United States Department of Agriculture

Natural Resources Conservation Service

National Planning Procedures Handbook (NPPH), Amendment 4

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Part 600.0 - Introduction

The purpose of this handbook is to provide guidance on the planning process the Natural Resources Conservation Service (NRCS) uses to help develop, implement, and evaluate conservation plans for individuals, and areawide conservation plans or assessments for groups.

NRCS provides conservation planning and technical assistance to clients (individuals, groups, and units of government). These clients develop and implement plans to protect, conserve, and enhance natural resources (soil, water, air, plants, and animals) within their social and economic interests.

In 1947, Hugh Hammond Bennett identified the principles of conservation planning in his text, *Elements of Soil Conservation*. According to Bennett, an effective conservation planner must adhere to the following principles:

- Consider the needs and capabilities of each acre within the plan
- Consider the farmer's facilities, machinery, and economic situation
- Incorporate the farmer's willingness to try new practices
- Consider the land's relationship to the entire farm, ranch, or watershed
- Ensure the conservationist's presence out on the land

This handbook reaffirms these principles throughout the planning process for all types of land uses.

Planning involves more than considering individual resources. It focuses on the natural systems and ecological processes that sustain the resources. The planner strives to balance natural resource issues with economic and social needs through the development of resource management systems (RMS).

The conservation planning process helps the planner and client accomplish the following:

- Help protect, conserve, and enhance natural resources
- Design alternatives that meet local resource quality criteria for identified resource issues
- Include the consideration of human concerns toward achieving sustainable agriculture
- Consider the effects of planned actions on interrelated geographical areas (i.e., looking off-site, beyond the planning unit boundary)
- Consider and explain the interaction between biological communities and society
- Focus on ecological principles
- Consider the effects and interactions of planned systems and practices on the natural resources, as well as economic and social considerations
- Assist with development of plans, regardless of scale, which will help achieve the client's and society's objectives
- Identify where knowledge, science, and technology need to be advanced

The planning process is used to assist clients in developing conservation plans for individuals, or areawide conservation plans or assessments for groups within watersheds or other defined areas. The process thus establishes a framework for planning and applying conservation systems on individual land units, as well as multiple ownerships. It also provides opportunities for input by stakeholders during development of areawide conservation plans or assessments.

Planning is complex and dynamic. Successful planning requires not only a high level of knowledge, skills, and abilities on the part of the planner, but also the exercise of professional judgment.

To gain or maintain the knowledge, skills, and abilities needed, this handbook can be used as a training tool by less experienced planners and as a reference tool by experienced planners.

The users of this handbook also need to become familiar with NRCS planning policy (General Manual 180, Part 409), program manuals, discipline manuals (agronomy, biology, economics, engineering, range, etc.), the Field Office Technical Guide (FOTG), and approved automated planning tools. In addition, users need to be thoroughly familiar with NRCS policy for complying with the National Environmental Policy Act (NEPA) and related environmental concerns (General Manual 190, Part 410).

Part 600.1 Framework for Planning

Subpart A

600.10 Overview of Conservation Planning

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Part 600.1 - Framework for Planning

600.10 - Overview of Conservation Planning

This section provides an overview of the process NRCS uses to assist clients (individuals, groups, and units of government) in developing, implementing, and evaluating conservation plans on agricultural lands, urban areas, or other land uses. The process is used regardless of the expected outcome, scope, size of the planning area, complexity of natural resource problems and opportunities, or source of funding to be used for implementation.

Conservation planning is a natural resource problem solving and management process. The process integrates economic, social (cultural resources are included with social), and ecological considerations to meet private and public needs. This approach, which emphasizes desired future conditions, helps improve natural resource management, minimize conflict, and address problems and opportunities.

The success of conservation planning and implementation depends on the voluntary participation of clients. While participation is voluntary, NRCS personnel must carry out outreach activities to reach underserved customers, such as minority, and small producers with limited resources, to ensure that services are offered to them on an equal basis with traditional customers. It is imperative that all customers be treated fairly and equitably, with dignity and respect.

The planning process used by NRCS is based on the premise that clients will make and implement sound decisions if they understand their resources, natural resource problems and opportunities, and the effects of their decisions.

Conservation planning helps clients, conservationists, and others view the environment as a living system of which humans are an integral part. Conservation planning enables clients and planners to analyze and work with complex natural processes in definable and measurable terms.

The conservation planning process, as described in this handbook, consists of nine steps divided into three phases. It is a process that considers people and the resources they use or manage. Conservation planning is based on a desired future condition that is developed by the client for an individual conservation plan, or by the client and stakeholders, in the case of an areawide conservation plan or assessment encompassing a watershed or other defined area.

To provide conservation planning direction and help ensure a balance of natural resource issues with economic and social needs, NRCS employees will work with conservation districts to establish objectives that reflect current resource issues in the district. The process should include meetings with stakeholders interested in resource issues. These objectives will help define some desired future condition of these resources in terms of what the local people want. To supplement data from other agencies or groups, the district and NRCS should rely on local knowledge, specific discipline input, and existing public information that relates to the local area. This public information can help identify other resource issues or human considerations that have not previously been a focus of interest in the area.

Once this data and objectives are collected and analyzed, and decisions are made, the information may be incorporated into the conservation district's long range plan or other plan as appropriate. As

areawide conservation plans or assessments are developed, they should be reviewed, and if additional objectives are defined for specific portions of the district, the long range plan or other plans should be updated. These objectives are then integrated with the FOTG and can form the basis for developing additional technical guidance material. This is accomplished by ensuring that:

- New or existing quality criteria support identified objectives.
- Guidance documents reflect local resource issues.
- Management systems in the FOTG, Section III, work toward accomplishing the identified human considerations for that area.

As conservation plans are implemented, progress is made toward accomplishing the agreed-upon desired future conditions of the resources and the needs of the people.

The challenge in conservation planning is to balance the short-term demands for production of goods and services with long-term sustainability of a quality environment. Natural resource problems and opportunities are usually expressed in terms of human values. In achieving a desired natural resource condition, human values determine the scope and extent of problems and the associated corrective actions to be taken.

When providing conservation planning assistance, the planner should:

- Recognize the interconnections between the planning unit (1/), larger areas outside of or encompassing the planning unit (e.g. watersheds), and smaller areas within the planning unit (e.g. riparian corridors). For these levels consider (1) the consequences of proposed actions, (2) the cumulative effects of proposed actions and (3) the needs of each level.
- Think of the planning area in terms beyond its administrative, jurisdictional, and geographic boundaries.
- Consider the short-term and long-term effects of actions.
- Consider the client's and society's economic needs and goals.
- Consider all of the client's enterprises and the interactions between them.
- Respect the rights and responsibilities of private landowners.
- Facilitate the creation of a desired future condition that meets individual and societal needs.
- Recognize that human welfare depends on the sustainability of natural resources.
- Base assistance on the best current knowledge, science, and technology.
- Incorporate the knowledge gained from previous planning, implementation, and evaluation efforts.
- Cooperate with others in collecting, assembling, and evaluating data.
- Utilize the resources and expertise of others.
- Identify, prevent, and mitigate, to the greatest extent practicable, disproportionately high and adverse human health or environmental effects of planning assistance on minority and low-income populations.

In summary, conservation planning deals with complete systems, rather than just parts of systems. The expected physical effects of conservation systems and practices are assessed in the context of ecological, economic, and social considerations as documented locally in the FOTG. The expected impacts of those effects on natural resource quality, economic needs, and social objectives are then used to help develop and evaluate management alternatives.

1/ Refer to the NPPH, Subpart G, Glossary for a complete definition of Planning Unit. Also see the Abbreviations and Terms in the Conservation Programs Manual (CPM), Part 502.

600.11 - The Planning Process

Planning areas generally exist in tiers. They encompass smaller planning units, or may be encompassed within a larger planning unit. For example, an areawide conservation plan or assessment encompasses individual enterprises, individual enterprises encompass land units, and land units encompass sub-units. Planning at each level is completed in appropriate degrees of detail, taking into account the objectives of those associated larger and smaller planning areas.

The planning process provides the framework for developing conservation plans on the basis of ecological, economic, social, and policy considerations. Implementation of these plans may then be facilitated by utilizing technical, educational, and financial assistance programs from NRCS or other sources.

The same planning process is used to develop conservation plans and areawide conservation plans or assessments, but different activities are required to complete each step of the process. Guidance in this handbook is separated accordingly into conservation planning and areawide conservation planning. *On-site visits with the client are an integral part of the planning process.*

Conservation plans are normally developed with an individual decision-maker. An areawide conservation plan or assessment reflects the desired future conditions developed in conjunction with the client and other stakeholders in the area. The stakeholders may, or more likely may not, be decision-makers for implementing planned activities.

The planning process used by NRCS is a three-phase, nine-step process. Although the nine steps are shown in sequence, the process is very dynamic. The process could start with any of the first three steps or even step nine. Cycling back to previous steps is often necessary. For example, step one and two may not be finalized until step four is completed. Also some planning activities may overlap planning steps, and some activities may not necessarily occur in a particular planning step each time.

Phase I - Collection and Analysis (Understanding the Problems and Opportunities)

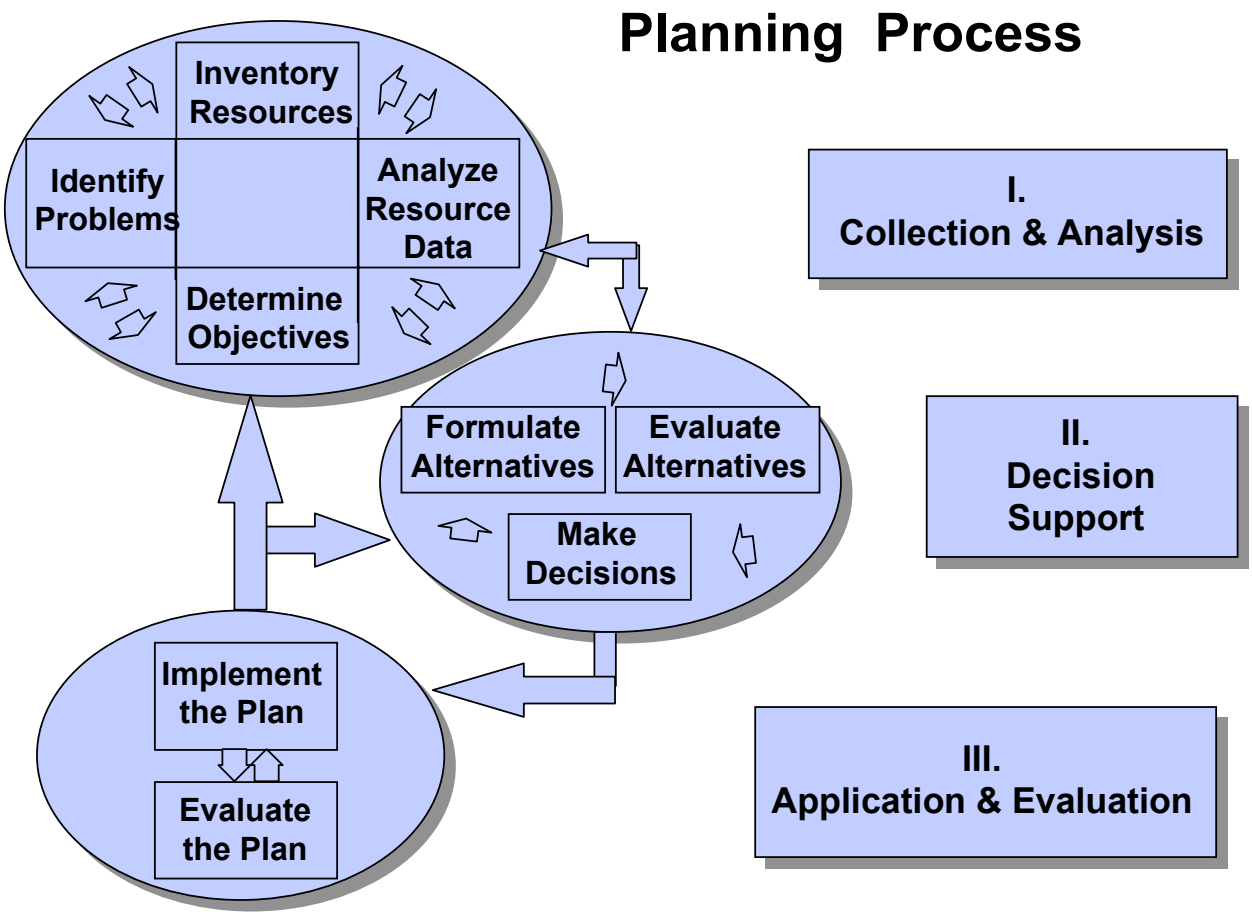
1. Identify Problems and Opportunities
2. Determine Objectives
3. Inventory Resources
4. Analyze Resource Data

Phase II - Decision Support (Understanding the Solutions)

5. Formulate Alternatives
6. Evaluate Alternatives
7. Make Decisions

Phase III - Application and Evaluation (Understanding the Results)

8. Implement the Plan
9. Evaluate the Plan



An illustration of the dynamic nature of the planning process.

The guidance in this handbook is focused on resource management system planning. However, programs exist, such as the Food Security Act of 1985, as amended, or may be legislated, that define other levels of planning for specific resource issues.

(a) Resource Management System (RMS)

A resource management system is a combination of conservation practices and resource management, identified by land or water uses, for the treatment of all resource concerns for soil, water, air, plants, and animals that meets or exceeds the quality criteria in the Field Office Technical Guide (FOTG) for resource sustainability.

Quality criteria for RMS's (see NPPH, Subpart D, Section 600.43) are approved by the state conservationist and located in the FOTG, Section III. The NRCS Objective in the conservation planning process is to help each client attain a Resource Management System.

(b) Conservation Management Unit (CMU)

Conservation planning on a specific farm, ranch, or other entity is done on a land unit basis using natural resource information to guide the client and planner. Land units in the same planning area may have similar soils and other natural resource conditions that require similar management systems and strategies. These land units can be aggregated for planning purposes. These aggregations are referred to as Conservation Management Units (CMU's). This concept, when correctly applied, improves efficiency in planning and generally simplifies the process. The CMU concept can be used in development of individual conservation plans as well as areawide conservation plans.

(c) Conservation Plan

Conservation plans are voluntary, site-specific, comprehensive, and action oriented. A conservation plan contains natural resource information and a record of decisions made by the client. It describes the schedule of operations and activities needed to solve identified natural resource problems and take advantage of opportunities. Using the planning process to develop conservation plans helps ensure that the needs of the client and the resources will be met, and that federal, state, and local requirements will be achieved. Conservation plans should include all contiguous and non-contiguous land that is a part of the client's enterprise, including owned and rented land.

A conservation plan may also be developed for a group where two or more decision-makers need assistance on planning, installing, and maintaining a conservation system crossing their land unit boundaries. The land units involved in a conservation plan of this type are generally owned or directly controlled by the individuals involved. The group serves as the decision-maker (client). For example, solving problems associated with a stream that flows through several properties requires the coordinated, cooperative efforts of all of the individuals involved.

All natural resource problems and opportunities should be addressed during the planning process. They include those identified by the client, those identified through the inventory process, those affected by existing regulatory and program requirements, and, based on the desires of the client, those which would help meet natural resource objectives of an areawide conservation plan where one exists.

The NRCS objective in conservation planning is to help the client achieve sound use and management of soil, water, air, plant, and animal resources to prevent their degradation, and assure their sustained use and productivity, while considering economic and social needs. Planning to an RMS level is necessary to meet sustained use of the resources.

(d) Areawide Conservation Plan or Areawide Conservation Assessment

Areawide conservation plans are voluntary, comprehensive plans for a watershed or other large geographic area. Areawide conservation plan development considers all natural resources in the planning area as well as social and economic considerations. Plan development follows the established planning process to assist local people, through a voluntary locally led effort, to assess their natural resource conditions and needs; set goals; identify programs and other resources to solve those needs; develop proposals and recommendations to do so; implement solutions; and measure their success. A locally led

effort should consider all federal, state, and local conservation programs, and private sector programs, singly and in combination, as tools to solve natural resource concerns.

Areawide conservation plans or assessments may be developed with informal or formal groups. These groups can include any combination of the following - landowners or operators with agricultural land uses, urban landowners, homeowner associations, agencies, groups, various entities, conservation clubs, schools, or any combination of these or other individuals or organizations. In an informal group, the group is generally the decision-maker if they have the authority to make decisions and implement the plan. The decision-maker in a formal group, such as an irrigation district or a watershed district, is generally a board of elected or appointed officials who have responsibility under law for developing and implementing areawide conservation plans.

Where an areawide conservation planning effort is underway without a decision-maker, the planning process can only proceed through planning step six. In that case, the product is an areawide conservation assessment, not an areawide conservation plan. A decision-maker is an individual, group, unit of government, or other entity that has the authority to make decisions and implement the plan.

NRCS may serve as the planner for areawide conservation plans or assessments, or may at other times primarily provide resource information.

The goal in an areawide conservation planning effort is to develop and implement an areawide conservation plan. Throughout the rest of this handbook, the term “areawide conservation plan” is used for that purpose, however, where an authorized decision-maker is not available, the product through planning step six is an areawide conservation assessment.

(e) Comprehensive Plans with a Unit of Government

Comprehensive plans, developed by a unit of government that has jurisdiction over an area, generally contain natural resource components. The decision-maker is a board of elected or appointed officials who may have professional planning staff assistance.

The plan may result in one or more ordinances that are implemented by the owners of land within the jurisdiction of the unit of government. An example might be a county plan for protection of open space in selected areas of the county.

NRCS usually does not serve as the planner on these types of plans. NRCS primarily provides resource information and related technical data to the unit of government, or to a professional planner, who use their own planning process.

(f) Progressive Planning

The planning process is progressive when a client is ready, willing, and able to make and implement some, but not all, of the decisions necessary to achieve an RMS level of management. When this occurs, and the client shows interest, planning and implementation should continue on a progressive basis following the planning process.

Conservation decisions will be documented in either hard copy or electronic format in the case file. Future assistance will be directed toward planning at an RMS level on the entire planning unit. The rate of progress depends on the client's objectives and ability to make and implement conservation decisions, based on the resource, economic, social, and policy issues the client is dealing with.

NRCS responsibility is to provide the client with, as a minimum, comparisons of the resource impacts between an RMS system and the benchmark (present) condition, as well as a comparison between the system chosen by the decision-maker and the benchmark condition. This provides the decision-maker with a comparison of the difference in projected impacts between the RMS system and the system chosen. The effects of changes made to a land unit must be evaluated against the anticipated effects of those changes on resources beyond the land unit, CMU, or property boundary. Information on these effects will be provided to the client.

(g) National Environmental Policy Act (NEPA)

All NRCS planning activities will be conducted in compliance with NEPA. See NPPH, Subpart D, Section 600.45 for more information on NEPA. NPPH, Subpart D, Section 600.47 provides recommended sources for additional planning process support guidance to assist planners in incorporating NEPA and other requirements into the planning process. NRCS policy for compliance with NEPA is located in the General Manual 190, Part 410 - Compliance with NEPA.

NEPA will be incorporated into all steps and activities of the planning process and should not be considered as a separate process or requirement. The level of NEPA documentation will depend on findings during the scoping process or the environmental evaluation. Environmental Evaluations (See NPPH, Subpart G, Exhibit 3), which may lead to an Environmental Assessment or Environmental Impact Statement, will be conducted for all NRCS planning activities and will be used to help determine the level of NEPA documentation required.

Planners should identify the level of NEPA documentation required for each planning activity as early in the planning process as possible, and incorporate activities into each planning step to ensure that information required for NEPA documentation is developed simultaneously with the plan document. An example is a plan being developed where implementation funding is highly likely under the Small Watershed Program, PL-566.

Following the guidance in this handbook will provide much of the information required for NEPA documentation. NEPA documentation may be published as a separate document or incorporated into the plan document. NRCS program manuals may also contain additional NEPA compliance guidance as requirements for specific programs.

(h) Social and Economic Considerations

One of the keys to successful conservation planning and implementation is understanding the behavior of clients and stakeholders. The term *human considerations* refers to the social and economic considerations that are addressed in the planning process. Cultural resources are included in this concept. **Human considerations should be considered early in the planning process since they can help guide the planner on providing the**

information the client needs to make informed decisions. Economic and social issues are important in formulating resource management systems since they are closely linked to human behavior. For a more complete discussion of economic and social topics, and their relationship to client behavior, see NPPH, Subpart D, Section 600.46, Working with Individuals and Groups.

Social considerations include public health and safety, as well as social, family, ethic, ethnic, and religious values. They also include societal goals, client characteristics, risk tolerance or aversion, tenure or time availability, and the presence of cultural resources. The most common cultural resources are sites, buildings, structures, landscapes, and objects that have scientific, historical, aesthetic, religious, or archaeological value.

Differing social or ethnic backgrounds may also effect the adoption of conservation practices. Such differences should be recognized and accounted for early in the planning process. Some groups may have landuse ethics or social customs that conflict with some NRCS conservation practices.

A key social consideration must be the integration of environmental justice considerations into planning considerations.

Economic considerations in planning are closely linked to individual or group behavior. In most cases, planning will include economic goals such as preserving income, minimizing costs, or reducing risk. By understanding the economic goals of decision-makers, planners can identify barriers to, and opportunities associated with, adopting conservation. On-site economic considerations may include operational income and expenses, conservation system costs, credit availability, yield effects, or base acreage impacts. On a larger scale, economic considerations could include water supply costs, flood damage reduction, recreation enhancement, or regional impacts such as job creation or changes in tax revenue.

Social and economic considerations can be evaluated by referring to information in the FOTG Section I (costs), Section III, and Section V (effects information and case studies); reviewing census data; consulting with farm managers, advisors, and other agency experts; modeling; and/or by experience. Cultural resources can be located and assessed with the help of cultural resource coordinators or specialists.

Planners must take steps to ensure that outreach activities are conducted to identify and reach underserved customers, such as minority, and small producers with limited resources. Planners must also be aware that many times traditional outreach activities do not reach the underserved customer. There are a host of personal, social, cultural, and economic barriers that serve as deterrents for underserved customers to come forward and ask for technical assistance for conservation planning and implementation.

Several outreach methods such as on-farm demonstrations, education meetings, increased cost- share rates, one-on-one assistance, involving local leaders, and making technical assistance available have helped to successfully address some of the barriers faced by underserved customers enabling them to participate in conservation planning or implementation.

Additional information may be found in NPPH, Subpart D, Section 600.46, Working With Individuals and Groups.

(i) Confidentiality

Client records are confidential except for those that are subject to the Freedom of Information Act. NRCS policy on the Freedom of Information Act and the Privacy Act are contained in National Instruction 120-310 and General Manual 120, Part 408.

No one outside of NRCS, except those specifically authorized by NRCS, such as certain conservation district employees, will be permitted access to electronic client data.

(j) Coordinated Resource Management (CRM) \1

Coordinated Resource Management is a collaborative, non-adversarial decision-making process. It is an example of one process that can be used for resource planning, problem solving, and conflict resolution and which allows for direct participation of everyone concerned with natural resource management in a given planning area.

CRM is based on the concept that coordinating the use and management of resources results in improving resource management, minimizing conflict, and solving problems. It focuses on resource needs, and is not limited by individual, agency, or political boundaries. A guiding principle of CRM is that those who live, work, and recreate on a given piece of land are the people most interested in and capable of developing plans for its use. They assume ownership of the resulting plan. The CRM process is well suited for developing areawide conservation plans. For more information on this process see the Coordinated Resource Management Guidelines published by the Society for Range Management.

(k) Farm*A*Syst and Home*A*Syst \2

Farm*A*Syst is a voluntary, self-assessment program for farmers and ranchers to evaluate the resource conditions and management on their farm or ranch. Once that assessment is completed the participant can elect to obtain additional information or help and then develop an action plan to address the concerns that surfaced during the assessment.

Home*A*Syst is a voluntary, self-assessment program non-farm residents can use to evaluate their home and property for pollution and health risks. After identifying the risks, and seeking more information as needed, the program motivates residents to develop an action checklist to address the risks and protect their health and financial well-being.

More information about Farm*A*Syst and Home*A*Syst is available from state contacts from NRCS, the Cooperative State Research, Education, and Extension Service, and the Environmental Protection Agency. National web sites are also available at http://www.wisc.edu/ farmasyst and http://www.wisc.edu/homeasyst.

\1, \2 These are examples of other methods or tools that are available to help with planning activities. Additional methods, tools, techniques, etc., are also available for clients to use according to their interests and needs.

600.12 - Planning Directives

Direction for applying the planning process is derived from five major sources.

(a) Policy

NRCS conservation planning policy is detailed in the General Manual 180, Part 409 - Conservation Planning Policy. General Manual 450, Part 401 - Technical Guides, describes NRCS policy for development of technical guides in support of the planning policy.

(b) Procedure

The National Planning Procedures Handbook (NPPH) supports the planning policy by describing the planning process and the how-to guidance used by NRCS to carry out that process.

(c) Technical Guidance

The FOTG contains five sections supporting the technical aspects of conservation planning activities:

I General Resource References
II Natural Resources Information
III Resource Management Systems and Quality Criteria
IV Practice Standards and Specifications
V Conservation Effects

(d) Tools

Conservation planning data may be documented in either hard copy or electronic format as appropriate. Agency approved software and software components will be used when the data is documented electronically.

(e) Program Guidance

Manuals (Program, Resource Conservation and Development, National Food Security Act Manual, etc.) contain policy and guidance for administering programs that can facilitate implementation of planned measures.

600.13 - Preplanning Activities

Preplanning activities are important to set the stage for conservation planning with the client, to ensure that basic information is obtained from the client, and to assemble background information necessary to initiate the planning process.

