



United States Department of Agriculture
Natural Resources Conservation Service

Helping People Help the Land

Conservation Effects Assessment Project

CEAP Highlights

April 2008

CEAP Synthesis: Extending Lessons Learned

In September 2007, USDA's Cooperative State Research, Education, and Extension Service (CSREES) and Natural Resources Conservation Service (NRCS) jointly funded two integrated research and outreach grants to conduct a synthesis of results from the 13 ongoing CSREES-NRCS competitive watershed studies contributing to the Conservation Effects Assessment Project (CEAP) (see map, below right).

The CEAP Synthesis project presents a major opportunity for USDA to study findings across the 13 funded watershed studies and compile important lessons learned, take stock of how implementation of conservation practices affects water resources at a watershed scale, and explore geographic and other systematic similarities and differences among the watershed projects.

Knowledge gained from the CEAP Synthesis will be instrumental in informing future conservation policy, program design, and program implementation. The Synthesis provides us with a unique opportunity to look across watersheds with regional and national perspectives. It was specifically designed to contribute to translating the science discovered through CEAP into practice.

One of the two grants was awarded to The North Carolina State University (NCSU). This team represents a diverse, interdisciplinary, and experienced team of investigators including Deanna Osmond, Greg Jennings, Dan Line, and Jean Spooner (NCSU), Mazdak Arabi and Dana Hoag (Colorado State University), Al Luloff (Pennsylvania State University), Mark McFarland (Texas A&M University), Don Meals (Ice.Nine Environmental Consulting), and Andrew Sharpley (University of Arkansas). A holistic framework will be used to syn-

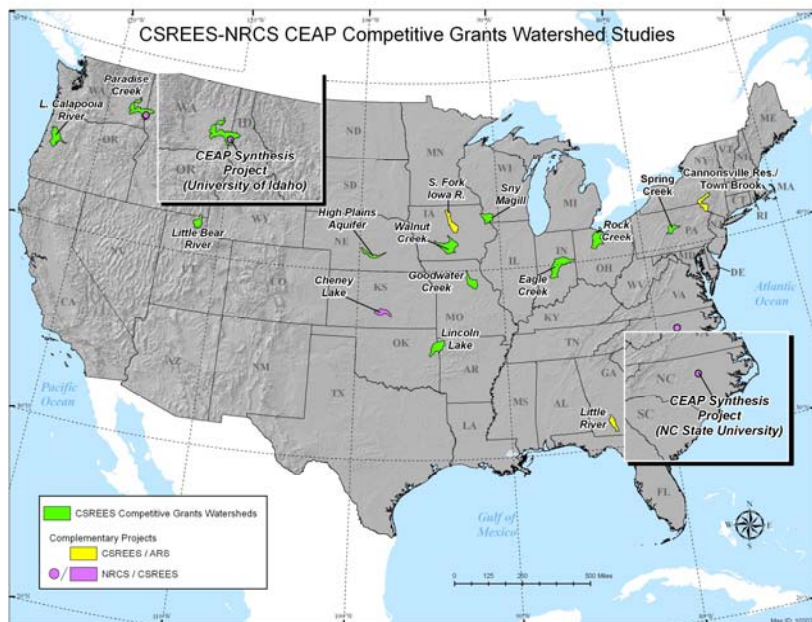
thesize the lessons learned from the 13 USDA-CSREES Conservation Effects Assessment Project studies.

The methodology developed for the synthesis relies on a series of nested, science-based strategies. A consistent framework for collecting and organizing project information will be developed and piloted. CEAP watershed study information will be assembled from publications and telephone interviews, after which a multi-disciplinary team with expertise in water quality modeling, water quality assessment and design, economics or sociology, and extension will be sent to each project location. On-the-ground information gathered through these visits will add to both data reliability and validity of the lessons learned, while providing context for much of the previously collected information.

From this information, synthesized lessons learned will be derived from all 13 projects. Extension and outreach of the

findings will occur through reports, fact sheets, distributed electronic presentations, newsletters, promotional brochures, journal articles, conferences, and presentations to targeted groups such as key USDA staff, the National Integrated Water Quality Program Committee for Shared Leadership, USEPA, agricultural commodity and environmental organizations, and scientific groups. For example, the team conducted several workshops at the 2008 CSREES National Water Conference on initial lessons learned and modeling efforts of the CEAP watershed projects.

