United States Department of Agriculture

Natural Resources Conservation Service

National Planning Procedures Handbook (NPPH), Edition 1

(180-600-H, 1st Ed., Amend. 6, Nov 2014)

Acknowledgements

The National Planning Procedures Handbook was first published in 1993 and has been amended four times: in 1996, 1997, 2003, and 2010. Many people have participated in updating it over time.

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Part 600 – National Planning Procedures Handbook

Subpart A – General

Subpart B – Framework for Planning

Subpart C – NRCS Planning Process

Subpart D – Plan Format and Content

Subpart E – Support Guidance

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Part 600 – National Planning Procedures Handbook

Subpart A – General

600.0 Purpose

A. NRCS is USDA's technical agency for providing assistance to private land managers, conservation districts, Tribes, and other organizations in planning and carrying out conservation activities and programs. The purpose of this handbook is to provide guidance on the planning process used by the NRCS and many of its partners for developing, implementing, and evaluating individual conservation plans and areawide conservation plans.

Figure 600-A1: Conservation Planning Pamphlet

B. A conservation plan is the record of decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The plan may include component plans that address one or more resource concerns. Example component plans include: comprehensive nutrient management plan, grazing plan, integrated pest management plan, wildlife management plan, etc. The needs of the client, the resources, and Federal, State, Tribal, territorial, and local requirements will be met.

C. NRCS provides conservation planning and technical assistance to individuals, groups, Tribes, and units of government to help plan and carry out conservation decisions to meet their objectives. This help includes onsite planning assistance in developing conservation plans. Conservation plans are

developed and implemented to protect, conserve, or enhance natural resources within the client's social and economic interests and abilities.

D. Natural resources are defined by NRCS to include soil, water, air, plants, animals, energy and human considerations (SWAPAE +H).

E. 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:

(1) Consider the needs and capabilities of each acre within the plan
(2) Consider the client's facilities, machinery, and economic situation
(3) Incorporate the client's willingness to try new practices
(4) Consider the land's relationship to the entire farm, ranch, or watershed
(5) Ensure the conservationist's presence out on the land

Figure 600-A2: Hugh Hammond Bennett (right)

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

G. Planning involves more than considering individual resources. It focuses on the natural systems and ecological processes that sustain the resources. Ultimately, the Earth is one ecological system, embodying all the smaller subsystems into one interconnected system. The relationship between living organisms and the environment are part of an ecological system's complexity and are not fully understood. Predicting both onsite and offsite effects upon ecological components is essential and is an inherent part of conservation planning.

H. The role of humans is considered in the formulation and delivery of planning activities. Human values and activities influence the structure and functions of ecological systems. Human actions result in direct and indirect effects on natural resources, both detrimental and beneficial. 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 facilitates a client to operate in an ecologically sustainable, economically sound, and socially acceptable manner within the client's social values.

I. 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. The planner strives to balance natural resource issues with economic and social needs through the development of the conservation plan.

J. When working with Tribal, Native Hawaiian, or Native Pacific Islander clients (indigenous peoples), NRCS can offer technical assistance to help increase their capacity to use the best of both agency methods and indigenous stewardship. The *Indigenous Stewardship Methods and NRCS Conservation Practices Guidebook* focused on Tribes and were developed to provide a sensitive process in which knowledge is shared, allowing planners to incorporate the indigenous knowledge into NRCS's assistance through its conservation practices. The indigenous perspective of living in harmony with the Earth and the agency perspective of scientific and experiential learning are portrayed in the words of the guidebook. Indigenous peoples' traditional resource management systems are based on a combination of traditional knowledge and contemporary resource management needs. Traditional knowledge is sustained and validated by continued application and adaptation, but without a contemporary operating context—our conservation practice standards—valuable traditional knowledge and traditional stewardship practices may be lost to all producers. NRCS's conservation planning procedures facilitate incorporation of traditional indigenous stewardship practices into producers' daily work.

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

(1) Help protect, conserve, and enhance natural resources
(2) Design alternatives that meet local resource planning criteria for identified resource issues
(3) Include human concerns for achieving sustainable agricultural systems
(4) Consider the effects of planned actions on interrelated geographical areas (i.e., looking offsite, beyond the planning unit boundary)
(5) Consider and explain the interaction between ecological communities and society
(6) Focus on ecological principles
(7) Consider the effects, risks, and interactions of planned systems and practices on the natural resources, as well as economic and social considerations
(8) Identify where indigenous stewardship methods might be needed or explored
(9) Assist with development of plans, regardless of scale, which will help achieve the client's and society's objectives
(10) Identify where knowledge, science, and technology need to be advanced
(11) Assist with meeting requirements for NEPA, which is incorporated into all steps and activities of the conservation planning process (see Section 600.41, "Integrating NEPA into the Planning Process," for additional information)

L. The planning process establishes a framework for planning and applying conservation systems on individual land units for individuals and businesses, as well as, geographic areas involving multiple ownerships, with stakeholder input, for the development of areawide conservation plans.

M. Planning is complex and dynamic. Successful planning requires not only a high level of knowledge, skill, and ability on the part of the planner, but also the use of professional judgment.

N. To gain or maintain the knowledge, skills, and abilities needed for conservation planning, this handbook may be used both for training purposes and as a reference guide.

O. Users of this handbook also need to become familiar with NRCS planning policy (Title 180, General Manual (GM), Part 409), program manuals, discipline manuals (agronomy, biology, economics, engineering, range, etc.), official soils data and interpretive information, the Field Office Technical Guide (FOTG), and user guides for approved automated planning tools. In addition, users need to be thoroughly familiar with NRCS policy and procedures for complying with NEPA and related environmental concerns (190-GM, Part 410, "Compliance with NEPA"; Title 190, National Environmental Compliance Handbook, Part 610); the Land Use Manual (see 310-GM); and the Farmland Protection Policy Act (see Title 440,Conservation Programs Manual (CPM), Part 523).

P. Planning by its nature is both progressive and adaptive. A first-time client may only be interested in a single practice to meet one of their resource concerns. By introducing the planning process, the client is presented a range of alternatives to address multiple resource concerns and ideally, to develop and implement an RMS. Planners and clients work closely together based on the client's knowledge level and where they are in the planning process. It is important to continue assisting the client in addressing resource concerns by increasing the level of planning and implementation over time and ultimately achieving planned goals.

600.1 References

A. Public Laws.—Numerous Federal laws or regulations effect actions or activities relating to natural resource management. Some laws pertain only where public lands are part of the planning area and others are inclusive of all Federal actions, regardless of ownership. Information is available from a number of sources. This is not an all-inclusive list. States are encouraged to supplement this handbook by creating a list of Federal, State, Tribal, and local laws, regulations, etc., that effect natural resource management in their planning area. Examples include the following:

(1) Public Law 95-341, the American Indian Religious Freedom Act of 1978
(2) Public Law 96-95, the Archaeological Resources Protection Act of 1979
(3) Public Law 95-95, the Clean Air Act
(4) Public Law 100-4, the Clean Water Act
(5) Public Law 101-508, the Coastal Zone Management Act
(6) Public Law 104-231, the Electronic Freedom of Information Act Amendments of 1996
(7) Public Law 93-205, the Endangered Species Act of 1973
(8) Public Law 97-98, the Farmland Protection Policy Act of 1981
(9) Public Law 107-17, the Farm Security and Rural Investment Act of 2002
(10) Public Law 104-127, the Federal Agriculture Improvement and Reform Act of 1996
(11) Public Law 101-624, the Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA)
(12) Public Law 110-234, the Food, Conservation, and Energy Act of 2008
(13) Public Law 99-198, the Food Security Act of 1985 (FSA) as Amended
(14) Public Law 89-487, the Freedom of Information Act of 1966
(15) Public Law 99-570, the Freedom of Information Reform Act of 1986
(16) Public Law 95-265, the Magnuson-Stevens Fishery Conservation and Management Act
(17) 16 U.S.C. Sections 703-712, the Migratory Bird Treaty Act of 1918
(18) Public Law 91-190, the National Environmental Policy Act of 1969 (NEPA)
(19) Public Law 89-665, the National Historic Preservation Act of 1966 (NHPA), Amended 2006
(20) Public Law 101-601, the Native American Graves Protection and Repatriation Act of 1990
(21) 54 Stat. Section 250, the Protection of Bald and Golden Eagles Act of 1990
(22) Public Law 93-502, the Privacy Act of 1974
(23) 30 Stat. Section 1121, the Rivers and Harbors Act of 1899
(24) Public Law 95-192, the Soil and Water Resources Conservation Act of 1977
(25) Public Law 106-229, the U.S. Electronic Signatures in Global and National Commerce Act (ESIGN) of 2000

(26) Public Law 90-542, the Wild and Scenic Rivers Act of 1968

B. Executive Orders.—Official documents, numbered consecutively, through which the President of the United States manages the operation of the Federal Government.

(1) Executive Order 12898, Environmental Justice
(2) Executive Order 11988, Floodplain Management, May 1977
(3) Executive Order 11990, Protection of Wetlands
(4) Executive Order 13007, Indian Sacred Sites
(5) Executive Order 13089, Coral Reef Protection
(6) Executive Order 13112, Invasive Species
(7) Executive Order 13175, Consultation and Coordination With Indian Tribal Governments
(8) Executive Order 13392, Improving Agencies Disclosure of Information

C. Other References to Assist in Planning

(1) Catalogue of Federal Domestic Assistance
(2) USDA Departmental Directives and Mandates
(3) Other laws or regulations listed in NRCS program manuals
(4) Indigenous Stewardship Methods and NRCS Conservation Practices Guidebook,
(5) Coordinated Resource Management Guidelines, published by the Society for Range Management
(6) *The Art of Communication* published by the Grazing Lands Technology Institute, available from the NRCS Distribution Center for Publications

D. Manuals.—Type of directive used by National Headquarters and State-level offices to issue policies and procedures on a specific subject.

(1) General Manual
  (i) 180-GM, Conservation Planning and Application
  (ii) 190-GM, Ecological Sciences
  (iii) 420-GM, Part 401, "Historic and Cultural Properties"
(2) Manuals
  (i) Conservation Planning and Application
    Title 180, National Food Security Act Manual (NFSAM), Parts 510 to 520
    Title 180, National Operation and Maintenance Manual, Part 500
  (ii) Ecological Sciences
    Title 190, Rangeland Interagency Ecological Site Manual, Part 500
    Title 190, National Agronomy Manual, Parts 500 to 509
    Title 190, National Biology Manual, Parts 510 to 514
    Title 190, National Forestry Manual, Parts 535 to 538
    Title 190, National Plant Materials Manual, Parts 539 to 542
  (iii) Engineering
    Title 210, National Engineering Manual, Parts 500 to 506
  (iv) Project Development and Maintenance
    Title 390, National Watershed Program Manual
  (v) Programs
    Title 440, Conservation Programs Manual (CPM)
      - Part 500, "Locally Led Conservation"
      - Part 501, "USDA Conservation Program Delivery"
      - Part 502, "Terms and Abbreviations Common to all Programs"
      - Part 503, "Commodity Credit Corporation (CCC) Procedures"
      - Part 504, "Technical Service Provider Assistance"

- Part 506, “Conservation Programs Long Term Contracting”
- Part 508, “Conservation Stewardship Program (CSP)”
- Part 509, “Equitable Relief from Ineligibility for Conservation Programs”
- Part 510, “Appeals and Mediation”
- Part 511, “Healthy Forests Reserve Program (HFRP)”
- Part 512, “Conservation Program Contracting”
- Part 513, “Resource Conservation and Development Program (RC&D)”
- Part 514, “Wetland Reserve Program (WRP)”
- Part 515, “Environmental Quality Incentives Program (EQIP)”
- Part 517, “Wildlife Habitat Incentives Program (WHIP)”
- Part 518, “Conservation Security Program (CSP)”
- Part 519, “Farm and Ranch Lands Protection Program (FRPP)”
- Part 520, ‘Forestry Incentives Program (FIP)”
- Part 521, “Agricultural Management Assistance (AMA)”
- Part 523, “Farmland Protection Policy Act”
- Part 524, “Grasslands Reserve Program (GRP)”
- Part 525, Conservation Technical Assistance Program (CTA)”
- Part 526, “NRCS Grants”
- Part 527, “Easement Common Provisions”

E. Handbooks.—Type of directive used by National Headquarters and State-level offices to issue detailed “how-to” procedures and processes on a specific subject. National program managers and technical specialists primarily generate these handbooks.

(1) Conservation Planning and Application
  (i) Title 180, National Planning Procedures Handbook, Part 600
  (ii) Title 180, Technical Service Provider Handbook, Part 610
(2) Ecological Sciences
  (i) Title 190, National Cultural Resources Procedures Handbook, Part 601
  (ii) Title 190, National Biology Handbook
  (iii) Title 190, National Environmental Compliance Handbook
  (iv) Title 190, National Forestry Handbook
  (v) Title 190, National Range and Pasture Handbook
  (vi) Title 190, Comprehensive Nutrient Management Planning Handbook, Part 620
(3) Economics
  Title 200, National Resource Economics Handbook
(4) Engineering
  Title 210, National Engineering Handbook Series
(5) Project Development and Maintenance
  Title 390, National Watershed Program Handbook
(6) Soil Survey
  Title 430, National Soil Survey Handbook
(7) Technology
  (i) Title 450, National Handbook of Conservation Practices
  (ii) Title 450, National Water Quality Handbook

F. Other

(1) Bennett, Hugh H. 1947. Elements of Soil Conservation. McGraw-Hill, New York
(2) Leopold, A. 1949. A Sand County Almanac. Oxford University Press

600.2 Definitions

This section defines terms that govern the conservation planning process. These terms are used by NRCS personnel and others to describe processes, activities, clients, and 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 information management systems are included in data dictionaries. For terms used to administer NRCS programs, see the abbreviations and terms in the 440-CPM, Part 502.

(1) **Agricultural Land**.—Cropland, rangeland, pastureland, forest land, and other land on which crops, livestock, food, fiber, and other agricultural products are produced. This also includes tree farms and horse operations.

(2) **Agricultural Operation**.—A parcel or parcels of land, whether contiguous or noncontiguous, constituting a cohesive management unit for agricultural purposes.

(3) **Air Quality**.—An NRCS resource concern 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.

(4) **Alternatives**.—One or more options provided to the client to solve resource concerns or address opportunities and achieve proper management of the resources.

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

(6) **Application (Financial Assistance Program)**.—A written request for financial assistance for implementing conservation practices.

(7) **Application (Practice)**.—The act of installing planned conservation treatments and management measures that are documented in plans and case files. (See also "implementation.")

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

(9) **Assessment**.—The act of assessing the physical condition or extent of management applied.

(10) **Assessment Level**.—A statement describing the physical condition or extent of management applied that is used by planners to determine if the resource concern planning criteria have been met. There are two levels of assessment:

(i) Screening Level.—Simple true-false statements of easily observable conditions planners can use to identify sites that have little or no probability of needing additional treatment to address the specific resource concern. If the site meets the screening level criteria, then no other assessment is needed to document that planning criteria are met on this site.

(ii) Basic Assessment Level.—Criteria used when a site does not pass the screening level or when no screening level criteria are defined.

(11) **Assessment Methods**

(i) Procedural.—For some resources, planners use well-defined procedures to acquire data used to determine the resource condition. An example of this approach is determining the ecological health of rangeland using the Interpreting Indicators of Rangeland Health protocol. The summary chart (Figure 600-C1, "Inventory Methods") lists the procedural method for several resource concerns where a standard inventory and assessment

procedures exist. The appropriate discipline handbook or manual may be consulted for more information.

(ii) Predictive.—The condition of some resources is best assessed using models created to predict the probability of an outcome. Estimating sheet and rill erosion rates using RUSLE2 or WEPS to model wind erosion are examples of predictive modeling tools.

(iii) Observation.—Where standard procedures to measure or model the condition of resources do not exist, planners often rely on direct observation or information provided by the client through an interview. Classic gully is an example where observation is the accepted method of evaluating resource conditions. Through observation, the planner discerns the stability of side slopes, head-cutting activity, or erosion in the gully bottom. Observation always implies onsite investigation.

(iv) Deduction.—When it is impractical to measure, model, or observe resource conditions, planners may rely on reason to deduce the status of a resource. Often, the deductive approach 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 less desirable condition will result. Planners must frequently rely on deductive methods to address offsite effects. For example, the delivery of dissolved nutrients to groundwater may not be a practical resource concern to measure, and until predictive tools are readily available, the planner can deduce whether or not a problem exists based on other sources of information. If a client utilizes all reasonable nutrient management techniques and has significantly modified the rate, timing, or both of nutrients applied to a field, the planner may deduce that the field in question is no longer a significant source of nutrients entering the groundwater.

(12) **Assistance Notes**.—Notes maintained by planners in the case file for each 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. Assistance notes include both planner-entered and system-generated notes and may include text, audio, video, or photographic formats.

(13) **Benchmark Condition**.—The present condition of identified resource and special environmental concerns that is used as a point of reference to measure changes 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).

(14) **Benchmark Narrative**.—A written statement of the benchmark condition. The narrative includes a description of the current conditions, crops, soils, major resource concerns, etc. It includes existing 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.

(15) **Benchmark Practices**.—Existing conservation practices included in the current management system for the planning unit. These practices meet NRCS standards and specifications.

(16) **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).

(17) **Brief Technical Assistance**.—Direct request from a client for natural resource information, data, or technical products received through office visits, phone calls, or written or electronic

communication. Assistance is generally a single transaction or related to a specific site and does not result in a conservation plan.

(18) **Case File**.—The record of resource information, decisions, and technical assistance for a specific client. A case file is established and maintained by the NRCS field office for each client that NRCS is providing continuing technical assistance. The case file will be maintained electronically to the greatest extent possible. Information not amenable to electronic format will be maintained in a hardcopy file.

(19) **Certified Conservation Planner**.—A person who possesses the necessary skills, training, and experience to implement the NRCS nine-step planning process to meet client objectives of solving natural resource concerns. The certified conservation planner has demonstrated skill in assisting clients to identify resource concerns, to document the client's objectives, to propose feasible solutions to identified resource concerns, and to lead the client to choose and implement an effective alternative that treats the resource concerns and meets the client's objectives.

(20) **Client**.—An individual, business, group, or unit of government that is the recipient of NRCS technical and financial assistance. NRCS clients, generally fall into two broad categories: individual owners, managers, partners or businesses, with primary responsibility for their business dealings with NRCS, and groups or local sponsoring organizations or other government officials, responsible for fulfilling requirements or exercising judgments consistent with law, Executive order, and established Federal policy. Examples of the first group include persons, groups, Tribes, corporations, and organizations. Examples of the second group include conservation districts and units of government.

(21) **Common Land Unit (CLU)**.—Closely related to the Farm Service Agency's definition of a field, a CLU is the smallest land unit that has a permanent, contiguous boundary, common land cover and land management, common owner, and common producer association.

(22) **Comprehensive Nutrient Management Plan (CNMP)**.—Any combination of structural practices, management activities, or land management practices associated with crop or livestock production that collectively ensures that the purposes of crop or livestock production and preservation of natural resources (especially the conservation of air, soil, and water quality) are compatible.

(23) **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.

(24) **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.

(25) **Conservation**.—The use and management of natural resources according to principles that assure their sustained productivity.

(26) **Conservation District**.—A subdivision of a State, Indian Tribe, or territory, organized pursuant to the State or territorial 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, or similarly legally constituted body.

(27) **Conservation District Cooperator**.—Any client who has entered into a working relationship or cooperative agreement with a conservation district to work together in planning and carrying out natural resource use, development, and conservation on a specific land area.

(28) **Conservation 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

onsite and offsite results of applied conservation treatments. They are measures of a level of outcome and may be expressed in ecological, economic, or social terms.

(29) **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.

(30) **Conservation Management Unit (CMU)**.—A field, CLU, group of fields, or other land units of the same land use and having similar treatment needs and planned management. A CMU, made up of one or more planning land units (PLU), has definite boundaries, such as fence, drainage, vegetation, topography, soil lines, or land use, and is used by the planner to simplify planning activities and facilitate development of management systems.

(31) **Conservation Partners**.—Conservation districts, State or Tribal conservation agencies, and other cooperating groups of organizations at the field, State, regional, and national levels having common interests dealing with natural resource conservation.

(32) **Conservation Plan**.—A record of the client's decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices and activities needed to solve identified natural resource concerns and takes advantage of opportunities. The plan may include components such as comprehensive nutrient management plan, grazing plan, integrated pest management plan, etc. The needs of the client, the resources, and Federal, State, Tribal, and local requirements will be met.

(33) **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.

(34) **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).

(35) **Conservation Practice Certification**.—The process of confirming and documenting a conservation practice is installed and maintained according to the practice standard and specification.

(36) **Conservation Practices Physical Effects (CPPE) Matrix**.—The matrix in the FOTG, Section V, that gives the physical effects of conservation practices on natural resources.

(37) **Conservation System**.—A combination of conservation practices and resource management for the treatment of resource concerns.

(38) **Conservation Treatment**.—Conservation practices, management measures, and works of improvement to solve or reduce the severity of natural resource use concerns or take advantage of resource opportunities.

(39) **Coordinated Resource Management (CRM)**.—A specific application of the planning process that utilizes a variety of clients, stakeholders, organizations, agencies, and others, and a variety of land ownerships, to 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 managers or have decision-making authority for the planning area involved. The planning area encompasses the geographical area defined by the parties involved in the CRM effort.

(40) **Cost-Return Analysis**.—Comparison of the costs to returns (revenue) in an agricultural enterprise. Also referred to as the return on investment.

(41) **Cultural Resource/Historic Property**.—Any prehistoric or historic district, site, building, structure or object included in or eligible for inclusion in the National Register of Historic

Places (NRHP), including associated records and artifacts. These properties are taken into account and protected under section 106 of the National Historic Preservation Act (NHPA).

(42) **Cumulative Effect**.—The effect on the environment that results from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

(43) **Decisionmaker**.—An individual, business, 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.

(44) **Desired Future Condition**.—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.

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

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

(47) **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.

(48) **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.

(49) **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.

(50) **Erosion**.—The wearing away of the land surface by running water, waves, or moving ice and wind, or by such processes as mass wasting and corrosion (solution and other chemical processes). The term "geologic erosion" refers to natural erosion processes occurring over long (geologic) time spans. "Accelerated erosion" generically refers to erosion that exceeds what is presumed or estimated to be naturally occurring levels and that is a direct result of human activities (e.g., cultivation and logging).

(51) **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.

(52) **Field Office Technical Guide (FOTG)**.—The official NRCS guidelines, criteria, and standards for planning and applying conservation treatments (450-GM, Part 401).

(53) **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.

