



# Science-Based Natural Resource Protection and Restoration via Conservation Practices in Minnesota

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## Purpose and Development of Conservation Practice Standards

Conservation practices on private working lands focus on protection and restoration of soil, water, air, plant and animal resources. Key objectives of many conservation practices are erosion control, water quality protection, soil quality protection and wildlife habitat enhancement.

The State Cost-Share Program utilizes **conservation practice standards** developed by the USDA Natural Resources Conservation Service (NRCS) to ensure effectiveness and reasonable maintenance requirements of these practices. These conservation practice standards are available electronically via the NRCS Field Office Technical Guide (FOTG) (<http://www.nrcs.usda.gov/technical/efotg/>). National standards can be tailored by NRCS state offices -- in cooperation with state and local partners -- to fit unique natural resource concerns, state laws and local ordinances. Interim practice standards can be developed at the state level, subject to national approval, to address natural resource concerns for which national standards do not yet exist. Interim standards serve as a mechanism for field testing new conservation practices and technologies.

Conservation practice standards are reviewed and updated on approximately a 5-year cycle. Technical specialists at the Board of Water and Soil Resources (BWSR) and Soil and Water Conservation Districts (SWCDs) in Minnesota participate with the NRCS in developing and updating conservation practice standards. If a significant failure of a conservation practice occurs, an ad hoc team with applicable expertise is assigned to investigate and report on the failure. These investigations contribute to revision of the applicable conservation practice standard or other technical guidance, as appropriate.

## Scientific Basis for Conservation Practice Standards

The following key research and extension organizations support the development and periodic updating of conservation practice standards:

- Agricultural Research Service (ARS)
- Cooperative State Research, Education and Extension Service (CSREES), which includes the University of Minnesota

The NRCS also involves numerous scientists in the development of conservation practice standards and other technical references through its Science and Technology Consortium, including:

- Technical specialists in 6 NRCS National Headquarters Divisions (Resources Inventory and Assessment, Resource Economics and Social Sciences, Soil Survey, Animal Husbandry and Clean Water, Conservation Engineering, and Ecological Sciences)
- 8 NRCS National Technical Centers (with various categories of expertise)
- 3 National Technology Support Centers (East, Central, West)
- 13 Cooperating Scientists

The Science and Technology Consortium includes scientists from a wide range of disciplines related to the conservation of natural resources, including soil scientists, engineers, agronomists, foresters, economists, sociologists and cultural resource specialists.

## Conservation Practice Outcomes Measurement

Historically, outcomes and effectiveness of conservation practices have been measured through relatively uncomplicated units, including numbers of practices installed, length of practices installed (such as terraces and grassed waterways), tons of soil saved, acres of land treated, and acres of habitat created or enhanced. Since 2003, BWSR and SWCDs have been documenting and measuring conservation practice outcomes via the BWSR eLINK database and associated pollution reduction calculators for erosion control and nutrient loss control.

Currently, there are various efforts to use developing technologies such as Geographic Information Systems and new correlations to water quality monitoring, vegetation monitoring and applicable databases to better define outcomes of conservation practices for multiple purposes. Many variables affect water quality and biota within watersheds, including both natural and human variables. Therefore, achieving substantial environmental outcomes within a watershed can require significant numbers and types of conservation practices, as well as significant time, to be reflected in representative monitoring data.

In 2003, the USDA began a multi-agency Conservation Effects Assessment Project (CEAP) to provide an enhanced scientific basis for a national assessment of the environmental effects of conservation practices. This project involves the following components:

- **Bibliographies, literature reviews, and a scientific workshop:**  
Establish what is known about the environmental effects of conservation practices at field and watershed scales, and what kinds of research and data collection are needed to better assess conservation practice benefits.
- **14 Agricultural Research Service (ARS) Benchmark Research Watersheds:**  
Long-term, coordinated research across a variety of hydrologic and agronomic settings to improve models for the National Assessment and develop policy planning tools.
- **10 Natural Resources Conservation Service (NRCS) Special Emphasis Watersheds:** Focus on livestock, poultry, irrigation and drainage management.
- **13 Cooperative State Research, Education and Extension Service (CSREES) Watersheds:**  
Evaluate interactions among practices and hydrology on the landscape, factors affecting farmer adoption of practices, and effective outreach.

These watershed projects also involve conservation districts, other local government units, producers, state agencies, drinking water suppliers, agricultural and environmental organizations, and universities.

The CEAP has substantially advanced the science for assessment of environmental effects of conservation practices at the local and watershed scales. Numerous articles and reports from and about the CEAP were published in the November/December 2008 issue of the Journal of Soil and Water Conservation (<http://www.jswconline.org/content/63/6>) by the Soil and Water Conservation Society. The CEAP is ongoing at this time.