The other grant was awarded to the University of Idaho. The team consists of Jan Boll, Bob Mahler, J.D. Wulfhorst (University of Idaho), Lyubov Kurkalo (North Carolina A&T University), Tammo Steenhuis (Cornell University), and George Vellidis (University of Georgia). Like the other synthesis project, this team will summarize and describe lessons learned across the 13



Locations of CEAP watershed studies and the two Synthesis Projects funded in 2004–07 through the joint CSREES-NRCS CEAP Competitive Grants Program (a component of the CSREES National Integrated Water

CEAP watershed studies. This project has a complementary approach to that of the other synthesis grant.

This project includes three phases: *analysis*, *synthesis*, and *outreach* to answer key CEAP questions and produce science-based knowledge to inform policy makers and key stakeholder groups. The study will characterize each project from a physical, economic, and social perspective.

Investigators will analyze effectiveness of individual BMPs and systems of BMPs that complement CEAP modeling studies with SWAT-VSA (Easton et al. 2008) and WEPP (Boll et al. in preparation), as appropriate. The team will analyze social and economic factors that facilitate or impede implementation or maintenance of BMPs, synthesize the findings, and develop systems of BMPs for different agricultural landscapes following an eco-region approach. A new element will be a synoptic approach for geographic prioritization of BMP implementation at multiple scales (see map at right). Targeted outreach activities will be conducted with key stakeholder groups for improving management of agricultural landscapes.

The final outcomes will include *characterization* of CEAP watersheds based on an eco-region classification, *assessment and analysis* of available data on physi-

cal and socio-economic aspects of conservation practices, and *synthesis* of findings for water-quality assessment and management related to ongoing and future government programs.

This project will establish the foundation for continued analysis and synthesis of BMP systems in other watersheds by developing a dynamic CEAP watershed assessment toolbox for NRCS and other state and local agency staff made available via the Internet.

References

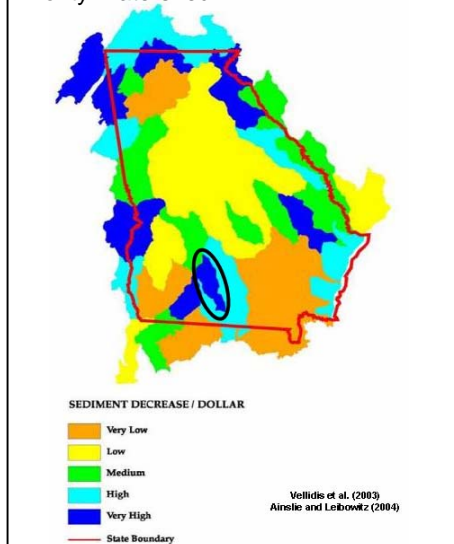
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Easton, Z.M., Fuka, D.R., Walter, M.T., Cowan, D.M., Schneiderman, E.M., Steenhuis, T.S. 2008. Re-conceptualizing the soil and water assessment tool (SWAT) model to predict runoff from variable source areas. *Journal of Hydrology* 348, 279– 291.

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The University of Idaho CEAP synthesis team will visualize results in a watershed-scale map to enable managers to identify areas where efforts optimize functional performance on a watershed scale. This map shows the results for Georgia on a regional scale. The Little River Watershed (circled in black), one of the 13 CEAP projects, is identified as a Priority Watershed.



CEAP-Grazing Lands

Onsite Data Collection to Aid Grazing Lands Modeling

Onsite data collection at National Resources Inventory segments will instigate new information on pastureland quality and composition, in addition to addressing resource concerns for planning activities. It will also improve the quality of simulation models used on grazing lands. Five years of onsite NRI rangeland data are already available for 20 states, including the western states plus Florida and Louisiana. Draft pastureland NRI protocols have been developed and are being tested in 13 states in 2008.

Literature Syntheses on Pace for 2009 Release

In early May, 20 grazing lands scientists from universities, ARS, and NRCS will

begin organizing a new pastureland literature synthesis. This new report, to be published in cooperation with the American Forage and Grassland Council (AFGC), will complement an ongoing rangeland synthesis study involving 37 scientists. The rangeland synthesis has a target date of January 2009 for peer review release. When complete, these studies will help build a foundation for our science base, documenting what we do and do not know about the environmental benefits of grazing lands conservation practices and systems.

ARS Researchers Look at Rangeland

In April, RIAD staff reviewed the progress of researchers at Agricultural Research Service laboratories, who are collaborating with CEAP-Grazing Lands

to develop knowledge about the effects of conservation practices on rangeland.

