



Introduction

Conservation Practice Physical Effects

Planning the soil, water, air, plant and animal resources and their interrelationships has increased the complexity of assisting decisionmakers. NRCS can no longer provide alternatives and assistance that address individual problems without being aware of the effects on all natural resources in the conservation planning unit.

As a technical agency, NRCS must constantly strive to improve methods to evaluate the potential effects of conservation practices on natural resources when providing technical assistance. It is necessary to determine the physical effects relevant to each resource during the planning process for several reasons:

- A conservation practice which has a positive effect on one resource problem may have a different effect on other resources.
- One conservation practice may not completely solve all problems, thus, consideration must be given to the other natural resources concerns present.
- When trying to meet all natural resource concerns within the conservation planning unit, the cumulative effects of various conservation practices need to be assessed.

Purpose

The purpose of Section V is twofold:

A) To provide a repository of data on the effects of conservation activities. Such data are an important part of technical reference material used by NRCS and decisionmakers in planning conservation actions. NRCS determines the effects of conservation treatments in order to help formulate and facilitate the identification of suitable conservation management systems to protect the resource base and to address the decisionmaker's and NRCS's environmental, social, cultural and economic objectives.

B) To serve as a source of appropriate procedures and methods for collecting, analyzing and displaying conservation effects data.

Conservation effects information will typically include the resource setting (i.e., soil, slope, ecological site, etc.), the conservation practices applied, and the kinds, amounts and timing of actions undertaken by decisionmakers. Also included should be the expected outcome in terms of solving resource problems and meeting social, cultural and economic objectives.



The effects of conservation may be expressed in either narrative terms that represent factual data based on experience, or the expected results of the specified conservation treatment as applied to the resource setting. For example, typical effects could be a soybean yield of 40 bushels per acre; an erosion rate of 4 tons per acre; irrigation efficiency of 60 percent; or “a significant reduction in ephemeral gully erosion will occur with this treatment.”

To the extent possible, conservation effects information will include conservation treatments on all five resources (soil, water, air, plants and animals), and their considerations as described under the Quality Criteria located in Section III. Examples of effects of conservation treatment on natural resources include but are not limited to:

- Expected effect on sheet and rill, wind or ephemeral gully erosion.
- Indicators or measures of soil conditions, such as tilth, compaction and infiltration.
- Where applicable, indicators of soil deposition.
- Measures or indicators of effects on quality and quantity of surface or subsurface waters, such as chemical runoff as influenced by the conservation system.
- Effects on plant conditions and management, such as expected status of range conditions with the indicated rangeland conservation practices.
- Measures of conservation effects on wild and domestic animals, including animal waste uses and effects on the resource base.
- Indicators of effects on air, such as airborne particles, odors and chemical drift.

Effects information will also include management, social, cultural and economic information. Factors such as cost, client acceptability and physical changes to cultural resource sites associated with the specific conservation treatment component are to be identified. Included for example would be:

- Tillage requirements, labor inputs, quantity and costs of inputs, net economic returns, expected yields, risk management requirements, operation and maintenance requirements, time requirements, presence of cultural resources, expected length of practice life, health and safety issues, aesthetic values, and community effects.



Information developed on conservation effects will vary significantly in scope and detail depending on the resource conditions in the local area as well as upon the needs for technical reference materials to carry out conservation activities in that location.

The effects of conservation planning are displayed in subjective detail in the conservation plan and are based on experience and available technical information. Each natural resource may have multiple problems associated with it. The effects of practices may be greater if they are associated with a land use change. On-site effects of practices are generally greater than off-site, i.e., the further away from the problem or treatment the less significant the effect.

The key question that should be asked when reviewing conservation effects is, “If this practice is applied, what effect will it have not only on the target problem, but also on all other resource problems?”

CPPE - Matrix

The CPPE matrix summarizes each conservation practice’s effects on specific natural resource concerns. The major effects of a single conservation practice on resource problems are identified. The purpose of the CPPE matrix is to help the planner develop and maintain a strong awareness of the effects of conservation practices on each of the five natural resources.

Both short and long term effects were identified in the CPPE matrix. Short term (ST) is defined as the “implementation period” of the conservation practice and long term (LT) as the “useful life” of the practice.

The conservation effect may be classified in one of the following forms, followed by additional information for clarity:

<u>Effect</u>	<u>Definition</u>	<u>Direction of Effect</u>
N/A	Not Applicable	N/A
Facilitating	Supports other Practices	+
Insignificant	No Measurable Change	0
Situational	Depends on Application	+/-
Slight	Minor Change	+ 1 Decrease, or - 1 Increase
Moderate	Meaningful Change	+ 2 Decrease, or - 2 Increase
Significant	Considerable Change	+ 3 Decrease, or - 3 Increase

A decrease (+) or increase (-) in the problem indicates the effect the installed practice has on the resource problem. For example, a practice may *moderately decrease* (+2) an erosion problem and *slightly increase* (-1) a water quality problem. The period and magnitude of the conservation effect are all identified in the CPPE matrix.



The CPPE matrix compares all NRCS conservation practices with natural resource concerns, thus yielding an anticipated effect for each concern. Resource concerns are listed across the top columns and conservation practices are listed down the rows of the matrix. The effect the conservation practice has on the resource problem is located at the intersection of each column and row.

When using the CPPE matrix you must assume, 1) the practice is being installed according to standards in Section IV, 2) there is a current resource concern, and 3) the resource concern can be addressed by the installation of the conservation practice. The matrix provides broad, general effects that can be expected from the application of the conservation practice.

The effects shown in the matrices in Section V may need to be adjusted locally to reflect site specific conditions for a given practice. Use the following guidelines when developing Site- Specific Practice Effects (SSPE):

- Evaluate each practice for the effect it will have on the area being planned, i.e., a field or a conservation management unit (CMU), and not the effect on the immediate area surrounding installation.
- Assume all practices will be installed according to practice standards in Section IV of the FOTG.
- Do not "reach" for effects. Not all practices have an effect on all possible concerns associated with each resource.
- The CPPE matrix assumes that the practice is not part of a conservation system and that each practice is applied independently of others.
- Assume that the practice being evaluated is not presently being applied.
- Practices are evaluated based on fields or CMUs that result from planning decisions.
- When a land use change is considered, evaluate practices needed to change the land use against the present condition(s). Evaluate practices necessary to manage the new land use against expected future conditions.

The planner needs to recognize the effect of applying conservation practices in order to select combinations of practices that solve the identified or predicted resource concern without creating new problems. In addition, secondary benefits should be identified. The effects concept is applicable for formulation and evaluation of Resource Management System (RMS) options for specific fields, or CMU's, or other planning areas.