(54) **Geographic Database**.—A collection of spatial data and its attributes, organized for efficient storage and retrieval.

(55) **Geospatial**.—Pertaining to the geographic location and characteristics of natural or constructed features and boundaries on, above, or below the earth's surface; especially referring to data that is geographic and spatial in nature

(56) **Guidance Documents**.—Documents contained in the FOTG, Section III. They are examples of RMS options to treat the most commonly identified resource concerns and opportunities for each locally applicable major land use.

(57) **Highly Erodible Land**.—A field where highly erodible land is predominant. HEL is considered to be predominant if either 33.33 percent or more of the total field acreage is identified as soil map units that are highly erodible or 50 or more acres in such a field are identified as soil map units that are highly erodible. For a specific definition of a highly erodible field as it relates to the Conservation Reserve Program, please consult 2-CRP.

(58) **Historically Underserved**.—Underserved individuals and groups include those who have not participated in or have received limited benefits from USDA or NRCS programs that may improve their quality of life or the environment. Historically, the underserved are land managers who are socially disadvantaged, have limited resources, are beginning farmers or ranchers, or are American Indians or Alaskan Natives.

(59) **Human Considerations**.—The potential social, economic, and cultural resource/historic property factors that are considered in the conservation planning process.

(60) **Implementation**.—The act of installing planned conservation treatment and management measures that are documented in plans and case files. (See also "application.")

(61) **Indian Tribe**.—Any federally recognized Indian Tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. Section 1601 et seq.) that is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians.

(62) **Indigenous**.—For purposes of this document, "indigenous" refers to populations or communities and their conservation technologies. According to a common definition used by many governments, indigenous peoples are those who inhabited a country or a geographical region at the time when people of different cultures or ethnic origins arrived.

(63) **Indigenous Stewardship Methods**.—Indigenous stewardship methods include the traditional manipulation (including spiritual interactions) of natural surroundings by indigenous people with the purpose of increasing production, improving plant and animal biodiversity, increasing soil health, and numerous other human and ecological benefits. This reciprocal use hinges on respect and spiritual interconnectedness with all of nature. These methods incorporate traditional knowledge generally defined as longstanding traditions and practices of certain regional, indigenous, or local communities.

(64) **Interdisciplinary Planning**.—An interdisciplinary planning approach in which specialists and groups having different technical expertise act as a team to jointly evaluate existing and future environmental quality. The interdisciplinary group considers structure and function of natural resource systems, complexity of problems, and the economic, social, and environmental effects of alternative actions. Public participation is an essential part of effective interdisciplinary planning. Even if an NRCS employee provides direct assistance to an individual land user, the basic data used are a result of interdisciplinary development of guide and planning criteria.

(65) **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.

(66) **Inventory**.—The identification of attributes, features, and other data pertaining to natural resources and special environmental concerns on and surrounding a planning area.

(67) **Land Unit**.—Any area of land or water that is of concern in the planning process. (See also "planning land unit.")

(68**)** **Land Use Designation**.--NRCS has developed the following land use designations to be used by planners and modelers at the field and landscape level.

i. **Crop**.—Land used primarily for the production and harvest of annual or perennial field, forage, food, fiber, horticultural, orchard, vineyard, or energy crops.

ii. **Forest**.—Land on which the historic and or introduced vegetation is predominantly is tree cover managed for production of wood products or nontimber forest products.

iii. **Range**.—Land on which the historic and/or introduced vegetation is predominantly grasses, grass-like plants, forbs or shrubs managed as a natural ecosystem. Range land may include natural grasslands, savannas, shrublands, tundra, alpine communities, marshes and meadows..

iv. **Pasture**.—Land composed of introduced or domesticated native forage species that is used primarily for the production of livestock. Pastures receive periodic renovation and cultural treatments, such as tillage, fertilization, mowing, weed control, and may be irrigated. Pastures are not in rotation with crops.

v. **Farmstead**.—Land used for facilities and supporting infrastructure where farming, forestry, animal husbandry, and ranching activities are often initiated. This may include dwellings, equipment storage, plus farm input and output storage and handling facilities. Also includes land dedicated to the facilitation and production of high-intensity animal agriculture in a containment facility where daily nutritional requirements are obtained from other lands or feed sources.

vi. **Designated Protected 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. These areas are officially designated by legislation or other authorities. Examples: legislated natural or scenic areas and rural burial plots.

vii. **Developed Land**.—Land occupied by buildings and related facilities used for residences, commercial sites, public highways, airports, and open space associated with towns and cities.

viii. **Water**.—Geographic area whose dominant characteristic is open water or permanent ice or snow. May include intermingled land, including tidal-influenced coastal marsh lands.

ix. **Associated Agriculture Lands**.—Land associated with farms and ranches that are not purposefully managed for food, forage, or fiber and are typically associated with nearby production or conservation lands. This could include incidental areas, such as idle center pivot corners, odd areas, ditches and watercourses, riparian areas, field edges, seasonal and permanent wetlands, and other similar areas.

x. **Other**.—Land that is barren, sandy, rocky, or that is impacted by the extraction of natural resources, such as minerals, gravel or sand, coal, shale, rock, oil, or natural gas.

(69) **Land Use Modifier** -The restructuring effort introduces the use of land use modifiers to more accurately define the land's actual use. Modifiers provide another level of specificity and help denote what the land is actually managed for. The modifiers are:

i. **Irrigated**.—Used when an operational system is present and managed to supply water.

ii. **Wildlife**.—Used when the client is actively managing for wildlife.

iii. **Grazed**.—Used when grazing animals impact how land is managed.

(70) **Land Use/Cover**.—A term that includes categories of land cover and categories of land use. Land cover is the vegetation or other kind of material that covers the land surface. Land use is the purpose of human activity on the land; it is usually, but not always, related to land cover.

(71) **Land Treatment Area (CNMP)**.—Includes any land under control of the AFO owner or operator, whether it is owned, rented, or leased, and to which manure or process wastewater is, or might be, applied for crop, hay, pasture production, or other uses.

(72) **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.

(73) **Local**.—Pertaining to a specific location or area within a larger boundary. Examples include a county, a portion of a county, a watershed, or a multicounty region,

(74) **Locally Led Conservation**.—A process used by local people to 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.

(75) **Local Work Group**.—A group made up of representatives of local offices of the Farm Service Agency, the National Institute of Food and Agriculture (NIFA), the conservation districts, and other Federal, State, Tribal, and local government agencies, including, Tribes, with expertise in natural resources who advise NRCS on decisions related to implementation of USDA conservation programs.

(76) **Low-Initial-Cost Structures**.—Structures for treating resource concerns 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.

(77) **Major Land Resource Area (MLRA)**.—Broad geographic areas that are characterized by a particular pattern of geology – soils, climate, water resources, vegetation, and land use. Each MLRA in which rangeland and forestland occur is further broken into ecological sites.

(78) **Management Measure**.—One or more specific actions that are not conservation practices described in the FOTG Section IV, but actions that have the effect of alleviating problems or improving the treatment of the resources.

(79) **Management Practice**.—A conservation practice that requires regular input from the land manager. Examples include nutrient management, residue management, integrated pest management, etc. (See also "structural practice.")

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

(81) **Measurement and Assessment Tools**.—Description of the technology or process for determining if assessment criteria are met.

(82) **Minimum Level of Treatment**.—The specific conservation treatment NRCS requires that addresses a resource concern to a level that meets or exceeds the planning criteria according to NRCS technical guides.

(83) **Mitigate (Mitigation)**.—To moderate or alleviate the degree of effect on resource quality or condition. Mitigation includes the following:

(i) Avoiding the impact altogether by not taking a certain action or parts of an action

(ii) Minimizing impacts by limiting the degree or magnitude of the action and its implementation

(iii) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment

(iv) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action

(v) Compensating for the impact by replacing or providing substitute resources or environments

(84) **National Environmental Policy Act (NEPA)**.—The 1970 law 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.

(85) **National Historic Preservation Act (NHPA)**.—The 1966 law that is intended to preserve historical and archaeological sites in the United States of America. The act created the National Register of Historic Places, the list of national historic landmarks, and the State historic preservation offices, and requires that Federal agencies take into account the effects of their funded and permitted projects on historic properties (buildings, sites, structures, etc.) through a process known as "section 106 review."

(86) **Natural Resource**.—Any naturally occurring resource needed by an organism, population, or ecological system. NRCS applies this term to soil, water, air, plants, animals, energy, and humans (SWAPAE+H).

(87) **Natural Resources Conservation Service (NRCS)**.—An agency of the U.S. Department of Agriculture formerly called the Soil Conservation Service.

(88) **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.

(89) **Network Diagrams**.—NRCS prepares network diagrams of featured practices or related sets of practices that act together to achieve desired purposes. Network diagrams are flow charts of direct, indirect, and cumulative effects resulting from installation of the practices. Completed network diagrams are an overview of expert consensus on the direct, indirect, and cumulative effects of installing proposed practices. They show the potential positive and negative outcomes of practice installation and are useful as a reference point for next steps and as a communication tool with partners and the public.

(90) **No-Action Alternative**.—The projected future course of action that will occur if NRCS assistance is not provided.

(91) **Nontechnical Soil Description**.—A layman's description of soil properties and soil interpretations specific to a geographical location.

(92) **Objectives**.—Objectives are quantitative or qualitative statements of desired future conditions as determined by the client.

(92) **Offsite**.—Locations outside the planning area on which conservation treatment is being considered. It also refers to areas outside the planning unit that are considered for potential effects.

(94) **Onsite**.—Locations within the planning area on which conservation treatment has direct effect.

(95) **Operation and Maintenance (O&M)**.—Work performed by the land manager to keep the applied conservation practice functioning for the intended purpose during its lifespan. Operation includes the administration, management, and performance of nonmaintenance actions needed to keep the completed practice safe and functioning as intended. Maintenance includes work to prevent deterioration of the practice, repairing damage, or replacement of the practice to its original condition if one or more components fail.

(96) **Outreach**.—Activities to ensure that all programs and services are made fairly and equitably accessible to all customers.

(97) **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.

(98) **Personally Identifiable Information (PII)**.—Information that can be used to uniquely identify, contact, or locate a single person or can be used with other sources to uniquely identify a single individual.

(99) **Plan Map**.—A photograph, sketch or GIS document of a land area developed during the planning process that shows property boundaries, land unit boundaries, land use, physical features, location of planned and applied practices, and other features that are useful to the client in plan implementation.

(100) **Planner**.—A person, qualified by training and experience, who effectively assists the client in completing the planning process. (See also "certified conservation planner.")

(101) **Planning Criteria**.—A quantitative or qualitative statement of a treatment level required to achieve a minimum level of treatment for a given resource concern for a particular land area. It is established in accordance with local, State, Tribal, territorial, and Federal programs and regulations in consideration of ecological, economic, and social effects. (See also "quality criteria.")

(102) **Planning Land Unit (PLU)**.—A PLU is a unique geographic area, defined by a polygon, that has common land use and is owned, operated, or managed by the same client or clients. The PLU is the minimum unit for planning. (See also "land unit.")

(103) **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.

(i) Phase I – Collection and Analysis
Step 1: Identify Problems and Opportunities
Step 2: Determine Objectives
Step 3: Inventory Resources
Step 4: Analyze Resource Data

(ii) Phase II – Decision Support
Step 5: Formulate Alternatives
Step 6: Evaluate Alternatives
Step 7: Make Decisions

(iii) Phase III – Application and Evaluation
Step 8: Implement the Plan
Step 9: Evaluate the Plan

(104) **Planning Standard**.—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.

(105) **Planning Area**.—A planning area is generally the entire operating unit, but it 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 area must be large enough to encompass the area that influences, and the area that is impacted by, the resource management system or practice being planned. (See "conservation management unit.")

(106) **Practice**.—Same as conservation practice.

(107) **Practice Narrative**.—A brief, nontechnical description of the planned practice.

(108) **Practice Specification**.—Practice specifications are detailed requirements for installing the practice in a State.

(109) **Practice Standard**.—Practice standards define the practice and where it applies, and prescribes the minimum level of application and quality of materials.

(110) **Private Land**.—Land that is not owned by a local, State, Tribal, territorial, or Federal governmental entity.

(111) **Producer**.—An owner, operator, manager, landlord, tenant, or sharecropper who shares the risk of producing a crop and is entitled to share in the crop available for marketing from a farm or who would have shared, had the crop been produced (ERS definition).

(112) **Production Area (CNMP)**.—Includes the animal confinement, feed and other raw materials storage areas, animal mortality facilities, and the manure handling containment or storage areas.

(113) **Progressive Planning and Implementation**.—The conservation planning process is progressive when a client addresses only a limited number of resource concerns—or even a single resource concern alone, but does not achieve an RMS level of treatment. The rate of progress in moving to an RMS level will depend on the client's desires and constraints.

(114) **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.

(115) **Quality Criteria**.—A descriptive statement of desired resource condition and management, representing a level of use that is sustainable over the long term. Due to scientific and technical limitations, the establishment of quality criteria for all the NRCS resource concerns is an elusive goal. However, NRCS remains committed to using the latest tools and techniques that will continually move planning criteria in the direction of increased sustainability and the eventual establishment of true quality criteria for all resource concerns.

(116) **Ranch**.—An area of landscape, including various structures, traditionally used for the grazing and production of domestic livestock or wildlife. A ranch may also have nontraditional uses and produce other goods and services as well as environmental and social benefits.

(117) **Receipt for Services**.—Official agency record of service provided to, or of service refused or delayed by the agency, that is provided upon request of the client.

(118) **Record of Decisions (Planning Term)**.—A part of the conservation plan and case file documents that contain the decisions for the PLUs.

(119) **Record of Decision (NEPA Term)**.—A concise written rationale by the responsible Federal official regarding implementation of a proposed action requiring an environmental impact statement.

(120) **Resource Concern**.—An expected degradation of the soil, water, air, plant, or animal resource base to the extent that the sustainability or intended use of the resource is impaired. Because NRCS quantifies or describes resource concerns as part of a comprehensive conservation planning process, that includes client objectives, human and energy resources are considered components of the resource base. See Exhibit 6 for a list and descriptions of specific resource concerns.

(121) **Resource Management System (RMS)**.—An RMS is a combination of conservation practices and resource management activities for the treatment of all identified resource concerns for SWAPAE+H resources that meets or exceeds the planning criteria in the FOTG.

(122) **Resource Problem**.—The resource condition that does not meet the minimum acceptable condition levels as established by resource planning criteria shown in the FOTG, Section III.

(123) **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 concerns. 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.

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

(125) **Revised Universal Soil Loss Equation 2 (RUSLE2)**.—A computer model containing both empirical and process-based science that predicts rill and interrill erosion by rainfall and runoff.

(126) **Scoping**.—Scoping is the early, upfront, 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.

(127) **Screening**.—The process to select, reject, consider, or group data, people, objects, or ideas by examining them systematically.

(128) **Site-Specific Practice Effect**.—The expected effect that a particular conservation practice has on defined resource concerns or 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.

(129) **Soil Description**.—A listing of soil properties, both site and profile, specific to a geographical location.

(130) **Soil Health**.—Soil health is used synonymously with soil quality. (See definition for "soil quality.")

(131) **Soil Quality**.—Soil quality is the capacity of a soil to perform functions critical to its intended use. In other words, how well a soil does what we want and need it to do. Soil quality is assessed by evaluating the physical, chemical, and biological characteristics of soil. Specific tests or indicators can be used to individually and holistically to assess the soils overall quality or health. The terms soil quality and soil health are used synonymously. Soil quality has two main components:

(i) Inherent soil quality is the capacity to function based on soil forming factors at a geologic time scale.

(ii) Dynamic soil quality represents changes in function in response to human management or disturbance at a human (years, decades, or centuries) time scale. Soil health is a synonym of soil quality and usually refers to only the dynamic portion of soil quality.

(132) **Spatial Data**.—Information about the location and shapes of geographic features, and the relationship between them, usually stored as coordinates and topology.

(133) **Special Environmental Concern (SEC)**.—Concerns (including human considerations) that are protected by law, Executive order, or agency policy and will need to be analyzed according to the laws, regulations, or Executive orders established to protect them. For example, a description of wetland impacts describe not only the acres involved, but the functions of those wetlands, based on a hydrogeomorphic model, and perhaps their value as wildlife habitat, according to the results of habitat evaluation procedures or habitat appraisal guides, as well. There might also be a need to discuss and support impacts on downstream water quality and any other effects the wetland may have within the ecosystem. The list of NRCS special environmental concerns is included on the NRCS-CPA-52 worksheet.

(134) **Stakeholder**.—An individual or group of clients who 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.

(135) **State**.—Any of the 50 States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, the Freely Associated States of the Pacific Islands Area or any territory or possession of the United States. Or, a condition of an ecological site's characteristics. As characteristics change, there is a transition to a new state. (See "vegetation state and transition pathway.")

(136) **Structural Practice**.—A practice that involves a constructed facility, land shaping, or permanent vegetative cover designed to preserve soil; reduce runoff of nutrients, sediment, and pesticides; enhance wildlife habitat; or for other purposes. Examples include animal waste facilities, terraces, grassed waterways, contour grass strips, filter strips, tail water pits,

permanent wildlife habitat, and constructed wetlands. (ERS Definition) (See also "management practice.")

(137) **Sustainable Agriculture**.—Agriculture that involves the use of technologies to produce food and fiber in farming systems that are ecologically, economically, and socially beneficial.

(138) **System**.—See "conservation system."

(139) **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 planning criteria, if at all. Alternative, planned, and completed systems meet planning criteria specified in the FOTG. Benchmark systems may not meet FOTG specifications; deficiencies may be noted in the description and system evaluation records.

(140) **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.

(141) **Technical Service Provider (TSP)**.—An individual, private-sector entity, or public agency certified or approved by NRCS to provide technical services through NRCS or directly to program participants, as defined in 7 CFR Part 652.

(142) **Technical Specialist**.—A person, qualified by training and experience, who effectively assists NRCS planners in completing the planning process. Examples: area and State soil scientists, biologists, engineers, economists, water quality specialists, or resource conservationists.

(143) **Topology**.—The spatial relationship between connecting or adjacent features in a geographic data layer.

(144) **Tribal Lands**.—All lands within the exterior boundaries of any Indian reservation and all dependent Indian communities. This definition is consistent with the definition in the NHPA; other statutes use alternate definitions.

(145) **Unit of Government**.—A State, Tribal, 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.

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

(147) **Water Quality**.—Resource concerns or opportunities, including such concerns as excessive nutrients, pesticides, sediment, contaminants, and pathogens in surface waters and excessive nutrients and pesticides in ground waters.

(148) **Watershed**

(i) A total area of land above a given point on a waterway that contributes runoff water to the flow at that point.

(ii) A major subdivision of a drainage basin.

(149) **Wind Erosion**.—The process of detachment, transport, and deposition of soil by wind.

(150) **Wind Erosion Prediction System (WEPS)**.—A model that simulates weather, field conditions, and wind erosion. Used for assessing soil loss by wind from agricultural fields and to assess plant damage, calculate suspension loss, and estimate PM-10 emissions from a field.

(151) **Zoning**.—A means by which governmental authority is used to promote a specific use of land under certain circumstances. This power traditionally resides in the State, and the power to regulate land uses by zoning is usually delegated to minor units of government, such as towns, municipalities, and counties, through an enabling act that specifies powers granted and the conditions under which these are to be exercised.

Part 600 – National Planning Procedures Handbook

Subpart B – Framework for Planning

600.10 Overview of Conservation Planning

A. This section provides an overview of the process NRCS uses to assist clients (individuals, groups, businesses, 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 concerns and opportunities, or source of funding to be used for implementation.

B. Conservation planning is a natural resource problem solving and management process. The process integrates economic, social (cultural resource and historic property 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 identified resource concerns and opportunities.

C. 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 Tribes, minority producers, 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 clients be treated fairly and equitably, and with dignity and respect.

D. 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 concerns and opportunities, and the effects of their decisions.

E. 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.

F. 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.

G. 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.

H. Locally led conservation is a process based on the principle that community stakeholders are best suited to identify and resolve local natural resource problems. See Title 440, Conservation Programs Manual, Part 500, for detailed guidance. To provide conservation planning direction and help ensure a balance of natural resource issues with economic and social needs, NRCS employees work with conservation districts to establish objectives that reflect current resource issues and priorities in the district. These objectives will help define a desired future condition for these resources in terms of what the local people want.

I. To supplement data from other agencies or groups, the district and NRCS rely on local knowledge, specific discipline input, and existing public information that relates to the local area. The locally led process utilizes the local work group to meet with stakeholders interested in resource issues. This public information can help identify other resource issues or human considerations that have not previously been a focus of interest in the area.

J. Once these data and objectives are collected and analyzed, alternatives developed 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 are developed, and if additional objectives are defined for specific portions of the district, the long-range plan or other plans may be updated.

K. Local objectives are integrated with the FOTG and may form the basis for developing additional technical guidance material. This is accomplished by ensuring that—

(1) New or existing planning criteria support identified objectives.
(2) Guidance documents reflect local resource issues.
(3) Management systems in the FOTG, Section III, serve as examples that work toward accomplishing the identified human considerations for that area.

L. As conservation plans are implemented, progress is made toward accomplishing the agreed-upon desired future state 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.