Researchers at the ARS Grazinglands Research Laboratory in El Reno, OK, staff are studying “Hydrologic and Environmental Impacts of Conservation Practices in Oklahoma Agricultural Watersheds.” They have also instrumented the ARS Ft. Cobb and Little Washita Watershed Projects, both of which will further conservation knowledge.

At the ARS Jornada Experimental Range in Las Cruces, NM, RIAD staff reviewed progress on the CEAP/NRI integration project; viewed a new wind erosion project collecting data from the nearby desert, and viewed a collection of Criollo cattle from Northern Mexico being evaluated for hardiness and low feed consumption in the United States.

Wildlife National Assessment

The efforts of the CEAP wildlife component described in the August 2007 issue of CEAP Highlights continue. Several projects described in that publication are nearing completion, including an assessment of the contribution of CRP to meeting habitat and population objectives for Central Mixed-Grass Prairie birds. CEAP Conservation Insights are being developed for these projects to disseminate findings.

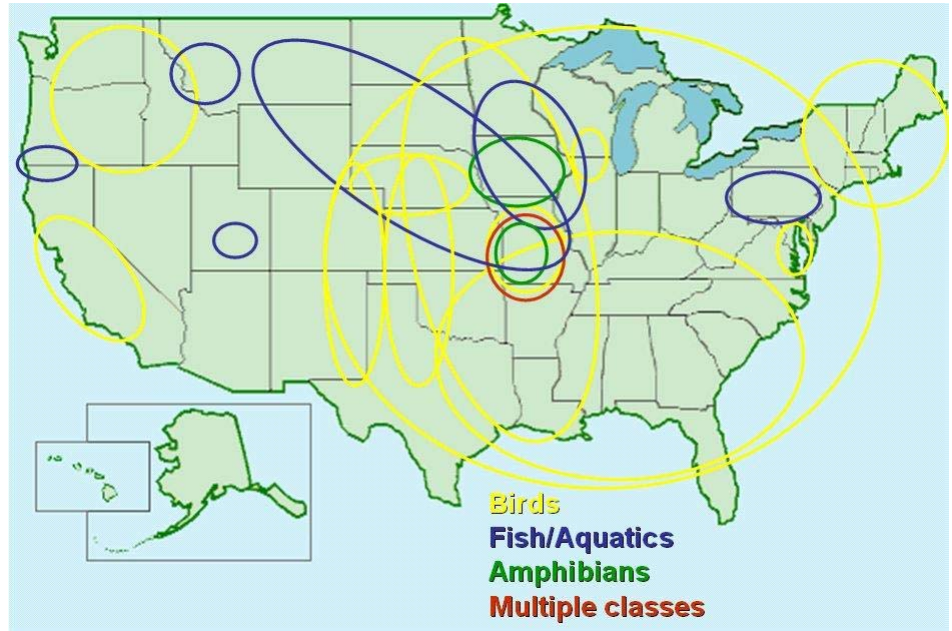
Most of the wildlife component assessment projects initiated from 2005 to 2007 involve quantifying the benefits of conservation programs and practices to bird species or groups. While birds represent an important component of the wildlife resource—and avian studies and conservation efforts have outpaced other taxa with respect to Farm Bill activities—we are expanding efforts to include effects on aquatic biota and other types of wildlife. Specifically, several assessment projects being initiated in 2008 involve assessing the effects of conservation practices on fish and amphibians. The map at right provides a general sense of the geographic context and wildlife taxa addressed through CEAP wildlife component assessments.

An assessment aimed at modeling the effects of land treatment and other conservation practices on aquatic biota provides a useful illustration. Under an agreement through the Upper and Middle Mississippi River Valley Coopera-

tive Ecosystem Studies Unit, the Missouri Resource Assessment Partnership at the University of Missouri (MoRAP) is leading an effort to use National Aquatic Gap Analysis Program and Stream Survey data to develop a geospatial layer of stressors that affect the health of aquatic biota throughout the Missouri River Basin.

These data will be combined with data on conservation practice implementation to predict the effects of those practices

on the stressors controlling the health of aquatic biota, and thus the effects of those practices on fish and other aquatic species. We are also initiating a partnership with the USGS Amphibian Research and Monitoring Initiative to conduct a geospatial analysis of the effects of the Wetlands Reserve Program, beginning in Iowa, on amphibian habitat and population dynamics. Additional information and outputs from these and other projects will be presented in future issues of CEAP Highlights.



General representation of the wildlife taxa addressed and geospatial reach of CEAP wildlife component assessments initiated among various partner entities through 2008.