The activities leading up to planning normally begin in one of three ways: 1) The potential client may contact the conservation district or NRCS to seek assistance on solving identified natural resource problems or opportunities. 2) Conservation district or NRCS personnel may contact a potential client for the purpose of initiating planning activities. 3) Pro-active citizens may contact the conservation district or NRCS for planning assistance to prevent potential problems from occurring or to take advantage of opportunities. Regardless of how the client and the planner are brought together, several items should be addressed before planning activities begin. Preplanning activities include:

- Identifying the principal client or clients that will participate in the planning process and their respective roles. Determine who has decision-making authority for the planning area and identify this person or entity electronically in the case file.
- Explaining the planning process in general terms to the client and the expected benefits of having a conservation plan.
- Explaining to the client the roles and responsibilities of the client and NRCS.
- Explaining the role of the conservation district and the relationship the district program has in making technical assistance available to land users. The district's prescribed procedure for entering into cooperative agreements for providing technical assistance should be followed.
- Defining the planning area on a map.
- Obtaining and preparing needed work maps and plan maps.
- Assembling needed information and data for use in planning. The FOTG is a principal source of reference material pertinent to the field office. A wealth of other information is also normally available. Some reconnaissance and data gathering may be appropriate before the initial planning session is held.
- Identifying tools and supplies that will be needed in the field and have them available for the first field visit.
- Identifying other sources of information or technical assistance that may be available from other agencies, organizations, etc.
- Making a firm commitment with the client for the initial planning session.

Additional preplanning activities specific to an areawide conservation plan include:

- Establishing an interdisciplinary team as appropriate to assist with preplanning activities.
- Obtaining assistance from key individuals in the planning area to identify stakeholders within each user group, including low-income and minorities.
- Inviting all interested or effected agencies, organizations, and interest groups to participate. Broad involvement is the cornerstone to successful areawide conservation planning. Their input is vital to the process. Leaving any of them out may cause problems later in the planning process.

Part 600.2 - NRCS Planning Process

Subpart B

600.20 Planning Steps

600.21 Step 1 - Identify Problems and Opportunities

Conservation Plan
AreaWide Plan

600.22 Step 2 - Determine Objectives

Conservation Plan
AreaWide Plan

600.23 Step 3 - Inventory Resources

Conservation Plan
AreaWide Plan

600.24 Step 4 - Analyze Resource Data

Conservation Plan
AreaWide Plan

600.25 Step 5 - Formulate Alternatives

Conservation Plan
AreaWide Plan

600.26 Step 6 - Evaluate Alternatives

Conservation Plan
AreaWide Plan

600.27 Step 7 - Make Decisions

Conservation Plan
AreaWide Plan

600.28 Step 8 - Implement the Plan

Conservation Plan
AreaWide Plan

600.29 Step 9 - Evaluate the Plan

Conservation Plan
AreaWide Plan

600.2 - NRCS Planning Process

600.20 - Planning Steps

This handbook describes the planning process in detail and provides guidance on carrying out each planning step. However, the process itself must be preceded by preplanning activities (see NPPH, Subpart A, Section 600.13), which can play a critical role in the outcome and effectiveness of plan development. Also, more detailed information on specific aspects of the planning process is provided in NPPH, Subpart D, Section 600.40, Planning Fundamentals.

Phase I - Collection and Analysis

Step 1 - Identify Problems and Opportunities

Identify resource problems, opportunities, and concerns in the planning area.

Step 2 - Determine Objectives

Identify and document the client's objectives.

Step 3 - Inventory Resources

Inventory the natural resources and their condition, and the economic and social considerations related to the resources. This includes on-site and related off-site conditions.

Step 4 - Analyze Resource Data

Analyze the resource information gathered in planning step three to clearly define the natural resource conditions, along with economic and social issues related to the resources. This includes problems and opportunities.

Phase II - Decision Support

Step 5 - Formulate Alternatives

Formulate alternatives that will achieve the client's objectives, solve natural resource problems, and take advantage of opportunities to improve or protect resource conditions.

Step 6 - Evaluate Alternatives

Evaluate the alternatives to determine their effects in addressing the client's objectives and the natural resource problems and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law or Executive Order.

Step 7 - Make Decisions

The client selects the alternative(s) and works with the planner to schedule conservation system and practice implementation. The planner prepares the necessary documentation.

Phase III - Application and Evaluation

Step 8 - Implement the Plan

The client implements the selected alternative(s). The planner provides encouragement to the client for continued implementation.

Step 9 - Evaluate the Plan

Evaluate the effectiveness of the plan as it is implemented and make adjustments as needed.

The next portion of the handbook describes the details for carrying out the nine steps of planning. Each step contains a planning standard, a list of inputs, and a list of products. The planning standard sets the minimum quality level for each step. The inputs provide sources of information to plug into the process, while the products describe the outputs of each step. These lists are not all-inclusive; therefore, planners are encouraged to supplement them as needed.

Also, a detailed description is included of "what" items occur during each planning step along with recommendations on "how" to accomplish the items. These detailed "what and how" discussions are divided into two approaches, one for working with an individual client (conservation plan) and one for working with a group (areawide conservation plan).

600.21 - Step 1 - Identify Problems and Opportunities

(a) Description

On-site visits are required to identify existing, potential, and perceived natural resource problems, opportunities, and concerns in the planning area. This also provides the first opportunity to determine associated problems and opportunities in interrelated planning areas. This step includes identifying the conditions that affect one or more of the resources or human considerations. The identified problems and opportunities guide the remainder of the planning process. Initially, the client and planner may identify only one or two problems. As planning progresses and additional information is gathered, other problems and opportunities may be identified.

(b) General

Problem identification frequently begins the planning process and continues through the resource inventory and data analysis steps. Initial problems and opportunities are identified on-site based on readily available information and discussion with the client. The planner may have additional information available relating to natural resource needs based on information available from the conservation district, or an areawide conservation plan, where one exists. Natural resource, economic, and social factors are considered.

Generally this step will not be finalized until the resource data are analyzed in planning step 4, although additional problems, opportunities, and concerns may be identified throughout the entire planning process.

(c) Planning Standard

The client's resource problems, opportunities, and concerns are identified and documented.

(d) Inputs

- Client input
- The planner's experience and knowledge of the area
- Conservation district long-range plan, annual plan, and priorities
- Locally led assessments
- Areawide conservation plans, where they exist
- Information available from other sources, such as state and federal agencies, universities, or centers of research
- Soil survey
- Discipline manuals and handbooks
- FOTG, Sections I, II, III, and V

(e) Products

- Identification and documentation of problems, opportunities, and concerns in the case file assistance notes
- Communication with the client

Step 1 Activities

Conservation Plan

AreaWide Plan

600.21.1 - Step 1 – Activities – Conservation Plan

WHAT	HOW
1. Complete an initial determination of the client's problems, opportunities, and concerns related to natural resources and human considerations and identify the planning area. (These problems and opportunities will be substantiated and further defined as planning intensifies.)	Obtain the client's statement of problems, concerns, and opportunities. This helps determine the basis for providing future assistance. Record the statement as clearly as possible in the case file in assistance notes. Identify the clients associated with the planning area and their relationship to the business, land, and the planning process (decision making, ownership, and business association). The planner can enter the information into assistance notes.
Note: A natural resource problem by definition is a resource condition that does not meet quality criteria for that resource.	The planner must have at least a general awareness of the kinds of problems that occur within the field office area. Sections I and III of the FOTG and any existing locally led assessments, or areawide conservation plans, or similar plans provide this kind of information. The planner should also keep abreast of agricultural industry trends within the field office area (*e.g.,* historical crop yields, stocking rates, local market prices, production inputs and prices, adopted management techniques, local marketing sources, USDA program requirements and local participation, production practices).
2. Begin recording identified problems, opportunities, and concerns.	Exhibit 1, Checklist of Resource Problems or Conditions, provides a convenient method of recording natural resource problems/opportunities identified by the client and planner. Use of a worksheet similar to this will help the client and planner organize natural resource problems/opportunities into clear, concise statements to be recorded in the case file.

WHAT	HOW
3. Discuss the process involved in conducting an inventory and evaluation of the resources.	This part of planning step 1 sets the stage for helping the client understand the planning area and identify causes of the problems. See planning steps 2, 3, and 4 of the planning process.
4. Compare the general status of the resources with current quality criteria to determine specific resource problems.	Refer to quality criteria filed in the FOTG, Section III. Use the data to complete an initial determination of the kind, amount, and extent of resource problems. Where new resource issues are found that are not covered by existing quality criteria, work with the conservation district to initiate the process for adoption of new quality criteria (see Section 600.10, Overview of Conservation Planning, and Section 600.24 (b), General.
5. Continue problem identification as planning steps 2, 3, and 4 are completed.	Make a complete record of the client's problems, opportunities, and concerns associated with all natural resources as an assistance note. Complete this planning step by utilizing the information obtained from planning step 4 and the established quality criteria to finalize the kind, amount, and extent of resource problems. Update the assistance notes to include information learned in planning step 1.

600.21.2 - Step 1 – Activities – Areawide Conservation Plan

WHAT	HOW
1. Make an initial identification of problems, opportunities, and concerns. This is the beginning of the scoping process. (These problems and opportunities will be substantiated and further defined as planning intensifies.)	The scoping process includes the following steps: • Review the client's request for assistance. • Gather and review existing information. • Request ecological, social, and economic information from other agencies and specific interest groups. • Obtain input from the public, other agencies, and special interest groups. This is best done through one or more public meetings. • Reach agreement with the client on the initial identification of problems, opportunities, and concerns.
2. Establish an interdisciplinary planning team.	The planning team should consist of NRCS and non-NRCS technical specialists who have the expertise to effectively evaluate existing natural and cultural resource conditions and to make recommendations for the resolution of natural resource problems.
3. Complete an initial reconnaissance of the planning area.	Conduct a field investigation of the planning area with the client and key stakeholders. This should be done by the interdisciplinary team. Representatives of other agencies should be encouraged to participate.
4. Develop and establish an areawide conservation planning management structure.	This activity is a transition between preplanning activities and the problem identification planning step. These activities are normally completed concurrently, the exact sequence of events being dictated by local conditions. • Develop and establish an areawide conservation planning management organizational structure (Steering Team, Committee, Alliance, etc.). • Develop a public participation plan. • Review the client's request for assistance. The request can be submitted on behalf of one or more stakeholders and may or may not represent an agreement of all stakeholders. The planning team should verify that broad stakeholder agreement exists to proceed with planning.

WHAT	HOW
	• Obtain input from the stakeholders and the public to complete actions for this activity. This may best be accomplished through one or more public meetings, possibly through the same meeting(s) required to identify the problems, opportunities, and concerns. Controversial issues may best be addressed by a facilitated approach.
5. Continue identification of problems and opportunities as planning steps 2, 3 and 4 are completed.	The interdisciplinary planning team, client, and stakeholders will evaluate the outputs of planning steps 2, 3, and 4 to determine the natural resource problems and opportunities in the planning area that need to be addressed to accomplish the client's objectives. Make a complete record of the client's problems and opportunities associated with all resources in the assistance notes. Client information should also be recorded accordingly.

600.22 - Step 2—Determine Objectives

(a) Description

Determining objectives requires developing an understanding with the client of the desired future conditions for the planning area as compared to the existing conditions. This includes the desired resource uses, resource problem reductions, and on-site and off-site ecological protection. As resources are inventoried, their interactions analyzed, and alternatives formulated, objectives may need to be reviewed and modified.

(b) General

The purpose of this planning step is to determine the client's planning objectives, based on the client's needs and values regarding the use, treatment, and management of the planning area involved.

Use this opportunity to help the client think more broadly about the on-site and off-site problems and opportunities for natural resource protection or enhancement and to consider policy issues such as state and federal laws or mandates.

NRCS will assist the client in making informed decisions that result in the wise use and conservation of resources. Due to the dynamic nature of the planning process, objectives may not be finalized until planning step 4 is completed.

(c) Planning Standard

The client's objectives are clearly stated and documented.

(d) Inputs

- Client input
- Conservation district long-range plan, annual plan, and priorities
- A list of problems, opportunities, and concerns to be analyzed
- Records from previous planning events
- Resource data for the planning area and adjacent areas
  1. Soils information
  2. Resource information as available from partnering organizations
  3. FOTG, Sections I and II
- Documentation of public concerns from locally led assessments, or areawide conservation plans, where they exist

(e) Products

A list of the client's objectives recorded in the case file

Step 2 Activities

Conservation Plan

AreaWide Plan

600.22.1 - Step 2 - Activities - Conservation Plan

WHAT	HOW
1. Reach agreement on the client's expectations for the planning effort.	This includes land uses, problems and opportunities the client wants to address, values the client holds regarding natural resource use and protection, and the client's desires for improving the quality of life. The planner and client should discuss, reach agreement, and document the client's operation in terms of: • Land uses • All farm/ranch enterprises and the interactions between enterprises • Resource conditions • Resource problems, concerns, and opportunities • Production and business goals • Planning horizon (short-term or long-term) • Land control (lease, own, rent) • Farm organization (sole-proprietor, partnership, corporation) • Financial constraints • USDA Farm Program involvement • Managerial skill needed • Legal requirements • Cultural resources • Identified community concerns from locally led assessments or areawide conservation plans, where they exist • Willingness to accept risk Use examples, pictures, and visits to similar planning units to help the client develop an understanding of conservation principles and options available to solve the stated problems. Interpretive information from the FOTG, Section III, can aid in defining the elements listed above. Complete planning steps 1, 3, and 4 to assist the client toward determining natural resource and personal objectives.

2. Determine the extent to which other legal mandates or laws are to be addressed.	After completing planning step 4 and finalizing problems, review those laws or mandates that were assembled in planning step 3 that are beyond the normal scope and legal requirements of NRCS. Objectives may need to be adjusted based on the client's decision.
3. Document the client's objectives.	Document the objectives as they evolve through the planning process.
4. Determine whether the client's objectives are consistent with those of the conservation	When a client's objectives will result in a negative effect on other resources, on-site or off-site, assistance may need to be terminated. NRCS will seek to work with the client through the evaluation of alternatives

district and NRCS.	(planning step 6) in order to provide the client with a level of risk management regarding his or her stated objectives.
5. Determine if NRCS has appropriate technology or resources.	Assess the technology and resources needed for this planning effort and their availability from NRCS. When NRCS does not possess the appropriate technology or resources, work with the client to identify an appropriate agency, group, or other entity to participate as a partner in the planning process.
6. Determine the need to continue the planning process.	Review the stated objectives and available resources. Continue the planning process or put it on hold as appropriate.
7. Determine the next steps and a schedule to complete the planning process.	Work with the client to determine the tasks that need to be accomplished and the timelines for completing the planning process.

600.22.2 - Step 2 - Activities – Areawide Conservation Plan

WHAT	HOW
1. Assist the client in determining the objectives required to realize the desired future condition for the areawide conservation planning area.	Determine the planned use of the resources and the problems that will be addressed by the planning effort. • Review the problems and opportunities identified in planning step 1 with the client. • Discuss opportunities and the ability to address problems, opportunities, and concerns. • Review available resource information with the client. This includes information developed through the remaining steps of the planning process. • Prioritize the problems, opportunities, and concerns. • Solicit input from the stakeholders, at a public meeting, on the desired use of the resources. Include special interest groups, and local, state, and federal agencies in the meeting. (This could be the same meeting described in planning step 1.) • Determine stakeholder attitudes and values. • Consider the goals of individuals and society. • Review with the client and stakeholders the potential uses of the planning area resources. • Ensure that the objectives address areas outside of the planning unit to the extent feasible.
2. Document the objectives.	Record the objectives in the plan.
3. Determine the need to revise, add, eliminate, or change the priority for problems, opportunities, and concerns identified in planning step 1.	Evaluate the objectives to determine if they are compatible with the problems, opportunities, and concerns developed in planning step 1. Review and revise the records in the plan as necessary.
4. Begin developing an action plan.	Determine the tasks that need to be accomplished, assign responsibilities, define procedures, identify inventory methods, define product or output expectations, and agree on time schedules required for the remaining planning steps of the planning process. The action plan is similar to the Plan of Work used in the planning phase of the Small Watershed Program. Refer to the National Watershed Manual for more information.

600.23 - Step 3 - Inventory Resources

(a) Description

Inventory or collect appropriate natural resource, economic, and social information about the planning area and related areas. Use this information to further define existing and potential problems and opportunities, clarify concerns, and to formulate and evaluate alternatives. Gather information as needed concerning the affected resources, the human considerations, and operation and management.

(b) General

A complete inventory (soil, water, air, plants, animals, social and economic) is the vehicle that moves the client and planner to a position of knowledge. Information is needed to understand the present natural resource conditions and potentials, and the human interaction with the environment. A complete inventory provides benchmark conditions that will be used in determining the effects and identifying impacts. The planner and client work together, on-site, to develop a picture of existing conditions, trends, problems, and opportunities. The description of existing conditions, also referred to as benchmark conditions, may include a description of current crops, farming practices, livestock type, and available equipment. Support guidance for inventorying resources is found in NPPH, Subpart D, Section 600.40, Support Guidance for Planning Step 3 - Inventory Resources.

Sufficient information must be gathered during the inventory phase to determine the status of the resources. The actual determination as to whether or not current conditions are acceptable is part of planning step 4.

Review the pertinent local, state, or regional program/legal requirements that could have an impact on current or potential activities of the client. The purpose is to be more proactive in providing relevant information for the client to make decisions. Begin to consider the client's ability and willingness to meet the financial obligations necessary to implement conservation systems.

Obtain information needed to comply with NEPA and other environmental laws, and to satisfy specific state or federal program requirements (*i.e.* state non-point source pollution abatement mandates, USDA farm program eligibility requirements).

(c) Planning Standard

Sufficient data and information are gathered to analyze and understand the natural resource conditions in the planning area.

(d) Inputs

- Knowledgeable residents, for an areawide conservation planning situation
- Stated objectives, and resource problems and opportunities identified
- Aerial photography
- Inventory tools and procedures (see NPPH, Subpart D, Section 600.40)

- State and federal reports and evaluations (*e.g.* soil surveys, highly erodible land determinations, census data).
- Previous resource inventories completed by NRCS or others
- Field observations and measurements
- FOTG resource references, soils information, quality criteria, and practice standards, Sections I, II, III, and IV

(e) Products

- Detailed resource inventories of the planning unit, as well as related off-site information
- Information on human considerations
- Identification of other ecological concerns, such as threatened and endangered species
- Identification of cultural resources
- Land units, locations, determinations, and client/land relationships described
- Identification of infrastructure physical features such as roads, houses, fences, power lines and other utilities
- Identification of how the client manages resources, including kinds, amounts, and timing of management activities
- Benchmark data for the planning area
- Assistance notes for technical services provided to the client

Step 3 Activities

Conservation Plan

AreaWide Plan

600.23.1 - Step 3 -Activities - Conservation Plan

WHAT	HOW
1. Establish the types of inventories and degree of detail needed in the inventory.	Review the objectives developed in planning step 2 as they relate to land uses, production goals, problems, opportunities, and other concerns. Use appropriate inventories for proposed land uses. Tailor the level of inventory detail to the complexity of the resource setting and the identified problems and opportunities, and objectives. An on-site inventory for a conservation plan is likely to be significantly different in scope from an inventory for an areawide conservation plan. Discipline handbooks provide detailed guidance for site-specific kinds of inventories.
2. Collect available information.	Review the conservation district long-range plan, other available plans and information, locally led assessments, any areawide conservation plans that exist, and appropriate FOTG, Section III, guidance documents, to establish a list of potential resource problems and opportunities. The information in the FOTG, Section II, will influence inventories, *i.e.*, Major Land Resource Area boundaries, water quality maps, cultural resource information, right-of-way locations, reference to applicable local or state laws or regulations, and threatened and endangered species. Utilize the resources and expertise of others, as available. Based on experience and observation, identify factors that could hinder plan development and implementation, such as the client's financial constraints, managerial skill levels, or commitment. Develop a list of state and federal mandates that currently affect or could affect existing operations. This list is for use only by the client in making a decision on the scope of the planning effort. The FOTG, Section I, can be used to help develop the list. Use soil survey information and resource data available electronically and/or the FOTG, Section II.
3. Keep the client informed of the planned inventories.	Discuss with the client the purpose and importance of the inventory process. Point out the value that the client's knowledge of the planning unit and associated resources will add to the quality of the inventory and the entire planning process. Emphasize that his or her input is essential. Explain what will be done, and estimate how much time is required to carry out the field activities.

WHAT	HOW
	Respect the client's private property rights by obtaining permission before conducting on-site visits if the client cannot be present during an on-site visit.
4. Conduct the inventory on-site. Include the client in the field inventory activities.	Follow inventory procedures outlined in appropriate discipline handbooks and manuals. Be familiar with the resource inventory methods described in Section 600.40, Support Guidance for Planning Step 3 – Inventory Resources. Use procedures and guidelines available for specific resource inventories, such as the Water Quality Indicators Guide and other assessment tools listed in the FOTG, Section I. Collect the information necessary to describe the benchmark condition (*i.e.*, resources; kinds, amounts, and timing of operations and activities). Where conservation measures or practices exist, determine their effectiveness in meeting current standards.
5. Use natural resources as teaching aids while in the field with the client.	Encourage the client to experience "hands-on" participation in the inventory process by helping with data collection. This provides an opportunity for the client to learn conservation principles. Offer the client the opportunity to conduct actual measurements, such as clipping vegetation, checking soil conditions, boring trees, and recording information.
6. Record the resource inventory data to facilitate analysis in step 4.	Resource records to be completed include, but are not limited to, the following: • Record land units. • Complete location descriptions for the land units. • Update the client/land associations learned in planning steps 1 and 2. • Record utilities, easements, legal constraints, and determinations. • Record soils for each land unit. • Enter the benchmark information, including the benchmark system narrative. Note: The narrative will include a description of the current conditions, crops, soils, major resource problems, etc. Describe existing conservation measures or practices that do, and those that do not, meet NRCS standards as outlined in the FOTG, Section IV. • List existing conservation practices found to meet NRCS standards. These are referred to as benchmark practices. Include estimates of quantities and the approximate application date.

600.23.2 - Step 3 -Activities - Areawide Conservation Plan

WHAT	HOW
1. Establish the types of inventories to conduct and the degree of detail needed in each inventory.	Review the objectives developed in planning step 2. Determine the inventory data needed to characterize historical and current ecological, social, and economic conditions and trends. Include the inventories necessary to help the decisionmaker address the problems, opportunities, and concerns identified for each resource. Tailor the inventory detail to the complexity of the natural resource setting. This can be accomplished by using the scoping process.
2. Develop and distribute an inventory action plan.	Work with the client, key stakeholders, and others that may be involved with the inventory to develop an action plan. Distribute the plan to all persons or agencies responsible for items in the action plan. Make additional copies available for distribution to interested stakeholders and the public as appropriate.
3. Collect available information.	Request any available information from local, state, and federal agencies and special interest groups. Where available, use geospatial processing to help identify, locate, and assemble available resource information. Remote sensing, when possible, can be used to help gather information. Obtain available data that NRCS has developed through soil surveys, river basin studies, and other activities. Obtain information on local, state, or federal laws or regulations that impact actions or activities relating to natural resource management and environmental compliance.
4. Keep the client informed of the planned activities.	Discuss the purpose and importance of the inventory process with the client. Point out the value the client's and stakeholders' knowledge of the planning unit and the associated resources will add to the quality of the inventory and the entire planning process, and that their input is essential. Explain what will be done and estimate how much time will be required to carry out the field activities.

WHAT	HOW
5. Conduct the inventory on-site. Include the client, and others as appropriate, in the field inventory activities.	Follow the inventory procedures as outlined in appropriate discipline handbooks for the proposed land use. The procedures to be used should be recorded in the action plan. Where possible, use the client and personnel from other organizations or agencies to help conduct the inventories. Respect private property rights by obtaining permission before making on-site visits if the property owner or a representative cannot be present during an on-site visit. Request non-NRCS planning participants to adopt this policy. Document the inventory according to NRCS procedures, keeping in mind the needs of the data users.

600.24 - Step 4 - Analyze Resource Data

(a) Description

Study the resource data and clearly define the natural resource conditions, including limitations to their use and potentials. This step provides the information needed to formulate and evaluate alternatives. The analyses should clearly establish the cause and effect relationships and provide information about existing and future conditions.

(b) General

To use the information gathered during the inventory process to full advantage, the planner must interpret the inventory data. Analysis is done to provide insight into natural resource information for the planner and to present that information in a meaningful and understandable form to the client. The format in which information is presented to the client has a significant influence on the decisionmaking process.

For some resources, analysis methods are well established. They are described in corresponding discipline handbooks and manuals. The FOTG, Section I, provides a list of technical references that relate to natural resource analysis. Approved automated analysis tools and reports generated can provide the planner and client with basic inventory analysis data.

Analysis of the natural resource data will help clarify the products from planning steps 1 and 2. When developing an areawide conservation plan or updating a conservation district long-range plan, if it is determined that new objectives will not be addressed by application of existing quality criteria, new localized criteria may be developed and submitted to the State Conservationist for approval. These additional criteria will be based on appropriate scientific guidance, local conditions, and input from partners, as needed.

In both planning steps 1 and 2, it was noted that each of these steps would likely not be completed until planning step 4 is complete, so that all of the appropriate information could be considered in total.

At this point in the planning process there should be agreement on problems, opportunities, and objectives. Upon completion of this planning step, the planning process moves into phase II (if other issues are identified, the planner may need to return to previous planning steps).

(c) Planning Standard

The benchmark condition is documented. Results are displayed in easily understood formats depicting current natural resource conditions, physical characteristics of the planning unit, and comparisons between existing and potential conditions. The causes of the resource problems are identified. An environmental evaluation is documented.

(d) Inputs

- Client's objectives
- Identified problems, opportunities, and concerns

- Resource inventory data
- FOTG, Sections I, II, III and V
- Resource evaluation tools (RUSLE, WEQ, etc.)