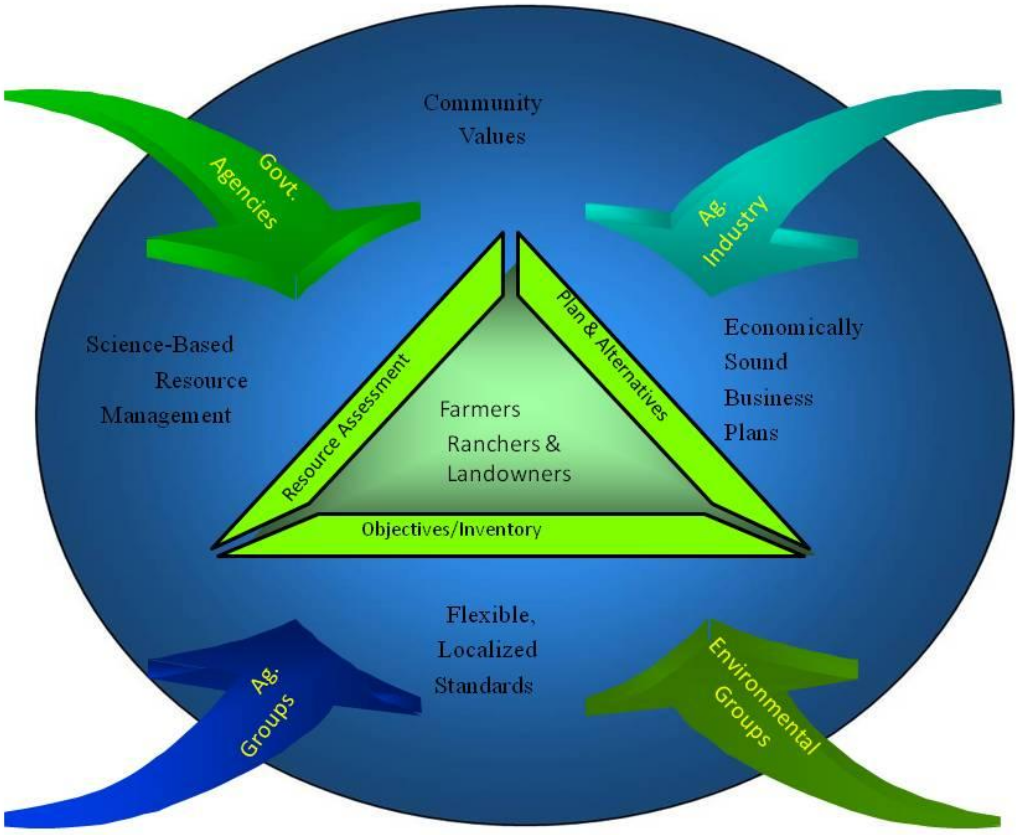

Figure 600-B1: Planning framework diagram

M. Natural resource concerns 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.

N. When providing conservation planning assistance, the planner will—

(1) Recognize the interconnections between the planning unit, larger areas outside of or encompassing the planning unit (e.g., watersheds), and smaller areas within the planning unit (e.g., riparian corridors).
(2) Think of the planning area in terms beyond its administrative, jurisdictional, and geographic boundaries.
(3) Consider the short-term, long-term, and cumulative effects of actions.
(4) Mitigate adverse and unintended effects to the maximum extent practicable.
(5) Consider the client's and society's economic needs and goals.
(6) Consider all of the client's enterprises and the interactions between them.
(7) Respect the rights and responsibilities of private land managers.
(8) Facilitate the creation of a desired future condition that meets individual and societal needs.
(9) Recognize that human welfare depends on the sustainability of natural resources.
(10) Base assistance on the best available knowledge, science, and technology (including indigenous stewardship methods).
(11) Incorporate the knowledge gained from previous planning, implementation, and evaluation efforts.
(12) Collaborate with others in collecting, assembling, and evaluating data.
(13) Leverage the resources and expertise of others.
(14) 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.
(15) Comply with all applicable Federal, State, Tribal, and local laws, regulations, and policies.

O. 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 outcomes of those effects on natural resource quality, economic needs, and social objectives are then used to help develop and evaluate management alternatives.

600.11 The Planning Process

A. Planning areas generally exist in a hierarchy. Each planning unit is contained within a larger planning unit. An areawide conservation plan may be developed for a watershed, a watershed contains individual farms and ranches, individual farms and ranches contain land 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.

B. The planning process provides the framework for developing a conservation plan on the basis of client objectives, as well as ecological, economic, social, legal, and policy considerations. Technical, educational, and financial assistance programs from NRCS or other sources are used to implement the plans.

C. The same planning process is used to develop conservation plans and areawide conservation plans, 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.

D. Onsite visits with the client are an integral part of the planning process.

E. In most instances, conservation plans are developed with an individual decisionmaker. An areawide conservation plan reflects the desired future conditions developed in conjunction with the client and other stakeholders in the area. The stakeholders may be decisionmakers for implementing planned activities, but probably are not.

F. 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.

(1) Phase I – Collection and Analysis (Understanding the Problems and Opportunities)
  (i) Step 1 – Identify problems and opportunities
  (ii) Step 2 – Determine objectives
  (iii) Step 3 – Inventory resources
  (iv) Step 4 – Analyze resource data
(2) Phase II – Decision Support (Understanding the Solutions)
  (i) Step 5 – Formulate alternatives
  (ii) Step 6 – Evaluate alternatives
  (iii) Step 7 – Make decisions
(3) Phase III – Application and Evaluation (Understanding the Results)
  (i) Step 8 – Implement the plan
  (ii) Step 9 – Evaluate the plan

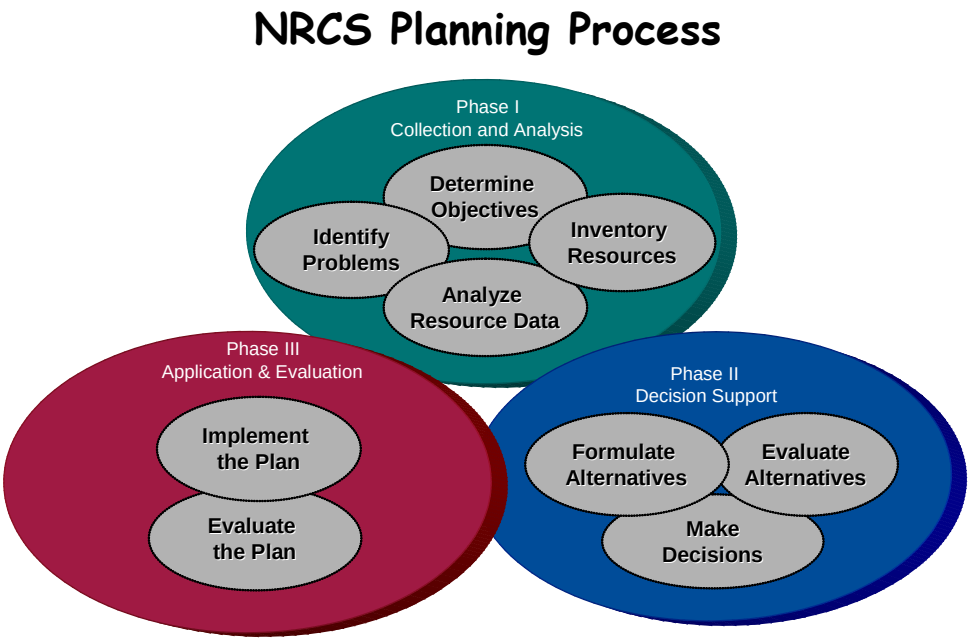

Figure 600-B2: An illustration of the dynamic nature of the planning process

600.12 Concepts in Conservation Planning

A. Conservation planning helps identify and address resource concerns. Whether through screening, assessment, or by client and planner identification, addressing resource concerns is a dynamic and adaptive process. Technology improvements, on-farm management changes, and new resource considerations come into play, while others may no longer be relevant. Clearly presenting alternative

solutions is critical to assisting land users when making key decisions on the land. Conservation planning and additional support concepts and strategies are presented here.

B. This guidance includes identifying and assessing resource concerns as part of the planning process. Technical assistance is key to identifying and assessing benchmark conditions, resource concerns, and effects of the current conditions; and developing, evaluating, and selecting an alternative solution to the concerns. Financial assistance conservation programs exist, such as those contained within the Food Security Act of 1985, as amended, that may define more specific levels of planning for specific resource issues.

(1) Conservation Plans

(i) Individual-Level Plans.—These plans are voluntary, site-specific, comprehensive, and action-oriented. A conservation plan is developed for one or more planning land units and documents the land manager's selected alternative. The plan contains natural resource information, supporting documents, and a record of decisions made by the client. It describes the schedule of operations and activities needed to solve identified natural resource concerns while taking advantage of opportunities to enhance resources.

- Using the planning process to develop the conservation plan helps ensure the needs of the client and the resources are achieved and that Federal, State, Tribal, territorial, and local requirements are met. Conservation planning is flexible and plans may include all contiguous and noncontiguous land that is a part of the client's enterprise, including owned and rented land, or may include only a portion of the enterprise.
- Conservation plans may include component plans to address one or more resource concerns. Examples include comprehensive nutrient management plans, grazing plans, integrated pest management pans, and irrigation water management plans etc. See subpart G for additional guidance.
- When two or more decisionmakers need assistance on planning, installing, and maintaining a conservation system that may cross land unit boundaries, the planner may utilize a group planning process. For example, solving problems associated with a stream that flows through several properties requires the coordinated, cooperative efforts of all of the individuals involved. The group may serve as the decisionmaker. However, a conservation plan is developed for each of the land units involved in of this type of group planning effort. Group plans are generally owned or directly controlled by the individuals involved.

(ii) Comprehensive Plans With Units of Government.—A comprehensive plan is developed 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 also may be called a general plan, master plan, community plan, or a regional development plan. NRCS may serve as a technical advisor for the development of these types of plans. NRCS primarily provides natural resource information and related technical data to the unit of government, or to a professional planner, who may use their own planning process.

(iii) Areawide Plans.—Areawide conservation plans are voluntary, comprehensive plans for a watershed or other large geographic area. Areawide conservation planning will consider all natural resources within 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, alternative actions, and other resources to solve those needs; develop proposals and recommendations to address those needs; implement solutions; and measure their success. A locally led effort considers all pertinent Federal,

State, Tribal, territorial, and local conservation programs and private sector programs, singly and in combination, as tools to solve natural resource concerns.

C. Resource Concerns

(1) Natural Resource Concerns.—Identified natural resource concerns and opportunities are discussed during the planning process. Resource concerns may be identified by the client through the resource inventory process and by screening and assessment of individual concerns. The NRCS objective in conservation planning is to help the client manage resources for sustained use and productivity while considering economic and social needs.

Figure 600-B3: Soil erosion – water: sheet, rill and gully

Figure 600-B4: Soil erosion – wind

Figure 600-B5: Soil erosion – excessive bank erosion from stream, shorelines or water conveyance

Figure 600-B6: Soil quality degradation - compaction

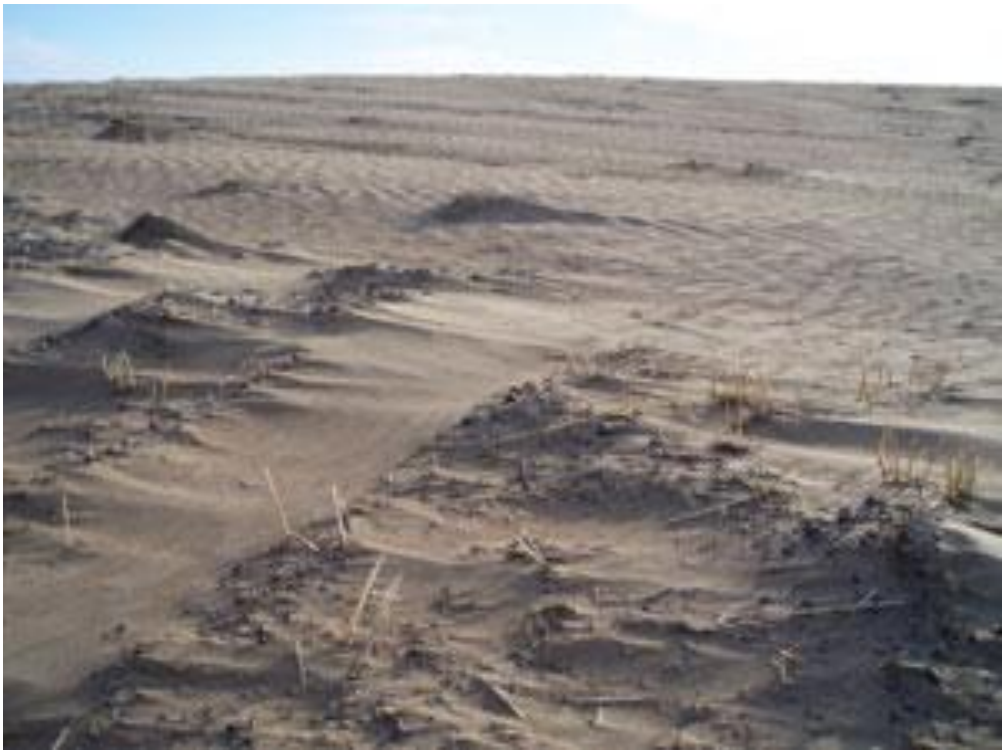

Figure 600-B7: Soil quality degradation – Organic Matter Depletion

Figure 600-B8: Soil quality degradation – Concentration of salts or other chemicals

Figure 600-B9: Degraded plant condition – undesirable plan productivity

Figure 600-B10: Degraded plant condition – wildfire excessive biomass accumulation

Figure 600-B11: Inadequate habitat for fish and wildlife – habitat degradation

Figure 600-B12: Water quantity – Insufficient moisture management

Figure 600-B13: Water quality degradation – excessive nutrients in surface waters

(2) Social and Economic Resource Considerations and Concerns.—One of the keys to successful conservation planning and implementation is understanding the behavior and way of life of clients and stakeholders. The term "human considerations" refers to the social and economic considerations that are addressed in the planning process. Cultural resources and historic properties are included in this concept. Human considerations will be considered early in the planning process since they can help guide the planner in 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 Subpart D, Section 600.42, "Working With Individuals and Groups."

(i) Social considerations include public health and safety, as well as social, family, ethic, ethnic, spiritual, and religious values. They also include societal goals, client characteristics, risk tolerance or aversion, tenure or time availability, and the presence of cultural resources and historic properties.

(ii) Differing social, ethnic, or religious backgrounds may also effect the adoption of conservation practices. Such differences must be recognized and accounted for early in the planning process. Some groups may have land-use ethics or social customs that conflict with some NRCS conservation practices.

(iii) 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 decisionmakers, planners can identify barriers to, and opportunities associated with, adopting conservation. Onsite economic considerations may include operational income and expenses, conservation system costs, credit availability, yield effects, or base acreage effects. When considering changing inputs and outputs of an operation, assessing the overall return on investment will highlight the effects of each change. For example no-till may result in a yield reduction, but due to fewer trips across a field, increased organic matter levels etc., there may be an overall economic savings, producing a higher return on their investment. On a larger scale, economic considerations could include water supply costs, flood damage reduction, recreation enhancement, or regional effects, such as job creation or changes in tax revenue.

(iv) 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 by experience. Cultural resource and historic property can be located and assessed with the help of cultural resource coordinators or specialists.

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

(vi) 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 may help to successfully address some of the barriers faced by underserved customers.

(3) Legal and Statutory Requirements

(i) Confidentiality and Privacy.—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 Title 120,

GM, Part 408. No one outside of NRCS, except those specifically authorized by NRCS, such as certain conservation district employees, is permitted access to client data. The conservation plan is a confidential document, and no person or agency other than NRCS may access it without written authorization by the client. The conservation plan does not provide public access to the property.

(ii) Personally Identifiable Information (PII).—USDA holds a vast amount of data on its employees and clients. Some of these data are readily available to the public and, in fact, is mandated to be made available through various legislative and legal vehicles. However, some data are sensitive and may never be made public, such as personally identifiable information.

- PII refers to information that can be used to distinguish or trace an individual's identity. PII can include information or combinations of information, such as Social Security numbers (in complete or truncated form), place of birth, date of birth, mother's maiden name, biometric record, fingerprint, iris scan, DNA, medical history, medical conditions, financial information, credit card numbers, bank account numbers, etc.
- USDA is committed to protecting PII for both employees and clients. USDA has a toll-free PII Incident Hotline at 1 (877) PII-2YOU. The hotline is available 24 hours a day, 7 days a week. There is also an Incident Hotline at 1 (888) 926-2373.

(iii) NEPA and Other Environmental Requirements.—Title 190, National Environmental Compliance Handbook, Part 610, contains detailed information on complying with NEPA. All NRCS planning activities will be conducted in compliance with NEPA and other applicable requirements for the protection of the environment. Subpart D, section 600.41, provides recommended sources for additional planning process support guidance to assist planners in incorporating NEPA and other requirements into the planning process.

600.13 Planning Directives

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

(1) Policy.—NRCS conservation planning policy is detailed in the 180-GM, Part 409, "Conservation Planning Policy." 450-GM, Part 401, "Technical Guides," describes NRCS policy for development of technical guides in support of the planning policy. NRCS policy for compliance with NEPA is located in the 190-GM, Part 410, "Compliance With NEPA."

(2) Procedures.—Title 180, National Planning Procedures Handbook, Part 600, supports the planning policy by describing the planning process and the how-to guidance used by NRCS to carry out that process. Title 190, National Environmental Compliance Handbook, Part 610, provides guidance on integrating the requirements of NEPA and other special environmental concerns into the planning process.

(3) Technical Guidance.—The FOTGs are the primary technical reference for NRCS and are localized to apply specifically to an identified geographic area. The FOTG contains five sections supporting the technical aspects of conservation planning activities as identified below (see 450-GM, Part 401, Sections 401.3 to 401.7, for content of FOTG):

(i) I – General Resource References
(ii) II – Natural Resources Information
(iii) III – Resource Management Systems and Planning Criteria
(iv) IV – Practice Standards and Specifications
(v) V – Conservation Effects

(4) Tools.—User guides for specific tools contain information for use and maintenance of conservation planning tools.

(5) Program Guidance.—Manuals contain policy and guidance for administering programs that can facilitate implementation of planned measures.

600.14 Preplanning Activities

A. This handbook describes the planning process in detail and provides guidance on carrying out each planning step. However, the process itself is preceded by preplanning activities, which can play a critical role in the outcome and effectiveness of plan development.

Figure 600-B14: Conservationist and client reviewing conservation plan information in a field office

B. Preplanning activities set the stage for conservation planning with the client by ensuring that basic information is obtained from the client and that background information, necessary to initiate the planning process, is assembled.

C. 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 in solving identified natural resource concerns or opportunities.
(2) NRCS, conservation district, or partner personnel may contact a potential client for the purpose of initiating planning activities.
(3) Proactive citizens may contact partners, the conservation district, or NRCS for planning assistance to prevent potential problems from occurring or to take advantage of opportunities.

D. Regardless of how the client and the planner are brought together, several items can be addressed before planning activities begin. Preplanning activities—

(1) Identify the principal client or clients that will participate in the planning process and their respective roles. Update client information. Determine who has decisionmaking authority for the planning area.

(2) Describe to the client in general terms the planning process and the expected benefits of having a conservation plan.
(3) Explain to the client the roles and responsibilities of the client and NRCS.
(4) Explain the role of the conservation district and the relationship the district program has in making technical assistance available to land users.
(5) Define the planning area on a map and geospatial layers.
(6) Assemble all needed information and data for use in planning. The FOTG is a principal source of reference material pertinent to the field office.
(7) Identify other sources of information or technical assistance that may be available from other agencies, organizations, etc.
(8) Identify tools and supplies that will be needed in the field and have them available for the first field visit.
(9) As necessary, perform some reconnaissance and collect some basic data before the initial planning session is held.
(10) Schedule an initial planning session with the client.

Part 600 – National Planning Procedures Handbook

Subpart C – NRCS Planning Process

600.20 Planning Steps

A. The conservation planning process consists of nine steps, divided into three phases, which cover development, implementation, and evaluation of a conservation plan. The planning process is not linear, but dynamic and iterative, and previously completed steps may be revisited and refined as more information is gathered and the process proceeds. Complete and proper documentation is critical at each step of the planning process. The three phases and nine steps are briefly explained below.

(1) Phase I – Collection and Analysis
  (i) Step 1 – Identify Problems and Opportunities.—Identify existing resource problems and concerns and potential opportunities in the planning area.
  (ii) Step 2 – Determine Objectives.—Identify and document the client's objectives.
  (iii) Step 3 – Inventory Resources.—Inventory and document the natural resources and their current onsite and offsite conditions and effects, as well as the economic and social considerations related to the resources.
  (iv) Step 4 – Analyze Resource Data.—Analyze the resource information gathered in Step 3, "Inventory Resources," to clearly define the existing natural resource conditions, along with economic and social issues related to the resources. Information from this step will help to further define and clarify problems, concerns, and opportunities.

(2) Phase II – Decision Support
  (i) Step 5 – Formulate Alternatives.—Formulate alternatives that will achieve the client's objectives, solve identified natural resource concerns, and take advantage of opportunities to improve or protect resource conditions, and demonstrate a variety of technical and economic implementation strategies.
  (ii) Step 6 – Evaluate Alternatives.—Evaluate the alternatives to determine their effects in addressing the client's objectives and the identified natural resource concerns 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.
  (iii) Step 7 – Make Decisions.—The client selects their preferred alternatives and works with the planner to schedule the conservation system and practice implementation.

(3) Phase III – Application and Evaluation
  (i) Step 8 – Implement the Plan.—The client implements the selected alternatives. The planner or technical expert provides the land manager with detailed practice implementation information, including engineered designs. Conservation staff will also provide practice layout, construction inspection, and certification. Each land manager directs the implementation of each practice. The planner provides encouragement to the client for continued implementation.
  (ii) Step 9 – Evaluate the Plan.—Evaluate the effectiveness of the plan in solving the resource concerns as it is implemented and work with the client to make adjustments as needed.

B. 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.

C. A detailed description is included of "what" items occur during each planning step along with recommendations on "how" to accomplish the items.

600.21 Step 1 – Identify Problems and Opportunities

A. Description.—Onsite 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 resource concerns and opportunities in interrelated planning areas. The identified problems and opportunities and the client objectives guide the remainder of the planning process and are the basis for the purpose and need for action that are documented on Form CPA-52, "Environmental Evaluation Worksheet." Initially, the client and planner may identify only one or two resource concerns. As planning progresses and additional information is gathered, other resource concerns 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 onsite 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. Generally, this step will not be finalized until the resource data are analyzed in Step 4, "Analyze Resource Data," although additional problems, opportunities, and concerns may be identified throughout the entire planning process. Some conservation alternatives may create additional indirect resource related issues and concerns that will need to be addressed by the planner and client.

Figure 600-C1: Conservationist and client discussing concerns and opportunities in the field

C. Planning Standard.—The client's resource problems, concerns, and opportunities are identified and documented.

D. Inputs

(1) Client information regarding their goals and objectives, description of their agricultural operations, etc.
(2) The planner's experience and knowledge of the area
(3) Planning and implementation information from other locally associated clients
(4) Conservation district long-range plan, annual plan, and priorities
(5) Locally led assessments
(6) Areawide conservation plans
(7) Information from other sources, such as State, Tribal, Territorial, and Federal agency; colleges and universities; or centers of research
(8) Resource data for the planning area and adjacent areas (soils, hydrography, hydrology, climate, land use and land cover, etc.)
(9) Discipline manuals and handbooks
(10) FOTG, Sections I, II, III, and V
(11) State resource assessments

E. Products

(1) Identification and documentation of problems, opportunities, and concerns in the case file; this becomes the basis for the statements of purpose and need in the Form CPA-52, "Environmental Evaluation Worksheet," and any required NEPA documents
(2) Communication with the client
(3) Assistance notes

F. Step 1: Identify Problems and Opportunities – 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.	• Identify the clients associated with the planning area and their relationship to the business, land, and the planning process (decisionmaking, ownership, and business association). • Elicit initial information about the client's problems, opportunities, and concerns through email or other electronic contact, office or field visit, or phone conversation between the client and the NRCS. • Gain, and continue to refine, a good general awareness of the kinds of problems that occur within your field office area, as well as the surrounding area. • Utilize sections I and III of the FOTG and any existing locally led assessments, or areawide conservation plans, or similar plans to enhance your understanding of the area's resource issues and potential solutions.

