meetings on the literature synthesis.

Special Emphasis Watersheds — preliminary findings on conservation practice effects on soil and water quality ... integrating remote sensing and modeling using geographic information systems (GIS) ... assessing ephemeral gully erosion using GIS ... linking AnnAGNPS, CONCEPTS, and REMM models to evaluate conservation measures ... quantifying the impact of EQIP on surface water ... determining the effects of tillage and subsurface tile drainage on manure management ... and spatial and temporal changes in nutrients, metals and pesticides.

California Central Valley Regional Investigation

The fourth regional CEAP wetlands investigation — the California Central Valley — was initiated in March 2007 with a meeting of more than 30 scientists and stakeholders to discuss the potential scope of the 3-year investigation.

General agreement was reached on the following:

- Focus on riverine wetlands and associated lands and waters in the Central Valley, with the potential to also initiate a regional investigation on riverine wetlands in the Intermountain Region of California and southeastern Oregon (e.g., Klamath River watershed).
- The sample population for the Central Valley regional investigation will include riverine wetlands and associated lands restored and enhanced on WRP lands; altered riverine wetlands embedded in a cropland matrix; selected “mature” restored wetlands and associated lands on U. S. Fish and Wildlife Service National Wildlife Refuges; and wetlands and associated lands that have not been hydrologically altered.
- Identify ecosystem services for riverine wetlands in the Central Valley that are important to measure: Bio-

diversity and habitat quality to support species such as fish, birds, pollinators, and amphibians (and perhaps reptiles and small mammals); potential nutrient reduction; attenuation of flood water; reduction in sedimentation potential; and, potentially, GHG emissions reduction.

- Ten potential science collaborators will be identified.

Next steps —

- Ground-truth potential sample sites throughout the valley and select a final sample population.
- Create a georeferenced coverage of sample sites, assembling existing data sets and digital coverages for use in the investigation.
- Conduct additional discussions with potential collaborators to finalize a study plan for the Central Valley.
- Initiate data collection.

The science leader for the regional investigation is Dr. Walter Duffy of the U.S. Geological Survey's California Fish Cooperative Research Unit at Humboldt State University. Dr. Duffy has been involved in wetland research throughout his career, including a study in the Prairie Pothole Region which closely resembled the CEAP-Wetlands regional investigation in terms of conceptual model design.



Grazing Lands National Assessment

CEAP Dialogue at SRM Annual Meeting

At the Society for Range Management (SRM) February 2007 International Meeting the CEAP grazing lands coordinator briefed the SRM Rangeland Monitoring Committee on CEAP strategies and met with scientists who are writing a book on rangeland fire ecology and are interested in incorporating information about conservation practices. He also met with potential authors of the grazing lands literature synthesis, to discuss one of the biggest challenges — how to address prescribed grazing .

Suite of Models Considered

Senior modelers from the Agricultural Research Service are exploring how CEAP might use a suite of models that complement the scale and attributes of RHEM (Rangeland Hydrology and Erosion Model). Two models under consideration are SWAT (Soil and Water Assessment Tool) and AGWA (Automated Geospatial Watershed Assessment). The National Resources Inventory will be a critical resource for all of these data-hungry models.

— Continued on page 4

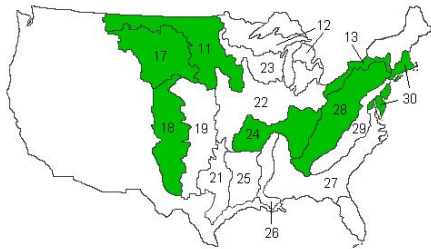
Wildlife National Assessment

CRP Effects on Grassland Birds

Farm Bill conservation programs and practices have long been heralded by the wildlife community as essential tools for wildlife conservation on private lands. Recent study findings related to the CEAP wildlife component are beginning to quantify that value. Here are some key findings from two recently completed assessments of the value of the Conservation Reserve Program (CRP) to grassland nesting birds

NRCS/University of Northern Colorado (UNCO). To determine how presence of CRP habitat affects grassland bird species at the landscape level, NRCS and UNCO researchers correlated data on the diversity of these species along 1,610 U.S. Geological Survey Breeding Bird Survey (BBS) routes to the occurrence of CRP grassland in the vicinity of these routes. CRP information was obtained from National Resources Inventory (NRI) land cover/use data. Local grassland bird diversity was assessed as the percentage of the regional species pool represented along the BBS route.

In 7 of the 16 BCRs investigated (see map), the species diversity was shown to be significantly higher along BBS routes in landscapes with CRP enrollments. Landscapes with CRP land had, on aver-



age, 51 percent of the regional species pool of grassland birds, whereas landscapes without CRP land had only 35 percent of the pool represented.

Fish and Wildlife Service. A Fish and Wildlife Service study funded by the Farm Service Agency also used BBS data to analyze the effect of CRP on grassland birds. This study, however, was limited to the Prairie Pothole Region of North Dakota and South Dakota and focused on bird counts at individual survey points along BBS routes, and

used remote sensing data in the vicinity of these survey points to depict CRP habitats. Spatial models were developed to link the number of birds detected at survey points to CRP grassland habitats.

To validate the BBS-based predictive models, additional breeding bird data were collected in 2003-2005 on 2,805 sample points throughout the area. These data were used in combination

with actual CRP field location data to develop an additional predictive model. Using these models, investigators were able to predict the effects of converting CRP grassland back to cropland on grassland bird populations.