(e) Products

- A complete analysis of all resources inventoried
- A clear statement of the benchmark condition of the planning unit and related areas
- Environmental evaluation data
- Cultural resources evaluation data
- Other program and legal evaluations data
- Identification of the causes or conditions that resulted in the resource problems
- A complete definition of problems, opportunities, and concerns (planning step 1 is completed to the extent that the client and planner reach agreement)
- A complete statement of objectives (planning step 2 is completed to the extent that the client and planner reach agreement)
- New quality criteria are established as needed

Step 4 Activities

Conservation Plan

AreaWide Plan

600.24.1 - Step 4 Activities - Conservation Plan

WHAT	HOW
1. Establish the types of analyses to be made.	The client's objectives, resource problems, land and resource uses, and the location of the planning area will help determine the types of analyses to be completed. Select the appropriate effects categories to be evaluated for analysis of each benchmark system. For example: • Identify the resource considerations and determine the best method of calculating resource effects and impacts. The considerations might include soil compaction, concentrated flow, soil contaminants, etc. (see FOTG, Section V). • Use forage suitability groups, ecological site descriptions, and vegetative production information to determine land carrying capacity to assist the producer in establishing initial stocking rates. • Use applicable models to evaluate water quality (see FOTG, Section I). In instances where the kind or extent of resource problems exceeds the expertise or resources of NRCS, the planner should ask an appropriate agency, group, or entity for assistance.
2. Establish scope, intensity, degree of accuracy, and procedures to be used. Discipline specialists may be needed to assist in data analysis.	Review the findings of the cultural resources inventory. For example, the presence of a historic or prehistoric cemetery could result in the need for a more intensive analysis. Recognize cause and effect relationships between planning areas. Identify resource stressors, which are either natural or human induced actions or events, that cause changes in the existing condition of an ecological system. Examples could include encroachment on wetlands by urban land uses, runoff from a feedlot into a body of water, or invasion by an exotic species. Determine their long-term and short-term impacts.

WHAT	HOW
3. Conduct the analysis.	Conduct the effects evaluation of each benchmark system for the planning area. Use procedures in appropriate discipline handbooks or manuals and automated analysis tools (i.e. RUSLE, WEQ, etc.). See Support Guidance for Planning Step 3 – Inventory Resources, Section 600.40. Record the benchmark evaluation effects as the benchmark system level. Effect quantities should be shown in standard units, e.g. tons per acre per year, parts per volume of water, visibility index, yield per acre, etc. The FOTG, Section II, contains interpretive information and response units. Document environmental evaluation data per state and federal guidance. Planners can use Exhibit 3 for documentation, or states can develop a format based on local conditions covering the material in Exhibit 3. This evaluation will help determine the overall level of NEPA documentation required. If a cultural resource site is documented and cannot be avoided, a cultural resource specialist is required to conduct an analysis/evaluation of the site.
4. Compare the results of the analysis with quality criteria, problems, opportunities, and objectives.	Compare the results of the analysis with the quality criteria in the FOTG, Section III, and with the problems, opportunities, and objectives determined in planning steps 1 and 2. Use the data to determine the kind, amount, and extent of existing and potential resource problems. Practices meeting standards, and systems meeting quality criteria, will be addressed in the conservation plan through operation and maintenance. (Note: The required operation and maintenance will be addressed in the conservation system narrative for each conservation system alternative.) Existing practices and systems not meeting quality criteria must be addressed during the formulation of alternatives.
5. Describe and record the effects on the resources.	Describe and record the effects of the benchmark system, including existing practices that meet current NRCS standards.
6. Assemble and display the data in an understandable form.	Place the resource information on maps, if appropriate, showing the location and the extent of the condition. Begin the process of grouping individual land units into conservation management units (CMUs) when more than one land unit has similar natural resource conditions requiring similar management/treatment systems.

600.24.2 - Step 4 Activities - Areawide Conservation Plan

WHAT	HOW
1. Establish the types of analyses to be completed.	Based upon the identified problems, opportunities, and the client's objectives, determine the type of analyses needed. Input from the client, interdisciplinary team, special interest groups, the public, and other agencies is needed.
2. Establish the scope and intensity, degree of accuracy, and procedures to be used.	Consider the planning scope, size of the planning unit, cost, the potential for adverse ecological, economic or social impacts, and the potential for controversy. Agreement by the stakeholders and state and federal agencies is essential. Identify linkages between planning areas and ecological processes. Identify resource stressors, which are either natural or human induced actions or events, that cause changes in the existing condition of an ecological system. Examples could include encroachment on wetlands by urban land uses, runoff from a feedlot into a body of water, or invasion by an exotic species. Determine their long-term and short-term impacts. Determine natural resource/land use changes needed to meet objectives. Identify the structure and functions associated with the planning area by being aware of how natural and human resources are arranged spatially (structure), and by noting those processes that are critical to describing how living and non-living things interact (function). Examples of functional processes include biogeochemical reactions, succession, nutrient cycling, energy flows, production, decay, and disturbance.
3. Conduct the analysis.	Use the procedures in appropriate discipline handbooks or manuals and automated analysis tools (RUSLE, WEQ, etc.). See Support Guidance for Planning Step 3 – Inventory Resources, Section 600.40. The analysis may be conducted by the specialist(s) assigned to the task, or by partnering agencies/groups/entities better equipped to handle the type of analysis to be done. Interdisciplinary, interagency, and partnership input should be obtained whenever needed. Document environmental evaluation data per state and federal guidance. Planners can use Exhibit 3 for documentation or states can develop a format based on local conditions covering the material in exhibit 3. This evaluation will help determine the overall level of NEPA documentation required.
4. Define the existing resource conditions. This helps to clearly define the conditions that prevent clients from realizing	Identify minimum resource conditions needed to establish quality criteria for each natural resource consideration, where this has not already been accomplished in the FOTG. Consider possible indicators to be associated

their objectives.	with the criteria.
5. Document the information in a usable and understandable form.	Use tables, maps, photographs, charts, and narrative, as appropriate, to display and present the information in a usable and understandable manner. Base this on how the information will be used.
6. Determine the need to revise, add, eliminate or change priorities for problems, concerns, opportunities, or objectives from planning steps 1 and 2.	Discuss potential changes with the client and stakeholders based on the analysis of the resource inventory. Review and revise the records as necessary.
7. Initiate the process for development of new quality criteria that are needed to support the objectives as defined by an areawide conservation plan, or conservation district plan.	State NRCS specialists will work with planners and clients to review proposed quality criteria to ensure they reflect achievable goals, are scientifically based, and are linked to appropriate indicators and target values (see Section 600.43, Quality Criteria, Resource Considerations, Indicators, and Target Values).

600.25 - Step 5 - Formulate Alternatives

(a) Description

Develop alternatives that will achieve the objectives of the client, solve the identified problems, take advantage of opportunities, and prevent additional problems from occurring.

A broad range of technically feasible alternatives should be developed with the client. Alternatives may include an appropriate mix of structural measures such as terraces, dams, and waterways; non-structural measures such as crop residue management, livestock exclusion, and flood-proofing; market-based measures such as cost-sharing, easements, and local tax incentives; and institutional measures such as zoning or local regulations, and state and federal laws and regulations.

Include measures that mitigate potential adverse impacts on the resources. Also consider the potential to address regulatory requirements, based on the client's desires and objectives.

(b) General

This planning step begins phase II of the planning process. Revisit earlier steps if new objectives or concerns are identified.

NPPH, Subpart D, Section 600.41, Support Guidance for Planning Step 5 - Formulation of Resource Management Systems (RMS), outlines the thought process the planner should use with the client. The purpose of formulating alternatives is to provide the most effective, efficient, and economical conservation treatments that meet quality criteria and are acceptable to the client in solving problems, addressing opportunities, and meeting the stated objectives. These alternatives relate to identified problems and opportunities and are developed in view of the cultural, social, ecological, and economic conditions of the planning area.

During the alternative formulation process utilize the associated guidance documents developed and located in the local FOTG, Section III.

Include the client in the formulation of alternatives. This allows practical alternative formulation, improves decisionmaking, and enhances the chances of successful implementation. It also helps ensure that low initial cost measures are developed in limited resource situations where costs are a critical issue. For areawide conservation plans, it is essential that stakeholders, the public, special interest groups, and state and federal agencies participate in the development of alternatives.

Develop enough alternatives to provide the client with the opportunity to consider several possibilities.

If incorrect or insufficient data has been assembled for formulating alternatives, the planner needs to return to planning steps 3 and 4 before proceeding.

The planner must have a clear understanding of the problems, including cause and effect relationships. If it is noted that the problem is not clearly identified or defined, return to planning step 4 and review these concerns with the client.

(c) Planning Standard

Alternative treatments are developed to meet quality criteria, the objectives of the client, and in the case of an areawide conservation plan, the objectives of the client in conjunction with the stakeholders.

(d) Inputs

- The client's objectives from planning step 2
- Physical, cultural resource, social, economic, and ecological information pertaining to the planning area and related areas
- List of resource problems, opportunities and concerns, from planning step 1
- Resource data and analysis from planning steps 3 and 4
- FOTG, Sections II, III, IV, and V

(e) Products

A description of the alternatives available to the client

Step 5 Activities

Conservation Plan

AreaWide Plan

600.25.1 - Step 5 Activities - Conservation Plan

WHAT	HOW
1. Establish conservation management units as appropriate.	With the client, group land units into conservation management units. Base the CMUs on similar land uses, management objectives, intensity of management, and treatment needs. NOTE: It is not necessary to separate land units into different CMUs on the basis of a different single practice when land use management objectives and intensity of management are the same.
2. Compare the client's resource concerns with the resource concerns identified in the FOTG, Section III, guidance documents.	Review the RMS quality criteria and guidance documents found in the FOTG, Section III. These guidance documents identify the potential systems and practices for dealing with natural resource problems in the planning area. Compare the resource considerations and objectives of the client with the appropriate guidance documents. Select the guidance document with the resource considerations that most closely approximates those found in the planning area under consideration. When the resource concerns are different and/or the objectives of the client require a system not reflected in the guidance documents, refer to the procedure outlined in Section 600.41, Support Guidance for Planning Step 5 - Formulation of Resource Management Systems (RMS).
3. Build the conservation system alternatives.	This effort is facilitated based on the planner's knowledge of the resource concerns of the area and the types of systems normally used to address those concerns. Select the potential practices and systems available to meet the client's specific needs. The complexity of resource issues or specific responsibility for certain resource issues may require that other agencies be contacted to provide specific technical assistance. Consider the potential to address existing laws or mandates with the proposed system if this is a part of the client's objectives. Compare the expected effects of each alternative to the quality criteria. Where the predicted result from the alternative does not meet quality criteria, modify the alternative or drop it from consideration as an RMS. See Section 600.11 (f), Progressive Planning. When the planning process becomes progressive, document the client's alternative and continue with the development of at least one alternative that reaches an RMS level. Evaluate this alternative in planning step 6 with the client.

WHAT	HOW
	Describe the proposed primary land use for each alternative in terms of both the client's and NRCS's designation. Record as the client's land use the land use agreed upon by the client and planner that provides the client with meaningful information. Complete the conservation system narrative. Identify the problem area addressed, practices needed (this includes existing conservation practices or measures that do not currently meet NRCS standards), and necessary existing practices with needed operation and maintenance to comply with NRCS standards. List the practices and estimated planned amounts for each RMS alternative. These are new conservation practices necessary to meet the planned level of treatment. Existing practices that serve as a component of the planned RMS will be described in the system narrative. Enter an assistance note to capture discussions between the client and planner during the development of alternatives. Note: Scheduling practice implementation is not a part of this planning step or planning step 6. Scheduling practices is included in planning step 7. Complete the conservation system narrative. Identify the problem area addressed, practices needed (this includes existing conservation practices or measures that do not currently meet NRCS standards), and necessary existing practices with needed operation and maintenance to comply with NRCS standards. List the practices and estimated planned amounts for each RMS alternative. These are new conservation practices necessary to meet the planned level of treatment. Existing practices that serve as a component of the planned RMS will be described in the system narrative. Enter an assistance note to capture discussions between the client and planner during the development of alternatives. Note: Scheduling practice implementation is not a part of this planning step or planning step 6. Scheduling practices is included in planning step 7.

600.25.1 - Step 5 Activities - Areawide Conservation Plan

WHAT	HOW
1. Identify conservation systems and other treatments that will address the objectives from planning step 2, and the problems and opportunities from planning step 1. Consider both land treatment (non-structural and structural) and preventive measures.	Obtain input from the public, special interest groups, and local, state, and federal agencies. The information can be obtained from: • Public meetings, Federal Register Notices, and personal contacts with colleagues in other agencies. • Other agencies or groups may be able to provide technical assistance the planner may need and not have available otherwise.
2. Develop alternative plans.	Make a preliminary evaluation of the effects of each system or practice. Formulate scenarios of future conditions if no accelerated action is taken. Group complementary measures that have a positive effect into alternatives. Each alternative should provide results that meet quality criteria.
3. Estimate the costs and effects of each alternative.	Develop conceptual designs and cost estimates. Complete an initial estimate of ecological, social, and economic effects. Establish the acceptability of the alternatives to the client, the public, and state and federal agencies. Check to determine that the alternative is complete (contains all components, including operation and maintenance) to assure that it will function as planned and will produce the desired effects. Include measures needed to mitigate any potential ecological damages. Refer to General Manual 190, Part 410 for guidance. The planner should attempt to avoid the need to mitigate by developing alternatives that avoid ecological damages. Evaluate the risk and uncertainty associated with each alternative.
4. Obtain client input.	Keep the client involved in the process of developing alternatives. Discuss progress made toward alternative development with the client. Involve the stakeholders in identifying and formulating alternatives. For each alternative, evaluate the likelihood of acceptance.
5. Record the alternatives.	Make a record of the alternatives using a format that meets the needs of the client.

600.26 - Step 6 - Evaluate Alternatives

(a) Description

Evaluate the alternatives to determine their effectiveness in addressing the client's problems, opportunities and objectives. Attention must be given to those ecological values protected by law or Executive Order.

(b) General

The purpose of evaluating alternatives is to provide the client with the information needed to make sound decisions. This provides the client further opportunity to be involved in the planning process and maximizes the likelihood of full implementation, including proper operation and maintenance.

During the evaluation of alternatives, careful consideration must be given to social, economic, and ecological resource factors that influence planning. The planner may discover a need to revisit any or all of the previous steps during discussions with the client or during any part of the evaluation.

(c) Planning Standard

The effects of each alternative are evaluated and the impacts are described. The alternatives are compared to benchmark conditions to evaluate their ability to solve problems, meet quality criteria, and meet the client's objectives.

(d) Inputs

- The client's objectives from planning step 2
- FOTG, Sections I, II, III, IV, and V
- List of problems and opportunities developed during planning step 1
- Benchmark data from planning step 4
- List of alternatives from planning step 5
- Environmental and cultural resource evaluations
- Program information and requirements

(e) Products

- A set of practical RMS alternatives that are compatible with client and NRCS objectives
- A record of public participation for areawide conservation planning
- An evaluation, for each alternative, displaying the effects and impacts for the client to consider and use as a basis for decisionmaking for the conservation plan
- Technical assistance notes reflecting discussions between the planner and the client

Step 6 Activities

Conservation Plan

AreaWide Plan

600.26.1 - Step 6 Activities - Conservation Plan

WHAT	HOW
1. Determine the evaluation period.	The length of the client's evaluation period may be determined by the client, practice life, or program criteria. Information collected during the inventory phase, data from the FOTG, Section I, or information from other sources can help identify the evaluation period. In some cases, an individual's evaluation period may differ greatly from the period over which the expected benefits will be realized.
2. Quantify the social, cultural resource, economic, and ecological effects for each alternative.	Evaluate and record the effects. Assistance or guidance is available from technical specialists or appropriate discipline handbooks. Information in the FOTG, models, and other sources can be used. Effect quantities should be shown in standard units (*e.g.* tons per acre per year, parts per volume of water or concentrations, a visibility index, yield per acre, or number per acre). Convert the effects into monetary terms where possible and if desired by the client. At a minimum, the planner should estimate the costs of each alternative. Cost information is available in the FOTG, Section I, from discipline specialists, and other sources. Automated tools are available for quantifying certain resource use problems. To the extent that tools are available and applicable, they should be used to quantify effects on resources. Otherwise, conservation effects will be qualitatively described. If cultural resources are present, the effects will be evaluated according to policy in the General Manual 420, Part 401 and the procedures in 420, Part 601. Where a planner anticipates any situations that may lead to a program, procedure, or activity being implemented that has disproportionately adverse human health or environmental effects on minority or low-income populations (environmental justice not being positively served), obtain state level technical support.
3. Determine the impacts of each alternative.	Compare the effects of each alternative to the benchmark to estimate expected impacts. These impacts may be described in narrative terms, quantified in physical terms, or expressed in monetary terms. Record the impacts for each evaluated effect category. The personal, social, and community background of the client determines which impacts have the most influence on the choice of an alternative. Those background factors may also help determine which impacts have positive or negative values to the client. Values that cannot be quantified may be the most important to the client. Determine the degree to which the client's resource objectives will be met

WHAT	HOW
	by the implementation of each alternative. Least-cost (cost effectiveness) analysis, cost-return analysis, partial budgeting, net present value analysis, break-even analysis, and internal rate of return can be used to estimate the monetary impacts of each alternative.
4. Identify potential sources of financial assistance.	Information on sources of financial assistance, including cost sharing, loans, and grants, may be located in NRCS program manuals, or through state and local agencies or public interest groups. Awareness of these sources can aid the client in making decisions.
5. Present and review the alternatives and their impacts with the client.	Present and review the alternatives in a manner that clearly demonstrates to the client the long-term and short-term economic, social, and ecological impacts. The effects need to be related directly to the client's operation in terms of land, labor, capital, and management. Present the information to the client in formats that meet the needs of the client. Materials may range from a simple narrative comparison to a complex, detailed accounting of the impacts using automated tools. Often a limited amount of detailed information is sufficient. When the planning process is progressive, NRCS will provide and discuss with the client the client's alternative and an RMS level evaluation of effects. This is necessary to ensure that the client is aware of the potential impacts of his or her decisions and to provide him or her with risk management information. Document discussions between the client and planner in assistance notes.

600.26.2 - Step 6 Activities - Areawide Conservation Plan

WHAT	HOW
1. Quantify the effects on the physical resources, where possible, both for the benchmark and each alternative.	Quantification of the effects should be done according to the action plan or as agreed-to by the interdisciplinary team. The level of detail in the evaluation of the effects for each alternative will vary, and become more refined, as needed, in the selection process. The client, stakeholders, other agencies, and interest groups should be included in the quantification process. The following information will also help in the process: • The FOTG, Section V, Conservation Effects, and associated materials, such as references and technical notes, CPPE, Site-Specific Practice Effects worksheets, Resource Management Systems Options worksheets, and case studies. • Research publications, Experiment Station reports, water resource documents. • Simulation models. • Effect quantities should be shown in standard units (*e.g.*, tons per acre per year, parts per volume of water or concentrations, a visibility index, yield per acre, or number per acre).
2. Quantify effects of each alternative on social and economic considerations. Describe, in qualitative terms, effects that cannot be quantified.	Interviews with the client provide insight into the effects of the benchmark and proposed alternatives on human considerations. See Figure 1 in Section 600.40 for a partial listing of economic and social considerations. Consider the consequences of actions on larger and smaller planning areas. If cultural resources are present, an evaluation is conducted according to policy in the General Manual 420, Part 401 and the procedures in 420, Part 601. Where a planner anticipates any situations that may lead to a program, procedure, or activity being implemented that has disproportionately adverse human health or environmental effects on minority or low-income populations (environmental justice not being positively served), obtain state level technical support.
3. Convert effects to monetary terms. Detail is determined by the client's desires. Consider the trade-offs between short-term profit needs and long-term sustainability.	The FOTG, Section I, has data on the costs of commonly used financial information. One typical data base from that source is the "Flat Rate Schedule of Costs." This schedule shows installation, operation and maintenance, and average annual costs over the expected life of common practices.

600.27 - Step 7 - Make Decisions

(a) Description

The client determines which alternative(s) to implement and the planner prepares the necessary documentation. In the case of an areawide conservation plan, public review and comment are obtained, if needed, before a decision is reached. Documentation includes recording the decision and preparing the conservation plan or areawide conservation plan, and NEPA documents.

(b) General

The planner assists the client in selecting conservation treatment alternatives. This planning step involves comparing conservation alternatives and selecting one or more for implementation.

(c) Planning Standard

A resource management system is selected based on the client's clear understanding of the impacts of each alternative. The selected alternative is recorded in the client's plan.

(d) Inputs

- Resource inventory record
- A set of evaluated alternatives
- Conservation effects and impacts information
- FOTG, Section V

(e) Products

- The plan document with the selected alternative, including potential program or implementation opportunities, and operation and maintenance.
- Schedule of conservation system and practice implementation.
- Record of public participation for areawide conservation plans.
- NEPA documentation.
- Revised conservation effects and impacts information.

Step 7 Activities

Conservation Plan

AreaWide Plan

600.27.1 - Step 7 Activities - Conservation Plan

WHAT	HOW
1. Present the alternatives and evaluations.	Review the alternatives and evaluation data from planning step 6 with the client. Discuss the advantages and disadvantages of each alternative, including constraints imposed by law. Point out the beneficial and adverse impacts to aid the client in reaching a decision.
2. The client makes decisions.	If the client chooses one or more of the alternatives, proceed to item 3. If the client chooses to implement only part of an alternative, planning assistance will continue on a progressive basis toward applying alternatives that meet quality criteria. Return to planning step 6 and evaluate the client's selected portion. If the client does not choose one of the alternatives, yet is interested in exploring more options, return to one or more of the previous planning steps.
3. Record the selected alternative(s) and schedule practices.	Complete the following items. • Record the selected alternative(s) as the planned system(s). • Schedule practice application for implementation. • Adjust effects and impacts, if needed. • Record assistance notes reflecting discussions with the client not otherwise captured in the plan development. • Explain the interdependency of certain practices as practice scheduling is completed.
4. After the client selects an alternative to implement, prepare the plan documents.	Prepare the plan documents. General guidance is provided below. However, detailed training and experience are necessary to understand proper sequence and scheduling of conservation practices, operation and maintenance requirements, and other facets of planning. • Prepare the conservation plan map and soil map according to Section 600.30, Plan Format and Content. • Prepare the conservation plan. Selection of a plan format should be based on the needs of the client. • Include appropriate forms and job sheets in the client's copy of the plan.

WHAT	HOW
	• Include an operation and maintenance plan or information. • Refer to specific program requirements as appropriate. • Additional guidance is provided in Section 600.30, Plan Format and Content.
5. Deliver the plan to the client.	Review the plan with client and discuss implementation. Document discussions with the client in assistance notes.
6. Schedule the next follow-up or application assistance.	Establish the date accordingly with the client.

600.27.2 - Step 7 Activities - Areawide Conservation Plan

WHAT	HOW
1. Present the alternatives and evaluations.	Meet with the client and stakeholders. Assist the client in reviewing the information.
2. Provide the opportunity for public response.	Use public meetings, mailings, review of NEPA documents, Federal Register, required notices, and brochures, as appropriate.
3. The client reviews the plan, solicits public input, discusses obligations and responsibilities, and makes decisions.	Provide information on available programs that can be used to implement the plan. Schedule a decisionmaking meeting, as appropriate, if a decision is not made at this time. Return to one or more previous planning steps if no decisions are forthcoming.
4. Prepare the plan documents. See section 600.3, Plan Format and Content, for guidance.	Prepare the plan documents based on the client's decisions. The format of the plan document is determined by the client's needs, as appropriate, and by environmental laws and regulations. Obtain needed plan reviews from the public, other agencies, and special interest groups. Obtain needed approvals, including agreement among the stakeholders.

600.28 - Step 8 - Implement the Plan

(a) Description

Implementing the plan includes providing technical assistance for installing conservation practices and obtaining needed permits, funding, land rights, surveys, final designs, and inspections for structural practices. It also includes the operation, maintenance, and management needed by the client to assure proper functioning of practices following installation.

(b) General

Implementing a plan is the process of carrying out the conservation treatments that make up the planned conservation system(s). Well documented and understood decisions are a prerequisite to application of the plan. The client may be able to implement the plan without additional technical assistance. Generally, additional technical assistance is necessary, and plan revisions are occasionally warranted. Additional information or documentation may be required by an implementation program or funding authority. Thorough planning sets the stage for providing efficient and effective technical assistance.

Most areawide conservation plans require the involvement of numerous disciplines, various NRCS office levels, and sponsoring entities, as well as local, state, and federal agencies.

Implementation includes the design, layout, construction, inspection, management, operation, and maintenance of planned systems and practices. Specific program requirements and deadlines may also be involved and need to be considered when scheduling assistance with the client.

(c) Planning Standard

The client has adequate information and understanding to implement, operate, and maintain the planned conservation systems. Practices implemented with NRCS technical assistance will be installed according to NRCS standards and specifications.

(d) Inputs

- Conservation plan or areawide conservation plan
- Case file data
- Technical studies
- Environmental evaluations and documents
- All necessary permits
- Job sheets
- Conservation practice designs
- Technical assistance
- Program requirements
- FOTG, Section IV

(e) Products

- Conservation practices applied

- Resource management systems applied
- Communication with the clients and stakeholders
- Updated plan document
- Conservation plan revision notes
- Technical assistance notes
- Conservation contract where applicable

Step 8 Activities

Conservation Plan

AreaWide Plan

600.28.1 - Step 8 Activities - Conservation Plan

WHAT	HOW
1. Initiate NRCS assistance to install practices.	A personal contact, letter, telephone call, or cooperating agency referral initiates NRCS assistance to the client.
2. Become familiar with the conservation plan.	Review the client's decisions and assistance notes. Discuss the plan with the person who last serviced the plan, if that person is available.
3. Review the plan with the client. If needed, revise the existing plan or develop a new plan.	Contact the client to schedule an appointment. Reconfirm before the date scheduled. Discuss the implementation schedule, costs, sequence of practice application, and other factors. This helps keep information current relative to progress made toward plan implementation. If a particular planning unit resides within a defined areawide conservation planning area, review the objectives of the larger plan. This activity provides an opportunity to determine if the client's objectives have changed. If a plan revision is required, document the reason in assistance notes. Repeat the planning process, beginning with the appropriate planning step.
4. Complete the field surveys (if not already done) for practice design. Contractors may do survey, design, layout, and final checkout for some practices.	Determine the type and intensity of field data needed for design purposes. Confirm the type of vegetation to be planted and the location of the planting, if needed. Discuss the practices scheduled to be applied and the needed easements, land rights, and permits.
5. Complete practice designs and job sheets.	Review the appropriate practice standards in the FOTG, Section IV. Use available automated tools for engineering practice design: • National (*i.e.* hydrology, open channel hydraulics, and surveying) • State-approved software. Identify the need for area or state office specialist assistance and request it accordingly. Otherwise, have a qualified member of the field office staff complete the design or job sheets. Engineering practices require job approval authority. If cultural resources are present, consult with the NRCS cultural resource coordinator or specialist.