2. Begin recording identified problems, opportunities, and concerns.	• Make a complete record of the client's problems, opportunities, and concerns associated with all natural resources. • Record and organize natural resource problems and opportunities into clear concise statements, using agency planning software and resource concern worksheets. • Document EE data per State, Tribal, Territorial, and Federal guidance (see section 600.71). • Document discussions between planner and client in assistance notes.
3. Discuss the process involved in conducting an inventory and evaluation of the resources.	• Describe to the client the onsite nature of the conservation planning process and the benefits of having the land owner, manager, or operator, who will make planning decisions, present for at least the initial field visit. • Agree to how access to the property will be granted to the planner and if the client always wants to be present. • Discuss any hunting, fishing, or other seasonal impacts to accessing the property.

600.22 Step 2 – Determine Objectives

A. Description.—Determining a client's planning objectives requires developing an understanding with the client of the desired future conditions for the planning area as compared to the existing conditions. This is the purpose for the client to take action. It includes the desired resource uses, resource problem reductions, onsite and offsite ecological protection, and production concerns. As resources are inventoried, their interactions are analyzed, and alternatives formulated, objectives may need to be reviewed and modified.

(1) There may be times when withdrawal of technical assistance becomes necessary.
   (i) Technical assistance may be withdrawn when a client's objectives will result in a negative effect on natural resources, onsite or offsite.
   (ii) Technical assistance may also be withdrawn if a client fails to comply with or will not agree to actions required to be taken by NRCS to comply with local, State, Tribal, Territorial, or Federal regulatory requirements.
(2) For additional information about withdrawing assistance, see Title 440, CPM, Part 525, Subpart A, Section 525.4.

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.

(1) Help the client think more broadly about the onsite and offsite problems and opportunities for natural resource protection or enhancement and to consider policy issues, such as State, Tribal, Territorial, and Federal laws or mandates.
(2) 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 later in the planning process.

Figure 600-C2: Client and conservationist discussing objectives

C. Planning Standard.—The client's objectives are clearly stated and documented.

D. Inputs

(1) Client input
(2) Conservation district long-range plan, annual plan, and priorities
(3) The need for action – the list of problems, opportunities, and concerns to be analyzed
(4) Records from previous planning efforts
(5) Resource data for the planning area and adjacent areas
  (i) Critical resource data (soils, hydrography, hydrology, climate, landuse/landcover, etc.)
  (ii) Additional resource information from partnering organizations
  (iii) FOTG, Sections I and II
(6) Documentation of public concerns from locally led assessments or areawide conservation plans, where they exist

E. Products

(1) A list of the client's objectives recorded in the case file
(2) Assistance notes

F. Step 2 – Determine Objectives, Activities, and Conservation Plan

WHAT	**HOW**
1. Reach agreement on the client's expectations for the planning effort.	• Identify the client's production and business goals for the operation. • Identify the client's desired future conditions for the planning area

WHAT	HOW
	as compared to existing conditions. • Identify the client's recognized or perceived resource problems, concerns, and opportunities. • Identify values the client holds regarding natural resource use and protection, and the client's desires for improving the quality of life. • Identify financial constraints and the client's willingness to accept risk.
2. Document the client's objectives.	• Record and document the client's objectives in terms of the above expectations. • Document discussions between planner and client in assistance notes. • Continue to document the client's objectives as they are better defined and understood, by the planner and client, throughout the planning process.
3. Determine whether the client's objectives are consistent with those of the conservation district and NRCS.	• Utilize the NRCS strategic plan, Chief's priorities, State resource assessment (SRA), district long-range plan, local work group priorities, and other local and State assessments to determine NRCS resource priorities. • If a particular planning area 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 could be broadened to consider the larger area's objectives. • Explain NRCS priorities and targets to the client, so that it is understood why NRCS may need to withdraw assistance if the client's objectives result in a negative effect for other onsite or offsite resources. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71.
4. Determine if NRCS has appropriate technology or resources.	• Assess the technology and resources needed for this planning effort and their availability from NRCS. • Identify an appropriate agency, group, or other entity to participate as a partner in the planning process, when NRCS does not possess the appropriate technology or resources.
5. Determine the need to continue the planning process.	• Review the stated objectives and available resources with the client and determine if the planning process will continue, be put on hold, or be discontinued.
6. Determine the next steps and	• Schedule a convenient time for the client to meet the planner in the

WHAT	HOW
a schedule to complete the planning process.	field to start resource inventory process. • Discuss with the client, the tasks that need to be accomplished and the timelines for completing the planning process.

600.23 Step 3 – Inventory Resources

A. Description.—Collect appropriate natural resource, economic, and social information about the planning area and related areas. Use this information to—

(1) Identify existing or potential resource concerns or opportunities.
(2) Further define known existing and potential resource concerns and opportunities.
(3) Clarify resource concerns.
(4) Formulate and evaluate alternatives.
(5) Gather pertinent information concerning the affected resources, the human considerations, and operation and management.

B. General.—The resource inventory is the identification of SWAPAE+H resources and special environmental concerns (SECs) that are present and are the basis of all planning efforts. This information furthers the understanding of the presence of the natural resources in the planning area. Planners will inventory all applicable resources (see section 600.75). The inventory will provide the planner the understanding of the existing natural resource conditions necessary to convey resource conditions to the client in a knowledgeable manner. Step 1, "Identify Problems and Opportunities," and Step 2, "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.

Figure 600-C3: Conservationist collecting data in the field with client

C. 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." It is essential that clients understand their resources and the resource conditions. This is best accomplished in the field while resource conditions are being inventoried. Inventory resources activities:

(1) Assemble general inventory data and information about the planning area before the planning process begins. Information relating to ground water and surface water quality, cultural resources and historic properties, threatened and endangered species, laws and local ordinances, utility rights-of-way, buried utilities, and other ecological considerations are located in section II of the FOTG. The FOTG, Section II, and the certified soils data provide information relating to all land uses in terms of soil interpretations and ecological site descriptions.

(2) Review this information prior to meeting with the client. Be prepared to relate to resource questions and to 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.

(3) Different land uses normally require different inventory 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.

(4) Use a variety of technical worksheets to inventory specific land uses or modifiers and to assess resource concerns. At a minimum, screen for and assess the required resource concern for the landuse and those flagged as a client objective.

(5) Work together with the client, onsite, to develop a picture of existing conditions, trends, resource concerns, and opportunities. The description of existing conditions, known as the "benchmark condition," may include a description of current crops, farming practices, livestock type, and available equipment and technology. Also document any previously installed or implemented conservation practices that are maintained to NRCS standards and specifications, known as benchmark practices. The benchmark condition will be used in estimating the effects and identifying outcomes of conservation planning efforts.

(6) Though an initial inventory will be completed early in the planning process, be prepared to collect additional resource data during later stages of planning, particularly Step 4, "Analyze Resource Data," and Step 5, "Formulate Alternatives," to more completely refine the resource concerns and opportunities in the planning area, and effects of the alternatives.

(7) Consider all natural and human resources during the inventory process, regardless of complexity or land uses involved. Recognize that some resource concerns will require further assessment. Resource concerns are identified by comparing present conditions with the planning criteria established for the particular natural resource consideration.

(8) Gather sufficient information 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, "Analyze Resource Data."

(9) Review the pertinent local, State, Tribal, Territorial, and Federal programmatic and other statutory requirements that could have an effect on current or potential activities of the client. While it is ultimately the responsibility of the client to be aware of and comply with all pertinent Federal, State, Tribal, Territorial, and local laws and regulations, help the client in making conservation planning decisions by providing relevant information to the client. Begin to consider the client's ability and willingness to meet the financial obligations necessary to implement conservation systems.

(10) Obtain information needed to comply with NEPA and other environmental laws, (see Section 600.1, "References"), and to satisfy specific State, Tribal, Territorial, or Federal program requirements (e.g., State nonpoint source pollution abatement mandates).

(11) If not properly equipped to discuss a client's resources, it is best for the planner to admit that he or she "doesn't know," and offer to find out more and get back to the client with the needed information.

(12) Share natural resource and related information with the client. This opportunity must 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.

(13) When beginning planning Step 3, "Inventory Resources," take the opportunity to enhance the client's knowledge of natural resource conservation principles, utilizing the land unit or plant community. The natural environment is often the best-equipped classroom available to demonstrate effects of erosion, costs of overgrazing, or benefits of water management to the client. These concepts 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.

(14) Utilize the inventory process to acquire the information and data necessary to assist the client in planning for the correct use of the resources. Use this opportunity to demonstrate your technical ability and earn the professional respect of the client. This will promote the client's confidence in your professional skills and lead to a higher quality of planning.

D. Planning Standard.—Sufficient data and information are gathered for analysis.

E. Inputs

(1) Knowledgeable land managers, past and present
(2) Stated objectives, and resource problems and opportunities identified
(3) Imagery
(4) Inventory tools and procedures, including discipline-specific manuals and procedural documentation (see subpart D, section 600.40)
(5) State, Tribal, Territorial, and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(6) Areawide plans, including State resource assessments, rapid watershed assessments, and watershed plans.
(7) Previous resource inventories completed by NRCS or others
(8) Field observations and measurements
(9) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

F. Products

(1) Detailed resource inventories of the planning unit, as well as related offsite information
(2) Information on human considerations
(3) Identification of special environmental concerns, such as threatened and endangered species
(4) Identification of cultural resource and historic property and areas of potential impacts
(5) Planning land units, locations, determinations, and client-land relationships described
(6) Onsite soil investigation report prepared by the planner or the resource soil scientist
(7) Identification of infrastructure physical features, such as roads, houses, fences, power lines and other utilities, right of ways, and easements
(8) Identification of how the client manages resources, including kinds, amounts, and timing of management activities
(9) Benchmark data for the planning area, including benchmark practices
(10) Assistance notes for completing the inventory step.
(11) Receipts for service (upon request by client)

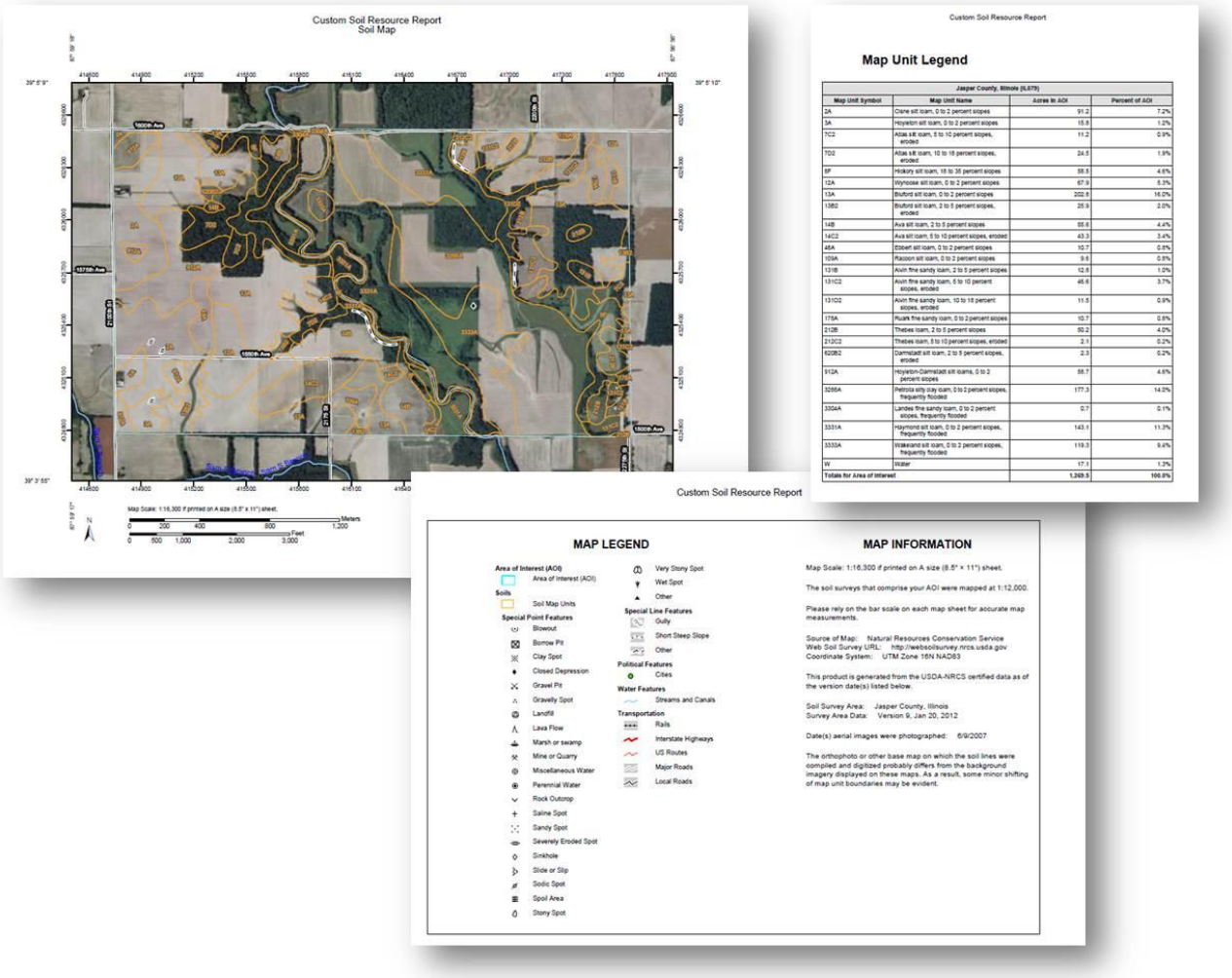

Figure 600-C4: Example of a resource inventory map with legends

G. Tools and Support Information

(1) Inventory Collection Tools and Procedures.—Each discipline has acceptable procedures and tools for conducting resource inventories. Many of these are described in detail in discipline manuals and handbooks, such as the National Agronomy Manual, National Biology Manual, National Forestry Manual, National Range and Pasture Handbook, the Stream Visual Assessment Protocol (SVAP2), and soil quality/health score card or test kit.

(2) GIS Tools and Resource Models.—GIS and resource models are valuable tools to assist the planner in assembling data and predicting resource conditions. The information gathered and documented during the inventory process can benefit the planner and client in analysis and evaluation of the resources.

(3) 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.

(4) Natural Teaching Tools.—In addition to the more common, traditional tools listed above are those of perhaps the greatest importance, the "natural teaching tools." Planners need to know how best to use these tools to their advantage. This includes using the clients' existing

natural resources 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.

(5) The planning criteria established by the States (FOTG, Section III) provide guidance as to the appropriate inventory or assessment method or combination of methods to use for each resource consideration. Some of these are shown in Figure 600-C6, "Inventory Methods," with brief notes describing 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. The information in this figure is not to be considered complete or definitive. It may vary between States. Methods listed in Figure 600-C6, "Inventory Methods," may be used in combination or separate. Some professional 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.

H. General Inventory and Assessment Methods

(1) Procedural
(2) Predictive
(3) Observation
(4) Deduction

I. Special Environment Concerns (SECs)

(1) Clean Air Act
(2) Clean Water Act and waters of the United States
(3) Coastal zone management areas
(4) Coral reefs
(5) Cultural resources and historic properties
(6) Endangered and threatened species
(7) Environmental justice
(8) Essential fish habitat
(9) Floodplain management
(10) Invasive species
(11) Migratory birds and the Bald and Golden Eagle Protection Act
(12) Prime and unique farmlands
(13) Riparian areas
(14) Wetlands
(15) Wild and scenic rivers

J. Step 3 – Inventory Resources, Activities, and 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, "Determine Objectives," as they relate to land uses, production goals, problems, opportunities, and other concerns. • Select the appropriate inventories for each proposed land use, using the appropriate discipline handbooks for detailed guidance. • Tailor the level of inventory detail to the complexity of the resource setting and the identified problems, opportunities, and objectives.
2. Collect available information.	• Establish a list of potential resource concerns and opportunities by reviewing 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. • Utilize the resources and expertise of others. • 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, Tribal, Territorial, and Federal mandates that currently affect or could affect existing operations. The FOTG, Section I, can be used to help develop the list. • Use available and applicable soil survey information and other resource data.
3. Maintain good communications between the client and the planner through the resource inventory process.	• Discuss the purpose and importance of the inventory process with the client. • Emphasize to the client the importance of their knowledge of the planning area and associated resources. Emphasize that their input is essential. • Explain what will be done during the inventory process and why. • Estimate how much time is required to carry out the field inventories. • Always obtain permission from the client before conducting onsite visits.

WHAT	HOW
4. Conduct the inventory onsite. Include the client in the field inventory activities.	• Familiarize yourself with the resource inventory methods described in Figure 600-C6, "Inventory Methods." • Follow inventory procedures as described in appropriate discipline handbooks and manuals. • 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 (e.g., resources; kinds, amounts, and timing of operations and activities) and document. • Document EE data per State, Tribal, Territorial and Federal guidance. See section 600.71. • Determine the effectiveness of existing management measures and practices in addressing resource concerns.
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. • Encourage the client to conduct actual measurements, such as clipping vegetation, checking soil conditions, boring trees, and recording information.

WHAT	HOW
6. Record the resource inventory data to facilitate analysis in Step 4, "Analyze Resource Data."	• Identify the client's planning land units. • Review, and update as necessary, planning land units with key information, including current land use. • Update information on the relationships of the clients to planning land units determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Record utilities, easements, legal constraints, and determinations. • Review soils information for each planning land unit. • Document the existing conservation practices found, using the standardized NRCS practice symbols. Include both those that do and do not meet NRCS standards, as appropriate, to facilitate the current planning effort. Include estimates of quantities and the approximate implementation date, if known. • Record benchmark data, including— o Current crop rotation data. o Pasture inventory. o Range inventory. o Forest management inventory. o Developed land inventory. o Associated land inventory. o Cultural resource and historic property inventory. • Document natural resource information on the appropriate technical worksheet. • Document discussion between planner and client in assistance notes.

600.24 Step 4 – Analyze Resource Data

A. Description.—Study the resource data and clearly define the existing natural resource conditions, including any limitations to their use and potentials. This step provides the information needed to determine resource concerns to be addressed and formulate alternatives. The analyses 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.

(1) 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 information.

(2) Often each of the first four steps, "Identifying Problems and Opportunities," "Determining Objectives," "Inventorying Resources," and "Analyzing Resource Data," are very closely associated and occur concurrently and iteratively, before a complete analysis of resource concerns is accomplished. While resource concerns and opportunities initially identified by the client and planner during Step 1, "Identify Problems and Opportunities," result in collecting and analyzing certain data, other resource concerns and opportunities may come to light during the inventory and analysis steps.

(3) At this point in the planning process, there must be agreement between the planner and the client on resource concerns, opportunities, and objectives. It may also be discovered that perceived problems are not resource concerns when compared to planning criteria. 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.

Figure 600-C5: Client and conservationist viewing data from laptop in the field.

C. Planning Standard.—The benchmark condition is documented by describing the current condition, crops, soils, existing conservation practices, and identified resource concerns in a benchmark narrative. The causes of the resource concerns are identified.

D. Inputs

(1) Client's objectives
(2) Identified problems, opportunities, and concerns
(3) Resource inventory data
(4) FOTG, Sections I, II, III and V
(5) Results from various resource evaluation tools (e.g., RUSLE2, WEPS, etc.)

E. Products

(1) An analysis of all resources inventoried
(2) A clear statement of the benchmark condition (benchmark narrative)
(3) Environmental evaluation data to meet NEPA requirements
(4) Cultural resource and historic property evaluation data
(5) Endangered Species Act (ESA) resources evaluation data
(6) Other program and legal evaluation data
(7) A complete definition of resource concerns and opportunities identified
(8) Identification of the causes or conditions that contribute to the resource concerns
(9) A complete statement of objectives
(10) Assistance notes

F. Step 4 – Analyze Resource Data Activities – Conservation Plan

WHAT	HOW
1. Determine the method of analyses to be completed.	• Determine the types of analyses to be completed by reviewing the client's objectives, resource concerns, SECs, land and resource uses, and the location of the planning area. • Identify the resource considerations and determine the best method of calculating resource effects and outcomes. For example, use soil capability data, ecological site descriptions, and vegetative production information to determine land carrying capacity to assist the producer in establishing initial stocking rates or use applicable models to evaluate water quality (see FOTG, Section I). • Ask an appropriate agency, group, or entity for assistance after obtaining the decision-maker's permission, in instances where the kind or extent of resource problems exceeds the expertise or resources available.
2. Establish scope, intensity, degree of accuracy, and procedures to be used, utilizing discipline specialists as needed.	• Review the findings of the cultural resource/historic property inventory. • 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. • 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 resource concerns. Interpretive information from the FOTG, Section III, can aid in defining the elements listed above.
3. Conduct the analysis.	• Use procedures in appropriate discipline handbooks or manuals and automated analysis tools (e.g., RUSLE2, WEPS, etc.). See Figure 600-C6, "Inventory Methods."
4. Compare the results of the analysis with planning criteria, problems, opportunities, and objectives.	• Compare the results of the analysis with the planning criteria in the FOTG, Section III, and with the problems, opportunities, and objectives determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Use the inventory data that were collected, based on client objectives, to determine the kind, amount, and extent of existing and potential resource concerns.

WHAT	HOW
5. Describe and record the benchmark condition	• Describe and record the benchmark condition, including existing practices, identified resource concerns, human resources, and special environmental concerns. Include the kind, amount, and location. Quantities are shown in standard units (e.g., tons per acre per year, parts per volume of water, yield per acre, etc.). • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussion between planner and client in assistance notes.
6. Produce resource maps and reports.	• Display the resource information on maps, showing the location and the extent of the condition.

Figure 600-C6: Inventory Methods

Note: 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. The information in this figure is not to be considered complete or definitive. States are encouraged to make adjustments to this information to meet local needs.

