



Introduction

Conservation Practice Physical Effects

Planning for 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 management unit (CMU).

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 CMU, 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 CMUs 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 information.

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.

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.

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 concerns 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. The Florida CPPE matrix is maintained in SmarTech at the following web address: <https://smartech.sc.egov.usda.gov/cppe.aspx>. When the SmarTech site comes up Florida is selected as the state and a Resource Concern Category is selected. Then click the Go button to access the matrix for the selected category.

The screenshot shows the SmarTech web application interface. At the top, there is a navigation bar with the USDA logo and the text "United States Department of Agriculture Natural Resources Conservation Service". Below this is a breadcrumb trail: "You are here: Home / Conservation Practice Physical Effects". The main heading is "Conservation Practice Physical Effects for Florida". Below the heading, there are dropdown menus for "State: Florida" and "Resource Concern Category: Air Quality", followed by a "Go" button. There are also "Save" and "Export" buttons. The main content is a table with the following structure:

Resource Concern	Access Road (560)	Agrichemical Mixing Facility (702)	Alley Cropping (311)	Amendments for the Treatment of Agricultural Waste (591)	Anaerobic Digester, Ambient Temperature (365)	Anaerobic Digester, Controlled Temperature (366)	Animal Mortality Facility (316)	Animal Trails and Walkways (575)	Anionic Polyacrylamide (PAM) Erosion Control (450)
Adverse Air Temperature	0	0	2	0	0	0	0	0	0
Ammonia (NH3)	0	0	0	4	3	3	2	0	0
Chemical Drift	0	3	0	1	0	0	0	0	0
Excessive Greenhouse Gas - CH4 (methane)	0	0	0	4	3	3	2	0	0
Excessive Greenhouse Gas - CO2 (carbon dioxide)	0	0	2	0	-1	-1	-1	0	0
Excessive Greenhouse Gas - N2O (nitrous oxide)	1	1	0	3	1	1	1	0	0
Excessive Ozone	0	0	2	0	0	0	0	0	0
Objectionable Odors	0	0	0	3	4	4	4	-1	0
Particulate matter less than 10 micrometers in diameter (PM 10)	-2	0	2	0	0	0	0	0	3
Particulate matter less than 2.5 micrometers in diameter (PM 2.5)	-2	0	2	0	0	0	0	0	3
Reduced Visibility	-1	0	0	0	0	0	0	0	3
Undesirable Air Movement	0	0	1	0	0	0	0	0	0

The CPPE matrix compares all NRCS conservation practices with each of the nationally recognized natural resource concerns, thus yielding an anticipated effect for each concern. Resource concerns are listed in rows on the left side and conservation practices are listed across the top columns of the matrix. The effect the conservation practice has on the resource concern is located at the intersection of each column and row. The matrix can be exported to an Excel file by clicking the Export button and then either opening the excel file and printing the matrix or it can be saved. If the file is saved it will be called RenderExcel and the user may want to rename it to the resource concern category that it was developed for.



The values in the SmarTech CPPE are single numbers and range between + 5 and a - 5. See the table below for a definition of these values. Short term effects are not rated in the CPPE, but they are still an important aspect of conservation planning, particularly when dealing with engineering or construction-type practices that require temporary ground disturbance.

Definition of Value	Value in SmarTech CPPE
Substantial Decrease	+5
Moderate to Substantial Decrease	+4
Moderate Decrease	+3
Slight to Substantial Decrease	+3
Slight to Moderate Decrease	+2
Slight Decrease	+1
Not Applicable	0
No Effect	0
Slight Increase	-1
Slight to Moderate Increase	-2
Moderate Increase	-3
Slight to Substantial Increase	-3
Moderate to Substantial Increase	-4
Substantial Increase	-5

A decrease (+) or increase (-) in the concern indicates the effect the installed practice has on the resource concern. For example, a practice may *moderately decrease* (+3) an erosion concern and *slightly increase* (-1) a water quality concern.

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 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 concerns. 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.