WHAT	HOW
6. Review the designs, job sheets, practice specifications, and estimated costs with the client.	Encourage the client to involve the contractor in the review of designs and specifications. Schedule a time to meet with the client and contractor, if applicable. Discuss the practice specifications and job sheets in detail with the client and the contractor. Discuss permits, easements, and/or land rights, if needed.
7. Stake the treatment area as needed to define the location and extent of the practice or structure.	Refer to discipline handbooks and manuals for procedures. Involve the client and the contractor in the practice layout. Remember that the contractor is not the client. The contractor is responsible to the client, not to NRCS! Make any needed adjustments in practice location, practice extent, and other specifications.
8. Provide application checks as needed.	Some clients may do their own work and may need more detailed assistance than an experienced contractor would need. This may be especially true when dealing with management practices such as residue management or prescribed grazing. Application checks are needed during practice installation, which may extend over two or three years on some management practices. If at any time during practice installation it is determined that NRCS specifications, including safety standards, are not being followed, notify the client orally and in writing as to what corrective action is needed. If corrective action is not taken, NRCS assistance will need to be withdrawn.
9. Conduct a final checkout of the practice.	Make the final checks and record the data. Use the data to make sure that each practice meets standards and specifications. Complete the needed measurements to determine the extent of the practices applied. Example: feet of terraces or acres seeded or planted.
10. Document the completed practice.	Sign and date the appropriate form certifying that the practice meets standards and specifications consistent with the General Manual 450, Part 407. Document, in the case file, the extent of the practice certified and the date the practice was certified. Document only those practices that meet NRCS specifications. Enter the applied amounts of all completed practices in the practice schedule.
11. Review the operation and maintenance requirements with	Explain the need for and the benefits of proper operation and maintenance of the applied conservation practices. Explain that periodic inspections

WHAT	HOW
the client.	are needed to ensure that the structural practices are functioning properly and do not need repair.
12. Schedule follow-up assistance.	Review the planned sequence of practice application. Agree on the application dates with the client and record them in the case file.
13. Document technical assistance notes.	Record in assistance notes all significant activities. Ensure that discussions with the clients and contractors are adequately documented to reflect agreements. Include implementation, maintenance, and follow-up information in assistance notes.

600.28.2 - Step 8 Activities - Areawide Conservation Plan

WHAT	HOW
1. Review the plan with the client and update it to meet current conditions.	Meet with the client to assure that the plan continues to represent current conditions and will achieve the client's objectives. For complex projects an interdisciplinary team may need to be established to work with the client. This activity may result in a plan modification.
2. Develop an implementation strategy.	Work with the client and stakeholders to develop an implementation strategy. The extent of the strategy will depend on the complexity of the plan to be implemented. The strategy should identify who, what, where, when, why, and how as appropriate. Specific items to consider include: • Environmental requirements and documentation • A detailed implementation schedule • Funding programs or authorities • Program or funding requirements, guidance, and procedures • Permits • Agreements (*i.e.* operation and maintenance, project) • Mitigation of lost environmental values • Land rights • Practice design, layout, installation, inspection, and certification • Contracting
	The client decides which programs or funding authorities to pursue. Implementation through a specific program or funding authority will require following the guidelines and procedures for that program or authority. For example, for the Small Watershed Program (PL-566) follow the guidelines in the National Watershed Manual. This may require revisiting previous planning steps to develop more detailed information and documentation to meet program requirements, *e.g.* cost / benefit ratios, etc. Where individual conservation plans will be developed and implemented

WHAT	HOW
	in the planning area to carry out the areawide conservation plan, follow the guidance for developing a conservation plan under planning steps 1 - 9.

600.29 - Step 9 - Evaluate the Plan

(a) Description

Evaluate the effectiveness of the implemented plan to ensure that it is functioning as planned and achieving the objectives; to identify reasons for lack of progress in plan implementation, if applicable; and to obtain information on the results of the applied treatment. Where the actual results differ from those anticipated, provide feedback into the planning process. This could include revision of quality criteria; modification of indicators and target values; changes to current practice standards and specifications; revision of other FOTG data; and modifications to the plan. Also take the opportunity to encourage the client to continue plan implementation.

(b) General

Conservation planning is an ongoing process that continues after the plan has been implemented. Continue contact with the client to evaluate operation and maintenance needs and to determine if management systems and practices are performing properly and meeting the client's and NRCS's objectives. On-site visits are a part of this process.

Technology may be developed through field observation of practices that have been implemented. Every planning area serves as a potential laboratory to help in the continuous process of improving alternative treatments for natural resource problems and concerns, and to take advantage of opportunities. This type of information can also help to focus on research needed.

The process of monitoring, evaluating, and experimenting in order to add to resource management information and modify decisions is known as adaptive management.

The key to successfully evaluating the results of a plan is to take advantage of the synergistic effect of the client, planner, and technical specialists working together as they make observations and record the data. The planner should enlist the help of the technical specialists and non-agency partners, as appropriate.

(c) Planning Standard

The planner maintains contact with the client to determine whether the implementation results are meeting ecological, economic, and social objectives and solving conservation problems in a manner satisfactory to the client and beneficial to the resources. Resource impacts that are different from those predicted are fed back into the FOTG development process (adaptive management).

(d) Inputs

- Copy of the conservation plan or areawide conservation plan
- Results of previous evaluations
- On-site observation and data available from the client
- New or modified objectives or needs of the client
- Appropriate new technology

- FOTG, Sections I, II, III, IV, & V

(e) Products

- O&M reports
- Outline of maintenance needs or other changes
- A decision to update or revise the plan, if needed
- Technical assistance notes indicating the effectiveness of the plan
- Case studies, if appropriate, following the guidance provided in the FOTG, Section V
- Recommendations for changes in practice standards, specifications, or designs
- Recommendations for changes in FOTG materials
- A decision to revise or expand implementation strategies
- Updated conservation plan effects
- Updated CPPE and guidance documents

Step 9 Activities

Conservation Plan

AreaWide Plan

600.29.1 - Step 9 Activities - Conservation Plan

WHAT	HOW
1. Set a date to meet with the client to evaluate the plan.	This may be initiated by the conservation district, the client, or NRCS by means of personal contact, letter, or telephone call.
2. Prepare for follow-up and evaluation with the client.	Review the conservation plan, planning and assistance notes, and the resource concerns for which the system was developed. Discuss the plan with the last person to provide technical assistance, if possible. Confirm the date scheduled with the client.
3. Review and evaluate the plan with the client.	Observe the performance of each applied conservation practice to determine if the practices and management systems are solving the identified problems and meeting ecological, economic, and social objectives. Solicit feedback from the client concerning the effectiveness of applied practices and management systems. Reaffirm basic conservation planning principles. Discuss with the client routine operation and maintenance as well as needed maintenance of damaged or non-functioning practices. Determine the type of technical assistance needed to restore the practice. Encourage the client to make repairs promptly so the function of the practices is not further impaired. Encourage the client to complete any additional planned conservation practices on schedule.
4. Determine if adjustments are needed for management practices or systems.	Compare the actual effects of practices with the planned effects. Consider the effects in terms of ecological, economic, and social factors considered important by the client and NRCS. Determine the actual effects of applied conservation treatment by measurement, judgment, models, and observation. Review the effects on-site and off-site. Where the effects are significantly different than anticipated, submit a summary of the effects to the state conservationist for possible inclusion into the FOTG. Adjust the conservation system evaluations to reflect actual or predicted effects of the system. Determine the client's acceptance of, and satisfaction with, the conservation treatment applied and the technical assistance provided.
5. Evaluate the status of conservation district cooperator	Inform the district governing body of the client's progress in carrying out planning and implementation consistent with district or NRCS program

WHAT	HOW
working arrangements.	objectives, or both. Keep the district informed of any problems.
6. Determine the need for a plan revision, development of a new plan, or cancellation of the plan.	Cancel the plan if the client no longer owns or operates the land included in the conservation plan. If the conservation plan needs revision, or a new plan is needed, repeat planning steps 1 through 7.
7. Update the assistance notes.	Enter assistance notes to capture NRCS/client interaction.
8. Conduct a case study, if appropriate.	Follow the procedures in the FOTG, Section V. Utilize assistance from other agencies, etc., as appropriate.

600.29.2 - Step 9 Activities - Areawide Conservation Plan

WHAT	HOW
1. Establish the objectives of the evaluation. This includes deciding on the use of the results.	Meet with the client to review the case file and program criteria. Make a field trip to the planning area.
2. Develop an action plan to guide the evaluation efforts.	Develop a list of the products needed to complete the evaluation. This should include work to be performed by the client, NRCS, contractors, and other agencies. The complexity of the action plan will vary based on the particular areawide conservation plan and the purposes of the evaluation. Identify NRCS personnel and others who will be involved in the evaluation. As a group, develop the procedures to be used, time required, costs, etc. Identify the sequence in which the jobs must be accomplished. Develop a schedule showing the responsibility and timelines for each action item. Personnel who will be conducting the evaluation must participate in this step. Obtain concurrence and needed approvals of the action plan. Normally, the client and participating agencies should concur.
3. Gather information, complete the analyses, and prepare the appropriate reports.	Follow the procedures outlined in the General Manual, program manuals, technical manuals, or established in the action plan. This must be an interdisciplinary effort.
4. Compare the actual effects and impacts, both within and outside of the planning area, to those anticipated in the plan, and make recommendations.	Review the actual ecological, economic, and social effects and impacts and compare them to those anticipated in the plan and the local FOTG. Where significant differences are noted, work with local and state office staffs, the conservation district, and partners to analyze the results and recommend appropriate changes to the plan and applicable technical material. Keep the client and stakeholders fully informed and involved throughout the evaluation process.

600.3 - Plan Format and Content

Subpart C

600.30 **Introduction**

600.31 **Conservation Plan**

600.32 **Areawide Conservation Plan**

600.3 - Plan Format and Content

600.30 - Introduction

The conservation plan is developed by the client for the client's use to record decisions for natural resource protection, conservation, and enhancement. The NRCS copy of the plan is maintained in hard copy or electronically as appropriate.

Decisions and resource information needed during implementation and maintenance of the plan are recorded. The plan narrative and supporting documents provide guidance for implementation and may serve as a basis for compliance and/or program funding through federal, state, or local financial support initiatives.

Plans are referred to as either conservation plans or areawide conservation plans. A conservation plan generally encompasses all land units that the client either owns or over which he or she has decision-making authority. Areawide conservation plans usually involve large geographic areas with multiple ownerships and a variety of stakeholders.

Plan format and content are somewhat different between the two. The following guidance helps to maintain quality and provide appropriate documentation of a plan. The lists show the suggested items to be given to the client. However, the plan content should be tailored to the client's needs.

600.31 - Conservation Plan

The plan document provided to the client must be a quality document containing meaningful information for the client. It should include the following items:

- A folder, binder, or other means to assemble the contents of the plan.
- A conservation district cooperative agreement, where applicable.
- A soil map with appropriate interpretations, such as land capability groupings, woodland suitability groups, pasture and hayland suitability groups, and other interpretive information regarding suitability for specific land uses.
- Appropriate worksheets developed with the client. The worksheets should include such things as forage inventories, erosion estimates, and cost estimates.
- Available job sheets and other prepared material applicable to the client's specific planned practices.
- Operation and maintenance agreements and procedures. Detailed operation and maintenance procedures, depending on their extent and complexity, may be contained in a separate document, but must be referenced in the conservation plan in conjunction with the conservation system and practices contained in the plan.
- In some cases designs may be included, however, they are generally kept in the office file under the client's name.
- A conservation plan map. At a minimum, each map should include the following:

(a) Title block showing:

- "Conservation Plan Map"
- "Prepared with assistance from USDA - Natural Resources Conservation Service" or from "_____"
- Name of the conservation district, county, and state
- Scale of the map
- Data needed to locate the specific land unit, such as section numbers, etc.
- Date prepared
- North arrow

(b) Body of map with:

- Boundary lines of the planning unit outlined
- Field boundaries
- Land use and acres for each land unit correlating to client land use in the case file
- Appropriate map symbols and a map symbol legend on the map or as an attachment using NRCS map symbols (see the National Map Symbol Handbook, Title 170, Part 601)

(c) Land use designations:

Client-specific land use designations can be used on the plan map as desired.

The NRCS land use designations are:

(1) Crop

Land used primarily for the production of field crops or orchard crops alone or in association with sod crops.

(2) Forest

Land on which the primary vegetation is forest (climax, natural, or introduced plant community) and use is primarily for production of wood products.

(3) Grazed Forest

Forest land that produces understory vegetation that is used for the production of livestock.

(4) Grazed Range

Rangeland that is used primarily for the production of domestic livestock. Includes native plant communities and those seeded to native or introduced species, or naturalized by introduced species, that are ecologically managed using range management principles.

(5) Hay

Land on which perennial plants are managed and harvested for hay. (Annual plants planted for hay, and forage crops in short-term rotation are cropland.)

(6) Headquarters

Land used for dwellings, barns, pens, corrals, or other facilities used in connection with farm and ranch operations.

(7) Mined

Land on which the soil has been disturbed by the mining of minerals.

(8) Native or Naturalized Pasture

Forest land that is used primarily for the production of forage for grazing by livestock rather than for the production of wood products. Overstory trees are removed or managed to promote the native or introduced understory vegetation occurring on the site. This vegetation is managed for its forage value through the use of grazing management principles.

(9) Natural Area

Land or water used for the preservation, protection, and observation of the existing resources, archaeological or historical interpretation, resource interpretation, or for aesthetic value. Some of these may be officially designated by legislation or other authorities.

(10) Pasture

Grazing lands composed of introduced or domesticated native forage species that are used primarily for the production of domestic livestock. They receive periodic renovation and/or

cultural treatments, such as tillage, fertilization, mowing, weed control, and may be irrigated. They are not in rotation with crops.

(11) Recreation

Land and water used and managed for recreational purposes.

(12) Urban

Land occupied by buildings and related facilities used for residences, industrial sites, institutional sites, public highways, airports, and similar uses associated with towns and cities.

(13) Water

A geographic area whose dominant characteristic is open water, but which may include a large proportion of intermingled land, including coastal marsh lands.

(14) Watershed Protection

Land managed and used specifically for water production into streams, rivers, lakes, and aquifers.

(15) Wildlife

Land or water used, protected, and managed primarily as habitat for wildlife.

(d) Secondary land use, when appropriate to the client's objectives.

(1) A record of the client's decisions.

- Use reports generated electronically as applicable
- The recorded decisions will apply to land units reflecting common land use, objectives, and treatment needs (referred to as conservation management units)
- Include the appropriate land unit label, official practice name, brief description of the practice, and schedule of practice application in the proper sequence by calendar year

(2) Available maps, sketches, and designs resulting from the planning process that will be useful to the client in implementing the plan.

(3) Information reflecting site-specific effects and impacts based on on-site visits.

The NRCS case file will contain:

- Client’s objectives and decisions
- Assistance notes
- Engineering notes
- Operation and maintenance agreements and plans
- Design documentation
- Documentation of applied practices
- Forms and worksheets used in developing and evaluating alternatives

- Environmental documentation
- Maps - conservation plan and soils
- Conservation district information related to the plan, and
- Other appropriate supporting documents

600.32 - Areawide Conservation Plan

The format and content of the plan will be designed to meet the needs of the client. The NRCS copy of this document will be maintained in hard copy or electronically as appropriate. The document should contain the following information:

(1) Abstract or cover sheet

- Letter of request or commitment to participate in planning
- Reason for preparing the report (underlying need and purposes for taking action)
- Date and title of the document, and
- Additional letters of request

(2) Executive Summary (generally less than two pages)

(3) Planning area

- Describe the areawide conservation planning area in terms of physical, demographic, and social data and include predicted changes that may occur in the future
- Describe the present land use and predicted future land use based on changes identified earlier in this section

(4)Problems and opportunities

- Introductory paragraph—a short summary of the section
- Describe each problem or opportunity in terms of location and magnitude and include:
  - Extent of area affected
  - Magnitude and context
  - Types of stuctures damaged, such as houses, buildings, roads, and water supply
  - Limitation of desired activities because of impaired resources; *i.e.*, recreation, fishing, and hunting
  - Quantified damage in days; loss of fish, wildlife, and plant species; etc., in monetary or non-monetary units
  - Map showing the location where damages are occurring, where opportunities may exist, or where damage may be prevented
  - Frequency of damaging events, and
  - Social, cultural resource, and ecological impacts that are occurring (may include safety, health, peace of mind, race, elderly, threatened or endangered species, wetland values, evacuation plans, and police/fire protection)
    - Discuss opportunities for improving quality of life, such as recreation, habitat improvement, or aesthetic values
    - When minor problems, or those not related to the resources, are introduced, explain how they will be handled in relation to the areawide conservation planning effort, i.e., those not related to the resources may be referred to an appropriate person, agency, or entity to handle

(5) Client's objectives

Describe the objectives of the client and stakeholders in terms of desired future conditions for the ecological, economic, and social considerations.

(6) Resource inventory

- Describe significant resources by location, quantity, and quality
- Describe how the inventory was conducted
- Develop predictions of future conditions without an areawide conservation plan. Include a specific time period and recognize the impacts of ongoing programs
- Include a discussion on how scoping was used in this process

(7) Alternatives

Describe each alternative and include:

- Type of measures
- Costs
- Effects, and
- Probability of meeting the client's objectives

Note: NEPA requires all viable alternatives to be presented with substantially equal analyses.

(8) Record of decisions

- Record the decisions agreed-to by the client and stakeholders
- Public participation record - agency consultation (required for NEPA)
- List of preparers (required for NEPA)

(9) Implementation documentation

Implementation strategy developed in planning step 8

Note: Include additional documentation developed for specific programs or funding authorities based on the client's and stakeholder's decisions to pursue these programs or authorities.

(10) Plan evaluation

Action plan developed in planning step 9

Part 600.4 Planning Fundamentals

Subpart D

600.40 Support Guidance for Planning Step 3 - Inventory Resources

600.41 Support Guidance for Planning Step 5 ---Formulation of Resource Management Systems (RMS)

600.42 Support Guidance for Conservation Effects

600.43 Quality Criteria, Resource Considerations, Indicators, and Target Values

600.44 Ecological System Principles

600.45 Integrating NEPA into the Planning Process

600.46 Working with Individuals and Groups

600.47 Support Guidance for the Planning Process – Additional Materials

600.48 Support Guidance for the Planning Process - Acronyms

600.49 Training Courses and Self Development Opportunities

600.4 - Planning Fundamentals

600.40 - Support Guidance for Planning Step 3 - Inventory Resources

(a) General

All resources will be inventoried as required to help the planner understand the existing natural resource conditions sufficiently to convey resource conditions to the client in a knowledgeable manner. Planning steps 1 and 2, "Identify Problems and Opportunities" and "Determine Objectives," are normally the planner's best guides to inventory needs and the degree of detail. Objectives relating to the client's enterprises, planned land uses, production, or economic returns provide guidance for the amount of detail needed and the extent of resource inventories.

The planner should assemble general inventory data and information about the planning unit before the planning process begins. Information relating to ground water and surface water quality, cultural resources, threatened and endangered species, laws and local ordinances, utility rights-of-way, buried utilities, and other ecological considerations are located in the FOTG, Section I. This information is commonly displayed on maps contained or referenced in this part of the FOTG. The FOTG, Section II, and the electronic soil survey database provide information relating to all land uses in terms of soil interpretations and ecological site descriptions.

The successful planner will have reviewed this information before meeting with the client and will be able to relate to resource questions and raise the client's awareness of issues influencing the planning process. The planning process is an educational effort whereby the client and planner acquire additional knowledge regarding the client's enterprises and the resources, and share that knowledge. The inventory phase of planning is a critical part of that educational process.

The complexity of the planning unit and the particular land uses involved also influence the approach to inventorying resources. Different land uses normally require different approaches, and the emphasis changes from one land use to another. For example, both cropland and grazed range require a strong emphasis on soils, but grazed range also requires a more detailed description of the plant community and the factors that affect it.

Regardless of complexity or land uses involved, all resources and their considerations will be addressed during the inventory process. Problems are identified by comparing present conditions with the quality criteria established for the particular natural resource consideration. Resource conditions that are below the minimum standard quality level, shown in the FOTG, Section III, or established for an areawide conservation planning area, should be addressed to meet the requirements of conservation plans, or areawide conservation plans based on FOTG guidance.

(b) Planning Philosophy - Inventory with the Client.

The basic concepts described require that the client fully participate in the entire planning step, if possible. It is a good practice for the planner to develop a personal goal regarding the client that can be expressed in terms of, "If I am working on your land, I want you with me." This is more easily accomplished when planning at the site-specific level than at broader areawide planning

levels. Yet it is still essential that clients understand their resources and the resource conditions. This is best accomplished in the field while resource conditions are being inventoried.

If the planner is not properly equipped to discuss a client's resources, it is best to admit that he or she “doesn’t know.” Fortunately, the planner can tell the client, "I don't know, but let's go have a look." This is what inventories are all about.

The inventory phase of planning provides the planner with his or her greatest opportunity to share natural resource and related information with the client. This opportunity should not be missed. In most cases, the landowner or client also has a great deal of knowledge about the planning unit to share with the planner. By involving the client in inventory activities, the planner can take advantage of the client’s experience and knowledge to understand the resources more completely.

When planning step 3 begins, the planner should view each land unit or plant community as the best-equipped classroom available for teaching natural resource conservation principles. Effects of erosion, costs of overgrazing, or benefits of water management cannot be as effectively discussed or demonstrated in an office or kitchen as they can while looking at, measuring, digging, comparing, or evaluating the real thing.

The inventory process offers important opportunities for both the planner and the client. Not only does the planner acquire the necessary information and data to assist the client in planning for the correct use of the resources, but he or she also has the opportunity to demonstrate technical ability and earn the professional respect of the client. This promotes the client's confidence in the planner and leads to a higher quality of planning.

When the client participates in the resource inventory, the cause and effect relationships of resource problems and opportunities become much clearer, and he or she will reach better management decisions as a result of this additional knowledge. The inventory process will "set the stage" for everything that follows, including making decisions and implementing the plan.

(c) Points to Consider:

(1) Specialized Tools and Procedures -

Each discipline has acceptable procedures and tools for conducting resource inventories. Many of these are described in detail in discipline handbooks, such as the National Agronomy Manual, National Biology Manual, National Forestry Manual, National Range Handbook, and the Water Quality Indicators Guide: Surface Waters, NRCS-TP-161.

(2) Conservation or Management Tools -

These are tools that illustrate a conservation or management principle. Although these tools may be the same as those listed above, in this case they are used to determine the resource condition and to illustrate the importance of that condition. "Thunderbooks" (a personal collection of summarized technical references) are often developed for the same purpose. They can also become valuable planning tools to illustrate a point or principle at any stage of planning. Soil characterization data, along with maps, soil descriptions, interpretations, and other field observations, are part of the inventory of resources.

(3) Automated Tools and Resource Models -

Computer programs and models are valuable tools to assist the planner in assembling data and predicting resource conditions. This source of support is rapidly expanding, with new products being developed on a continuing basis. These tools can be used to assemble and supplement resource information gathered during the inventory process. The information gathered and documented should benefit the planner and client in analysis and evaluation of the resources.

(4) Inventory Forms -

Inventory forms are essential to ensure that correct information is collected in the prescribed manner. Guidelines for inventory form formats are in national discipline handbooks or manuals. Some forms and worksheets are developed in the state office based on national guidelines and tailored to state conditions. State specialists are the source for accepted inventory forms within their state.

(5) Reference and Support Materials -

Reference and support materials are essential tools for the planner. The FOTG is the basic support document for all NRCS technical assistance to land users. Sections I and II are the primary sources for inventory support for the planner.

(6) Natural Teaching Tools -

In addition to the more common, traditional tools listed above are those of perhaps the greatest importance, the "natural teaching tools." These tools are already in place in the form of soil, water, air, plants, and animals. Planners need to know how best to use these tools to their advantage. This includes using the resources (specifically the client's) as teaching aids or tools to increase the client's understanding and knowledge of resource management needs and potentials. The best time to carry out this vital element of planning is while the resource inventory is being conducted. For more information on the use of natural teaching tools, refer to the publication *The Art of Communication* published by the Grazing Lands Technology Institute.

(d) General Inventory Methods

(1) Procedural -

The resource considerations often require different inventory methods. For some resources and their respective considerations, inventory methods are well defined and are simply procedural. An example of this approach is determining range condition. The procedural method is outlined in the National Range Handbook. The summary chart (Figure 1) shows the procedural method for several resource considerations. This is intended to imply that a standard procedure exists, and the appropriate discipline handbook or manual should be consulted for more information.

(2) Observation -

Standard or accepted procedures do not exist for all considerations, and determination of the resource condition relies on observation. The classic gully is an example where observation

is the accepted method of evaluating resource conditions. The planner will have to make judgments as to whether side slopes are stable, if head-cutting is continuing, and whether erosion is occurring in the gully bottom. These factors are commonly shown in the quality criteria for gully erosion, and evaluation depends on observation. Observation always implies on-site investigation and may, to some degree, require sampling of the resources involved.

(3) Predictive -

A predictive method may be the most appropriate means of estimating resource condition. Estimating sheet and rill erosion using RUSLE, or using a predicting model rather than actual measurement or sampling are examples.