SOIL

Resource Consideration or Concern	Measurement and Assessment Tools
Soil Erosion	
Sheet & Rill, Wind	Predictive (RUSLE2, WEPS) Procedural (RHA) Observation
Concentrated Flow	Observation
Streambank, Shoreline, Conveyance Channels	Procedural (SVAP2) Observation
Soil Quality/Health Degradation	**Measurement and Assessment Tools**
Subsidence	Observation Deduction
Compaction	Procedural (PCS, RHA) Observation Deduction
Organic Matter Depletion	Procedural (PCS, RHA) Predictive (RUSLE2) Observation Deduction

Resource Consideration or Concern	Measurement and Assessment Tools
Concentration of Salts or Other Chemicals	Observation Deduction

WATER

Resource Consideration or Concern	Measurement and Assessment Tools
Excess Water	
Seeps, Runoff, Flooding, or Ponding	Observation Deduction
Insufficient Water	
Inefficient Moisture Management	Procedural (RHA) Observation Deduction
Inefficient Use of Irrigation Water	Procedural (IWI)
Water Quality Degradation	
Nutrients	Procedural (PCS) Deduction Leaching Index Phosphorus Index Water Quality Index
Pesticides	Predictive (WinPST) Deduction
Excess Pathogens and Chemicals From Manure, Bio-solids, or Compost Applications	Observation Deduction
Salts	Observation Deduction Soil Test
Petroleum, Heavy Metals, and Other Pollutants	Observation Deduction
Sediment	Procedural (RUSLE2, WEPS, PCS, RHA, SVAP2)) Observation Deduction
Elevated Water Temperature	Procedural (SVAP2) Observation Deduction

AIR

Resource Consideration or Concern	Measurement and Assessment Tools
Air Quality Impacts	

Resource Consideration or Concern	Measurement and Assessment Tools
Emissions of Particulate Matter (PM) and PM Precursors	Predictive (WEPS) Observation Deduction
Emissions of Ozone Precursors	Observation Deduction
Emissions of Greenhouse Gases	Observation Deduction
Objectionable Odors	Observation Deduction

PLANTS

Resource Consideration or Concern	Measurement and Assessment Tools
Degraded Plant Condition	
Undesirable Plant Productivity and Health	Procedural (WEPS) Deduction
Inadequate Structure and Composition	Procedural (RHA) Observation Deduction
Excessive Plant Pest Pressure	Procedural (PCS) Observation Deduction
Wildfire Hazard, Excessive Biomass Accumulation	Observation Deduction

ANIMALS

Resource Consideration or Concern	Measurement and Assessment Tools
Fish and Wildlife - Inadequate Habitat	
Food, Cover/Shelter, Water, Space Continuity	Procedural (WHEG, WHSI, SVAP2) Observation Deduction
Livestock Production Limitation	
Inadequate Feed and Forage	Procedural (GRAS) Observation Deduction
Inadequate Shelter	Procedural (GRAS) Observation Deduction
Inadequate Water	Procedural (GRAS) Observation

Resource Consideration or Concern	Measurement and Assessment Tools
	Deduction

ENERGY

Inefficient Energy Use	
Equipment and Facilities	Predictive (Online Energy Tools) Observation Deduction
Farming/Ranching Practices and Field Operations	Predictive (RUSLE2, Online Energy Tools) Observation Deduction

ECONOMIC

Resource Consideration or Concern	Measurement and Assessment Tools
Land	
Land Use, Land Available for Production, Farm Program Eligibility (base)	Observation Deduction
Capital	
Total Investment, Annual Cost ,Cost Per Unit of Production	Observation Deduction
Labor	Observation Deduction
Management	Observation Deduction
Risk	Observation Deduction
Profitability	Observation Deduction

SOCIAL

Resource Consideration or Concern	Measurement and Assessment Tools
Cultural Resources and Historic Property	Procedural Predictive Observation Deduction
Client Characteristics	

Resource Consideration or Concern	**Measurement and Assessment Tools**
Education, Health, Family Values, Attitudes	Observation Deduction
Community Characteristics	
Recreational Opportunities, Cultural Opportunities (theater, music, shopping, civic organizations, higher education, etc.), Crime, Community Health	Observation Deduction

600.25 Step 5 – Formulate Alternatives

A. Description.—Develop alternatives that will achieve the objectives of the client, solve the identified resource concerns, take advantage of opportunities, and prevent or lessen the possibility of additional problems occurring.

(1) A broad range of technically feasible alternatives will be developed with the client. Alternatives may include an appropriate mix of structural conservation practices, such as terraces, dams, and waterways; nonstructural conservation practices, such as crop residue management, or livestock exclusion; market-based measures, such as cost-sharing, easements, and local tax incentives; and institutional measures, such as zoning or local regulations, and State, Tribal, Territorial, and Federal laws and regulations.

(2) Some conservation practices are primary, resulting in treatment of the identified resource concerns. Others are supporting – they facilitate a primary conservation practice and may not have a direct effect on the identified resource concern (however, they must meet the primary practice standard and achieve the desired treatment). An example of a primary conservation practice is a terrace. When needed for the terrace to function effectively, an underground outlet is an example of a supporting practice that facilitates a primary practice. Because the primary practice will not function properly without the supporting practice or practices, the primary conservation practice will not be certified as complete until all supporting practices are installed.

(3) When developing alternatives, include conservation practices and management measures that mitigate potential adverse effects on the resources. Consider the potential to address regulatory requirements, based on the client's desires and objectives.

Figure 600-C7: Client and conservationist discussing resource data in the field.

B. General.—This planning step begins phase II of the planning process. Revisit earlier steps if new objectives or resource concerns are identified. The purpose of formulating alternatives is to provide a variety of effective, efficient, and economical conservation treatments that meet planning criteria and are acceptable to the client in solving resource concerns, addressing opportunities, and meeting the stated objectives. These alternatives relate to the identified problems, opportunities, and resource concerns, and are developed in view of the cultural, social, ecological, and economic conditions of the planning area.

(1) Include the client in the formulation of alternatives. This enhances 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 cost is a critical issue.
(2) 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 Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data," before proceeding.
(3) The planner and the client must have a clear understanding of the resource concerns, including their cause and effect relationships. If the resource concerns and their cause and effect relationships are not clearly understood by the client, return to planning Step 4, "Analyze Resource Data," and review these concerns with the client.

C. Planning Standard.—Alternative treatments are developed to meet the resource needs, objectives of the client, and planning criteria for the identified resource concern.

(1) One or more action alternatives will be developed, included in the case file, and presented to the client.

(2) Conservation planning is conducted with the client, working progressively towards an RMS level of management.

D. Inputs

(1) List of resource problems, opportunities, and concerns from Step 1, "Identify Problems and Opportunities"
(2) The client's objectives from Step 2, "Determining Objectives"
(3) Physical, cultural resource and historic property, social, economic, and ecological information pertaining to the planning area and related areas
(4) Resource data and analysis from Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data"
(5) FOTG, Sections II, III, IV, and V

E. Products

(1) A set of alternatives that are compatible with client and NRCS objectives and address the identified resource concerns
(2) Assistance notes

F. Step 5 – Formulate Alternatives Activities – Conservation Plan

WHAT	**HOW**
1. Build the conservation system alternatives.	• Become familiar with resource concerns identified in Step 3, "Inventory Resources," and Step 4, "Analyze Resource Data," and the types of systems commonly used to address those concerns. • Solicit assistance from technical specialists at NRCS or other agencies and organizations if the complexity of resource issues or specific responsibility for certain resource issues requires their input. • Include all requirements to comply with existing laws and special environmental concerns. • Designate the proposed primary land use for each alternative in terms of both the client's and NRCS's designation. • Select the potential practices to meet the client's specific needs and address the identified resource concerns. Take into account existing practices or management measures that do not currently meet NRCS standards. • List the practices and estimated planned amounts for each necessary to meet the planned level of treatment. • Create additional alternatives to provide the client with multiple feasible approaches to address their objectives and identified resource concerns. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Enter assistance notes, as appropriate, to capture discussions between the client and planner during the development of

WHAT	HOW
	alternatives.

600.26 Step 6 – Evaluate Alternatives

A. Description.—Evaluate the alternatives to determine their effectiveness in addressing the client's identified resource concerns, opportunities, and objectives. Attention must be given to those ecological values protected by law or Executive order. See Section 600.1, "References."

B. General.—The purpose of evaluating alternatives is to provide the client with the information needed to select the desired alternative. 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 and decisionmaking. The planner may need to revisit any or all of the previous steps during discussions with the client or during any part of the evaluation.

Figure 600-C8: Conservationists and client evaluating forage in pasture.

C. Environmental Evaluation.—Federal law requires NRCS planners to consider the environmental consequences of recommended actions and to provide decisionmakers information about the actions that might significantly affect the human environment. Therefore, planners must assess the physical effects of planned actions during the planning process. Planning to address issues with the natural resources and their interrelationships is complex. A conservation practice with a positive effect on one resource may have a negative effect on another. Therefore, planners must be aware of and consider the effects of recommended actions on all resources even when the assistance provided only addresses individual resource concerns.

D. Purpose.—This guidance emphasizes the reality that resources are interrelated and that the treatment of one resource may affect another. It also shows the importance of formulating alternative conservation systems in recognition of these interrelationships by providing a process that—

(1) Starts with identified client objectives and the determination of resource concerns.
(2) Considers the effects of practices on each resource.
(3) Facilitates combining complementary practices in the alternative systems.
(4) Helps evaluate the potential options against the planning criteria.
(5) Provides a scientific and economic basis for decisions.

E. Conservation Effects.—The conservation effects process is useful in formulating and evaluating conservation system alternatives. Using the CPPE matrix and the Conservation Practice Network Diagrams helps planners communicate with decisionmakers the physical effects of conservation practices, so they can determine if proposed alternative systems solve identified resource concerns, while being reasonably certain that the recommended treatment will not create new problems. See section 600.72.

F. Network Diagrams.—Network diagrams, found in the National Handbook of Conservation Practices, are flow charts that represent an overview of expert consensus on the direct, indirect, and cumulative effects of installing proposed practices. Network Diagrams show the potential positive and negative outcomes of practice installation and are useful as a reference point for evaluating the effects of alternative systems.

G. Conservation Practice Physical Effects (CPPE).—The CPPE documents, found in the FOTG, Section V, and the National Handbook of Conservation Practices, display in subjective terms the physical effects conservation practices have on the natural resources and their associated problems or concerns. See also Subpart E, 600.40, "Support Guidance for Conservation Effects." Technical specialists document in the CPPE the practice effects based on their experience and available technical information. See 450-GM, Part 401, Subpart A, Section 401.1A(5), for additional information.

(1) When creating the CPPE, the question is presented, "When this practice is installed in accordance with NRCS practice standards and is fully functional, what effect will it have on the various resource concerns?" The answer is in the form of a rating that represents the practice's effect on the resource concern, and the magnitude of the effect.

(i) The following terms define "effect" values:

- No Effect.—The conservation practice being evaluated has no discernible effect on the resource concern identified.
- Worsening.—The conservation practice further deteriorates the condition of the resource
- Improvement.—The conservation practice improves the condition of the resource

(ii) The following terms express the magnitude of the effects:

- Slight.—Some effect (positive or negative) of the practice on the resource, 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.
- Substantial.—A significant measurable effect (positive or negative) of the practice on the resource.

(2) National technical specialists with responsibility for a given practice establish CPPE values for each conservation practice. The effects listed in the national CPPE represent general conditions nationwide.

Example: The national agronomist determines that generally, the implementation of Residue and Tillage Management, No Till/Strip Till/Direct Seed (329) will significantly reduce the sheet and rill erosion problem because of increased surface cover and decreased soil disturbance. Therefore, a value is entered as "Substantial Improvement" to the Soil Erosion – Sheet and Rill Erosion resource concern. However, the implementation of 329 may cause a slight increase in soluble nitrate nitrogen infiltration depending on the time and method of application, rainfall, nutrient form, organic matter, soil texture, and depth to water table, and therefore a value is entered as "Moderate Worsening" to the Water Quality Degradation – Nutrients in Groundwater resource concern.

(3) Since data on the CPPE are national in scope, State-level offices are encouraged to review and localize the information as necessary to reflect those effects expected to occur under local conditions. Each State will review and, if needed, edit the values in the national CPPE based on local knowledge and experience to reflect typical conditions in their State. It is imperative that States use an interdisciplinary group to refine existing entries to ensure proper consideration of all effects to all of the resource concerns.

(4) If a State modifies the national CPPE, the State will provide a description of the local conditions and a depiction of the typical practice installation to justify the change. A well-written description of the typical practice installation will aid the planner when it comes time to conduct site-specific analysis.

Example: The national agronomist determined that, in general, the implementation of Residue Management, Seasonal (344) results in a "Slight to Moderate Reduction" in the Soil Erosion – Wind problem. However, a State agronomist observes that with the implementation of Residue Management, Seasonal (344) the reduction of wind erosion is significant because the critical wind erosion period occurs when the soil is covered with residue or crop. The State agronomist will change the value to "Substantial Improvement" in the Soil Erosion – Wind resource concern, with a rationale statement as to why the practice has been deemed to have a "Significant" rather than a "Slight to Moderate" reduction in the wind erosion resource concern.

H. SmarTech Version of CPPE

(1) A spreadsheet version of the CPPE displaying the effects values in a numerical format is stored in the SmarTech database accessible through the FOTG, Section V, or through the "Technology" tab of the My.NRCS intranet site. Various programs and databases rely on this rendering of the effects data. See 450-GM, Part 401, Subpart A, Section 401.7, for additional information.

(2) The following conversion establishes the national values in the SmarTech CPPE matrix:

(i) Substantial Improvement	+5
(ii) Moderate to Substantial Improvement	+4
(iii) Moderate Improvement	+3
(iv) Slight to Moderate Improvement	+2
(v) Slight Improvement	+1
(vi) No Effect	0
(vii) Slight Worsening	-1
(viii) Slight to Moderate Worsening	-2
(ix) Moderate Worsening	-3

(x) Moderate to Substantial Worsening -4
(xi) Substantial Worsening -5

I. Use the Effects Concept and CPPE in Conservation Planning

(1) After planners formulate an alternative conservation system, they use their State's CPPE and the Conservation Practice Network Diagrams as guides to refine the evaluation of effects of practices to reflect the site-specific environmental conditions and practice design. (See Exhibit 3)

(2) Planners also use the CPPE and Network Diagrams to identify potential negative effects on resources that may result from the implementation of practices. If the CPPE indicated the potential for a negative effect or, if through experience, planners discern that a practice may result in a negative effect, planners may need to add one or more additional practices to the system in order to mitigate for predictable degradation of resources. In such situations, planners will add these newly selected practices to the alternative system and once again evaluate the site-specific practice effects on the identified resource concerns. Planners will repeat this process until they develop a combination of practices that—
(i) Meets the client's objectives.
(ii) Meets the planning criteria for the identified resource concerns.
(iii) Has mitigated all negative effects.

(3) When a client considers a land use change as an option, the planner will evaluate the effects of practices used to facilitate the land use change against present conditions. The planner will evaluate the effects of practices necessary to manage the new land use based on the new land use.

Example: Where cropland is to be converted to pasture, initially evaluate the effects of pasture planting for the resource concerns identified on the crop field. Pasture planting will significantly reduce sheet and rill erosion that occurs with the existing cropping system. Then, evaluate the potential resource concerns that may occur after conversion to pasture. Pasture grazing may cause a water quality concern indicating the need for filter strips and fencing.

(4) Displaying the positive and negative effects of alternative conservation systems allows the decisionmaker to compare the various alternatives and better understand the benefits of all their options so they can select the one that best meets their objectives.

Example: Alternative #1 is very effective in treating soil related resource concerns and is not quite as effective in treating one or more of the other resources. In contrast, alternative #2 is very effective in treating the water and animal resources and not quite as effective in treating the soil resource concerns.

(5) Site-specific evaluations of the effects of conservation system alternatives are required.

J. Cumulative Effects.—When clients apply systems that address the same resource concern to several PLUs in a watershed, significant cumulative or synergistic effects are probable. Planners may consult the Conservation Practice Network Diagrams as they consider the outcomes of treatment applied to surrounding land when conducting effects evaluations. The CPPE does not reflect the potential of cumulative effects.

Example: The evaluation of effects of a conservation system treating a single PLU may indicate a slight improvement to the concern over sediment in surface waters. However, in a watershed consisting of several PLUs treated to reduce sediment delivery to a water body, an evaluation of the cumulative effect may indicate a moderate or significant positive reduction in the amount of sediment reaching the water body.

K. Planning Standard.—The effects of each alternative are evaluated and the results are described. The alternatives are compared to benchmark conditions to evaluate their ability to solve problems, meet planning criteria, and meet the client's objectives. The analysis includes evaluation of the direct, indirect, and cumulative effects.

L. Inputs

(1) List of problems and opportunities developed during Step 1, "Identify Problems and Opportunities"
(2) The client's objectives from Step 2, "Determine Objectives"
(3) Benchmark data from Step 4, "Analyze Resource Data"
(4) List of alternatives from Step 5, "Formulate Alternatives"
(5) FOTG, Sections I, II, III, IV, and V
(6) National Handbook of Conservation Practices – Network Diagrams
(7) Environmental and cultural resource and historic property evaluations
(8) Program information and requirements

M. Products

(1) An evaluation for each alternative that displays the effects (including the rationale supporting the effects determination) for the client to consider and use as a basis for decisionmaking for the conservation plan
(2) Technical assistance notes reflecting discussions between the planner and the client
(3) Cost estimate for each alternative
(4) List of applicable financial assistance programs

N. Step 6 – Evaluate Alternatives Activities – Conservation Plan

WHAT	**HOW**
1. Determine the effects of each alternative.	• Compare the effects of each alternative to the benchmark condition to estimate expected outcomes and determine the degree to which the client's resource objectives will be met by the implementation of each alternative. • Express effects in narrative terms or quantify in physical terms (e.g., tons per acre, parts per million, bushels per acre). Record the effects for each resource concern. • Verify that each alternative would comply with existing national, State, Territorial, local, and Tribal laws and regulations, as appropriate.

WHAT	HOW
2. Evaluate each alternative for potential negative effects.	• Evaluate each alternative for potential negative effects. If an alternative is likely to result in an adverse effect to any resource (environmental, cultural resource/historic property, or human) modify alternative to mitigate potential damage and to conform to client objectives. • Evaluate the risk and uncertainty associated with each alternative. • Obtain State-level technical support in situations where an offered alternative leads to a program, procedure, or activity that has disproportionately adverse human health or environmental effects on minority or low-income populations (environmental justice not being positively served).
3. Identify potential sources of financial assistance.	• Identify sources of financial assistance through NRCS programs, or through other Federal, State, Territorial, Tribal, and local agencies or public interest groups. Awareness of these sources can aid the client in making decisions.
4. Review the alternatives and their effects with the client.	• Prepare an effects summary of each alternative that clearly displays the long-term and short-term ecological, economic, and social outcomes (i.e., land, labor, capital, and management). • Use a format that meets the needs of the client. Effects may be expressed using a range of formats from a simple narrative comparison to a complex, detailed accounting of the effects using automated tools. Often, a limited amount of detailed information is sufficient. • Consider the personal, social, and community background of the client to determine which effects have the most influence on the choice of an alternative. Values that cannot be quantified may be the most important to the client. • If requested by client, express the effects of alternatives in monetary terms. Estimate the monetary effects using least-cost (cost-effectiveness) analysis, cost-return analysis (return on investment), partial budgeting, net present value analysis, break-even analysis, or internal rate of return. Cost information is available in the FOTG, Section I, from discipline specialists, and other sources. • Document environmental evaluation (EE) data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussions between the client and planner in assistance notes.

600.27 Step 7 – Make Decisions

A. Description.—The client determines which alternatives to implement and the planner prepares the necessary documentation. Documentation includes recording the decision and preparing the conservation plan, the CPA-52, "Environmental Evaluation Worksheet," and any necessary additional NEPA or consultation documents.

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

Figure 600-C9: Conservationist and client shaking hands in crop field.

C. Planning Standard.—A conservation system is selected based on the client's clear understanding of the effects for each alternative. The selection is recorded in the client's plan.

D. Inputs

(1) The analysis of all resources inventoried
(2) A set of evaluated alternatives
(3) Conservation effects information
(4) FOTG, Section V

E. Products

(1) The plan document with the selected alternative, including potential program or implementation opportunities, and operation and maintenance with approval by a certified conservation planner
(2) Schedule of conservation system and practice implementation
(3) NEPA documentation

(4) Revised conservation effects information
(5) Assistance notes

F. Step 7 – Make Decisions Activities – Conservation Plan

WHAT	**HOW**
1. Discuss the alternatives.	• Set a date with the client to discuss the alternatives. • Discuss the advantages and disadvantages of each alternative, including constraints imposed by law. • Point out the beneficial and adverse effects for each alternative to aid the client in reaching a decision. • If the client chooses one or more of the alternatives, proceed to Item 2, "The client makes decisions." • If the client chooses to implement only part of an alternative and a resource concern is not addressed, return to Step 6, "Evaluate Alternatives Activities," 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. • Discuss financial assistance options.
2. The client makes decisions.	• Record the selected alternative as the planned system. • Schedule selected practices for implementation. • Explain the interdependency of certain practices as practice scheduling is completed. • Explain any Federal, State, Territorial, Tribal, or local regulations that may apply and potential permit requirements. • Adjust effects, if needed. • Inform client that if NRCS funding or other implementation assistance is sought, NRCS may need to meet consultation requirements and that some activities may be modified as a result. • Record assistance notes reflecting discussions with the client.

3. 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, in accordance with Section 600.31, "Conservation Plan." • Prepare the conservation plan, in accordance with Section 600.31, "Conservation Plan." • Include appropriate forms, practice overview sheets with practice specifications, and implementation requirements. • Update the environmental evaluation if necessary • Revise conservation effects, if needed. • Include an operation and maintenance plan or information. • As appropriate, refer to specific program requirements.
4. Deliver the plan to the client.	• Schedule a time to meet in person with the client. • Review plan with the client and discuss implementation. • Encourage the client to sign the plan. While optional at the national level, it is recommended as an acknowledgement of decisions. • Ensure that a certified conservation planner signs the plan for NRCS. • Provide copies of plan documents to client. • Document discussions with the client in the assistance notes.
5. Discuss the next follow-up or implementation assistance.	• Discuss need for followup assistance. • Discuss applicable compliance and program status review requirements.

600.27 Step 8 – Implement the Plan

A. Description.—Implementing the plan includes providing technical assistance, and in many instances, financial assistance, for installing conservation practices and management systems. Implementation includes obtaining needed permits, funding, land rights, surveys, initial and final designs, inspections and certifications. 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 systems. Well-documented and understood decisions are a prerequisite to implementation of the plan. The client may be able to implement the plan without additional technical assistance. However, additional technical assistance is usually necessary, and plan revisions may be warranted. Additional information or documentation may be required by an implementation program or funding authority. Thorough and high-quality planning sets the stage for providing efficient and effective technical and financial assistance.