Cropland National Assessment

CEAP-Cropland Briefings

In January and February, the CEAP-Cropland modeling team briefed technical specialists from all three NRCS NTSCs and from the NRCS Science and Technology and Programs Deputy Areas in NHQ. They also briefed staff from the Economic Research Service (ERS) and National Agricultural Statistics Service (NASS) on dataset development activities from the CEAP farmer survey to support CEAP modeling activities.

The cropland modeling team consists of researchers from NRCS, ARS, Texas AgriLife Research (formerly known as the Texas Agricultural Experiment Station), Texas A&M University, and the University of Massachusetts.

Upper Mississippi River Basin (UMRB) Report

In February, the CEAP-Cropland modeling team met in Beltsville for a project working session. Topics included data edit, review, and database preparation in support of modeling applications for the Upper Mississippi River Basin (UMRB). The modelers are compiling technical documentation reports and preparing for final model runs. The schedule for completion of this eagerly awaited report calls for peer review of the draft report beginning in late summer 2008, with early presentation at the Tucson Soil and Water Conservation Society meeting in July and final release in August. The UMRB report is expected to be the template for a further series of reports on the

other major river basins and water resources regions nationwide.

SPARROW-CEAP Model Collaboration

NRCS modelers, agronomists, and statisticians met with the USGS SPARROW (SPATIally Referenced Regressions On Watershed Attributes) modeling group in March at the USGS facility in Reston, VA. This first formal meeting of this group began a process of developing mutual understanding of and technical collaboration on CEAP and SPARROW model functionalities and modeling approaches. These meetings also included discussions relative to the development, improvement, and utilization of the datasets that drive these modeling efforts.

Wetlands National Assessment

USGS Releases PPR Evaluation Results

One of the tasks undertaken by the Principal Investigators with the U. S. Geological Survey Northern Prairie Wildlife Research Center (USGS NPWRC) leading the CEAP-Wetlands Prairie Pothole Regional Investigation was to evaluate a potential approach that could be adapted for use in the NRCS National Wetlands Monitoring process under development through CEAP-Wetlands. The results of the evaluation are presented in the recently released preliminary findings report for the CEAP-Wetlands Prairie Pothole Regional Investigation published by the USGS.

Presented here are highlights of that approach and findings. For the complete text, visit <http://pubs.usgs.gov/pp/1745/>. The report will be discussed in more



detail in an upcoming *CEAP Conservation Insight*.

- Following enrollment in the Conservation Reserve Program, landscape composition and structure changed, shifting to something resembling more of a prairie mosaic than one dominated by the former production agriculture matrix.
- The increase in the number of grassland patches resulting from enrollment of lands in CRP exceeded the breeding area requirements of all species assessed.
- The upland portion of restored seasonal catchments potentially provide nesting habitat for all nine bird species assessed, as does native prairie temporary and semipermanent catchment types.
- Restored temporary catchments and native prairie seasonal catchment types potentially provide nesting habitat for seven of the nine species, and restored semipermanent catchments provide nesting habitat for eight of the nine evaluation species.
- Planting the upland portions of restored wetland catchments can provide potential nesting habitat for a variety of prairie bird species.
- The approach presented by Laubhan et al. is central to developing model

algorithms involving key multiple-scale habitat variables for selected species as part of the larger CEAP-Wetlands National Wetlands Monitoring process.

Interim MAV Report Issued

The U. S. Geological Survey recently issued to NRCS the interim findings report for the CEAP-Wetlands Mississippi Alluvial Valley regional study. The study was initiated in 2006, with field sampling focusing in the Tensas River and Lower White/Cache River Basins, LA and AR, respectively. Following the CEAP-Wetlands conceptual design, sampling was conducted in cropland, on former croplands that were reforested and enrolled in the Wetlands Reserve Program (WRP), and mature bottomland hardwood forest. Findings include a comparison of metrics measured for several ecosystem services provided by bottomland hardwood wetlands, including regulating greenhouse gases (carbon sequestered in soil and vegetation), supporting suitable fish and wildlife habitat (migratory neotropical migrants, waterfowl, and amphibians), regulating storm water runoff and floodwater (flood compatibility of land enrolled in WRP) and regulating pollutants (denitrification potential; sediment reduction). The report is available online at <http://www.nrcs.usda.gov/technical/NRI/ceap/MAVreport.pdf>.

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 make informed conservation choices.

The three principal components of CEAP—the national assessments, 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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