(4) Deduction -

A final method is by deduction. The planner sometimes has to rely on reason and common sense to deduce a best estimate of what is believed to be the status of a resource. This is largely because of the absence of procedures or tools or the impracticability of applying known methods. For example, restricted capacity of water bodies may not be a practical resource consideration to measure, nor are predictive tools available. However, the planner can deduce whether a problem exists or not based on other sources of information. If RUSLE shows that very low rates of soil erosion are occurring throughout the watershed, the planner can deduce that if there is no significant source of sediment, a significant reduction in storage capacity of a reservoir because of sediment deposition within the water body is not probable. The planner must frequently rely on deductive methods to address off-site effects.

Another example of using a deductive approach in determining resource conditions is related to treatment standards. In this case the planner must assume that a certain condition is met if specific treatment is applied, and, conversely, if the specific treatment is not applied, a different and less desirable condition will result.

The application of this concept is illustrated by an approach to qualifying soil tilth. Currently, NRCS does not have a prescribed procedure or predictive model to determine status of soil tilth. Also, even though the planner may determine through observation that soil tilth is "good" or "bad," these words in themselves do not adequately qualify the condition.

In these cases the planner generally depends on a deduction that, if conservation systems are applied that are expected to have a positive or improving impact on soil tilth, through time soil tilth will be at a desirable level and will remain so indefinitely as long as the prescribed treatment is continued. Using the same deductive rationale, it is assumed that if adequate treatment is not being applied, then soil tilth is, or will become, less than desirable, or a problem.

When addressing the many resource conditions, it is apparent that the separation between planning steps 3, "Inventory Resources," and 4, "Analyze Resource Data," is not always distinct. This close linkage between planning steps 3 and 4 should be kept in mind when reviewing the following guidelines.

The "Quality Criteria" established by the states (FOTG, Section III) provide indicators and guidance as to the appropriate inventory method or combination of methods to use for each resource consideration. Some of these are shown in Figure 1 with brief notes regarding the

most common approaches to inventory methods, reference to guidance sources, and basic data that must be collected during the inventory process. Methods and terminology indicated are shown from an NRCS field perspective and do not imply that procedures, models, or methods used by other agencies or research institutions are not adequate. Nor is the information in this figure to be considered complete or definitive. It will vary among states.

Methods listed in Figure 1 may be used in combination or separate. Some judgment must be exercised in determining which method or combination of methods shown will be most appropriate for the field conditions the planner is experiencing.

600.40 Figure 1 Inventory Methods—Support/Guidance for Step 3 *

SOIL

Resource consideration and/or problem	Method	Data needs and sources
Erosion		
Sheet & rill, wind	Predictive (RUSLE, WEQ), National Agronomy Manual, FOTG	• Soil map unit components • Climatic data equation factor values • Crop information
Irrigation induced	Observation or predictive (FUSED) (see quality criteria)	Soil, crop, and water management information
Concentrated flow Ephemeral gully (cropland only) Other classic gully, streambank	• Predictive (EGEM) • Observation (see quality criteria)	• Observation notes • Other management

Resource consideration and/or problem	Method	Data needs and sources
Soil mass movement	Observation, deduction (see quality criteria), soil survey	• Soils interpretations • Topographic data • Observation notes
• Roadbanks • Construction sites	Observation, deduction (see quality criteria)	Observation notes

Resource consideration and/or problem	Method	Data needs and sources
Streambank erosion	• Observation • Deduction	Observation notes

Condition		
Tilth	• Observation • Deduction (see quality criteria) • National Agronomy Manual, guide to soil condition ratings	• Soil description • Observation notes • Crop and tillage information
Compaction	• Observation • Deduction (see quality criteria)	• Soil description • Observation notes • Present management
Soil contaminants	• Predictive • Deductive • FOTG-Section II	• Soil description • Present management
Deposition		
Damage	• Observation • Deduction	• Soil interpretations • Topographic data • Observation notes
Safety	• Observation • Deduction	• Soil interpretations • Topographic data • Observation notes

* Note: The information presented in Figure 1 is not meant to be all-inclusive. States are encouraged to make adjustments to this information to meet local needs.

600.41 - Support Guidance for Planning Step 5 - Formulation of Resource Management Systems (RMS)

(a) General

The resource management system guidance provided in this handbook is directly related to the FOTG and the FOTG policy, General Manual 450, Part 401. The tools in this handbook help to develop quality resource management systems and assist the planning process.

Planning the soil, water, air, plant, and animal resources and their interrelationships has increased the complexity of assisting decisionmakers. The planner can no longer provide alternatives and assistance that address individual problems without being aware of the effects on all resources. NRCS involvement with water quality has brought this reality to the forefront, as has the public's growing concern for the environment, especially wetland protection, food and water safety, fish and wildlife protection and enhancement, and a sustainable agriculture.

NRCS must constantly strive to improve methods to evaluate the potential effects of conservation practices on the resources. The physical effects relevant to each resource must be assessed during the planning process since a conservation practice that has a positive effect on one resource problem may have a positive or negative effect on other resources. One conservation practice usually does not completely solve a problem when all of the resources are considered. The objectives of the client also factor into the process.

(b) Purpose

This guidance emphasizes to planners the realization that resources are interrelated and that the treatment of one resource may affect another. It also shows the importance of formulating an RMS in recognition of these interrelationships by providing a process that:

- Starts with the determination of identified and predictable resource problems (step 1 of the planning process)
- Considers the effects of practices on individual aspects of each resource for specific land uses
- Facilitates combining practices into potential RMS options, and
- Helps evaluate the potential options against quality criteria for an RMS

Additionally, the physical effects used in formulating RMS options for solving identified and predictable problems in typical conservation planning situations are addressed. When coupled with analytical tools such as Cost and Return Estimator, Grazing Lands Applications and state supported computer decision aids, it provides the basis for decisions by those involved.

(c) Conservation Effects Concept

The planner needs to recognize the effect of applying conservation practices so he or she can select combinations of practices that solve the identified or predictable problems without creating new problems at interrelated geographic scales. In addition, secondary benefits should be identified. The effects concept is applicable to formulating RMS options for specific fields or land units, conservation management units (CMUs), or other planning areas. It can also be used to assist in developing FOTG guidance documents, and to explain resource problems and

potential solutions to the decisionmaker and others. It is simply another tool to assist the planning process.

Technical materials also aid in evaluating the effects of applying resource management systems on the identified and predictable problems affecting the resources dealt with in conservation planning at various or interrelated levels. They are excellent training tools for establishing a pattern of thinking for developing effective RMSs in conservation planning assistance with individuals in actual situations. When making planning recommendations, the planner must be reasonably certain that the identified and predictable resource problems are treated without creating new problems in one or more of the other resources, as well as interrelated planning areas. RMS options formulated must meet established quality criteria. This handbook provides the process and working tools for consistently achieving adequate treatment of the resources.

The Site-Specific Practice Effects worksheet (NPPH, Subpart F, Exhibit 4) and the Resource Management System Options worksheet (NPPH, Subpart F, Exhibit 5) are not required for each conservation plan. Their use depends on the experience of the conservationist and the complexity of the situation. Once the process is understood and implemented, only unique or complex situations warrant documentation of the complete process. This will be addressed in more detail in paragraph 600.41(e), How To Use The Effects Concept.

(d) Conservation Practice Physical Effects (CPPE)

The CPPE matrix displays in subjective detail the physical effects that conservation practices have on resource problems for the natural resources based on experience and available technical information. A completed CPPE is to be filed in the FOTG, Section V-A-I. Each resource may have multiple problems that are represented by the various columns. 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 effects. The further away a practice is from the problem or treatment, generally the less effect it will have.

The key question that should be asked when reviewing the CPPE is "If this practice is applied, what effect will it have on the target problem and all the other resource problems contained in the column headings?" The ratings shown in the column blocks are explained in paragraph 600.41(g), Resource Management Systems: Glossary and Explanations. The headings in each column of the CPPE briefly describe identified or predictable resource problems. Some of the column headings have expanded explanations in the terminology and explanations section.

Example:

If no-till is being considered for treating an identified sheet and rill erosion problem and a nitrate-nitrogen ground water problem also exists, the CPPE will assist the user in identifying the physical effects of no-till on these problems. In this case, no-till will significantly reduce the sheet and rill erosion problem because of increased surface cover and decreased soil disturbance. However, no-till may cause a slight increase in soluble nitrate nitrogen infiltration depending on the time and method of application, rainfall, nutrient form, vadose zone, organic matter, soil texture and structure, macropores, and depth to water table. By reviewing the CPPE, the user can quickly identify both the positive and negative potential effects of a particular practice. These effects need to be tailored to local conditions and taken into account in formulating a RMS.

The conservation practices shown in the CPPE will be installed according to practice standards and specifications shown in the FOTG, Section IV.

The CPPE was developed nationally for commonly used practices. Each state needs to develop effects for additional practices applicable to their needs. As knowledge and experience are gained in working with the CPPE, states may wish to further refine it to Major Land Resource Areas, subareas, or other areas to better reflect typical conditions in the state. It is imperative that an interdisciplinary group be used in refining existing entries and when adding additional practices to the CPPE. This will ensure proper consideration of all resource problems/opportunities. If there is a need to identify a resource problem that is not included in the present CPPE column headings, an "other" column may be used under the appropriate resource to list the problem and include the effects.

The effects listed in the CPPE are displayed for general conditions nationwide or as modified by the state. If these general effects need to be modified to fit state conditions, any explanations described in the third column (Other/Explanations) need to be considered. This will assure that local conditions either do or do not fit the conditions described for the practice in the CPPE. Not all conservation practices listed have special settings identified. If the CPPE is modified, it is necessary to have a good definition of the situation for which the conservation practice effects are being displayed. The effects under the column headings are dependent on any explanations as defined in the third column.

Example:

Brush management is displayed for four methods (mechanical, chemical, prescribed burning, and biological). If the local conditions fit the description in one or more of these methods, the displayed effects may be used directly. If the description is changed, the effects need to be reviewed to see if they are still appropriate.

Conservation crop rotation is essential in developing an RMS on land used for crop production and establishes the base from which it is developed. The crop rotation and sequence of the crops planned in the rotation were not evaluated in the CPPE because of the wide variation in cropping practices across the country. States need to include in the CPPE three or four crop rotations common to their area to serve as an example. These example rotations should be evaluated, using conventional tillage, across all applicable columns following the format used for the practices that are presently included.

Irrigation system, sprinkler, is displayed for converting a furrow surface irrigation system to a sprinkler system. If a sprinkler system is planned to be installed on land not previously irrigated, a new display of effects would be needed.

Effects displayed should be those influencing the selection of a specific conservation practice or practices. Some practices are primary, resulting in treatment of the main resource problem(s) identified. Others are supporting - they facilitate a primary practice and may not have a direct effect; however, they are needed to achieve the desired treatment. These practices are generally associated with management practices, but can be used to facilitate structural or vegetative practices, or both. Some can stand alone in certain situations. A practice may facilitate more than one primary practice.

Example:

An example of a primary practice is a terrace. When needed for the terrace to function effectively, an underground outlet is an example of a supporting practice that facilitates another practice. In this case the underground outlet by itself does not have a direct effect; therefore, its effect should be shown as "facilitates terrace."

A facilitating practice is rated on the RMS Options worksheet only where it has a direct effect on the resource problem shown in the column heading.

In developing guidance documents, the typical problems/opportunities encountered in the field office work area are identified. The CPPE may be used to select the different practices which combine to form the RMS options in the guidance documents (FOTG, Section III). The guidance documents provide the conservationist the foundation of RMS options to be applied to the expected planning situations in the field office area.

(e) How to Use The Effects Concept

The first step in formulating an RMS with a decisionmaker is to establish all identified or predictable resource problems and/or opportunities in the planning area and determine how they relate to each of the resources. The effects shown on the CPPE are based on the condition that the practice being evaluated is not presently applied. The planner should understand that the problems/opportunities identified on a field or CMU occur under present management and

conditions. During planning, an existing field may be divided into more than one field or CMU because of different soils, planning objectives, or other characteristics in treating problems that are not applicable to the entire field. The effects shown in the CPPE should be applied to the proposed field or CMU.

The effects shown on the CPPE are often displayed as a range and generally need to be refined to site-specific effects to address the problems/opportunities in the planning area where technical assistance is being provided. This can be done using the Site-Specific Practice Effects worksheet.

After the resource problems/opportunities for the specific site have been identified, the applicable conservation practice effects can be considered using the information in the CPPE. The selected practices are then listed on the Site-Specific Practice Effects worksheet, and the site-specific effects are entered in the appropriate block using such terminology as not applicable, negligible, slight, moderate, significant, or facilitating a specific practice.

Where a land use change is considered as an option, the effects of practices that cause the land use change are evaluated against present conditions. The effects of the other practices necessary to manage the new land use are evaluated based on the new land use.

Example:

Where a land use conversion from crop to pasture occurs, the effects of pasture planting should be evaluated for the problems identified on the crop field. The other practices relating to pasture, such as pasture management and planned grazing systems, should be evaluated for the predicted problems that may occur on the pasture.

At this point, the list of conservation practices can be scanned, choosing the ones that have a high potential to solve one or more resource problems without increasing problems on another resource. When the practice list is complete on the Site-Specific Practice Effects worksheet, conservation practices are selected for their major effects on identified or predictable resource problems/opportunities. These practices are combined into candidate RMS options and entered on the Resource Management System Options worksheet as discussed with the decisionmaker during the planning process. These effects may be displayed in the appropriate block using N/A for not applicable, (+) for a positive, (-) for a negative, or (0) for negligible effects. The letter F in the block indicates a facilitating practice.

The primary reason for displaying the pluses and minuses in the RMS Options worksheet is to indicate differences in the effects of the options. For instance, while all the options meet the minimum quality criteria, one option may be very strong in the soil resource and not quite as strong in one or more of the other resources. In contrast, another option may be very strong in the water and animal resources and not quite as strong in the soil resource. Therefore, clients can better understand the benefits of all the options so they can select the one that best meets their objectives.

Selecting an acceptable combination of practices is a technical skill that requires ingenuity and warrants a great deal of attention. Some practices will be needed to offset limiting features of other practices.

Once the combinations have been completed that meet the quality criteria for each of the identified resources affected, the combinations of practices become viable RMS options.

Although the worksheets are used as planning tools to develop sound conservation alternatives, especially when complex situations are encountered in the field, they are also designed for formulation of guidance documents and can be used for training. They can also be used to document physical effects of specifically planned RMSs to show the decisionmaker or others what impacts can be anticipated.

Example:

Assume that a land user has been contacted by a state dairy inspector and notified that the landowner's operation will be shut down in 90 days unless measures are taken to reduce pollution. The landowner contacts NRCS for assistance. In this case, it may be advisable to complete the Site-Specific Practice Effects worksheet and the RMS Options worksheet to ensure comprehensive evaluation of the problems and potential treatments. These worksheets can also be used to assist the landowner in selecting the best option and to document to the state agency that progress is being made in correcting the identified problems.

The Site-Specific Practice Effects worksheet and the Resource Management System Options worksheet are not required for each conservation plan. This depends on the experience of the conservationist and the complexity of the situation.

(f) Forms

The two worksheets (Site Specific Practice Effects worksheet and Resource Management System Options worksheet) can be used in conjunction with the CPPE to aid the planning process (See NPPH, Subpart F, Exhibit 4 and Exhibit 5).

(1) Site Specific Practice Effects Worksheet (Exhibit 4)

This worksheet uses the practices in the CPPE to list the most applicable conservation practices to address site-specific identified or predictable resource problems and opportunities while considering land user objectives. It displays effects for only the identified resource problems that exist, are predicted on the planning area, or have influence off-site. This array of practices lends itself to a quick comparison of the relative value of each practice, including both positive and negative effects on the resource problems identified.

(2) Resource Management System Options Worksheet (Exhibit 5)

Conservation practices having the potential to solve the resource problems listed on the Site-Specific Practice Effects worksheet are now grouped in combinations and placed on the RMS Options worksheet to address the identified site-specific problems. The different combinations of practices become RMS options when the quality criteria have been achieved for all the identified and predictable resource problems.

The system the land user is currently following should be rated across the top of the RMS Options worksheet. The next step is to compare this to the options developed.

After the RMS options have been developed, the Conservation Effects process may be followed if the land user needs additional information to reach a decision (step 7 of the planning process).

Together, these technical tools provide a powerful new technique to plan, evaluate, and select among alternative systems.

(g) Resource Management Systems: Glossary and Explanations

This glossary contains ratings effects definitions, elaboration of column headings, and special terminology. All column headings in the Conservation Practice Physical Effects (CPPE) matrix represent an identified or predictable problem that needs to be treated.

(1) Ratings Effects Definitions

Not applicable

The conservation practice being evaluated has no relationship to (*i.e.*, no effect on) the conservation problem identified.

Negligible

The practice does have an effect on the problem of concern, but the effect is insignificant.

Slight

Some non-measurable effect (positive or negative) of the practice on the resource problem of concern, but not enough to influence the decision to select the practice to solve the problem.

Moderate

A measurable effect (positive or negative) of the practice on the resource problem of concern that would influence the selection of the practice in RMS options.

Significant

A major measurable effect (positive or negative) of the practice on the resource problem that would have a major influence on the selection of the practice in RMS options.

Range of effects

The effect of a single practice on a given resource problem that is shown in the CPPE may vary depending on the local conservation management unit, climate, topography, geology, soils, vegetation, and hydrologic conditions. Therefore, a range of possible effects may be presented. Sometimes the types of physical conditions that cause the range of effects are listed in the column. In other cases, a reference is made to an expanded definition elsewhere as noted.

The CPPE shows a range of effects that applies on a national basis to a conservation management unit (CMU). However, when used by a field office, the proper effects or range of effects apply to a CMU that has specific topography, soils, hydrology, plants, and animals.

If several CMUs are treated, significant cumulative or synergistic effects are probable. For example, if the cumulative effects in a watershed consisting of several CMUs are evaluated, the slight off-site effect of one practice could increase to a moderate or significant effect. The national CPPE does not reflect cumulative effects.

600.42 - Support Guidance for Conservation Effects

(a) Purpose and Scope

Planners must display and evaluate the effects of various conservation options available to the client. The conservation effects process helps planners assist clients with their conservation decisions by:

- Providing a framework in which to organize and present information that facilitates comparison of the positive (gains) and negative (losses) impacts of a conservation option.
- Permitting consideration of all ecological, economic, and social values pertinent to the evaluation.
- Encouraging the employment of analytical tools at appropriate levels of sophistication to provide information.
- Capitalizing on the knowledge and experience of planners and clients to foster interaction throughout the decisionmaking process.

(b) Framework

Effective conservation is in part dependent on the ability of the planner to integrate information from many disciplines so the client can make a comprehensive evaluation. In essence, the conservation effects role in conservation planning is to help systematically record and display effects information so the client understands the implications of his or her decisions. Effects are defined as the measurable and describable results of treatments, practices, and systems.

The conservation effects process requires three categories of information, which include descriptions of:

- The resource setting (*e.g.*, predominant soils, rainfall, relationships to other planning areas).
- The production and conservation systems expressed as the kinds, amounts, and timing of actions (*e.g.*, crops, farming operations, conservation practices).
- The effects of the production and conservation systems on ecological, economic, and social considerations (*e.g.*, erosion rates, net income, habitat values).

The resource setting, kinds, amounts, and timing of actions and the effects of those actions are recorded in the case file.

(c) Conservation Effects Concepts

(1) Benchmark

Planning efforts should always identify the present condition of the planning area, which is known as the benchmark condition. The planner and client work together to develop a picture of existing enterprises, resource conditions, trends, problems, opportunities, and objectives. The assistance provided is based upon soil, water, air, plant, animal, economic and social information. The description of benchmark conditions could include other inventories and evaluations as needed. It may include a description of current crops, farming practices, livestock type and condition, and available equipment. Consideration of sociological and economic characteristics is also needed. Planning objectives and the

complexity of each situation determine the level of detail necessary for inventories and evaluations.

For areawide conservation planning, other points of reference, besides the benchmark condition, are sometimes used for discussion and comparison purposes. For instance, it is beneficial to forecast the resource conditions expected at some point in the future by just maintaining the current levels of resource management and treatment.

The objectives of the client generally affect the kind and amount of information gathered and evaluated. However, the formulation of planning objectives requires that the objectives of society as well as those of the client be considered. The planning process should also identify opportunities. This creates a broader view that goes beyond the search for resource problems to recognize where resource enhancements may be achieved. For example, if a given area does not have a significant soil resource problem on-site, opportunities may still exist to make on-farm improvements that could increase efficiency and profitability, while at the same time reducing negative water or air quality effects off-site.

(2) Alternatives

Alternatives that meet both individual and societal objectives need to be considered after the benchmark situation and expected future trends are noted. The RMS formulation process is normally used to develop alternatives that provide a desirable future.

An alternative is generally a Resource Management System (RMS). It could be a single practice or simply an adjustment to present farming operations. Proposed alternatives must be consistent with the FOTG, Sections III and IV. Apart from the FOTG, the experience and knowledge of the planner and decisionmaker are the main sources of information used for selection.

Certain steps or actions need to be taken to achieve a specific alternative. Examples include a change in cropping sequence; land use; time of seeding, tillage, or cultivation; structural improvements to the farm; or simply reducing the speed of a single tillage operation.

One of the most useful learning experiences for planners is to visit land users who have successful conservation treatments already applied. If successful on-farm experiences are documented and shared, such as case studies, the knowledge base of others within and outside the agency could also be easily enhanced. Such experiences should be recorded first in physical and biological terms, rather than monetary ones, because monetary values are simply a translation of the former and can be expressed in current dollars at any time.

(3) Impact

The proposed alternative is compared with the benchmark condition to estimate the impact of the actions. The impact of applied conservation alternatives is the difference between the benchmark and the proposed alternative. Quantification of the impact depends upon the degree of detail used to describe or measure the benchmark and expected alternative conditions. The impact should be described in narrative form at a minimum, and in quantitative terms to the extent possible. It should also be recorded in an easy-to-understand manner for consideration by the decisionmaker.

Differences in erosion rates, habitat values, water quality, acres farmed, bushels harvested, labor and fuel requirements, pesticides used, and other such information should all be documented to the extent that such information is needed by the client or is required by the agency. The time frame when the impact occurs might also be identified, because certain actions, such as pasture improvements, can result in immediate costs, but the resulting yield increases may be delayed and then occur for an extended period of time.

(4) Values

Each individual's values affect the relative merits of an impact. Ten additional quail may be a positive impact to one person and a negative one to another. An individual's values may be in harmony with society's best interest, or they may be in direct conflict. Once values have been applied to the impact, the positive and negative points may be listed. This listing can start out in a general manner, and can then be expanded to more and more detailed levels. The procedure may involve traveling back through the decisionmaking process or producing increasingly sophisticated levels of detail on the same impact. The process is continued until the client has enough detail to make an informed decision. In most cases the planner will identify the costs and describe necessary maintenance for each of the alternatives. Often a limited amount of detailed information is enough. Occasionally, however, a more complex analysis is needed. This is where the concepts presented in this handbook may help.

(d) Case Studies

Information regarding the effects of conservation can be collected from any source, but in the absence of extensive research results or local expert knowledge, a case study is a convenient and relevant way to collect this information. A case study enables the conservation planner to document conservation systems currently used in a specific farming or ranching community, along with the motivations that led to their adoption. Having ready data about the effect and impact of conservation systems enhances the client's ability to implement effective conservation technologies.

A case study is also a way to record conservation effects information. Resulting case studies should become part of the FOTG, Section V, Part B (Conservation Effects).

(1) Types of Case Studies

The three types of case studies are:

- A comparison of the "before and after treatment" conditions on a single site.
- A comparison of two separate but comparable resources and land use situations (sites) on different farms or even on the same farm (*i.e.*, one site with and one without treatment).
- A simple recording of farmer experiences with treatment on a single site regardless of the earlier conditions.

(2) Procedure

The FOTG, Section V, contains procedural references on Guidance for the Development and Use of Case Studies as a Source of Conservation Effects Information. This is a useful reference for those interested in developing their own case study files.

600.43 - Quality Criteria, Resource Considerations, Indicators, and Target Values

(a) Quality Criteria

Quality criteria are quantitative or qualitative statements of a treatment level required to achieve a RMS for identified resource considerations for a particular land area. They are established in accordance with local, state, and federal programs and regulations in consideration of ecological, economic, and social effects. Quality criteria are published in the FOTG, Section III.

(b) Resource Considerations

Resource considerations is a term used to describe the kinds of natural resource aspects/problems that might be found on the landscape. The Conservation Practice Physical Effects matrix, found in the FOTG, Section V, describes a national set of resource considerations. Currently the quality criteria for many resource considerations are qualitative narrative statements in Section III of the FOTG. Agency policy calls for the continual refinement of the FOTG, including the quality criteria.

(c) Indicators and Target Values

Closely associated with resource considerations and quality criteria are resource condition indicators. An *indicator* is a kind or type of measurement that assesses a condition, and, when observed periodically, demonstrates trends. Indicators provide a measure for, or can describe, a current, past, or future ecological, economic, or social condition.

Rather than using the term "indicator" to mean both "what to measure" and "the acceptable result," the term *target value* is used for the value of an indicator to be achieved. Another way of looking at indicators and target values is to think of an indicator as a yardstick and a target value as a point on that yardstick used to make judgments about what is measured.

Resource considerations and quality criteria do not necessarily equate to indicators and target values. For example, the resource consideration "soil compaction" can be "indicated" by several kinds of measurements, such as infiltration, crop growth, bulk density, organic matter, or root mass. Once a kind of measurement (indicator) is chosen, an acceptable target value is selected that helps planners and decisionmakers determine the condition or status of the resource consideration being evaluated. The target value can be used to see if specific quality criteria are met.

Using indicators is important for two additional reasons. First, using indicators to assess the results of management decisions provides a way to gain knowledge in conservation planning. If indicators begin to show results that are not anticipated, it may trigger a review of planning assumptions to determine if changes are needed (this is the adaptive management process). Second, indicators can be helpful in resolving disputes over conflicting objectives. By quantifying the desired future conditions over which stakeholders disagree, polarized positions can be avoided and quantitative analysis tools are used to look at tradeoffs.