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

Figure 600-C10: Conservationist and contractor reviewing practice design in the field

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 in accordance with NRCS standards and specifications.

D. Inputs

(1) Conservation plan
(2) Case file data
(3) Technical studies
(4) Environmental evaluations and documents
(5) Technical assistance
(6) Financial assistance conservation program requirements
(7) FOTG, Section IV, "Practice Standards and Specifications"
(8) National Engineering Handbook
(9) Communication with clients and stakeholders

E. Products

(1) Practice designs and job sheets
(2) Survey notes
(3) All necessary permits
(4) Practice certification notes
(5) Conservation practices applied
(6) Conservation systems applied
(7) Technical assistance notes
(8) Financial Assistance Conservation Program contract, where applicable

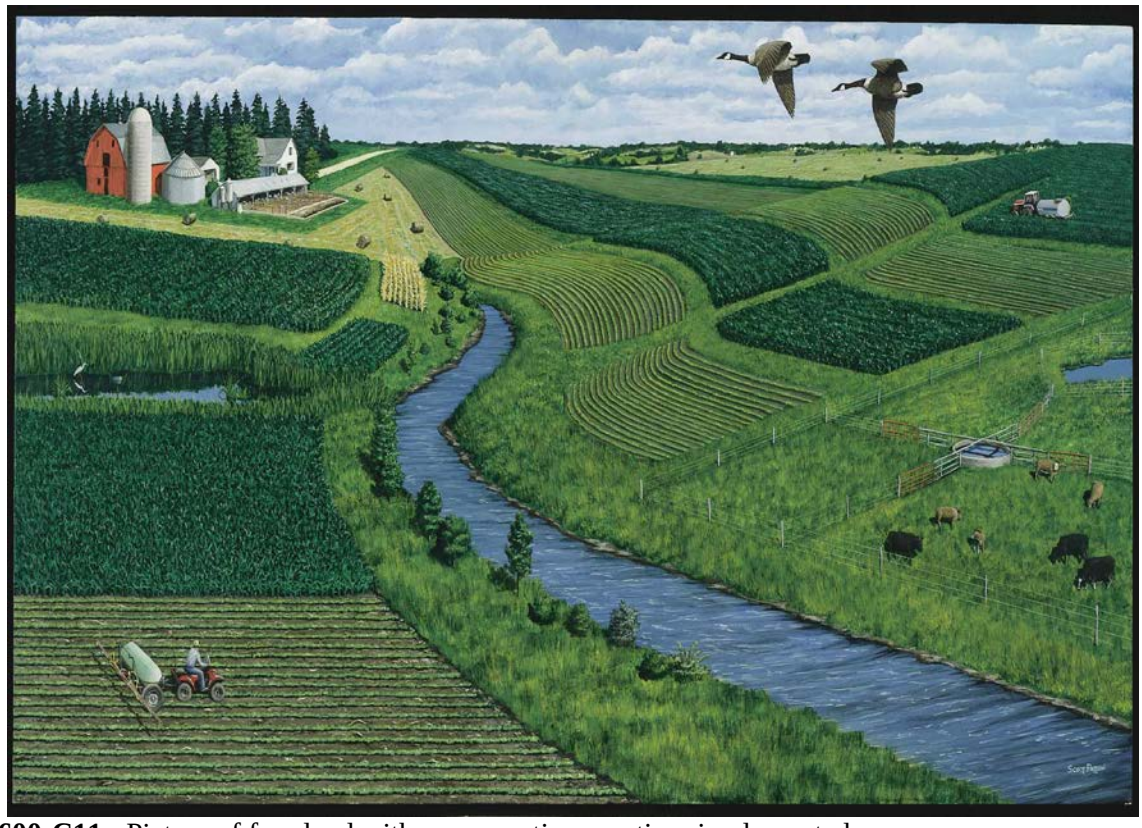

Figure 600-C11: Picture of farmland with conservation practices implemented.

F. Step 8 – Implement the Plan Activities – Conservation Plan

WHAT	**HOW**
1. Initiate NRCS assistance to install practices.	• A personal contact may be initiated by the client, NRCS or cooperating agency. It may be in the form of a letter, telephone call, agency Web tool, email, etc.
2. Become familiar with the conservation plan.	• Review the client's decisions and assistance notes. • Discuss the plan with the person who last updated the plan, if that person is available. If not, discuss with others in your field office familiar with the client or land. • Review the resource data, soils, topography, the environmental assessment, etc.
3. Review the plan with the client. If necessary, revise the existing plan or develop a new plan.	• Contact the client to schedule an appointment. Reconfirm before the date scheduled. • Discuss: o Client objectives o The implementation schedule o Costs o Financial assistance o Sequence of practice implementation o Operation and maintenance o Followup o Other factors • Track progress towards implementing the conservation plan. • Update the plan any time practices are considered for conservation program enrollment, so practice information, such as planned dates and amounts, meet program requirements. • 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 data collection, including surveys (if not already done) for practice design.	• Determine the type and intensity of field data needed for design purposes. • Develop job sheets. • Discuss the practices scheduled to be applied. • Discuss needed easements, land rights, and permits. • Discuss timeframes of each step of the implementation process.

WHAT	HOW

5. Complete practice designs and job sheets.	• Verify the practices, as designed, with the appropriate practice standards in the FOTG, Section IV.
	• Design the practice design, using available agency automated design tools.
	  o National (e.g., hydrology, open channel hydraulics, and surveying)
	  o 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. Obtain and document required practice job approval authority.
	• If cultural resources or historic properties are present, consult with the NRCS cultural resource coordinator or specialist. Alternative designs or practices may be necessary.
	• If threatened or endangered (T&E) species are present, consult with the NRCS T&E specialist.

6. Review the designs, practice job sheets, practice specifications, and estimated costs with the client.	• Schedule an appointment with the client to review the designs. • Encourage the client to involve the contractor and anyone to be involved in managing the practice, in the review of designs and specifications. • Discuss the practice specifications and practice job sheets, in detail, with the client and the contractor. • Discuss permits, easements, and land rights, if needed. • Discuss roles of client, contractor, and NRCS staff during practice implementation. In most cases, clients will hire contractors that will work cooperatively with the client and NRCS staff. • Ensure the client is informed and directing the contractor's progress as needed.
7. Stake the treatment area as needed to define the location and extent of the practice or structure.	• Refer to discipline handbooks as listed in the reference section for procedures. • Involve the client, the contractor and all other appropriate parties in the practice layout. **Remember, however, that the land manager and contractor are not the clients. They are responsible to the client, not to NRCS!** • Make any needed adjustments in practice location, practice extent, and other specifications. • Consider the many safety issues that may be important in the design, layout and construction of conservation practices. See detailed guidance in the Title 210, National Engineering Manual, Part 503,

WHAT	HOW
	"Safety," and Title 210, National Engineering Handbook. • Inform the client of their responsibility to contact all applicable utilities in the project area, or a coordinated entity, such as 811, State One Call system, MISS UTILITY, DIG SAFE, etc., to check for any buried utilities and arrange for having identified utilities marked prior to construction.
8. Provide practice implementation inspections, as needed.	• Perform inspections throughout conservation practice construction or implementation. This activity may extend over 2 or 3 years on some management practices. • Take photographs of all underground components of practices prior to covering to document installation. • 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 they are constructing practices or dealing with management practices, such as prescribed grazing. • If, at any time during practice installation, it is determined that NRCS specifications, including safety standards, are not being followed, immediately notify the client orally and in writing as to what corrective action is needed. If corrective action is not taken, NRCS assistance will be withdrawn.
9. Conduct a final certification of the practice.	• Conduct the final inspection of the practice and record the installation data. Verify that each practice has been installed and meets standards and specifications, as designed. • Complete the needed measurements to determine the extent of the practices applied using approved methods that meet acceptable standards for accuracy. 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 450-GM, 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/certified amounts of all completed practices in the practice schedule, using agency approved planning software. • Document all certified practices on plan map with correct symbology. • If financial assistance is involved, forward certification result to appropriate staff.
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.

WHAT	HOW
the client.	• Explain that periodic inspections are needed to ensure that the structural practices are functioning properly and to identify any need for repair.
12. Schedule followup assistance.	• Review the planned sequence of practice implementation. • Schedule next practice to be implemented, if possible. • Agree on the implementation dates with the client and record them in the case file. • Revise plan, if necessary.
13. Document technical assistance notes.	• Record all significant activities in assistance notes. • Ensure that discussions with the clients and contractors are adequately documented to reflect agreements. • Include implementation, maintenance, and followup information in assistance notes.

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. Identify reasons for lack of progress in plan implementation, if applicable. Obtain information on the results of the applied treatment and where the actual results differ from those anticipated, and provide feedback into the planning process. This could include revision of planning criteria, 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 both the client's and NRCS's objectives. Onsite visits are a required part of this process.

(1) 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.
(2) The process of monitoring, evaluating, and experimenting in order to add to resource management information and modify decisions is known as adaptive management.
(3) 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 can enlist the help of the technical specialists and nonagency partners, as appropriate.

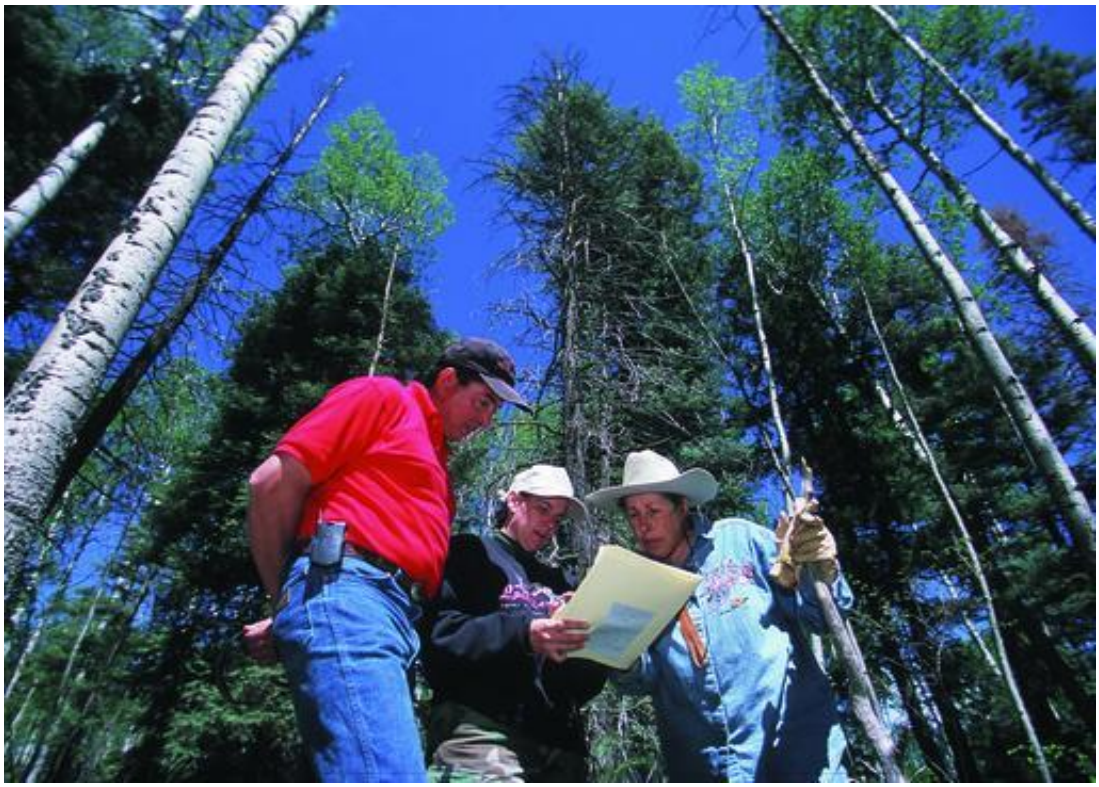

Figure 600-C12: Conservationists and client discussing a plan in the field.

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 resource concerns in a manner satisfactory to the client and beneficial to the resources. Resource effects that are different from those predicted are fed back into the FOTG development process (adaptive management).

D. Inputs

(1) The conservation plan
(2) Results of previous evaluations
(3) Onsite observation and data available from the client
(4) New or modified objectives or needs of the client
(5) Appropriate new technology
(6) FOTG, Sections I, II, III, IV, and V

E. Products

(1) Operations and maintenance (O&M) reports
(2) Outline of maintenance needs or other changes
(3) A decision to update or revise the plan, if needed
(4) Technical assistance notes, indicating the effectiveness of the plan
(5) Case studies, if appropriate, following the guidance provided in the FOTG, Section V
(6) Recommendations for changes in practice standards, specifications, or designs
(7) Recommendations for changes in FOTG materials
(8) A decision to revise or expand implementation strategies
(9) Updated conservation plan effects
(10) Updated CPPE and guidance documents

F. Step 9 – Evaluate the Plan Activities – Conservation Plan

WHAT	**HOW**
1. Meet with the client to evaluate the plan.	• Schedule an appointment with the client to evaluate the plan activities. • This may be initiated by NRCS, the conservation district, TSP, or the client, by means of personal contact, letter, Internet, electronically, email, or telephone call. • If a TSP or other third party service provider was involved in developing the plan or component plans, they will be asked to participate in the evaluation.
2. Prepare for followup and evaluation with the client.	• Review the conservation plan, planning and assistance notes, and the resource concerns for which the system was developed. • Review the client's objectives. • Review the resource data. • Discuss the plan with the last person to provide technical assistance, if possible. • Review the practice implementation information, including designs and construction notes. • Review the operation and maintenance plan. • Confirm the date scheduled with the client.
3. Review and evaluate the plan with the client.	• Observe the performance of each applied conservation practice in the field for structural practices and review component management plans for management practices. • Determine if the practices and management systems are solving the identified resource concerns and meeting ecological, economic, and social objectives. • Solicit feedback from the client concerning the effectiveness of applied practices and management systems. Discuss with the client routine operation and maintenance as well as needed maintenance of damaged or nonfunctioning practices. • Determine the type of technical assistance needed to restore a practice, if needed. • 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. • Revisit the plan and determine if the client is ready to progress to a higher level of planning.

WHAT	HOW
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, onsite and offsite. • 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. • Determine if the client's objectives have been met.
5. Evaluate the status of conservation district cooperator working arrangements.	• Inform the conservation district of the client's progress in carrying out planning and implementation consistent with district program objectives, NRCS program objectives, or both. • Keep the conservation district informed of any problems.
6. Determine the need for a plan revision, development of a new plan, or cancellation of the plan.	• Determine if the client no longer owns or operates the land included in the conservation plan. Make changes as necessary. • If the conservation plan needs revision, or a new plan is needed, repeat Step 1, "Identify Problems and Opportunities," through Step 7, "Make Decisions."
7. Revise the plan	• Revise the plan if necessary.
8. Update the assistance notes.	• Enter assistance notes to capture planner interactions with the client.
9. Conduct a case study, if appropriate.	• Follow the procedures in the FOTG, Section V. Utilize assistance from other agencies, etc., as appropriate.

Part 600 – National Planning Procedures Handbook

Subpart D – Plan Format and Content

600.30 Introduction

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

Figure 600-D1: Client and conservationist discuss a conservation plan.

B. Decisions and resource information needed during implementation and maintenance of the plan are recorded throughout the planning process. The plan narrative and supporting documents provide guidance for implementation and may serve as a basis for compliance and program funding through Federal, State, Tribal, Territorial, or local financial support initiatives. Assistance notes are recorded at each step in the planning process to document important points or discussions with the client.

C. The following guidance helps to maintain quality and provide appropriate documentation of a plan. Though this section outlines required items to be included in a plan, the plan content will be tailored to the client's needs.

600.31 Conservation Plan

A. The plan document provided to the client must be a quality document containing meaningful information for the client. The document may be provided to the client electronically or as hardcopy. It must include the following items:

(1) A folder, binder, or other means to assemble the contents of the plan (if hardcopy).
(2) A conservation plan map. This may consist of several map documents to account for the entire planning area.
(3) Soils maps and other resource maps, as needed, with appropriate interpretations, such as soil descriptions or land cover descriptions.
(4) At a minimum, each map will include the following:
  (i) Title block showing the following:
    - Title, "Plan Map"
    - Client's name (individual or business)
    - "Prepared with assistance from USDA – Natural Resources Conservation Service" and "ASSISTED BY [planners name]"
    - Name of the applicable conservation district, county, and State
    - Date prepared
  (ii) Scale of the map
  (iii) Information needed to locate the planning area, such as geographic coordinates, public land survey coordinates, etc.
  (iv) North arrow
  (v) Appropriate map symbols and a map symbol legend on the map or as an attachment
(5) The "Plan Map" will specifically include the following items:
  (i) Boundary lines for the PLUs with labels (name, number, or both)
  (ii) Land-use designation and applicable land use modifiers for each PLU
  (iii) Acreage for each PLU
(6) Location of planned and applied conservation practices, using NRCS map symbols (see Title 170, National Map Symbol Handbook, Part 601)
(7) If the conservation plan includes non-private lands, such as Federal or Tribal lands, a land status map must be included to display land ownership categories (Private, State Trust, BLM, Tribal, and Territorial, etc.)
(8) A record of the client's decisions, which includes the following:
  (i) PLU label (name, number, or both)
  (ii) NRCS practice name and code
  (iii) Amount or estimated amount to be applied (update amount when practice design is completed and when financial assistance is requested)
  (iv) Brief description of the practice (practice narrative)
  (v) Date the planned practice is scheduled to be implemented (update when financial assistance is requested)
  (vi) Certified amount of practice applied (after implementation)
  (vii) Date practice was certified (after implementation)
(9) Appropriate worksheets developed with the client. Worksheets include such things as forage inventories, erosion estimates, and cost estimates
(10) As needed, applicable "Conservation Practice Overview" sheets, specifications and implementation requirements (job sheets), and other prepared material
(11) Operation and maintenance agreements and procedures
(12) Practice designs, if completed at this time. Some designs may also be kept in the office file under the client's name when size limits duplication
(13) Conservation district cooperative agreement, where applicable
(14) Available maps, sketches, and designs resulting from the planning process that will be useful to the client in implementing the plan
(15) Information reflecting site-specific practice effects, based on onsite visits

B. Some component plans and resource concerns have specific plan requirements in addition to the items listed above. See subpart G, 600.60, for policy guidance to address these special plan requirements.

C. The NRCS case file contains the following, as applicable:

(1) Client information
(2) Client's objectives
(3) Conservation plan and record of decisions (practice schedule)
(4) Assistance notes
(5) Geospatial layers for PLU, practices, resource inventory, etc.
(6) Maps – conservation plan, soils, etc.
(7) Forms and worksheets used in developing and evaluating alternatives
(8) Conservation district information related to the plan
(9) Inventory and analysis information
(10) Practice design documentation and job sheets
(11) Engineering notes
(12) Operation and maintenance agreements and plans
(13) Documentation of applied practices
(14) Photographs, audio and video files
(15) Environmental documentation – CPA-52, "Environmental Evaluation Worksheet," and any other documents needed to meet the requirements of NEPA or other applicable environmental requirements, such as the Endangered Species Act.
(16) Financial contract documents
(17) Product documents resulting from the planning process
(18) Determinations (highly erodible land, wetland, etc.)
(19) Receipt for services
(20) Other appropriate supporting documents

600.32 Documentation of the Electronic Case File

A. NRCS will document and maintain conservation plan data using agency approved tools and the official planning database, National Planning and Agreements Database (NPAD). See Title 130, General Manual, Part 408, for mandatory electronic field office business tools.

B. The following terms are important to maintain electronic conservation plan data.

(1) Planning Land Unit (PLU).—A PLU is a unique geographical area defined by a polygon, which has a common land use and land use modifier and is owned, operated, or managed by the same client.
(2) Special Data.—Information about the location and shapes of geographical features, and the relationship between them; usually stored as coordinates and topography.
(3) Topology.—The special relationship between connecting or adjacent features in a geographic dat layer.
(4) Geographic database.—A collection of special data and its attributes, organized for efficient storage and retrieval.

C. To ensure data integrity and implement a national planning database that is current, accurate, and useful for modeling and reporting purposes:

(1) The PLUs for all active conservation planning will be spacially located (digitized and attributed) in the proper geographic data layer (active PLU layer) in the agency's official conservation planning database.

(2) Each PLU in the active PLU layer will be associated with a unique geospatial boundary (polygon).
(3) The following horizontal topology is required for PLUs in the active PLU layer:
(i) No overlapping of adjacent PLU boundaries (polygons)
(ii) No stacking of PLUs (polygons)

D. Conservation Practices

All planned conservation practices must be spacially located with its standard geometry (point, line, or polygon) in the proper geographic data layer (practice layer) in the agency's official conservation planning database.

Part 600 – National Planning Procedures Handbook

Subpart E – Support Guidance

600.40 Support Guidance for Conservation Effects

A. Purpose and Scope.—Planners must display and evaluate the effects of various conservation alternatives available to the client. The conservation effects process helps planners assist clients with their conservation decisions by—

(1) Providing a framework in which to organize and present information that facilitates comparison of the positive (gains) and negative (losses) effects of a conservation alternative.
(2) Permitting consideration of all ecological, economic, and social values pertinent to the evaluation.
(3) Encouraging the employment of analytical tools at appropriate levels of sophistication to provide information.
(4) 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.

C. The conservation effects process requires three categories of information, which include descriptions of—

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

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

E. Conservation Effects Concepts

(1) Benchmark.—Planning efforts 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, resource concerns, opportunities, and objectives. The assistance provided is based upon SWAPAE+H resources. 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.
   (i) For areawide conservation planning, points of reference other than 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.

(ii) The objectives of the client 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 must 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 concern onsite, 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 offsite.

(2) Alternatives.—Alternatives that meet both client and societal objectives need to be considered after the benchmark situation and expected future trends are noted.

(i) An alternative treats one or more resource concerns. It may be a single practice or a RMS. Proposed alternatives must be consistent with the FOTG, Sections II, 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 of the preferred alternative.

(ii) 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.

(iii) One of the most useful learning experiences for planners and clients is to visit land managers 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, inside and outside the agency, could also be easily enhanced. Such experiences will 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) Effects.—The proposed alternatives are compared with the benchmark condition to estimate the outcome of the actions. The effect of conservation alternatives is the difference between the benchmark and the proposed alternative. Quantification of the effects depends upon the degree of detail used to describe or measure the benchmark and expected alternative conditions. The effect will be described in narrative form, in qualitative terms, at a minimum, and in quantitative terms to the extent possible. It will 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 will all be documented to the extent that such information is needed by the client or is required by the agency. The timeframe when the effect 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 effect. Ten additional quail may be a positive effect 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 effects, 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 effect. The process is continued until the client has enough detail to make an informed decision. In most cases, the planner will estimate the costs and describe necessary maintenance for each of the alternatives. Often, a

limited amount of detailed information is sufficient. Occasionally, however, a more complex analysis is needed. This is where the concepts presented in this handbook may help.