The table below shows the model estimates of bird numbers lost if CRP lands were converted to cropland.

Population estimates for grassland birds in the Prairie Pothole portion of North Dakota and South Dakota using two different models, and modeled population estimates following simulated conversion of all CRP lands to cropland, with differences (absolute and percent) between estimates.

State	Species	Predictive model	Modeled estimate	Estimate without CRP	Difference	Percent difference
ND	Northern harrier	BBS Spatial model	16,247	14,116	-2,131	-13.1
		Field data model	460,554	281,660	-179,894	-38.8
	Sedge wren	BBS Spatial model	1,203,872	786,040	-417,832	-34.7
		Field data model	624,274	446,183	-178,091	-28.5
	Grasshopper sparrow	BBS Spatial model	624,274	446,183	-178,091	-28.5
		Field data model	1,343,117	1,133,661	-209,457	-15.6
	Dickcissel	Field data model	26,499	17,630	-8,870	-33.5
	Bobolink	Field data model	2,114,651	1,291,675	-822,976	-38.9
Western meadowlark	BBS Spatial model	1,654,648	1,528,541	-126,107	-7.6	
	Field data model	960,885	871,999	-88,886	-9.3	
SD	Sedge wren	BBS Spatial model	384,935	281,716	-103,219	-26.8
		Field data model	269,553	129,412	-140,141	-52.0
	Grasshopper sparrow	BBS Spatial model	480,489	456,167	-24,322	-5.1
		Field data model	1,573,972	1,464,257	-109,715	-7.0
	Dickcissel	BBS Spatial model	730,427	673,426	-57,001	-7.8
		Field data model	188,920	171,997	-16,923	-9.0
	Western meadowlark	BBS Spatial model	903,947	868,419	-35,528	-3.9
		Field data model	1,610,589	1,583,165	-27,424	-1.7

Source: Niemuth, N. O., F. R. Quamen, D. E. Naugle, R. E. Reynolds, M. E. Esty, and T. L. Shaffer. 2007. Benefits of the Conservation Reserve Program to grassland bird populations in the Prairie Pothole Region of North Dakota and South Dakota. Unpublished Report to USDA—Farm Service Agency.

Watershed Assessment Studies

Jobs Bay, Puerto Rico

Work planning sessions and a joint briefing for USDA and National Oceanic and Atmospheric Administration (NOAA) management in March 2007 initiated action on the newest CEAP Special Emphasis Watershed (SEW) – Jobs Bay, Puerto Rico.

The main objective of the Jobs Bay project is to determine the environmental effects that agricultural conservation practices implemented by farmers on the upland landscape may have on coastal waters and associated habitats in the tropical ecosystem, and ultimately on coral reefs.

This project is collocated with the Jobs Bay National Estuarine Research Reserve (NERR) in south-central Puerto Rico and is the first SEW established in the tropics.

The Jobs Bay watershed was chosen

because it is adjacent to a NOAA NERR site and has a larger percentage of agricultural land use than the other candidate watershed. It will initiate a collaborative partnership between USDA, NOAA, and other partners — including USDA's Agricultural Research Service — to address spatially complex natural resource issues in coastal environments.



This SEW will be the first coordinated research and demonstration project to meet the management and conservation objectives of both USDA and NOAA. The project also directly addresses the goals and objectives of the U. S. Coral Reef Task Force concerning land based sources of pollution and increasing partnerships for coral reef conservation.

The specific goals of the Jobs Bay Special Emphasis Watershed Study include:

- Estimate the benefits of conservation practices currently present on the landscape.
- Estimate the effects of conservation practices on terrestrial and aquatic species habitat.
- Estimate the need for conservation practices and the benefits that could be realized if appropriate conservation practices were implemented on all cropland and poultry farms.
- Simulate alternative options for implementing conservation programs on cropland and poultry farms in the future.

The multi-agency team is preparing a draft 3-year plan of work that describes activities and deliverables to be completed by USDA and NOAA. The plan also describes ongoing research by Jobs Bay NERR and its partners. Additional resource needs and opportunities for collaboration are identified also.

CEAP *Building the Science Base for Conservation*

Science based conservation is the key to managing agricultural landscapes for environmental quality. The Conservation Effects Assessment Project (CEAP) is a multi-agency effort to scientifically quantify the environmental benefits of conservation practices used by private landowners participating in U.S. Department of Agriculture (USDA) and other conservation programs. Project findings will guide USDA conservation policy and program development and help farmers and ranchers to make informed conservation choices.

The three principal components of CEAP — the national assessment, the watershed assessment studies, and the bibliographies and literature reviews — contribute to the evolving process of building the science base for conservation. That process includes research, monitoring and data collection, modeling, and assessment.

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Grazing Lands (Continued from pg. 2)

Useful Insights

Scientists from around the country are engaged in planning the CEAP grazing lands assessment. In the process of that dialogue we learn of interesting studies and resources that provide insight about conservation practices used on grazing lands. Here are two examples:

- An Arizona case study of a large gully check structure constructed in 1938, preventing miles of gullying and providing hundreds of acres of productive meadow.
- The American Sheep Industry Association's handbook *Targeted Grazing: A natural approach to vegetation management and landscape enhancement* (www.sheepusa.org/targetedgrazing). This resource includes goat grazing options.

Targeted grazing is a subset of our own prescribed grazing practice and has great utility to replace herbicide use, controlled (prescribed) fire, and mechanical treatment with mowers/tractors or other equipment.