As the effectiveness of new indicators and target values is demonstrated through application, follow-up, and adaptive management, the State Field Office Technical Guide Committee should

work with conservation districts and field office staffs to adopt the new indicators and target values to strengthen quality criteria in Section III of the FOTG.

(d) Additional Information

For more information on quality criteria, resource considerations, indicators, and target values, refer to the NRCS publication Ecosystem Indicators - A Process To Assist With Planning And Monitoring Activities, dated April 1996.

600.44 - Ecological System Principles

(a) Definition of an Ecological System

The term *ecological system* is used to describe the organization and interactions of communities of living things, including humans, together with the chemical and physical factors in their environment. Ecological systems are characterized by the "nesting of systems," interdependence, change, and cycling.

(b) Ecological System Principles:

(1) Ecological Systems are Hierarchical

Everything in ecological systems is connected in space and time. Boundaries are assigned to ecological systems by humans for convenience, to facilitate analysis, or for manipulation. The boundaries, or scale, may be changed, depending on human requirements, values, or desired resource use. For example, a wetland, a field, a farm, or a watershed can all be considered ecological systems. Interconnections may be obvious, such as between a river and its adjacent riparian area, or they may be difficult to perceive, such as ground water flows from mountains into valley lakes. Ultimately, the Earth is one ecological system, embodying all the smaller subsystems into one interconnected system.

(2) Ecological Systems are Complex

The living and non-living components of ecological systems are interconnected and interdependent. A change in any part ripples through the system similar to the effect of a rock tossed into a pond. An ecological system is a dynamic continuum. There is tremendous complexity reflected in many cause and effect interrelationships. For example, human decisions to change landuses, reactions to existing succession and retrogression trends, introduction of conservation practices, or management changes, can all create far reaching short-term and long-term ecological changes in natural resource communities.

(3) Ecological Systems are Dynamic

Ecological systems are always changing. The organisms, numbers, and relationships change in a process of succession. The species present and the physical environment control the patterns, rates, and limits of this succession. As an ecological system matures, species stabilize and energy is stored. Large trees and organic prairie soils are rich energy stores in mature ecological systems. Even the most stable ecological systems change, however, when affected by cyclic or catastrophic disturbances.

Changes in a small ecological system can have an impact on larger ecological systems. Cumulative changes in many smaller ecological systems can add up to a significant impact on larger ecological systems. Changes in one ecological system may exert a significant impact on others that are not obviously connected.

(4) Ecological Systems Perform Critical Life-Support Functions

Matter cycles through ecological systems. For example, carbon is captured by growing plants from carbon dioxide in the air through the process of photosynthesis. The carbon in plant material may later be partly decomposed by soil microbes and remain in the soil as humus. Or, if eaten by an animal, it might be fully oxidized during respiration and exhaled back into the air as carbon dioxide. Other elements, such as nitrogen and phosphorous, also have natural cycles, each with unique pathways. Characteristic phases of nutrient cycles include production, consumption, and decomposition. Water also cycles through the ecological system from the atmosphere into plants, animals, soil, and ground and surface water, and back to the atmosphere. While cycling, water transports many other elements and compounds along with it.

Diversity is the product of these unique and dynamic cycles. It provides relative stability in the face of changing conditions in time and space. Diversity exists at many scales of ecological systems, such as within and among species, communities, and landscapes.

(5) Humans are an Integral Part of Ecological Systems

Human values and activities influence the structure and functions of ecological systems. Human actions result in direct and indirect impacts, both adverse and beneficial.

The role of humans is considered in the formulation and delivery of planning activities. The challenge in conservation planning is to balance the short-term demands for goods and services with the long-term sustainability of ecological systems. A conservation plan should enable a client to operate in an ecologically sustainable, economically sound, and acceptable manner within the stakeholders' social values, including property rights. Problems and opportunities are usually expressed as human values. In achieving a desired ecological system condition, human values determine the scope and extent of problems/opportunities and the associated corrective actions to be taken.

Conservation planning is based on a desired future condition that is developed with the client for a conservation plan, and with the client and stakeholders for an areawide conservation plan. Keeping in mind the vision to be achieved, management objectives are developed using historical data and current ecological information. The goals, values, and concerns of the individual, as well as those of society in the case of areawide conservation plans, determine the nature of conservation plans developed and implemented.

The viability of conservation planning is dependent on the voluntary participation of landowners and users, and on their objectives regarding natural resource stewardship. These objectives should reflect the shared vision of the stakeholders in the case of an areawide conservation plan. Land use and management alternatives should include economic and social considerations of the land user which should be in balance with the desired future condition.

(6) Ecological System Knowledge is Incomplete

The relationships between living organisms and their environment are part of an ecological system's complexity and are not fully understood. While our knowledge of the natural world grows daily, some important relationships regarding the effects of management activities on resources and ecological system functions are unknown. Although our knowledge is

incomplete, we still provide assistance based upon the best available knowledge derived from cooperative efforts.

To understand ecological system complexity, scientific data and technical tools are used to help evaluate impacts upon ecological system components and processes. In many instances, individual effects to the ecological system cannot be directly determined; therefore, indicators are used to describe effects. Predicting both on-site and off-site effects upon ecological system components is essential and is an inherent part of conservation planning.

Since many decisions are made with inherent risk and uncertainty, the concept of adaptive management is included in conservation planning. Adaptive management is the process of using monitoring, evaluation and experimentation to provide information that can be used in future management decisions.

Conservation planning can be implemented successfully using current knowledge and technology, while recognizing that the art and science of natural resource management will continue to evolve and will never be complete or finished.

(c) Ecological System Management and Conservation

If basic ecological system components, their characteristics, and their behavior are understood, the ecological system can be manipulated to obtain benefits without causing degradation or dysfunction. By evaluating the capacity of the ecological system to perform basic functions, such as cycling, and to maintain the structures (diversity) needed for long-term stability, we can refine quality criteria to ensure the sustainability of our resources. We can then assess our intervention, such as diversity controls (use of pesticides or brush management) and successional disruptions (tillage or prescribed burning), and develop and implement measures to restore and conserve resource quality and ecological system vitality.

Examples:

Healthy riparian ecological systems provide biological diversity, animal travel corridors, and erosion control. They buffer waterways from sedimentation, temperature change, and nutrient and chemical contamination. They capture fugitive dust from wind erosion, construction, and farm machinery. By incorporating these systems, we can enhance the ecological system, increase the scope of beneficial land uses, maintain long-term productive capacity, and help prevent off-site transport of potential pollutants.

A properly designed management system may have conservation crop rotation; stripcropping; windbreaks/shelterbelts; cover crops; pest, nutrient, and residue management; and other conservation practices as appropriate to enhance the quality of the soil, water, air, plant and animal resources in the ecological system.

600.45 - Integrating NEPA into the Planning Process

National Environmental Policy Act (NEPA)

NEPA was passed in the latter part of 1969 and signed into law on January 1, 1970 by President Nixon.

Section 101 of NEPA contains the following information:

(a) ...it is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."

(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practical means consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

(1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;

(2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings;

(3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

(5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and

(6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

(c) The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment.

NEPA requires more than the environmental assessments and environmental impact statements for which it is best known. Section 102 of NEPA contains the following information:

The Congress authorizes and directs that, to the fullest extent possible.....(2) all agencies of the Federal Government shall.....

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment; [and]

(B) identify and develop methods and procedures,.....which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations.....

NEPA will be incorporated into all steps and activities of the planning process and should not be considered as a separate process or requirement. NRCS policy for compliance with NEPA is located in the General Manual 190, Part 410 - Compliance with NEPA.

600.46 - Working with Individuals and Groups

One of the key elements of an effective voluntary conservation program is the planner's understanding of the factors that influence client behavior. This is true for both individuals and groups. Partnerships and alliances can play a powerful role to identify behavioral characteristics and to change behavior.

(a) Working with Individuals

Two components shape behavior: first, the tastes, preferences, and values of the client; and second, the environment in which the conservation decisions are being made. The motivational factors related to tastes, preferences, and values can vary widely from client to client. The planner must rely on continuous dialogue with the client to gain insight into factors that affect their willingness to adopt conservation. It is also essential that the planner keeps up-to-date on issues related to the agribusiness, institutional, and social factors that encourage or discourage conservation decisions.

When working with individuals, planners should possess the skills of sales people. They must know their products and the needs of their clients. They must know what to say and how to say it - communication skills are essential. Planners must also be technically competent and have the latest information about conservation. Using these skills and information, planners match their products with the needs of the client and the resources. To do this they must assess the environment in which the client lives - the social, economic, resource, and policy elements of the client's environment.

From a financial standpoint, the planner must be aware of the economic factors that affect or result from conservation decisions, such as interest rates, market uncertainty, commodity prices, land tenure, taxes, land rights, customary rental agreements, costs, and farm programs. In addition, many personal characteristics such as experience, education, background, and the working relationship with NRCS or the conservation district affect behavior.

Throughout the planning process, and especially in the inventory phase, the planner seeks to broaden his or her understanding of the client's willingness to adopt conservation. Listening and observing will reveal the barriers and incentives to a client's adoption of conservation systems and practices. It is the planner's responsibility to be aware of this information in order to help the client, as appropriate, address the barriers and seek incentives. The planner can discover why a client may be able or willing to adopt a resource management system by considering questions such as the following:

- Is there sufficient ecological, economic, and social information available for the client to make sound decisions, such as alternative systems, effects, impacts, and risks?
- Is the system too complex for the client to install and operate?
- Are adequate resources available, such as land and labor?
- Is the planning and evaluation horizon of the client long enough to realize the benefits of the system?
- Is there a supporting network of agribusiness, agencies, or citizen groups to help the client install and manage the system?
- Does the system require increased management skill to install, operate, and maintain, and if so, is training available to help bridge the gap?

- Does NRCS information conflict with other agency or private sector information?
- Is the system compatible with existing production goals and enterprises?
- Are there any incentives / barriers to changing production methods?
- Are there USDA or other programs that influence the client?
- Can the system be implemented on a small scale?
- Are the effects visible?
- Has the risk and uncertainty in the analysis of the system been presented to the client?

(b) Working with Groups

Building alliances and partnerships is another important component of successful voluntary conservation programs. This approach is based on encouraging local landowners and stakeholders to take a greater responsibility for managing the Nation's resources. This in turn can empower local people, reduce the Nation's dependence on regulation, leverage both dollars and human resources, and reduce duplication of personnel and programs across federal, state, and local agencies. The overarching objective is to create a forum in which individual and group interests can be expressed and reconciled, thereby changing the attitudes and behavior of clients and stakeholders.

Developing a desired future condition held by a broad range of landowners, stakeholders, and agencies is essential for this approach to succeed. In addition, the local team must identify critical success indicator or quality criteria to measure progress. Success can be measured using indicators such as attitude changes, acceptance of involvement in an integrated planning process, significant ecological improvements, leveraged funds and personnel, and inputs by other agencies.

(c) Underserved Customers

In working with both individuals and groups, planners must be proactive in identifying underserved customers, such as minority, and small producers with limited resources, and ensuring that program benefits offered to them are on an equal basis with traditional customers. Also, planners must be aware that barriers may exist that prohibits and/or discourages participation by these individuals and groups. Those barriers must be identified and addressed in order to ensure equity in program development and participation, and in the delivery of program benefits or services under both federally assisted and federally conducted programs.

Examples of barriers:

- Limited Resources
- Educational Background or Training
- Lack of Equipment, Labor, or Capital
- Language
- Culture
- Farm Size
- Lack of Access to Information
- Limited Cash Flow
- Discrimination

Examples of actions to overcome barriers:

- Increased Cost-Share Level

- Educational Meetings
- Door to Door Contact
- Videos
- Focus Group Meetings
- Printing Publications in the Local Language
- Working with Community Leaders
- Conducting Local Demonstration Projects
- Learning About the Customer's Culture
- Matching Conservation Alternatives with Customer Needs and Capabilities
- Allowing In-Kind Labor or Equipment for the Customer's Contribution

These barriers and actions are not all-inclusive. They are meant to stimulate thought and action for identifying and effectively working with underserved customers.

(d) Risk Management

Clients make conservation and production decisions in an environment dominated by risk and uncertainty. Risks arise from weather variability, price fluctuations, changes in government programs, pest infestations, new technology, marketing strategies, financial conditions, and lack of information. The planner must be aware of these risks, how clients manage their risk, and how conservation effects information can help reduce risk.

The overriding problem in risk management is the lack of information about probable outcomes. Clients react to the risk problem by using decision rules that minimize risk (*e.g.*, select the strategy with the best of the worst outcomes, or the strategy that provides the least change, or the strategy that ensures survival because loans can be repaid). Clients also seek to reduce production risk by diversifying; selecting more stable enterprises; irrigating; and purchasing insurance (especially crop insurance).

Market risk can be reduced by spreading sales over time; hedging on the commodity futures market; contracting sales with processors; or participating in various programs. Financial risk can be mitigated by maintaining a cash reserve; using self-liquidating loans (loans that can be paid off with income from collateral; for example, loans for feeder livestock), and steadily increasing net worth.

Many conservation practices affect a client's risk level. For example, installing terraces may increase the producer's debt, reduce his or her income, and reduce options related to future equipment purchases. On the other hand, terraces can reduce the producer's risk by increasing water availability, and preventing soil loss and the formation of gullies that lead to the loss of production and costly equipment repairs. Agronomic practices will have similar risk-increasing or risk-decreasing effects. In all cases, the conservation planner must work with the client to understand his or her risk tolerances and the effects of the conservation system on risk.

One of the key points to remember is that the risk of a conservation decision can be significantly reduced by providing the decisionmaker with clear, relevant information on what is needed to install and operate the conservation system; its costs; and the on-site and off-site ecological, economic, and social effects.

(e) Stewardship

The term "stewardship" has been used since the beginning of the conservation movement. Webster defines stewardship as "the individual's responsibility to his life and property with proper regard to the rights of others." In this sense, stewardship implies that landowners view their actions in terms of how they affect their neighbors, their grandchildren, and all those that might be influenced by their production and conservation decisions.

Seen in this light, stewardship is about being responsible. It is about changing attitudes, forging local shared visions of the desired state for private and public natural resources, and facilitating the actions needed to realize the desired future condition. Institutionally, stewardship is about assisting land users to care for the resources.

(f) Land Ethic

The three broad motives for conservation are self-interest, legislation, and ethics. Although self-interest and legislative motivations for conservation are most often addressed by the client and the conservation planner, the land or environmental ethic can play a powerful role in conservation adoption. Understanding the land ethic requires an appreciation of the role of ethics in day-to-day life.

In a formal sense, ethics is the science of moral duty which deals with idealized human behavior as it relates to achieving the greatest good. In a practical sense, ethics is expressed as a set of moral rules associated with how an individual interacts with other people and society. Whereas instincts impel a person to compete within the community, ethics induce him or her to cooperate within the community.

In a natural resource setting, ethics can be applied to the relationship between humans and nature. In this context, the land ethic is associated with limitations on the range of actions that might be taken to maximize short-run profits or goals.

Developing an ethical relationship with the environment or land depends on individuals and society understanding the ecological interconnectedness of the world. As our understanding of natural and human processes improves, the land ethic will evolve from a focus on individual resources, such as soil and water, to a focus on the biotic and abiotic community as a whole.

In Aldo Leopold's words, "....a system of conservation based solely on economic self-interest is hopelessly lopsided. It tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning. It assumes, falsely, I think, that the economic parts of the biotic clock will function without the uneconomic parts. It tends to relegate to government many functions eventually too large, too complex, or too widely dispersed to be performed by government. An ethical obligation on the part of the private owner is the only visible remedy for these situations." (Aldo Leopold, A Sand County Almanac, 1949)

600.47 - Support Guidance for the Planning Process - Additional Materials

Numerous federal laws or regulations that affect actions or activities relating to natural resource management in a planning area. Information is available from a number of sources. Examples include:

Public Laws

PL-59-209

Antiquities Act of 1906

PL-96-95

Archaeological Resources Protection Act of 1979

PL-100-4

Clean Water Act

PL-101-508

Coastal Zone Management Act

PL-104-231

Electronic Freedom of Information Act Amendments of 1996

PL-93-205

Endangered Species Act of 1973

PL-97-98

Farmland Protection Policy Act of 1991 (FPPA)

PL-104-127

Federal Agriculture Improvement and Reform Act of 1996

PL-85-624

Fish and Wildlife Coordination Act of 1958

PL-101-624

Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA)

PL-99-198

Food Security Act of 1985 (FSA)

PL-89-487

Freedom of Information Act of 1966

PL-99-570

Freedom of Information Reform Act of 1986

PL-74-292

Historic Sites Act of 1935

PL-93-291

Historical and Archaeological Data Preservation Act of 1974

PL-95-265

Magnuson-Stevens Fishery Conservation and Management Act

PL-

Migratory Bird Treaty Act of 1918

PL-91-190

National Environmental Policy Act of 1969 (NEPA)

PL-89-665

National Historic Preservation Act of 1966 (NHPA), Amended 1992

PL-93-502

Privacy Act of 1974

30 Stat. 1121

Rivers and Harbors Act of 1899

PL-95-192

Soil and Water Resources Conservation Act of 1977

PL-90-542

Wild and Scenic Rivers Act of 1968

Executive Orders

12898

Executive Order on Environmental Justice

11988

Executive Order on Floodplain Management, May 1977

11747

Executive Order on Principles and Guidelines

11990

Executive Order on Protection of Wetlands

Other

- Catalogue of Federal Domestic Assistance
- Other laws or regulations listed in NRCS program manuals, (*i.e.* National Watershed Manual)

States are encouraged to supplement this handbook by creating a list of state and local laws, regulations, etc. that impact natural resource management in a planning area.

600.48 - Support Guidance for the Planning Process - Acronyms

BMP

Best Management Practice

CAPSS

Centralized Automated Practice Standards System

CMU

Conservation Management Unit

CPPE

Conservation Practice Physical Effects

CRM

Coordinated Resource Management

CST

Customer Service Toolkit

EA

Environmental Assessment

EE

Environmental Evaluation

EIS

Environmental Impact Statement

FACTA

Food, Agriculture, Conservation, Trade Act of 1990

FONSI

Finding of No Significant Impact

FOTG

Field Office Technical Guide

FPPA

Farmland Protection Policy Act of 1991

FSA

Food Security Act of 1985

GM

General Manual

GIS

Geographic Information System

HEL

Highly Erodible Land

LESA

Land Evaluation and Site Assessment

NEDS

National Employee Development Staff

NEPA

National Environmental Policy Act

NFSAM

National Food Security Act Manual

NHCP

National Handbook of Conservation Practices

NPPH

National Planning Procedures Handbook

NRCS

Natural Resources Conservation Service

O&M

Operation and Maintenance

PL-566

Public Law - 566

RC&D

Resource Conservation and Development Program

RFO

Responsible Federal Official

ROD

Record of Decision

RMS

Resource Management System

RUSLE

Revised Universal Soil Loss Equation

SHPO

State Historic Preservation Officer

SSPEW

Site-Specific Practice Effects Worksheet

USDA

United States Department of Agriculture

WEQ

Wind Erosion Equation

These are common acronyms used in this handbook. The list is not all-inclusive. The Conservation Programs Manual (CPM), Part 502 contains programmatic definitions and abbreviations, as does the National Food Security Act Manual (NFSAM), Part 525.

600.49 - Training Courses and Self Development Opportunities

Conservation planning related training courses:

NRCS National Courses	Type	Contact
Introduction to NRCS	NEDC	NEDS
Natural Resources Conservation	NEDC	NEDS
Conservation Planning	NEDC	NEDS
Areawide Conservation Planning	NEDC	NEDS
Economics of Conservation Planning	NEDC	NEDS
Introduction to Ecological Principles	NEDC	NEDS

NRCS Regional and State Courses	Type	Contact

Courses Outside of NRCS	Type	Contact

Regions and states are encouraged to supplement this listing of training courses and self development opportunities to assist the planner with the planning process, team building, conflict resolution, working with clients and stakeholders, etc.

Part 600.5 – Comprehensive Nutrient Management Planning Technical Guidance

Subpart E

600.50 Background

600.51 Definition of a Comprehensive Nutrient Management Plan (CNMP)

600.52 Objective of a CNMP

600.53 General Criteria for CNMP Development

600.54 Element Criteria for CNMP Development

Part 600.5 – Comprehensive Nutrient Management Planning Technical Guidance

600.50 - Background

Conservation planning is a natural resource problem-solving process. The process integrates ecological (natural resource), economic, and production considerations in meeting both the owner's/operator's objectives and the public's natural resource protection needs. This approach emphasizes identifying desired future conditions, improving natural resource management, minimizing conflict, and addressing problems and opportunities. Comprehensive nutrient management plans (CNMPs) are developed in accordance with NRCS conservation planning policy and rely on the planning process and established conservation practice standards.

A CNMP identifies management and conservation actions that will be followed to meet clearly defined soil and water conservation goals, including nutrient management, on an animal feeding operation (AFO). Defining soil and water conservation goals and identifying measures and schedules for attaining these goals are critical to reducing potential and actual threats to water quality and public health from AFOs. The CNMP fits within the total resource management objectives of the entire farm/animal feeding operation.

The CNMP Technical Guidance is for use by those individuals who develop or assist in the development of CNMPs. The purpose of this document is to provide technical guidance for the development of CNMPs, whether they are developed for USDA ' s voluntary programs or as a means to help satisfy the United States Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) permit requirements.

The Technical Guidance is not intended as a sole-source reference for developing CNMPs. Rather, it is to be used as a tool in support of the NRCS conservation planning process, as described in the preceding Sections 600 through 600.4 of this handbook and NRCS Technical References, Handbooks, and Policy Directives. The conservation planning process has not been changed by the introduction of CNMPs.

600.51 - Definition of a Comprehensive Nutrient Management Plan (CNMP)

A CNMP is a conservation plan that is unique to animal feeding operations. It is a grouping of conservation practices and management activities which, when implemented as part of a conservation system, will help to ensure that both production and natural resource protection goals are achieved. A CNMP incorporates practices to utilize animal manure and organic by-products as a beneficial resource. A CNMP addresses natural resource concerns dealing with soil erosion, manure, and organic by-products and their potential impacts on water quality, which may derive from an AFO. A CNMP is developed to assist an AFO owner/operator in meeting all applicable local, tribal, State, and Federal water quality goals or regulations. For nutrient impaired stream segments or water bodies, additional management activities or conservation practices may be required to meet local, tribal, State, or Federal water quality goals or regulations.

The conservation practices and management activities planned and implemented as part of a CNMP must meet NRCS technical standards. For those elements included by an owner and/or operator in a CNMP for which NRCS currently does not maintain technical standards (i.e., feed management, vector control, air quality), producers should meet criteria established by Land Grant Universities, industry, or other technically qualified entities. Within each state, the NRCS State Conservationist has the authority to approve non-NRCS criteria established for use in the planning and implementation of CNMP elements.

600.52 - Objective of a CNMP

The objective of a CNMP is to document the AFO owner's and/or operator's plan to manage manure and organic by-products by combining conservation practices and management activities into a conservation system that, when implemented, will achieve the goal of the producer and protect or improve water quality.

In developing a CNMP with an AFO owner and/or operator, alternatives are developed that address treatment of the resources of concern and are in accordance with the applicable NRCS technical standards. The AFO owner/operator, as decision-maker, selects from these alternatives to create a CNMP that best meets his/her management objectives and environmental concerns.

CNMP implementation may require additional design, analysis or evaluations. It is important for the certified conservation planner to maintain a relationship with the producer throughout CNMP implementation to address changes or new challenges. Evaluation of the effectiveness of the CNMP may begin during the implementation phase and not end until several years after the last practice is applied. Follow-up and evaluation determines whether the implemented alternative is meeting the client needs and solving the conservation problems in a manner beneficial to the resources.

600.53 - General Criteria for CNMP Development

CNMPs will, as a minimum, meet the following criteria:

- Provide documentation that addresses the items outlined in Section 600.6, Exhibit 15, Comprehensive Nutrient Management Plan-Format and Content.
- Document the AFO owner's/operator's consideration of the six CNMP elements. It is recognized that a CNMP may not contain all six elements; however, they need to be considered by the AFO owner/operator during development of the CNMP, and the owner's and/or operator's decisions regarding each must be documented. These elements are as follows:
  - Manure and Wastewater Handling and Storage
  - Land Treatment Practices
  - Nutrient Management
  - Record Keeping
  - Feed Management
  - Other Utilization Activities
- CNMPs will contain actions that address water quality criteria for the feedlot, production area, and land on which the manure and organic by-products will be applied (i.e., as a minimum the plan would address CNMP element numbers 1, 2,3, and 4 listed above). This includes addressing soil erosion to reduce the transport of nutrients within or off of a field to which manure is applied. For AFO owners and/or operators who do not land apply any manure or organic by-products, the CNMP would address only the feedlot and production areas (i.e., address CNMP element numbers 1,4, and 6 listed above).
- Meet requirements of the NRCS Field Office Technical Guide (FOTG) conservation practice standards for all practices contained in the CNMP.
- Meet all applicable local, Tribal, State, and Federal regulations. When applicable, ensure that USEPA-NPDES or State permit requirements (i.e., minimum standards and special conditions) are addressed.

600.54 - Element Criteria for CNMP Development

The degree to which each CNMP element is addressed is determined by the General Criteria (NPPH, Section 600.53) and the specific criteria provided for each element in this section.

(a) Manure and Wastewater Handling and Storage

This element addresses the components and activities associated with the production facility, feedlot, manure and wastewater storage and treatment structures and areas, and any areas used to facilitate transfer of manure and wastewater. In most situations, addressing this element will require a combination of conservation practices and management activities.

(1) Criteria for Manure and Wastewater Handling and Storage

Provide for adequate collection, storage, and/or treatment of manure and organic by-products that allows land application in accordance with NRCS Nutrient Management Policy and the conservation practice standard for Nutrient Management (Code 590). Collection, storage, treatment, and/or transfer practices shall meet the minimum requirements as addressed in the following NRCS conservation practice standards contained in Section IV of the NRCS FOTG, as appropriate:

- Waste Storage Facility (Code 313)
- Waste Treatment Lagoon (Code 359)
- Manure Transfer (Code 634)
- Heavy Use Protection Area (Code 561)

Comply with existing federal, Tribal, State, and local regulations, associated with the following activities:

- Disposal of dead animals.
- Disposal of animal medical wastes.
- Disposal of spoiled feed or other contaminants that may be regulated by other than an NPDES or State concentrated animal feeding operation (CAFO) permitting program.