F. 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 of conservation systems enhances the client's ability to implement effective conservation technologies.

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

(1) Types of Case Studies.—The three types of case studies are as follows:
   (i) A comparison of the "before and after treatment" conditions on a single site
   (ii) A comparison of two separate but comparable resources and land use situations (sites) on different farms or even on the same farm (e.g., one site with and one without treatment)
   (iii) A simple recording of client 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.

H. The Conservation Effects Assessment Project (CEAP) is a multiagency effort to quantify the environmental effects of conservation practices and programs and develop the science base for managing the agricultural landscape for environmental quality. Project findings will be used to guide USDA conservation policy and program development and help conservationists and clients make more informed conservation decisions.

600.41 Integrating NEPA into the Planning Process

A. NEPA requirements will be incorporated into all steps and activities of the planning process as applicable and will 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. EEs, which may lead to an EA or EIS, will be conducted for all NRCS planning activities and will be used to help determine the level of NEPA documentation required. Planners will 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. (Note that some programs such as the Watershed Program (PL-566) have specific planning procedures and plan content and format requirements. See the National Watershed Program Manual and Handbook).

B. Specific guidance related to general NRCS environmental compliance for NEPA, as well as all special environmental concerns (SECs) listed on the Form NRCS-CPA-52, "Environmental Evaluation Worksheet," can be found in section 600.71 and in Title 190, National Environmental Compliance Handbook (NECH), Part 610, in eDirectives.

(1) NRCS administers Federal assistance within the overall environmental policies outlined in 190-GM, Part 410, Subpart A, Section 410.3. It is important to note that NRCS policy is to consider environmental quality equal to economic, social, and other factors in decisionmaking. These policies were developed to comply with the requirements established by the CEQ, which requires Federal agencies to follow a systematic process when a Federal

action is proposed. CEQ regulations that implement NEPA also require that Federal agencies promulgate their own regulations that implement NEPA for their actions.

(2) NRCS regulations and policy implementing NEPA identify categories of activities that normally are categorically excluded, normally require an EA, and normally require an EIS. (See NRCS implementing regulations for NEPA in 7 CFR Part 650 and NRCS environmental compliance policy in 190-GM, Part 410.)

(3) Refer to the NRCS NEPA compliance flowchart in the National Environmental Compliance Handbook (190-NECH, Part 610, Subpart H, Section 610.100).

C. Applicability of the Environmental Evaluation in the Conservation Planning Process.—NRCS is required to conduct an EE for all planning and financial assistance, including, but not limited to the following:

(1) Development of individual conservation plans (including component plans, such as nutrient management plans and CNMPs)
(2) Areawide and watershed planning
(3) Financial assistance in the form of grants (e.g., Conservation Innovation Grants (CIGs))
(4) Conservation planning activities contracted to entities outside of NRCS (e.g., technical service providers (TSPs)).
(5) All NRCS conservation programs, including financial assistance
(6) Other State, Tribal, Territorial, or local programs that require NRCS approval (e.g., State cost-share program requiring NRCS approval of conservation practice completion)
(7) The establishment of new structures associated with Snowpack Telemetry (SNOTEL) sites, plant material facilities, etc.
(8) Propagation and release of plant materials
(9) Emergency Watershed Program (EWP) damage survey reports (DSRs) (using the DSR form in the EWP Manual)
(10) NRCS-assisted programs through outside agencies (e.g., FSA for CRP, BCAP, etc.)
(11) Infrastructure projects on NRCS easements (e.g., pipelines crossing easements)

D. The EE is used to determine the need for an EA or an EIS. The results of the EE are documented on the NRCS-CPA-52, "Environmental Evaluation Worksheet." Among other things, the NRCS-CPA-52 is used to document the appropriate use of a categorical exclusion and existing environmental analysis. The form, instructions and the worksheet can be found on the NRCS National Environmental Compliance Web site. A copy of the blank form is in section 600.71 Exception: An EE is not required when making Food Security Act highly erodible land (HEL) determinations or wetland determinations.

E. As a result of the EE process, the conclusions ("findings") that may be reached include any of the following:

(1) There is no Federal action, as defined by NEPA, subject to NRCS Federal regulations occurring that requires a NEPA document (see 190-NECH, Subpart D, Section 610.43, "The National Environmental Policy Act").
(2) The action is a Federal action that is categorically excluded with no extraordinary circumstances present so no further documentation is needed (see 190-NECH, Subpart D, Section 610.46, "The National Environmental Policy Act").
(3) There is an existing NRCS State, Tribal , Territorial, regional, or national programmatic NEPA document that has sufficiently analyzed the particular Federal action and there are no predicted significant adverse effects or extraordinary circumstances (see 190-NECH, Subpart F, Section 610.81, "NEPA Tools for Efficiency").

(4) Another Federal agency's NEPA document (EA or EIS) has been formally adopted by NRCS that sufficiently analyzes the specific action (see 190-NECH, Subpart F, Section 610.83, "NEPA Tools for Efficiency").
(5) The proposed action is a Federal action that has not been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.

600.42 Working With Individuals and Groups

A. 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 role to identify behavioral characteristics but the individual makes the change.

B. Working With Individuals.—There are myriad factors within the human and physical environment that can shape individuals' decisions relative to the adoption of conservation practices and systems. Personal values, as well as client needs and concerns, are shaped and reshaped by factors, such as community characteristics (agribusiness support), agency and organizational assistance (training), regulation, and changing climate conditions. In dialoguing with the client throughout the nine-step planning process, the planner must stay abreast of changing needs and conditions that influence the conservation decision process.

(1) 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, partners, or the conservation district affect behavior.
(2) 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 plans. 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 conservation plan by considering questions, such as the following:
   (i) Is there sufficient ecological, economic, and social information available for the client to make sound decisions, such as alternative systems, effects, impacts, and risks?
   (ii) Is the system too complex for the client to install and operate?
   (iii) Are adequate resources available, such as land and labor?
   (iv) Is the planning and evaluation horizon of the client long enough to realize the benefits of the system?
   (v) Is there a supporting network of agribusiness, agencies, or citizen groups to help the client install and manage the system?
   (vi) Does the system require increased management skill to install, operate, and maintain, and if so, is training available to help bridge the gap?
   (vii) Does NRCS information conflict with other agency or private sector information?
   (viii) Is the system compatible with existing production goals and enterprises?
   (ix) Are there any incentives or barriers to changing production methods?
   (x) Are there USDA or other programs that influence the client?
   (xi) Can the system be implemented on a small scale? On a large scale?
   (xii) Are the effects visible?
   (xiii) Have the risk and uncertainty in the analysis of the system been presented to the client?

C. Working with Groups.—Building alliances and partnerships is another important component of successful voluntary conservation programs. This approach is based on encouraging local land managers 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, Tribal, Territorial, 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.

(1) Coordinated Resource Management (CRM) 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.
(2) 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.
(3) 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.
(4) The CRM process is well suited to developing areawide conservation plans. For more information on this process, see the Coordinated Resource Management Guidelines published by the Society for Range Management.
(5) Developing a desired future condition held by a broad range of land managers, stakeholders, and agencies is essential for this approach to succeed. An interdisciplinary planning approach, where specialists and groups having different technical expertise act as a team to jointly evaluate existing and future environmental quality, can be very effective in bringing people with different interests together. In addition, the local team must identify critical success indicator or planning 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.

D. Historically Underserved Customers.—In working with both individuals and groups, planners must be proactive in identifying historically underserved customers, such as minority, small producers with limited resources, beginning farmers and ranchers, and Tribes. They will ensure that program benefits offered to them are on an equal basis with traditional customers. Also, planners must be aware that barriers may exist that prohibit or discourage 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.

(1) Examples of Barriers
  (i) Limited Resources
  (ii) Educational Background or Training
  (iii) Lack of Equipment, Labor, or Capital
  (iv) Language
  (v) Culture
  (vi) Farm Size
  (vii) Lack of Access to Information
  (viii) Limited Cash Flow
  (ix) Discrimination
  (x) Alternatives not culturally relevant

(2) Examples of Actions to Overcome Barriers
  (i) Educational meetings
  (ii) Door-to-door contact
  (iii) Videos
  (iv) Focus group meetings
  (v) Printing publications in the local language
  (vi) Working with community leaders and Tribal elders
  (vii) Conducting local demonstration projects
  (viii) Learning about the client's culture
  (ix) Increased cost-share level
  (x) Matching conservation alternatives with client's needs and capabilities
  (xi) Allowing in-kind labor or equipment for the client's contribution
(3) These barriers and actions are not all-inclusive. They are meant to stimulate thought and action for identifying and effectively working with underserved customers.

E. Risk Management.—Clients make conservation and production decisions in an environment dominated by risk and uncertainty. Risks arise from weather variability, price fluctuations in both inputs and outputs, changes in government programs, regulations, 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.

(1) The overriding problem in risk management is the lack of relevant, accurate information about probable outcomes. Clients react to the risk problem by using decision rules that mitigate risk (e.g., select the strategy with the best of the worst outcomes, 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).
(2) 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.
(3) 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.
(4) 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 onsite and offsite ecological, economic, and social effects.

F. 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 land managers 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.

G. 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.

(1) In a formal sense, ethics is the science of moral duty that 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.
(2) 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.
(3) 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.
(4) 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)

600.43 Training Courses and Self-Development Opportunities

A. Conservation planning related training courses: Refer to the National Employee Development Center (NEDC) Web page for a NEDC course listing.

(1) C: Classroom
(2) S: Self-paced
(3) W: Web-based
(4) W(AC): Webinar

NRCS National Courses	**Type**	**Contact**
Introduction to NRCS (S,W)	NEDC	NEDS
Conservation Planning: Part I Modules 1-5(W)	NEDC	NEDS
Areawide Conservation Planning (C)	NEDC	NEDS
Economics of Conservation Planning (C)	NEDC	NEDS

Introduction to Ecological Principles: A Basic Ecology Course (S)	NEDC	NEDS
Introduction to Conservation Planning on Cropland (W,S)	NEDC	NEDS
Introduction to Water Quality (S)	NEDC	NEDS
Nutrient and Pest Management Considerations in Conservation Planning (W)	NEDC	NEDS
Environmental Compliance for Conservation Assistance (W)	NEDC	NEDS
Working Effectively with American Indians (C)	NEDC	NEDS
Working Effectively with Alaska Natives (C)	NEDC	NEDS

NRCS Regional and State Courses	**Type**	**Contact**
Conservation Planning Part II Modules 6-8 (C)	State	State
Conservation Planning Part III	Local	Local

B. 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.

C. Training Resources

(1) Aglearn
(2) S&T Training Library

Part 600 – National Planning Procedures Handbook (NPPH)

Subpart F – Areawide Conservation Planning

600.50 Areawide Conservation Planning

A. This handbook describes the planning process in detail and provides guidance on carrying out each planning step. The process itself is preceded by preplanning activities, which can play a critical role in the outcome and effectiveness of plan development.

B. What is an Areawide Conservation Plan?

(1) Areawide conservation plans are voluntary, comprehensive plans for watersheds or other broad-based geographical areas. Areawide conservation plan development considers all natural resources in the planning area as well as relevant social and economic considerations. Plan development follows the established nine-step 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 achieve those goals, develop proposals and recommendations, implement solutions, and measure their success. The 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.

(2) 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. Where an areawide conservation planning effort is underway without authorized decisionmakers available, the product through planning step six is an areawide conservation assessment.

C. Who Develops an Areawide Conservation Plan?

NRCS may serve as the planner for areawide conservation plans or assessments, or may only provide technical assistance. Technical assistance may include resource information or analysis from discipline specialist. Areawide conservation plans may be developed with informal or formal groups. These groups may 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 decisionmaker if they have the authority to make decisions and implement the plan. The decisionmaker 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.

D. Preplanning Activities and Considerations

(1) Preplanning activities set the stage for conservation planning with the decisionmakers by ensuring that basic information is obtained and that background information, necessary to initiate the planning process, is assembled.

(2) The activities leading up to planning normally begin in one of three ways: Stakeholders from the potential planning area may contact the conservation district or NRCS to seek assistance in solving identified natural resource concerns or opportunities; NRCS, conservation district, or partner personnel may contact decisionmakers in potential planning area for the purpose of initiating planning activities; or proactive citizens may contact partners, the conservation district, or NRCS for planning assistance to prevent potential problems from occurring or to take advantage of opportunities.

(3) Preplanning activities are important to set the stage for areawide planning. Several items should be addressed before planning steps are undertaken.

(i) Identify the decision makers and stakeholders who will participate in the planning process and their respective roles.

(ii) Establish an interdisciplinary team as appropriate to assist with preplanning activities. Obtain assistance from key individuals in the planning area to identify stakeholders within each underserved user group; limited resource, beginning, and socially disadvantaged and veteran land users and residents.

(iii) Invite all interested or effected agencies, organizations, and interest groups to participate. Broad involvement is the cornerstone to successful areawide planning. Their input is vital to the process. Leaving any of them out may cause problems later in the planning process.

(iv) Assess the statutory and policy requirements that are required or may affect the planning process.

(v) Assess the available resources, tools, and data sources that are available to assist in the planning process.

(vi) Describe in general terms the planning process and the expected benefits of having a conservation plan to the stakeholders.

(vii) Explain to the decisionmakers the roles and responsibilities of the decisionmakers and stakeholders and NRCS.

(viii) Explain the role of the conservation district and the relationship the district program has in making technical assistance available to land users.

(ix) Define the planning area on a map and geospatial layers.

(x) Assemble all needed information and data for use in planning. The FOTG is a principal source of reference material pertinent to the field office.

(xi) Identify other sources of information or technical assistance that may be available from other agencies, organizations, etc.

E. People, Partnerships, and Communities

(1) Strengthening Public Involvement

Complex natural resource issues and concerns are inevitable in any community. A variety of State and Federal programs are designed to respond to natural resource needs within the parameters of limited budgets and changing political support. NRCS was founded on the principle of having local landowners identify their goals, assist in developing conservation alternatives, and make decisions to meet their goals. Today, the agency, through locally led conservation and other processes, continues to utilize public involvement as a way to effectively help people conserve soil, water, and other resources.

Figure 600-F1

Areawide planning engages participants from the public, private, and nonprofit sectors. The commitment of stakeholders should be obtained before the planning process begins.

The participants in areawide planning are important also for the resources they bring to the table. People who have expertise in conservation science, landscape architecture, and related areas; political power and connections; or financial resources or an understanding of how to tap needed resources may be particularly helpful in moving an areawide planning process forward.

Possible decisionmakers…

Possible stakeholders in areawide planning include—

- *Elected officials of the State, regional, and local governments*
- *Planners, managers, and other employees of the State, regional, and local governments*
- *Conservation and water resource districts*
- *Indian Tribes*
- *Research scientists, including conservation biologists, landscape architects, etc.*
- *Nonprofit conservation organizations*
- *State or Federal natural resources or other related agencies*
- *Professors and graduate students in related departments of local universities (e.g., landscape architecture, regional planning, wildlife ecology, landscape ecology, etc.)*
- *Representatives of large and small landowner interests*
- *Industry representatives*
- *Real estate developers*
- *Citizens*

(2) Working With Community Leaders

(i) Identifying and working with community leaders can be extremely beneficial when promoting conservation through locally led and watershed planning activities. It is even more crucial when working with underserved communities that have not previously worked with NRCS. The advantage of working with a community leader is that you will be working with someone who has already earned the community's trust. Gaining the community's trust will be a major hurdle for you to overcome. In some instances, it can take a period of months, if not years, for you to earn a community's trust. Identifying the right person or leader to work with you can help decrease the length of time it takes to accomplish your goals. If you do not work closely with a community leader, he or she can easily hamper your efforts.

(ii) Leaders tend to stand out from other community members. Remember, the public is only marginally involved in most issues. Only about 5 percent of community members are directly involved in decisionmaking, and not all of these people are community leaders. Research suggests that leaders might possess some, but certainly not all, of the following characteristics: good at giving instructions, empathetic, talkative, persistent, self-confident, popular, and original or creative.

(3) Developing and Maintaining a Network

A network is a system of relationships in which people exchange information and resources to achieve common goals or serve common interests. Networks are easy to join or leave and tend to be informal. However, networking can also take place through planned meetings. These meetings may or may not occur regularly and may or may not pursue joint initiatives. Networking is a process for expanding resources while maintaining your organizational autonomy. For most, the motivating factor for being in a network is the access to valuable

information and the expertise of others in the group. With more people involved, creativity and options increase. Networks can also provide a strong support system.

(4) Understanding Community Power Structures

Power in a community is the ability to affect the decisionmaking process and the use of resources, both public and private, within a community or watershed group. Power is simply the capacity to bring about change. It is the energy that gets things done. All levels of the conservation partnership need to know about community power structures in order to more effectively implement and maintain locally led conservation initiatives. A community can be defined as a watershed, region, town, county, or other geographic or geopolitical boundary. Examining the concept of power involves looking at the sources and structures that influence local communities and exploring the relationships that shape cooperative efforts. The conservationist who has a basic understanding of social power and who can identify the power actors in a community can enhance the opportunity for success in conservation.

(5) Working With People of Different Cultures

(i) NRCS offices across the continental United States, Alaska, Hawaii, and many U.S. territories constantly work with people of different cultures. While much of working successfully with people of different cultures is best learned on the job, there are some concepts and methods that have been shown to ease cross-cultural communications. Using such proven concepts and methods to work with people of other cultures will improve NRCS service delivery and build better relations with our expanding customer base.

(ii) American society is changing rapidly. We are witnessing a growing number of different ethnic and racial groups in America. This increase affects agriculture and NRCS in two primary ways:

- There is an increase in the number of producers who belong to different cultural groups.
- The NRCS workforce is growing more culturally diverse.

(6) Using a Multidisciplinary Approach to Conduct a Situational Analysis

(i) As a conservation planner, do you have a clear and detailed understanding of the social and natural resource processes operating in a geographic area or with a particular group of producers? If not, you may want to conduct a situational analysis. By conducting a situational analysis, conservation planners can discover needs and problems facing stakeholders. Determining the myriad of factors facing stakeholders allows you to customize the conservation planning process. This fact sheet will help you assess the internal and external factors that influence conservation activities, while meeting the goals of the producers and the community. (ii) Additional Information regarding working with people, partnerships, and communities is contained in exhibit 11.

F. National Environmental Policy Act (NEPA)

(1) NEPA is a law that became effective on January 1, 1970. NEPA was written to ensure that Federal decisionmakers take into account the environmental effects of their proposed actions and consider ways to avoid, minimize, or mitigate adverse effects before implementing the action. This is also the purpose of the NRCS environmental evaluation process.

(2) USDA regulation 7 CFR Subtitle A, Part 1b, sets forth departmental policy related to NEPA. The regulation states that—

(i) All policies and programs of the various USDA agencies must be planned, developed, and implemented so as to achieve the goals and to follow the procedures declared by NEPA in order to assure responsible stewardship of the environment for present and future generations.

(ii) Each USDA agency is responsible for compliance with this part, the regulations of Council on Environmental Quality (CEQ), and NEPA. Compliance will include the preparation and implementation of specific procedures and processes relating to the programs and activities of the individual agency, as necessary.

Figure 600-F2

NRCS Compliance with NEPA (i) All planning activities will be conducted in compliance with NEPA. See 180-NPPH, Part 600, Subpart D, Section 600.41, for more information on NEPA. This NPPH section provides additional planning guidance to assist planners in incorporating NEPA and other requirements into the planning process. NRCS policy for compliance with NEPA is located in the Title 190, General Manual, Part 410, "Compliance with NEPA."

(ii) 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, 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.

(iii) 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.

(iv) 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's programmatic NEPA documents may also contain additional NEPA compliance guidance for specific programs.

(v) The agency's specific responsibilities under NEPA and related laws (like the National Historic Preservation Act (NHPA) and the Endangered Species Act) vary depending upon the level of agency involvement and control. The agency's NEPA policy is designed to help planners meet the requirements of federal law and regulations and must be incorporated throughout the planning process, and likely revisited frequently, particularly as agency actions are defined and redefined.

G. Farmland Protection Policy Act (FPPA)

(1) Pursuant to the Farmland Protection Policy Act, the Secretary of Agriculture, in cooperation with other Federal agencies, is required to—
   (i) Use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland.
   (ii) Consider alternative actions, as appropriate, that could lessen adverse effects.
   (iii) Ensure that programs, to the extent practicable, are compatible with State, local governmental, and private programs and policies to protect farmland.

(2) The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It ensures that, to the extent possible, Federal programs are administered to be compatible with State, local governmental, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every 2 years.

(3) The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

(4) For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest, pasture, crop, or associated ag land.

Figure 600-F3

Farmland Conversion Impact Rating Form

NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

The assessment is completed on Form AD-1006. The sponsoring agency completes the site assessment portion of the AD-1006, which assesses non-soil-related criteria such as the potential for impact on the local agricultural economy if the land is converted to nonfarm use and compatibility with existing agricultural use.

H. Land Evaluation Site Assessment

(1) The land evaluation and site assessment (LESA) system helps State and local officials make sound decisions about land use. Combined with forest measures and rangeland parameters, LESA can provide a technical framework to numerically rank land parcels based on local resource evaluation and site considerations.

(2) Land Evaluation

(i) In agricultural land evaluation, soils are rated and placed into groups ranging from the best to the least suited for a specific agricultural use, such as cropland, forestland, or rangeland. Then, a relative value is determined for each group. For example, the best group may be assigned a value of 100, while all other groups are assigned lower values. The land evaluation is based on data from the National Cooperative Soil Survey, often called the largest and most valuable natural resource database in the world.

(ii) LESA activities, such as measuring land and productivity, assist landowners and others prior to making land use conversions to nonagricultural uses.

(3) Site Assessment

(i) Site assessment involves three major areas:

- Non-soil factors related to agricultural use of a site
- Factors related to development pressures
- Other public values of a site

(ii) Each factor selected is assigned a range of possible values according to local needs and objectives. This process provides a rational, consistent, sound basis for making land use decisions.

(4) Local Committee or Work Group

In most cases, one or more committees or work groups should be organized to assist and guide the development of a LESA system. In areas where an agricultural land protection committee already exists, no new committee should be needed.

Figure 600-F4

Land Evaluation and Site Assessment System Design

When LESA is applied, a value for land evaluation is combined with a value for site assessment to determine the total value of a specific site for agriculture. The higher the total value of a site, the higher the capabilities of that site for agricultural use.