Note: NRCS does not have national conservation practice standards that address all these activities. Generally, federal, Tribal, State and local regulations dictate acceptable procedures, however, NRCS in some States has developed standards that address the disposal of dead animals by incineration or freezing.

Document the following:

- Types of animals and phases of production that exist at the facility.
- Numbers of each animal type, average weight, and period of confinement for each phase of production.
- Total estimated manure and wastewater volumes produced at facility. Where historical manure and wastewater production volumes are not documented, an estimate may be made using the procedures and tabular data provided in the NRCS Agricultural Waste Management Field Handbook (AWMFH), Chapter 4, "Waste Characteristics".
- Manure storage type, volume, and length of storage. (For more information on storage and treatment systems, how they function, their limitations, and design guidance see

NRCS AWMFH, Chapter 9, "Animal Waste Management Systems", and Chapter 10, "Component Design").

- Existing transfer equipment, system, and procedures.
- Operation and maintenance activities that address the collection, storage, treatment, and transfer of manure and wastewater, including associated equipment, facilities, and structures.
- Nutrient content and volume of manure, if transferred to others.
- An emergency action plan to address spills and catastrophic events.

(2) Considerations for Manure and Wastewater Handling and Storage

Additional considerations associated with CNMP development and implementation should be addressed. However, NRCS does not have specific technical criteria for these considerations required for CNMPs. These considerations are:

(i) Air Quality

During the CNMP development process, APO operators and/or owners need to consider the impact of selected conservation practices on air quality. Air quality in and around structures, waste storage areas, and treatment sites may be impaired by excessive dust, gaseous emissions, and odors. Poor air quality may affect the health of workers, animals, and persons living in the surrounding areas. Ammonia emissions from animal operations may be deposited to surface waters, increasing the nutrient load. Proper siting of structures and waste storage facilities can enhance dispersion and dilution of odorous gases. Conservation buffers placed with regard to prevailing wind patterns can intercept movement of some airborne pollutants. Enclosing waste storage or treatment facility can reduce gaseous emissions from AFOs in areas with residential development.

(ii) Pathogens

During the CNMP development process, AFO operators and/or owners need to consider the impact of selected conservation practices on pathogen control. Pathogenic organisms occur naturally in animal wastes. Exposure to some pathogens can cause illness to humans and animals, especially for immune-deficient populations. Many of the same conservation practices used to prevent nutrient movement from animal operations, such as leaching, runoff, and erosion control are likely to minimize the movement of pathogens. Certain waste treatment systems can further reduce the pathogen content of manure.

(b) Land Treatment Practices

This element addresses evaluation and implementation of appropriate conservation practices on sites proposed for land application of manure and organic by-products from an AFO. On fields where manure and organic by-products are applied as beneficial nutrients, it is essential that runoff and soil erosion be minimized to allow for plant uptake of these nutrients. An understanding of the present land use of these fields is essential in developing a conservation system to address runoff and soil erosion adequately.

(1) Criteria for Land Treatment Practices

- An on-site visit is required to identify existing and potential natural resource concerns, problems, and opportunities for the conservation management unit (CMU).
- Identification of the potential for nitrogen and phosphorus losses from the site.
- At a minimum, the conservation system developed for this element will address the NRCS Quality Criteria for water quality, found in Section III of the FOTG. Soil erosion is to be addressed to reduce the transport of manure nutrients within or off of a field to which manure is applied. Typical NRCS conservation practices, and their corresponding NRCS conservation practice standard code number, used as part of a conservation system to minimize runoff and soil erosion are:
  - Conservation Crop Rotation (Code 328)
  - Residue Management, No Till and Strip Till (Code 329A)
  - Residue Management, Mulch Till (Code 329B)
  - Residue Management, Ridge Till (Code 329C)
  - Contour Buffer Strips (Code 332)
  - Cover Crop (Code 340)
  - Residue Management, Seasonal (Code 344)
  - Diversion (Code 362)
  - Windbreak and/or Shelterbelt Establishment (Code 380)
  - Riparian Forest Buffer (Code 390)
  - Filter Strip (Code 393)
  - Grassed Waterway (Code 412)
  - Prescribed Grazing (Code 528A)
  - Stripcropping (Code 585)
  - Terrace (Code 600)
- Compliance with existing, federal, Tribal, State and Local regulations or ordinances associated with soil erosion and runoff.
- Document the following:
  - Land application areas on aerial photos.
  - Individual field maps with setbacks, buffers, waterways, and other planned conservation practices marked.
  - Soils information such as features, limitations, and capability for each field.
  - Conservation practice design information.
  - Identification of sensitive areas such as sinkholes, streams, springs, lakes, ponds, wells, gullies, and drinking water sources.
- Other site information features of significance, such as property boundaries.
- Identification of operation and maintenance (O&M) practices and/or activities.

(c) Nutrient Management

This element addresses the requirements for land application of all nutrients and organic by-products that must be evaluated and documented for each CMU.

Land application of manure and organic by-products is the most common use of manure because of the nutrient and organic matter content of the material. Land application procedures must be planned and implemented in a way that minimizes potential adverse impacts to the environment and public health.

(i) Criteria for Nutrient Management

- Meet the NRCS Nutrient Management Policy as contained in the General Manual, Title 190, Part 402, (May 1999), and clarified by the National Instruction, Nutrient Management -Policy Implementation, Title 190, Part 302, October 2000.
- Meet criteria in NRCS conservation practice standard Nutrient Management (Code 590) and, as appropriate, Irrigation Water Management (Code 449).
- Develop a nutrient budget for nitrogen, phosphorus, and potassium that includes all potential sources of nutrients.
- Document the following:
  - Planned crop types, cropping sequence, and realistic yield targets.
  - Current soil test results for nitrogen, phosphorus, potassium, heavy metals, and sodic condition.
  - Manure and organic by-product source testing results.
  - Form, source, amount, timing, and method of application of nutrients, by field.
- Description of application equipment and method used for calibration.

(ii) Considerations for Nutrient Management

Additional considerations associated with CNMP development and implementation should be addressed. However, NRCS does not have specific required technical criteria for these considerations for CNMPs. These considerations are:

Air Quality

AFO operators/owners should consider the impact of selected conservation practices on air quality during the CNMP development process. Air quality on land application sites may be impaired by excessive dust, gaseous emissions, and odors. Poor air quality may affect the health of workers, as well as animals and persons living in the surrounding areas. Ammonia emissions from animal operations may be deposited to surface waters, increasing the nutrient load. Soil incorporation of manure and organic by-products on land application sites can reduce gaseous emissions.

Pathogens

AFO operators and/or owners should consider the impact of selected conservation practices on pathogen control during the CNMP development process. Pathogenic organisims occur naturally in animal waste. Exposure to some pathogens can cause illness in humans and animals, especially for immune-deficient populations. Many of the same conservation practices used to prevent nutrient movement from animal operations, such as leaching, runoff and erosion control, are likely to prevent the movement of pathogens.

Salt and Heavy Metals

Build up of salt and heavy metals (i.e., arsenic, selenium, cadmium, molybdenum, zinc) in soils can create a potential for human and animal health problems and threaten soil productivity and crop marketability. Federal and State regulations do not address the heavy metal content associated with agricultural by-products. In developing a CNMP, the build-up of salt and heavy metals should be tracked through soil testing. Additional guidance on salt and heavy metal contamination from manure is available in the following:

- NRCS Agricultural Waste Management Field Handbook, Sections 651.1103 and 651.0604(b) deal with the salt content of agricultural waste.
- NRCS Agricultural Waste Management Field Handbook, Sections 651.0603(g) and 651.0605(a and b) deal with the heavy metal content of agricultural waste.
- USEPA Title 40 Part 503 -Standards for the Use or Disposal of Sewage Sludge. Section 503.13 contains pollutant limits for biosolids heavy metal content and cumulative loading rates, but does not address resident levels of metals in the soil.

(d) Record Keeping

It is important for AFO owners and/or operators to document and demonstrate implementation activities associated with their CNMPs. Documentation of implementation and management activities associated with a CNMP provides valuable benchmark information that the AFO owner/operator can use to adjust his/her CNMP to meet production and natural resource conservation objectives.

It is the responsibility of AFO owners and/or operators to maintain records that document the implementation and management of CNMPs.

Documentation will include:

- Annual manure tests for nutrient contents for each manure storage containment.
- Current soil test results, in accordance with Nutrient Management Code 590.
- Application records for each manure or commercial fertilizer application event, including:
    - Containment source or type and form of commercial fertilizer,
    - Field(s) where manure or organic by-products are applied,
    - Amount applied per acre,
    - Time and date of application,
    - Weather conditions during nutrient application,
    - General soil moisture condition at time of application (i.e., saturated, wet, moist, dry), and
    - Application method and equipment used.
- Crops planted and planting and/or harvesting dates, by field.
- Records that address manure and wastewater storage containment structures:
    - Dates of emptying, level before emptying, and level after emptying,
    - Discharge or overflow events, including level before and after event.
- Transfer of manure off-site or to third parties:
    - Manure nutrient content,
    - Amount of manure transferred,
    - Date of transfer, and
    - Recipient of manure.
- Activities associated with emergency spill response plan.
- Records associated with any reviews by NRCS, third-party consultants, or representatives of regulatory agencies:
    - Dates of review,
    - Name of reviewer and purpose of the review,
    - Recommendations or follow-up requirements resulting from the review, and
    - Actions taken as a result of the review.
- Records of maintenance performed associated with operation and maintenance plans.
- Nutrient application equipment calibration.

- Changes made in CNMP.

(e) Feed Management

Feed management activities may be used to reduce the nutrient content of manure that may result in less land being required to effectively utilize the manure. Feed management activities may be dealt with as a planning consideration and not as a requirement that addresses specific criteria; however, AFO owners and/or operators are encouraged to incorporate feed management as part of their nutrient management strategy. Specific information and recommendations should be obtained from the Cooperative State Research, Education, and Extension Service; Land Grant Universities; industry; the Agricultural Research Service; or professional societies such as the Federation of Animal Science Societies (FASS) or American Registry of Professional Animal Scientists (ARPAS); or other technically qualified entities.

An example of the effective use of feed management is presented as follows:

> *"If a dairy cow is fed 0.04 percent above recommended levels of dietary phosphorus she will excrete an additional six pounds of phosphorus annually. For a herd of 500 cows, this is an additional 3,000 pounds of phosphorus per year. In a single cropping system, corn silage is about 0.2 percent phosphorus on a dry matter basis. For a field yielding 30 tons of silage per acre, at 30 percent dry matter, this is 36 pounds of phosphorus in the crop. If an additional 3,000 pounds of phosphorus are recovered in manure it takes considerably more land for application if manure is applied on a phosphorus basis " Dr. Deanne Meyer, Livestock Waste Management Specialist, Cooperative Extension, University of California.*

Specific feed management activities to address nutrient reduction in manure may include phase feeding, amino acid supplemented low crude protein diets, or the use of low phytin phosphorus grain and enzymes, such as phytase or other additives.

Feed management can be an effective approach to addressing excess nutrient production and should be encouraged; however, it also is recognized that feed management may not be a viable or acceptable alternative for all AFOs. A professional animal nutritionist should be consulted before making any recommendations associated with feed ration adjustment.

(f) Other Utilization Activities

Using environmentally safe alternatives to land application of manure and organic by-products could be an integral part of the overall CNMP. Alternative uses for animal manure are needed in areas where nutrient supply exceeds the nutrient requirements of crops, and/or where land application would cause significant environmental risk. Manure use for energy production, including burning, methane generation, and conversion to other fuels, is being investigated and even commercially tested as a viable source of energy. Methods to reduce the weight, volume, or form of manure, such as composting or pelletizing, can reduce transportation cost, and create a more valuable product. Manure can be mixed or co-composted with industrial or municipal by-products to produce value-added material for specialized uses. Transportation options are needed to move manure from areas of over supply to areas with nutrient deficiencies (i.e., manure brokering).

More efficient and cost-effective methods are needed for manure handling, treatment, and storage. Areas in need of targeting include:

- Improved systems for solids removal from liquid manure.
- Improved manure handling, storage, and treatment methods to reduce ammonia volatilization.
- Treatment systems that transform and/or capture nutrients, trace elements, and pharmaceutically active compounds from manure.
- Improved composting and other manure stabilization techniques.
- Treatment systems to remediate or replace anaerobic lagoons.

As many of these alternatives to conventional manure management activities have not been fully developed or refined, industry standards do not always exist that provide for their consistent implementation. NRCS does not have conservation practice standards that address these other utilization options.

This element of a CNMP should be presented as a consideration for the AFO owner and/or operator in his/her decision-making process. No specific criteria need to be addressed unless an alternative utilization option is decided upon by the AFO owner and/or operator. When an AFO owner and/or operator implements this element, applicable industry standards and all federal, Tribal, State, and local regulations must be met.

Part 600.6 Exhibits

Subpart F

Exhibit 1 Sample Resource Checklist

Exhibit 2 (Reserved)

Exhibit 3 Environmental Effects for Conservation Plans and Areawide Conservation Plans

Exhibit 4 Site Specific Practice Effects

Exhibit 5 Resource Management Systems Options

Exhibits 6-12 (Reserved)

Exhibit 13 Relationship of the Planning Process and FOTG

Exhibit 14 Relationship of the Planning Process and RMS Tools

Exhibit 15 Comprehensive Nutrient Management Plan - Format and Content

Exhibit 1 Sample Resource Checklist

Tailor to Meet State or Local Needs

Note: Items protected by Federal Law, Executive Order, etc., such as threatened and endangered species, cultural resources, and other items of like nature must remain on the checklist.

Checklist of Resource Problems or Conditions

Soil Quality

Sheet/Rill Erosion; Ephemeral Gully Erosion; Classic Gully Erosion; Wind Erosion; Irrigation Induced Erosion; Mass Movement; Deposition; Streambank or Shoreline Erosion and Degradation; Phosphorus; Salinity; Contaminants; Compaction; Tilth; Crusting; Infiltration; Organic Matter; Other

Concern	**Extent**

Soil Quantity

Conversion of Agricultural Lands to Non-Agricultural Uses; Other

Concern	**Extent**

Water Quality (Surface Water)

Nutrients; Pesticides; Sedimentation; Animal Wastes; Salts; Loss of Riparian Vegetation;

Loss of Wetlands; Streambank or Shoreline Erosion and Degradation; Water Temperature Extremes; Other

Concern	Extent

Water Quality (Ground Water)

Nutrients; Pesticides; Animal Waste; Salts; Loss of Wetlands; Other

Concern	Extent

Water Quantity

Declining Water Tables; Insufficient Supply for Irrigation, Communities / Individuals, Livestock, Fish and/or Wildlife; Loss of Wetlands; Flooding / Excess Surface Water; Excess Subsurface Water; Other

Concern	Extent

Air Quality

Particulate Pollution such as Smoke or Other Particulates; Excessive Wind Erosion; Chemical Drift; Odors; Other

Concern	Extent

Plants

Invasion of Woody Vegetation or Noxious Weeds; Loss of Plant Diversity; Threatened or Endangered Species; Loss or Degradation of Riparian Vegetation; Plants not Adapted to the Site; Pest Infestation; Deforestation; Other

Concern	Extent

Animals - Wetlands

Impaired Water Quality from Agricultural or Non-Agricultural Sources; Loss of Wetlands / Loss of Adjacent Habitat; Loss of Plant Diversity; Threatened or Endangered Species; Sedimentation of Basins; Significant Hydrological Modification; Health; Other

Concern	Extent

Animals - Habitat Quality

Invasion of Non-Indigenous Plant or Animal Species; Loss or Fragmentation of Habitat; Inadequate Water Sources; Loss or Degradation of Forest, Grass Cover, or Riparian Habitat; Eutrophication of a Water Body; Water Temperature Extremes; Acid Rain; Other

Concern	**Extent**

Animals - Population

Loss of Diversity; Threatened or Endangered Species; Population Imbalance; Accumulation of Toxins; Health; Other

Concern	**Extent**

Human - Economics

Land; Labor; Capital; Management Level; Risk; Profitability; Other

Concern	**Extent**

Human - Social

Cultural Resources; Client Characteristics; Community Characteristics; Other

Concern	Extent

Exhibit 2 - (Reserved)

Exhibit 3 - Environmental Effects for Conservation Plans and Areawide Conservation Plans

U.S. Department of Agriculture
Natural Resources Conservation Service

SCS-CPA-52
04-98

Client:

Plan ID No:

For Conservation Plans and Areawide Conservation Plans

PURPOSE: This form summarizes the effects of the practices/systems. It also provides summary documentation for environmental evaluation of the planned actions.

INSTRUCTIONS: Complete the evaluation of each resource management system (RMS). Short-term refers to installation period and long-term refers to the effects during the life span of the practice or systems. Effect codes: + = beneficial; - = adverse; 0 = none. For Quality Criteria columns, check yes or no. Effects are to be quantified where possible.

Resource Considerations *	Effects		Effects Notes	Meets Q Criteria				Quality Criteria Notes
	Short	Long		Benchmark		Planned		
				No	Yes	No	Yes	
SOIL								
Erosion								
Condition								
Deposition								
WATER								
Quantity								
Quality								
AIR								
Quality								
Condition								
PLANT								
Suitability								
Condition								
Management								
ANIMAL								
Habitat (Domestic)								
Habitat (Wildlife)								
Management								

* May be amplified, if appropriate, by subcategories, such as sheet erosion, wind erosion, gully erosion, etc.

See continuation on reverse page.

Instructions

Complete the following evaluation for each Resource Management System (RMS). Short-term refers to installation period and long term refers to the effects during the life span of the practice or system. Effects codes: + = positive, - = adverse, and 0 = none. Check each category and quantify effects where possible. An explanation of the specific effects should be noted for each category necessary or important to decisionmaking. NRCS employees should treat "client data" and "financial" information as confidential information.

ECONOMIC AND SOCIALCONSIDERATIONS

	NRCS Policy or Procedure	**Effects**		**Effect Notes**
		Short	**Long**	
Economics	**GM Part 401** **Conservation Economics Handbook**			
Land Use				
Capital				
Labor				
Management level				
Risk				
Profitability				
Social	**National Social Sciences Manual**			
Client well being				
Community well being				
Environmental Justice				

SPECIAL ENVIRONMENTAL CONCERNS

Check each category. If the effect is adverse or positive to any of the following, explain in the notes section or on an attachment. For cultural resources purposes, separate primary documentation is required.

Concerns-See "Help Sheets"	**NRCS Policy Procedure**	**Present**		**Positive/Adverse Effects**	
		No	**Yes**	**No**	**Yes**
Prime and Unique Farmland	310 GM 403				
Threatened or Endangered Species	190 GM 410.22(b)				
Landscape Resource	190 GM 410.24				
Coastal Zone Management Area	NRCS/ASCS/EXT 3/9/93 Letter				
Natural Area	190 GM 410.23				
Wild and Scenic Rivers	FOTG Section 1				
Wetland	190 GM 410.26 FSA Manual & COE Tech Rpt Y-87-1				
Riparian Area	190 GM 411				
Special Aquatic Site	EPA 404(b)(1)230.3 & 230.10 Federal Register 12/24/80				
Floodplain Management	190 GM 410.25				
Stream Channel Modification	190 GM 410.27				
Cultural Resources	420 GM 401,601				
NOTES: (Attach Additional Comments)					

404 Permit needed?	__ No	__ Yes
State, county, local requirements met?	__No	__ Yes
Mitigation planned or required?	__ No	__ Yes
Public controversy about activity?	__ No	__ Yes
If yes to any of the above questions, explain in notes above.		
__ To the best of my knowledge, no further environmental analysis is required		
__ To the best of my knowledge, there is or may be a significant impact (adverse or beneficial) on one or more of the above environmental evaluation aspects. Further analysis, including the possibility of an Environmental Assessment, will be necessary		

Title	Signature	Date

Exhibit 4 - Site-Specific Practice Effects Worksheet

Example SSPEW

This example shows the effects of fourteen practices, on eight problems, on one field, for one land use, for three resource considerations, on one resource.

SITE-SPECIFIC PRACTICE EFFECTS			Client: Ira Farmer		Land Use: Cropland				
			Natural Resource Soil:						
Field or CMU	3/ Conservation Practices	1/ Erosion ---------- 2/ Sheet & Rill	Erosion ---------- Ephemeral Gully	Erosion ---------- Classic Gully	Condition ---------- Tilth	Condition ---------- Compact-ion	Condition ---------- Excess Fertilizer	Condition ---------- Excess Pesticides	Deposition ---------- Off-Site
5	Conservation Tillage, No-Till	4/ **Sig. Dec.**	**Mod. Dec.**	Neg.	**Mod. Dec.**	**Mod. Dec.**	Neg.	Sl. Inc.	**Mod. Dec.**
	Contour Farming	**Mod. Dec.**	Sl. Dec.	Neg.	Sl. Dec.	Neg.	Neg.	Neg.	Sl. Dec.
	Crop Residue Use	Sl. Dec	Neg.	Neg.	Sl. Dec.	Neg.	Neg.	Neg.	Sl. Dec.
	Diversion	Sl. Dec.	**Mod. Dec.**	**Mod. Dec.**	Sl. Inc.	Neg.	Neg.	Neg.	**Mod. Dec.**
	Field Border	Sl. Dec.	Sl. Dec.	Neg.	Neg.	Sl. Dec.	Neg.	Neg.	Sl. Dec.
	Grade Stab. Structure	N/A	Neg.	**Sig. Dec.**	N/A	N/A	N/A	N/A	**Mod. Dec.**
	Grassed Waterway	Neg.	**Sig. Dec.**	**Mod. Dec.**	Neg.	Neg.	Neg.	Neg.	Sl. Dec.
	Nutrient Mgt. (excess)	Neg.	Neg.	Neg.	Neg.	Neg.	**Sig. Dec.**	Neg.	Neg.
	Pest Mgt. (chemical)	Sl. Dec.	Neg.	Neg.	Neg.	Neg.	Neg.	**Mod. Dec.**	Neg.
	Stripcropping - Contour	**Mod. Dec.**	**Mod. Dec.**	Sl. Dec.	Sl. Dec.	**Mod. Dec.**	Sl. Dec.	Sl. Dec.	**Mod. Dec.**
	Terraces (storage)	**Mod. Dec.**	**Sig. Dec.**	**Mod. Dec.**	**Mod. Dec.**	Neg.	Neg.	Neg.	**Sig. Dec.**
	Underground Outlets	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces	Facilitates Terraces
	Wildlife Up-land Hab. Mgt.	Sl. Dec.	Sl. Dec.	Sl. Dec.	**Mod. Dec.**	**Mod. Dec.**	Neg.	Neg.	Neg.
	Wildlife Water Facility	Neg.	Neg.	Neg.	N/A	N/A	N/A	N/A	Neg.

1/ Enter the broad resource considerations illustrated in the CPPE matrix located in Section V FOTG

2/ Enter resource problems that correspond to the resource considerations.

3/ Enter conservation practices from the FOTG that contribute toward solving the identified problems.

4/ Enter practice effects illustrated in the CPPE matrix or localized practice effects data sheets.

Effects on the problem: N/A = Not Applicable; Neg. = Negligible; Sl = Slight; Mod. = Moderate; Sig. = Significant; Dec. = Decrease; Inc. = Increase.

Exhibit 5 - Resource Management Systems Options Worksheet

Example RMS Options Worksheet

This example shows the effects of one alternative, on eight problems, on one field, for one land use, for three resource considerations, on one resource.

RESOURCE MANAGEMENT SYSTEMS OPTIONS		**Client:** **Ira Farmer** **Natural Resource** **Soil:**			**Land Use:** **Crop**				
Field or CMU	3/ Conservation Practices	1/ Erosion ---------- -- 2/ Sheet & Rill	Erosion ---------- - Ephemeral Gully	Erosion ---------- - Classic Gully	Condition ---------- Tilth	Condition ---------- Compact-ion	Condition ---------- Excess Fertilizer	Condition ---------- Excess Pesticides	Deposition ---------- - Off-Site
5	RMS Option	4/							
	Crop Res Use 20%	+	O	O	O	O	O	O	O
	Terraces (Storage) Underground Outlet	+ F	+ F	+ F	+ F	O F	O F	O F	+ F
	Contour Farming	+	O	O	+	O	O	O	O
	Nutrient Mgt.	O	O	O	O	O	O	O	O
	Pesticide Mgt.	O	O	O	O	O	O	+	O

1/ Enter the broad resource considerations illustrated in the CPPE matrix located in Section V FOTG

2/ Enter resource problems that correspond to the resource considerations.

3/ Develop RMS options by listing combinations of practices based on the "SSPEW."

4/ Express the effects of selected practices. Refer to CPPE matrix located in Section V FOTG (codes N/A,F,O,+, or -).

Effects on the **problem**: N/A = Not Applicable; F = Facilitating; O = Slight or Negligible; + = positive; - = Negative.

Exhibits 6 – 12 - (Reserved)

Exhibit 13 - Relationship of the Planning Process and FOTG

Planning Process		**FOTG**
Preplanning Activities		Sections I, II, III, & V Reference Material Soils Information Guidance Documents Case Studies
Step 1	Identify Problems	Sections I, II, III, & V Reference Material Soils Information Guidance Documents Case Studies
Step 2	Determine Objectives	Sections I & II Reference Material Soils Information
Step 3	Inventory Resources	Sections I, II, III, & IV Reference Material Soils Information Guidance Documents Practice Standards

Planning Process		**FOTG**
Step 4	Analyze Resource Data	Sections I, II, III, & V Reference Material Soils Information Guidance Documents Conservation Effects
Step 5	Formulate Alternatives	Sections II, III, IV, & V Soils Information Resource Management Systems Guidance Documents Conservation Practice Descriptions Conservation Practice Physical Effects (CPPE) Matrix Conservation Effects
Step 6	Evaluate Alternatives	Sections I, II, III, IV, & V Reference Material Soils Information Resource Management Systems Predictive Tools and Models Practice Standards Conservation Effects
Step 7	Make Decisions	Section V Conservation Effects

Planning Process		**FOTG**
Step 8	Implement Plan	Section IV Practice Standards & Specifications
Step 9	Evaluate Plan	Sections I, II, III, IV, & V Conservation Effects Case Study Potential new data for some or all sections

Exhibit 14 - Relationship of the Planning Process and RMS Tools

Planning Process	RMS Tools	RMS Actions
Phase I		
Step 1 Identify Problems	Conservation Practice Physical Effects (CPPE)	Provides a list of resource considerations, problems, practices, and effects
Step 2 Determine Objectives		
Step 3 Inventory Resources	Conservation Effects for Decision Making Worksheet (CED)	Documentation of the benchmark conditions
Step 4 Analyze Resource Data	Site Specific Practice Effects Worksheet (SSPEW)	Documentation of land uses, resources, resource considerations, and resource problems, practices, and site specific effects

Planning Process	RMS Tools	RMS Actions
Phase II		
Step 5 Formulate Alternatives	CPPE, SSPEW	Identification and display of conservation practices and effects on resources
	Resource Management System Options (RMS Options	Combining conservation practices into systems that adequately treat resource problems
Step 6 Evaluate Alternatives	CED	Determination and display of the expected effects and impacts of RMS Options
Step 7 Make Decisions	CED	Use of the CED by the client to evaluate options and select desired option

Planning Process	RMS Tools	RMS Actions
Phase III		
Step 8 Implement Plan		
Step 9 Evaluate Plan	CED	Comparison of actual effects to benchmark conditions and projected effects, and providing feedback into the FOTG, electronic tools, NPPH, policy, and programs

Exhibit 15 - Comprehensive Nutrient Management Plan - Format and Content

A comprehensive nutrient management plan (CNMP) should address all land units that the animal feeding operation (AFO) owner and/or operator owns or has decision-making authority over **and** on which manure and organic by-products will be generated, handled, stored, or applied. This Exhibit describes the general contents of a CNMP and lists suggested items under each major section. The intent of this guidance is to help to maintain quality and provide appropriate documentation of a CNMP. The precise content of a CNMP will vary as it is tailored to the meet the needs of the AFO owner and/or operator.

Contents of a Comprehensive Nutrient Management Plan

1. Site information

- Names, phone numbers, and addresses of the AFO owner(s) and operator(s).
- Location of production site: legal description, driving instructions from nearest post office, and the emergency 911 coordinates.
- Farmstead sketch.
- Plat map or local proximity map (Optional).
- Emergency action plan covering: fire, personal injury, manure storage and handling, and land application operations.
- Operation procedures specific to the production site and practices.
- Existing documentation of present facility components that would aid in evaluating existing conditions, capacities, etc. (i.e., as-built plans, year installed, number of animals a component was originally designed for, etc.).

2. Production information

- Animal types, phases of production, and length of confinement for each type at this site.
- Animal count and average weight for each phase of production on this site.
- Calculated manure and wastewater volumes for this site.
- Manure storage type, volume, and approximate length of storage.

3. Applicable permits or certifications

- Federal, Tribal, State or local permits and/or ordinances.
- Operator or manager certifications.
- Manure applicator certifications.
- Record of inspections or site assessments.
- Changes made to CNMP.

4. Land application site information

- Date plan prepared.
- Written manure application agreements. (Where Applicable)
- Aerial maps of land application area.
- Individual field maps with marked setbacks, buffers, and waterways, and environmentally sensitive areas, such as sinkholes, wells, gullies, tile inlets, etc.
- Landowner names, addresses, and phone numbers.
- Legal description of land sites, including watershed codes.

- Specific and unique field identification codes.
- Land use designation.
- Soil map, with appropriate interpretations.
- Risk assessments for potential nitrogen or phosphorus transport from fields. (See NRCS GM_190, Part 402, Nutrient Management, Section 402.07)
- Land treatment practices planned and applied, and level of treatment they provide.

5. Manure application plans

- Crop types, realistic yield targets, and expected nutrient uptake amounts.
- Application equipment descriptions and methods of application.
- Expected application seasons and estimated days of application per season.
- Estimated application amounts per acre (volume in gallons or tons per acre, and pounds of plant available nitrogen, phosphorous as P205, and potassium as K20 per acre).
- Estimate of acres needed to apply manure generated on this site, respecting any guidelines published for nitrogen or phosphorous soil loading limits.

6. Actual activity records

- Soil tests not more than 5 years old.
- Manure test annually for each individual manure storage containment.
- Planned and applied rates, methods of application, and timing (month and year) of nutrients applied. (Include all sources of nutrients, i.e., manure, commercial fertilizers, etc.)
- Current and planned crop rotation.
- Weather conditions during nutrient application. (Optional)
- General soil moisture condition at time of application (i.e., saturated, wet, moist, dry). (Optional)
- Actual crop and yield harvest from manure application sites.
- Record of internal inspections for manure system components.
- Record of any spill events.

7. Mortality disposal

- Plan for mortality disposal.
- Methods and equipment used to implement the disposal plan.

8. Operation and Maintenance

- Detailed operation and maintenance procedures for the conservation systems, holding facility, etc., contained in the CNMP. This would include procedures as calibration of land application equipment, storage facility emptying schedule, soil and manure sampling techniques, etc.

Part 600.7 Glossary

Subpart G

600.70 Glossary

600.70- Glossary

This glossary defines terms that govern the conservation planning process. These terms are used by NRCS personnel and others to describe processes, activities, clients, or products of NRCS technical assistance. Other terms, used exclusively by certain NRCS disciplines, are defined in disciplinary manuals and handbooks, and are not repeated here. Similarly, definitions of specific data elements used in automated information systems are included in data dictionaries. However, this glossary has the overall controlling definitions for NRCS processes nationwide.

Adaptive Management
The process of using monitoring, evaluation, and experimentation to provide information to adjust resource management decisions as needed. Adaptive management is closely linked to planning step nine and is essential for continuous improvement of the resource base.

Air Condition
An NRCS air resource consideration that includes air temperature, air movement, and humidity.

Air Quality
An NRCS air resource consideration that includes airborne soil and smoke particulates that can cause safety related problems, machinery and structure damage, health problems, deposition of airborne sediment in water conveyances, airborne chemical drift, odors, and fungi, molds, and pollen.

Alternative Conservation System (ACS)
A conservation system for treating sheet, rill, wind, and ephemeral gully erosion on highly erodible land that is documented in the FOTG and which achieves a substantial reduction in soil loss rates. This term applies only to conservation plans and conservation systems developed to carry out the provisions of the Food Security Act of 1985, as amended by the Food, Agriculture, Conservation and Trade Act of 1990, and the Federal Agricultural Improvement and Reform Act of 1996.

Alternative System
A conservation system that is presented to a client during the planning process as one of multiple alternatives to address resource problems/opportunities. When a client decides which of the offered alternative systems will be implemented, the selected alternative becomes the planned system.

Alternatives
A set of one or more options provided to the client to solve resource problems or address opportunities and achieve proper management of the resources.

Application
Installing planned conservation practices, management measures, and management systems on the land.

Areawide Conservation Plan
A plan developed with a client for a watershed or other geographical area defined by the client and stakeholders. The areawide conservation plan addresses all resource problems identified, contains alternative solutions that meet the minimum quality criteria for each resource, and addresses applicable laws and regulations.

Assistance Notes
Notes maintained by planners in the case file for each individual client receiving planning and implementation assistance. These notes are to be a concise, factual, and chronological narrative of significant conservation activities, and may summarize progress in planning and implementation.

Basic Conservation System (BCS)

An erosion control system for treating sheet, rill, wind, and ephemeral gully erosion on highly erodible land. A BCS may be a component of a Resource Management System (RMS). The BCS must achieve soil loss tolerance requirements for the principal soil it is designed to protect and be documented in the FOTG. This term applies only to conservation plans and conservation systems developed to carry out the provisions of the Food Security Act of 1985, as amended by the Food, Agriculture, Conservation, and Trade Act of 1990, and the Federal Agricultural Improvement and Reform Act of 1996.

Benchmark Condition

The present condition or situation that is used as a point of reference to measure change in resource conditions resulting from conservation treatment. In addition to the benchmark condition, other points of reference are sometimes used for discussion and comparison purposes, especially in an areawide conservation planning situation, *i.e.*, forecasting the resource conditions expected at some point in the future by maintaining current levels of resource management and treatment.

Benchmark Narrative

A written statement of the benchmark condition. The narrative includes a description of the current conditions, crops, soils, major resource problems, etc. It includes conservation practices that meet NRCS standards and those that do not. For areawide conservation plans the narrative also includes information on future conditions if the problems are not treated.

Benchmark Practices

Existing conservation practices included in the current management system for the planning unit. These practices meet NRCS standards and specifications.

Best Management Practice (BMP)

An Environmental Protection Agency term used in water quality activities that may use NRCS technical assistance in planning and implementation. A BMP is a practice, or combination of practices, determined by a state or other agency to be the most effective and practicable (including technological, economic, and institutional considerations) means of reducing the amount of pollution from non-point sources to a level compatible with water quality goals.

Break-Even Analysis

Estimates target values that would just cover the costs of production (*i.e.*, "break-even"). For example, a client may want to know what the "break-even" yield is, given the cost of production and an expected price per unit of production. Break-even yield = (Total cost per acre)/(Price per bushel). Or a client may want to know at what price he or she will cover the costs of production given a yield. Break-even price = (Total cost per acre)/(Yield per acre).

Case File

The record of resource information, decisions, and technical assistance for a specific client. A case file is established and maintained in the NRCS field office for each client where NRCS is providing continuing technical assistance on a planning unit. The case file will be maintained electronically. Information not amenable to electronic format will be maintained in hard copy under the client's name.

Client

An individual, group, or unit of government that is the recipient of NRCS technical assistance. Examples of NRCS clients are: (1) An owner, manager, or partner who is primarily responsible for the business entity in its dealings with NRCS. (2) The group or local sponsoring organization or federal official responsible for fulfilling requirements or exercising judgments consistent with law, Executive Order, or established federal policy. Examples of clients include persons, groups, Tribes, corporations, organizations, conservation districts, and units of government.

Common Resource Areas

A geographical area where resource concerns, problems, and treatment needs are similar. Landscape conditions, soil, climate, human considerations, and other natural resource information is used to determine the geographical boundaries of the common resource area.

Comprehensive Plan

A plan for an area under the jurisdiction of a unit of government that may include, but is not limited to, policies, goals, and interrelated plans for private and public land use, transportation systems, community facilities, and capital improvements. The plan represents the decisions of local people as expressed through units of government. This type of plan may also be called a general plan, master plan, or a regional development plan.

Comprehensive Planning

A continuing process by a unit of government that includes preparation of a comprehensive plan and adoption of the administrative and regulatory measures to implement and maintain the plan. The Intergovernmental Cooperation Act of 1968 (Public Law 90-577), section 109, states: Comprehensive planning includes the following to the extent directly related to area needs or needs of a unit of general local government:

1. Preparation as a guide for governmental policies and action, of general plans with respect to:
   - a. pattern and intensity of land use
   - b. provision of public facilities (including transportation facilities) other government services
   - c. effective development and utilization of human and natural resources.
2. Long-range physical and fiscal plans for such actions.
3. Programming of capital improvements and other major expenditures based on a determination of relative urgency, together with definitive financing plans for such expenditures in the earlier years of the program.
4. Coordination of all related plans and activities of the state and local governments and agencies concerned.
5. Preparation of regulatory and administrative measures in support of the foregoing.

Conservation District

A subdivision of a state, Indian Tribe, or territory, organized pursuant to the state soil conservation district law, as amended, or Tribal law. They may be called soil conservation districts, soil and water conservation districts, resource conservation districts, land conservation committees, natural resource districts, etc.

Conservation District Cooperator

Any client who has entered into a working arrangement or cooperative agreement with a conservation district to work together in planning and carrying out resource use, development, and conservation on a specific land area.

Conservation Effects Process

A process that supports the NRCS planning process. It uses worksheets, client case studies, and other technologies to document and estimate effects of benchmark systems and resource management

systems, evaluate impacts, and gauge advantages and disadvantages to help the end user make informed conservation decisions.

Conservation Management Unit (CMU)
A field, group of fields, or other land units of the same land use and having similar treatment needs and planned management. CMU is a grouping by the planner to simplify planning activities and facilitate development of resource management systems. A CMU has definite boundaries, such as fence, drainage, vegetation, topography, soil lines, or land use.

Conservation Plan
A record of the client's decisions and supporting information, for treatment of a unit of land or water as a result of the planning process, that meets FOTG quality criteria for each natural resource (soil, water, air, plants, and animals) and takes into account economic and social considerations. The plan describes the schedule of operations and activities needed to solve identified natural resource problems, and take advantage of opportunities, at a resource management system level. The needs of the client, the resources, and federal, state, and local requirements will be met.

Conservation Planning
The activity of NRCS and others in helping a client use the planning process, which is intended to result in a conservation plan or an areawide conservation plan.

Conservation Practice
A specific treatment, such as a structural or vegetative measure, or management technique, commonly used to meet specific needs in planning and implementing conservation, for which standards and specifications have been developed. Conservation practices are contained in the FOTG, Section IV, which is based on the National Handbook of Conservation Practices (NHCP).

Conservation Practices Physical Effects (CPPE) matrix
The matrix in the FOTG, Section V, that gives the physical effects of many conservation practices on soil, water, air, plants, and animals.

Conservation System
A combination of conservation practices and resource management for the treatment of soil, water, air, plant, and/or animal resource concerns.

Conservation Treatment
Any and all conservation practices, management measures, and works of improvement that have the purpose of solving or reducing the severity of natural resource use problems or taking advantage of resource opportunities.

Coordinated Resource Management (CRM)
A specific application of the planning process, that may include a variety of clients, stakeholders, organizations, agencies, and others, and a variety of land ownerships, that can address a multitude of resource or resource related problems, opportunities, or concerns. CRM is frequently accomplished through "consensus" involving participants that may or may not be land owners or users, or have decisionmaking authority for the planning area involved. The planning area encompasses the geographical area defined by the parties involved in the CRM effort.

Cost-Return Analysis
A cost-return analysis compares the costs and returns (revenue) of agricultural enterprises.

Cultural Resources
Evidence of activities and accomplishments of people including remnants of past cultures and some unique resources associated with present day cultures. The most common are sites, buildings, structures, landscapes, and objects that have scientific, historical, or archaeological value.

Customer Service Toolkit

The Customer Service Toolkit (CST) is a software package for use in the conservation planning process to facilitate the development, presentation, and dissemination of information by Service Center field staff working in the field or in the office.

Decisionmaker
An individual, group, unit of government, or other entity that has the authority by ownership, position, office, delegation, or otherwise to decide on a course of action.

Desired Future Condition
Desired future condition is a quantitative or qualitative expression of an ecological, economic, or social condition one is attempting to achieve. It is the goal to compare with the predicted outcomes of alternative implementation options. A desired future condition should include at least one indicator and a target value for each indicator in order to quantify or qualify the condition.

Ecological System
The organization and interactions of communities of living things, including humans, together with the chemical and physical factors in their environment.

Effects
The anticipated or experienced results of applying one or more conservation treatments on a planning unit in a particular resource setting. They include both on-site and off-site results of applied conservation treatments. They are measures of a level of outcome and may be expressed in ecological, economic, or social terms.

Environmental Assessment (EA)
A concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental Evaluation (EE)
A concurrent part of the planning process in which the potential long-term and short-term impacts of an action on people, their physical or social surroundings, and nature are evaluated and alternative actions explored.

Environmental Impact Statement (EIS)
A document detailing the environmental impact of a proposed law, construction project, or other major action that may significantly affect the quality of the environment. The National Environmental Policy Act (NEPA) and various state environmental laws may require an EIS.

Environmental Justice
Requires, per Executive Order 12898, that no program, procedure, or activity be carried out that has disproportionately adverse human health or environmental effects on minority or low income populations.

Facilitating Practice
A conservation practice that facilitates management or the function of another practice, or both, but does not achieve the desired effects on its own. Example: A fence is a facilitating practice for prescribed grazing. Prescribed grazing helps improve forage for livestock.

Field Office Technical Guide (FOTG)
The official NRCS guidelines, criteria, and standards for planning and applying conservation treatments (General Manual 450, Part 401).

Finding of No Significant Impact (FONSI)
A document indicating that no significant environmental impact will occur with a proposed activity.

Follow-Up

The act of maintaining contact with the client to provide timely assistance in implementing decisions, keeping current with new technology, encouraging continued implementation, updating objectives and decisions in a conservation plan, and determining the conservation effects experienced.

Future Without Treatment or Future Projected Condition
The ecological, economic, or social condition(s) that is expected to exist in the future if no change is made in the current use, management, or treatment regarding one or more resources. This is sometimes referred to as the "no action" projection.

Group
Two or more clients who are cooperating to achieve common or mutual conservation objectives to address natural resource or related problems, concerns, or opportunities.

Guidance Documents
Documents contained in the FOTG, Section III. They are examples of RMS options to treat the most commonly identified resource problems/opportunities for each locally applicable major land use.

Human Considerations
The potential social, economic, and cultural resource factors that should be considered in the conservation planning process. A partial listing of human considerations, social and economic, are included in Figure 1 of this handbook.

Impacts
The difference between the anticipated effects of alternative treatment in comparison to existing or benchmark condition effects. Differences may be expressed by narrative, quantitative, visual, or other means. Impacts are used as a basis for making informed conservation decisions.

Implementation
The act of installing planned conservation treatment and management measures that are documented in plans and case files. Includes enacting measures called for in areawide conservation plans, such as flood plain zoning, and sediment and erosion control ordinances.

Indicator
The description or measurement of a resource concern that, when observed periodically, indicates or demonstrates trends. Directly linked to indicators are target values which identify a specific quantitative or qualitative estimate for the desired state of the resource concern.

Internal Rate of Return
A financial analysis tool that estimates the interest rate which would make the present value of a stream of net cash revenues equal to zero. The resulting interest rate can be compared to the internal rate of returns of other investment alternatives to determine the alternative with the highest rate of return.

Land Evaluation and Site Assessment (LESA)
A system developed by USDA NRCS to determine the quality of land for agricultural uses and to assess sites or land areas for their agricultural viability.

Land Unit
Any area of land that is of concern in the planning process.

Land Use
A term used by NRCS to identify the intent of the client with regard to the purpose to which a land unit is to be put. The two designations of land use are the official NRCS designation, and the client land use designation agreed-to by the client and planner.

Least-Cost Analysis (cost-effectiveness)
Least-cost analysis identifies the least costly alternative (compared to all other alternatives), with the stipulation that all alternatives satisfy the client's objective.

Locally Led Conservation
A concept whereby local people assess their natural resource conditions and needs, set goals, identify programs and other resources to solve those needs, develop proposals and recommendations, implement solutions, and measure their success.

Low Initial Cost Structures
Structures for treating resource problems that are specifically designed for low initial cost for certain situations, recognizing that the operation and maintenance costs may be higher than those for conventional structures.

Management Measure
One or more specific actions that is not a conservation practice but that has the effect of alleviating problems or improving the treatment of the resources. These actions are not conservation practices described in the FOTG, Section IV.

Map Unit
A collection of areas defined and named the same in terms of their soil components or miscellaneous areas, or both.

Multiple Use
Treating and managing a single area for two or more complementary or compatible uses occurring concurrently or consecutively. Examples: (a) land used for wood and wildlife production; (b) water areas used for flood control, recreation, and wildlife production; (c) land used for livestock grazing, wildlife habitat, and wood production.

National Environmental Policy Act (NEPA)
The 1970 Act that requires federal agencies to consider the effects on the environment of proposed federal actions. This Act established the requirement for conducting environmental evaluations and for the preparation of environmental assessments and environmental impact statements.

Natural Resource
Any naturally occurring resource needed by an organism, population, or ecological system. NRCS applies this term to soil, water, air, plants, and animals.

Net Present Value Analysis
Net present value analysis converts future flows of benefits and costs to the present, thus allowing for comparisons of alternatives on a common time basis.

Objectives
Objectives are quantitative or qualitative statements of desired future conditions as determined by the client.

Off-Site
Locations outside the area on which conservation treatment is being considered. Also refers to areas outside the planning unit that should be considered for potential impacts.

On-Site
Locations within the area on which conservation treatment is being considered.

Partial Budgeting
Partial budgeting analysis is used to analyze only the change in costs and returns associated with the agricultural enterprise affected by the adoption of proposed alternatives.

Plan Map
An aerial photograph or sketch of a land area developed during the planning process that shows property boundaries, land unit boundaries, physical features, location of planned and applied practices, and other features that are useful to the client in plan implementation.

Plan Revision

Action needed as a result of significant changes in one or more of the conservation systems defined in the conservation plan. This may be caused by changes in land use, changes in technology, changes in the set of practices included in the system, a change in the land units treated by the system, etc. The product is a revised plan.

Planned System
The conservation system selected for implementation and described in the plan document.

Planner
A person, qualified by training and experience, who effectively assists the client in completing the planning process.

Planning Process
The three-phase, nine-step process used by NRCS to help clients plan and apply conservation treatments or make land use and treatment decisions.

Planning Standard
Identifies the minimum quality level to which each step in the planning process must be carried out in order to help the client develop a successful plan. The standard establishes the condition expected to exist at the successful completion of each planning step.

Planning Unit
A planning unit is generally the entire operating unit, but can be a group, or groups, of fields with similar land use and management (see Conservation Management Unit) in which the decision has been made to initiate the planning process. A field is normally the smallest increment for planning resource management systems or practices. However, in rare instances a subfield (a field within a field - for example, the drainage area into a waterway and the outlet area below the waterway) may be appropriate. The planning unit must be large enough to encompass the area that influences, and the area that is directly impacted by, the resource management system or practice being planned.

Practice
Same as Conservation practice.

Practice Narrative
A brief non-technical description of the planned practice.

Progressive Planning
The planning process is progressive when a client is ready, willing, and able to make and implement some, but not all of the decisions necessary to achieve an RMS level of management. The rate of progress in moving to an RMS level will depend on the client's desires and constraints.

Public Participation
An integral part of areawide conservation planning. It provides opportunities for the public to be involved in the interchange of data and ideas.

Quality Criteria
A quantitative or qualitative statement of a treatment level required to achieve an RMS for identified resource considerations for a particular land area. It is established in accordance with local, state, and federal programs and regulations in consideration of ecological, economic, and social effects.

Record of Cooperator Decisions
A part of the conservation plan and case file documents that contains the decisions for the CMU(s).

Record of Decision
A concise written rationale by the responsible federal official regarding implementation of a proposed action requiring an Environmental Impact Statement.

Resource Consideration / Resource Concern

Elements of the natural resources that may be sensitive to change by natural forces or human activity. These elements directly impact the conservation planning process. A comprehensive list of resource elements is found on the Conservation Practice Physical Effects matrices in the FOTG.

Resource Management System (RMS)
A combination of conservation practices and resource management, for the treatment of all identified resource concerns for soil, water, air, plants, and animals, that meets or exceeds the quality criteria in the FOTG for resource sustainability.

Resource Problem
The condition related to one or more resources that does not meet the minimum acceptable condition levels as established by resource quality criteria shown in the FOTG, Section III.

Resource Setting
A description of ecological characteristics, land use, and management important for comparison of resource information among planning units. Such background information also provides better understanding of the relative magnitude of resource problems. An adequate description may include such information as dominant soils, range sites, important topographic or geomorphic characteristics, Major Land Resource Area, precipitation patterns, seasonal land use, climate, current resource conditions, type of operation, and relationships to streams, lakes, and aquifers.

Revised Plan
A conservation plan or areawide conservation plan that has been changed by mutual agreement of NRCS and the client to the extent that a new document needs to be generated to show changes in land unit boundaries, resource management systems, and type of enterprise.

Risk Analysis
A process for analyzing a selected course of action (or inaction) to determine risks expected from carrying it out.

Risk Management
Risk management is the process of identifying potential risks from various courses of action or non-action, gathering pertinent information relative to the risk, and then taking appropriate action to eliminate or minimize the risk as much as possible.

Scoping
Scoping is the early, up-front and open process to determine the extent of the significant issues, such as resource problems and concerns, regulatory requirements, etc., to be addressed in the planning process.

Site-Specific Practice Effect
The expected effect that a particular conservation practice has on defined resource problems/opportunities in a site-specific situation. This data represents the planner's refinement of more general effects shown in the CPPE Matrix in the FOTG, Section V.

Soil Description
A listing of soil properties, both site and profile, specific to a geographical location.

Stakeholder
An individual or group of clients that may or may not be decisionmakers and who have an interest in or may be impacted by actions recommended through application of the planning process.

System
See Conservation System.

System Narrative
A description of the existing, proposed, or planned conservation practices and management measures associated with specific land units for a client and business. The description defines how well the

system meets quality criteria, if at all. Alternative, planned, and completed systems should meet quality criteria specified in the FOTG. Benchmark systems may not meet FOTG specifications; deficiencies can be noted in the description and system evaluation records.

Target Value
Identifies a specific value to be used in conjunction with an indicator.

Technical Assistance
Help provided by NRCS, and employees of other entities or agencies under the technical supervision of NRCS, to clients to address opportunities, concerns, and problems related to natural resource use.

Unit of Government
A state or territorial government, together with its planning commissions, boards, agencies, and representatives. A municipality, county, town, parish, or other political subdivision of a state or territory, including its planning commissions, boards, agencies, and representatives having planning responsibility and concern over lands that it may or may not directly own or control.

Values
Ideals, customs, attitudes, and beliefs used to judge the impacts of conservation treatments as favorable or unfavorable. Includes individual client values as well as collective values of groups and society as a whole.

Walk-In
A recipient of information that does not result in the development of a case file and practices applied to the land. Walk-ins include people who visit or call the field office for information or assistance.