The LESA system can help units of government meet the following two overall objectives:

- *Facilitate identification and protection of important agricultural land*
- *Assist in implementing farmland protection policies*

LESA systems should be designed for consistent use in all applications. LESA provides a framework where land evaluation and site assessment procedures are documented before individual sites are considered. This process allows different individuals to evaluate sites consistently, without bias.

LESA systems are based on existing knowledge, but should be flexible enough to accommodate differences within States, counties, or areas. A LESA system may be developed at various levels of government—State, county, or township—or for an area such as a USDA-designated major land resource area (MLRA). LESA utilizes soil survey information and interpretations that are widely available throughout the United States, and planning concepts and principles that are regularly used by community planners.

LESA systems do not take away the power of local or State officials to make land use decisions, but help them make rational, consistent, and sound land use decisions. To do this, LESA systems include local values and objectives identified by a local work group or committee that helps develop the system. For this reason, a LESA system should be developed at the governmental level where it will be used—State, county, township, or town.

Finally, LESA systems need to be dependable. Planners and others need a reliable system to evaluate land and to determine under what conditions agricultural land should or should not be converted to nonagricultural uses. Soil survey information provides technically sound data for the land evaluation part of LESA. Thorough documentation of the site assessment part of LESA provides reliable information. Involving a local work group in the development phase also lends credibility to the system.

Additional Information regarding working with LESA is contained in exhibit 11.
A full description design and use of LESA systems may be found in the Land Evaluation Site Assessment Guidebook

I. Areawide Conservation Planning Steps

(1) The planning process for areawide conservation plans is the same as for individual conservation plans except for scope and scale that would add to both human and natural resource complexities. The process consists of nine steps, divided into three phases, which cover development, implementation, and evaluation. The planning process is not linear, but

dynamic and iterative, and previously completed steps may be revisited and refined as more information is gathered and the process proceeds. Complete and proper documentation is critical at each step of the planning process.

(2) The next portion of subpart F describes the details for carrying out the nine steps of areawide planning. 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.

(3) Below is a detailed description of what items occur during each planning step along with recommendations on how to accomplish the items.

600.51 Phase I – Collection and Analysis

A. Step 1 – Identify Problems and Opportunities.—Identify existing resource problems and concerns and potential opportunities in the planning area.

(1) Description

Identify existing, potential, and perceived natural resource problems, opportunities, and concerns in the planning area. This also provides the first opportunity to determine associated resource concerns and opportunities in interrelated planning areas. The identified problems and opportunities and the decisionmaker and stakeholder objectives guide the remainder of the planning process and are the basis for the purpose and need for action that are documented on Form CPA-52, "Environmental Evaluation Worksheet." Initially, the decisionmakers, stakeholders, and planner may identify a limited number resource concerns. As planning progresses and additional information is gathered, other resource concerns and opportunities may be identified. Additionally the CPA-52 provides documentation that may be required in the development of NEPA documentation.

(2) General

Problem identification frequently begins the planning process and continues through the resource inventory and data analysis steps. Initial problems and opportunities are identified onsite based on readily available information and discussion with the decisionmakers and stakeholders. The planner may have additional information available relating to natural resource needs based on information available from the conservation district or other areawide conservation plans. Generally, this step will not be finalized until the resource data are analyzed in Step 4, "Analyze Resource Data," although additional problems, opportunities, and concerns may be identified throughout the entire planning process. Some conservation alternatives may create additional indirect resource related issues and concerns that will need to be addressed by the planner and decisionmakers and stakeholder.

(3) Planning Standard

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

(4) Inputs

(i) Decision maker and stakeholder input
(ii) The planner's experience and knowledge of the area
(iii) Common resource area information
(iv) Conservation district long-range plan, annual plan, and priorities
(v) Locally led assessments
(vi) Other areawide conservation plans, or comprehensive plans where they exist

(vii) Information available from other sources, such as State and Federal agencies, universities, or centers of research
(viii) Soil survey
(ix) Discipline manuals and handbooks
(x) FOTG, Sections I, II, III, and V

(5) Products
(i) Identification and documentation of problems, opportunities, and concerns in the case file assistance notes
(ii) Communication with the decisionmakers
(iii) Mapping format, scale, precision, and role of technology
(iv) Base map with planning boundary
(v) Preliminary identification of SWAPAE+H resource problems and opportunities documented on base maps and short reports

Figure 600-F5

What	How	Resources and Tools
Identify the planning area and stakeholders.	• Identify the decisionmakers and stakeholders associated with the planning area.	• NRCS past clients, conservation and water resource districts, other Federal, State, Tribal, and local government agencies
Complete an initial assessment of the planning area's problems, opportunities related to natural resources and human considerations.	• Gather initial information about the area's problems, and opportunities • Gather data on planning area existing conditions • Identify resource concerns • Identify stakeholders that may contribute to planning effort	• Interviews with decisionmakers, meetings with stakeholders • Existing plans that include the planning area and any previous NRCS assessments and conservation plans
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.	• Meetings with decisionmaker, meetings with stakeholders • Planner's knowledge of available technical specialist in the area
Complete an initial reconnaissance of the planning area.	• Conduct a field investigation of the planning area with the stakeholders. This should be done by the interdisciplinary team. Representatives of other agencies should be encouraged to participate.	• Interdisciplinary team's knowledge of planning area • Initial assessment of planning area problems and opportunities
Record identified problems, opportunities, and concerns.	• Develop a database of the decisionmakers and stakeholder's problems, opportunities, and concerns	• Nominal group process or other facilitated group process

	associated with all natural resources. • Record and organize natural resource problems and opportunities into clear concise statements, resource concern worksheets. • Document EE data per State, Tribal, Territorial, and • Federal guidance (see section 600.71). • Document stakeholder and decisionmaker meetings in assistance notes.	
Garner stakeholder support the process involved in conducting an inventory and evaluation of the resources.	• Describe to stakeholders the steps of the conservation planning process. • Gain consensus on moving forward with the planning process.	NRCS Social Sciences Team information and training

B. Step 2 – Determine Objectives.—Identify and document the project objectives.

(1) Description

Determining decisionmaker's and stakeholder's planning objectives requires developing an understanding with the decisionmakers and stakeholder of the desired future conditions for the planning area as compared to the existing conditions. This is the purpose for the decisionmakers and stakeholders to take action. It includes the desired resource uses, resource problem reductions, onsite and offsite ecological protection, and production concerns. As resources are inventoried, their interactions are analyzed, and alternatives formulated, objectives may need to be reviewed and modified.

- There may be times when withdrawal of technical assistance becomes necessary.
- Technical assistance may be withdrawn when decisionmaker's and stakeholder's objectives will result in a negative effect on natural resources, onsite or offsite.
- Technical assistance may also be withdrawn if a decisionmakers and stakeholder fails to comply with or will not agree to actions required to be taken by NRCS to comply with local, State, Tribal, Territorial, or Federal regulatory requirements.
- For additional information about withdrawing assistance, see Title 440, Conservation Programs Manual (CPM), Part 525, Subpart A, Section 525.4.

(2) General

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

- Help the stakeholders think more broadly about the onsite and offsite problems and opportunities for natural resource protection or enhancement and to consider policy issues, such as State, Tribal, Territorial, and Federal laws or mandates
- Assist the decisionmakers and stakeholder 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 later in the planning process.
- Review the pertinent local, State, and regional program and legal requirements that could have an impact on current or potential activities of the decisionmakers. The

purpose is to be more proactive in providing relevant information for the decisionmakers to make decisions. Begin to consider the decisionmakers' 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).

(3) Planning Standard

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

(4) Inputs

(i) Knowledgeable residents, for an areawide conservation planning situation
(ii) Stated objectives, and resource problems and opportunities identified
(iii) Aerial photography, soils maps, and other data collected during Step 1
(iv) Inventory tools and procedures (see 180-NPPH, Part 600, Subpart C, Section 600.20C)
(v) State and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(vi) Previous resource inventories completed by NRCS or others
(vii) Field observations and measurements
(viii) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

(5) Products

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

(ii) Assistance notes Figure 600-F6

What	How	Resources and Tools
1. Reach consensus on the decisionmakers and stakeholder expectations for the planning effort.	• Identify the decisionmakers and stakeholder desired future conditions for the planning area as compared to existing conditions. • Identify project financial constraints and possible sources of funding.	Decisionmaker and stakeholder meetings
2. Document the decisionmaker and stakeholder objectives.	• Record and document the decisionmaker and stakeholder objectives in terms of the above expectations. • Document decisionmaker and stakeholder meetings in assistance notes. • Continue to document the decisionmaker and stakeholder objectives as they are better defined and understood, by the planner, decisionmakers, and stakeholders throughout the planning process.	Nominal group process or other facilitated group process

3. Determine whether the decisionmaker and stakeholder objectives are consistent with those of the conservation district and NRCS.	• Utilize the NRCS strategic plan, Chief's priorities, State resource assessment (SRA), district long-range plan, local work group priorities, and other local and State assessments to determine NRCS resource priorities. • Explain NRCS priorities and targets to the stakeholders, so that it is understood why NRCS may need to withdraw assistance if the decisionmakers and stakeholder objectives result in a negative effect for other onsite or offsite resources. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71.	NRCS strategic plan Existing NRCS priorities State, Tribal, and Federal guidance
4. Determine if NRCS has appropriate technology or resources.	• Assess the technology and resources needed for this planning effort and their availability from NRCS. • Identify appropriate agencies, groups, or other entities to participate as a partner in the planning process, when NRCS does not possess the appropriate technology or resources.	NRCS staff Other Federal, State and local staff
5. Determine the need to continue the planning process.	• Review the stated objectives and available resources with the stakeholders to determine if the NRCS planning process will continue, if other organization will assume lead for project, or if project will be discontinued. •	Decisionmaker and stakeholder meetings
6. Determine the next steps and a schedule to complete the planning process.	• Determine what information and tool resources will be needed to start resource inventory process. • Discuss with the stakeholders the tasks that need to be accomplished and the proposed timelines for completing the planning process.	Decisionmaker and stakeholder meetings

C. Step 3 – Inventory Resources.—Inventory and document the natural resources and their current onsite and offsite conditions and effects, as well as the economic and social considerations related to the resources.

(1) Description

Collect appropriate natural resource, economic, and social information about the planning area and related areas. Use this information to—

- Identify existing or potential resource concerns or opportunities.
- Further define known existing and potential resource concerns and opportunities.
- Clarify resource concerns.
- Formulate and evaluate alternatives.
- Gather pertinent information concerning the affected resources, the human considerations, and operation and management.

(2) General

Identify of SWAPAE+H resources and special environmental concerns (SECs) that are present and are the basis of all planning efforts. This information furthers the understanding of the presence of the natural resources in the planning area. Planners will inventory all applicable resources (see section 600.75). The inventory will provide the planner the understanding of the existing natural resource conditions necessary to convey resource conditions to the stakeholders in a knowledgeable manner.

(3) Planning Standard

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

(4) Inputs
(i) Knowledgeable stakeholders, for an areawide conservation planning situation
(ii) Stated objectives, and resource problems and opportunities identified
(iii) Aerial photography
(iv) Inventory tools and procedures (see 180-NPPH, Part 600, Subpart C, Section 600.20 C)
(v) State and Federal reports and evaluations (e.g., soil surveys, highly erodible land determinations, and census data).
(vi) Previous resource inventories completed by NRCS or others
(vii) Field observations and measurements
(viii) FOTG resource references, soils information, planning criteria, and practice standards, sections I, II, III, and IV

(5) Products
(i) Detailed resource inventories of the planning unit, as well as related offsite information completed through self-assessment screening tools or workbook online programs
(ii) Information on human considerations
(iii) Identification of other ecological concerns, such as threatened and endangered species
(iv) Identification of cultural resources
(v) Identification of visual resources
(vi) Land units, locations, determinations, and decisionmakers and land relationships described
(vii) Identification of infrastructure physical features such as roads, houses, fences, power lines and other utilities
(viii) Identification of how the decisionmakers manage resources, including kinds, amounts, and timing of management activities
(ix) Benchmark data for the planning area
(x) Assistance notes for technical services provided to the decisionmakers

Figure 600-F7

What	How	Resources and Tools
1. Establish the types of inventories and degree of detail needed in the inventory.	• Review the objectives developed in planning Step 2, "Determine Objectives," as they relate to land uses, production goals, problems, opportunities, and other concerns. • Select the appropriate inventories for each proposed land use, using the appropriate discipline handbooks for detailed guidance. • Tailor the level of inventory detail to the complexity of the resource setting and the identified problems, opportunities, and objectives.	Discipline specialist and literature reviews.
2. Collect available information.	• Establish a list of potential resource concerns and opportunities by reviewing existing plans for the area. • Identify factors that could hinder plan development and implementation, such as the project's financial constraints, managerial skill levels, or commitment. • Develop a list of State, Tribal, Territorial, and Federal mandates that currently affect or could affect existing operations.	• Soil Survey and other geographic information • Conservation district long-range plans • Previous areawide plans • Existing watershed plans • FOTG, Sections I and III • State and local existing regional or other land use plans

		• Resources and expertise of others
3. Maintain good communications between the stakeholders and the planner through the resource inventory process.	• Discuss the purpose and importance of the inventory process with the stakeholders. • Emphasize to the stakeholders the importance of their knowledge of the planning area and associated resources. Emphasize that their input is essential. • Explain what will be done during the inventory process and why. • Estimate how much time is required to carry out the field inventories. • Always obtain permission from landowners before conducting onsite visits.	Meetings with stakeholders
4. Conduct the inventory onsite. Include the stakeholders in the field inventory activities.	• Familiarize yourself with the resource inventory methods described in Figure 600-C6, "Inventory Methods." • Follow inventory procedures as described in appropriate discipline handbooks and manuals. • 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 (e.g., resources; types, amounts, and timing of operations and activities) and document. • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Determine the effectiveness of existing management measures and practices in addressing resource concerns.	
5. Use natural resources as teaching aids while in the field with the stakeholders.	• Encourage the stakeholders to experience "hands-on" participation in the inventory process by helping with data collection. This provides an opportunity for the stakeholders to learn conservation principles. • Encourage the stakeholders 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, "Analyze Resource Data."	• Identify planning land units. • Review, and update as necessary, planning land units with key information, including current land use. • Update information on the relationships of the stakeholders on planning land units determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Record utilities, easements, legal constraints, and determinations. • Review soils information for each planning land unit. • Record benchmark data • Document discussion between planner and stakeholders in assistance notes.	

D. Step 4 – Analyze Resource Data.—Analyze the resource information gathered in Step 3, "Inventory Resources," to clearly define the existing natural resource conditions, along with economic and social issues related to the resources. Information from this step will help to further define and clarify problems, concerns, and opportunities.

(1) 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.

(2) General

(i) 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 decisionmakers. The format in which information is presented to the decisionmakers has a significant influence on the decisionmaking process.

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

(iii) 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 partner long-range plan, if it is determined that new objectives will not be addressed by application of existing planning criteria, new localized criteria may be developed and submitted to the NRCS State specialists, through the local field office, for approval. These additional criteria, developed with guidance from NRCS, will be based on appropriate scientific guidance, local conditions, and input from partners, as needed.

(iv) 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).

(3) 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.

(4) Inputs

(i) Decision makers' objectives
(ii) Identified problems, opportunities, and concerns
(iii) Resource inventory data
(iv) FOTG, Sections I, II, III and V
(v) Resource evaluation tools (RUSLE, WEQ, etc.)

(5) Products

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

Figure 600-F8

What	How	Resources and Tools
1. Determine the method of analyses to be completed.	• Determine the types of analyses to be completed by reviewing the project's objectives, resource concerns, SECs, land and resource uses, and the location of the planning area. • Identify the resource considerations and determine the best method of calculating resource effects and outcomes. • Request appropriate agency, group, or entity for assistance after obtaining the decision maker's concurrence, in instances where the type or extent of resource problems exceeds the expertise or resources available.	• FOTG, Section I • Stakeholders and other resource agencies and groups.
2. Establish scope, intensity, degree of accuracy, and procedures to be used, utilizing discipline specialists as needed.	• Review the findings of the cultural resource/historic property inventory. • 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.	Discipline specialist and literature reviews
3. Conduct the analysis.	• Use procedures in appropriate discipline handbooks or manuals and automated analysis tools (e.g., RUSLE2, WEPS, etc.). See Figure 600-C6, "Inventory Methods."	
4. Compare the results of the analysis with planning criteria, problems, opportunities, and objectives.	• Compare the results of the analysis with the planning criteria in the FOTG, Section III, and with the problems, opportunities, and objectives determined in planning Step 1, "Identify Problems and Opportunities," and Step 2, "Determine Objectives." • Use the inventory data that were collected, based on project objectives, to determine the type, amount, and extent of existing and potential resource concerns.	• FOTG, Section III • Collected Data
5. Describe and record the benchmark condition.	• Describe and record the benchmark condition, including existing practices, identified resource concerns, human resources, and special environmental concerns. Include the type, amount, and location. Quantities are shown in standard units (e.g., tons per acre per year, parts per volume of water, yield per acre, etc.). • Document EE data per State, Tribal, Territorial, and Federal guidance. See section 600.71. • Document discussion between planner stakeholders in assistance notes.	
6. Produce resource maps and reports.	• Display the resource information on maps, showing the location and the extent of the condition.	

600.52 Phase II – Decision Support

A. Step 5 – Formulate Alternatives.—Formulate alternatives that will achieve the objectives, solve identified natural resource concerns, and take advantage of opportunities to improve or protect resource conditions, and demonstrate a variety of technical and economic implementation strategies.

(1) Description

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

(ii) A broad range of technically feasible alternatives should be developed with the stakeholders. Alternatives may include an appropriate mix of structural and nonstructural measures.

(iii) Include measures that mitigate potential adverse impacts on the resources. Also consider the potential to address regulatory requirements, based on the decisionmakers' desires and objectives.

(2) General

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

(ii) 180-NPPH, Part 600, Subpart B, Section 600.21, "Guidance for Planning Resource Management Systems (RMS)," outlines the thought process the planner should use with the decisionmakers. The purpose of formulating alternatives is to provide the most effective, efficient, and economical conservation treatments that meet planning criteria and are acceptable to the decisionmakers 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.

(iii) During the alternative formulation process, the planner should use the associated conservation system guides developed and located in the local FOTG, Section III, located at http://www.nrcs.usda.gov/technical/efotg/. Identify the State and county in which the plan is being developed to reference localized conservation system guides.

(iv) Include the stakeholders in the formulation of alternatives. This allows practical alternative formulation, improves decisionmaking, and enhances the chances of successful implementation. 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.

(v) Develop enough alternatives to provide the decisionmakers with the opportunity to consider several possibilities.

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

(vii) 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 decisionmakers.

(3) Planning Standard

Alternative treatments are developed to meet planning criteria, the objectives of the decisionmakers, in conjunction with the stakeholders.

(4) Inputs

(i) The decisionmakers and stakeholder objectives from planning step 2

(ii) Physical, cultural resource, social, economic, and ecological information pertaining to the planning area and related areas

(iii) List of resource problems, opportunities and concerns, from planning step 1

(iv) Resource data and analysis from planning steps 3 and 4

(v) FOTG, Sections II, III, IV, and V

(5) Products

A description of the alternatives available to the decisionmakers

Figure 600-F9

What	How	Resources and Tools
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 (nonstructural and structural) and preventive measures.	• Obtain input from the public, special interest groups, Indian Tribes, and local, State, and Federal agencies.	• Public meetings, Federal Register notices, and personal contacts with colleagues in other agencies.
2. Develop alternatives.	• 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 planning criteria.	Conservation Practice Physical Effects (CPPE) , Conservation Effects Assessment Project (CEAP)
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 stakeholders, the public, Indian tribes, and State and Federal agencies. Check to determine that the alternative is complete (contains all components, including operation and maintenance) to ensure that it will function as planned and will produce the desired effects. Include measures needed to mitigate any potential ecological damages.	Title 190, General Manual (GM), Part 410
4. Obtain decisionmakers and stakeholder input.	• Keep the stakeholders involved in the process of developing alternatives. Discuss progress made toward alternative development with the stakeholders. Involve the stakeholders in identifying and formulating alternatives. For each alternative, evaluate the likelihood of acceptance.	Public involvement techniques
5. Record the alternatives	• Make a record of the alternatives using a format that meets the needs of the stakeholders. Planners may use CPA-52 in the NPPH for documentation or a similar format.	

B. Step 6 – Evaluate Alternatives.—Evaluate the alternatives to determine their effects in addressing the project objectives and the identified natural resource concerns and opportunities. Evaluate the projected effects on social, economic, and ecological concerns. Special attention must be given to those ecological values protected by law, treaty or Executive order.

(1) Description

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

(2) General

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

(ii) 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 decisionmakers or during any part of the evaluation.

(3) 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 planning criteria, and meet the decisionmakers' objectives.

(4) Inputs

(i) The decisionmakers' objectives from planning step 2
(ii) FOTG/eFOTG, Sections I, II, III, IV, and V
(iii) List of problems and opportunities developed during planning step 1
(iv) Benchmark data from planning step 4
(v) List of alternatives from planning step 5
(vi) Environmental and cultural resource evaluations
(vii) Program information and requirements

(5) Products

(i) A set of practical RMS alternatives that is compatible with decisionmakers and NRCS objectives
(ii) A record of public participation for areawide conservation planning
(iii) An evaluation, for each alternative, displaying the effects and impacts for the decisionmakers to consider and use as a basis for decisionmaking for the conservation plan
(iv) Technical assistance notes reflecting discussions between the planner and the decisionmakers

Figure 600-F10

What	How	Resources and Tools
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 decisionmakers, stakeholders, Indian Tribes, other agencies, and interest groups should be included in the quantification 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.	• Consider the consequences of actions on larger and smaller planning areas. See in section 600.11 (9) for a partial listing of economic and social considerations. • If cultural resources are present, an evaluation is conducted according to policy	• Interviews with stakeholders provide insight into the effects of the benchmark and proposed alternatives on human considerations. • 420-GM, Part 401 • 200-GM , Part 400
3. Convert effects to monetary terms. Detail is determined by the decisionmakers and stakeholder's desires. Consider the tradeoffs between short-term profit needs and long-term sustainability.	• Estimate the costs of other effects must be estimated. The type, amount, and timing of actions included in the alternative should be included.	FOTG, Section I
4. Determine the beneficial and adverse impacts of each alternative.	• Compare the effects of each alternative to the benchmark. The stakeholders decide if the impacts are desirable or undesirable. • Evaluate the risk and uncertainty associated with each alternative.	
5. Present the evaluations in a manner easily understood by the stakeholders.	The same format should be used for the benchmark and all alternatives, and should contain the following: • A description of the resource setting • A description of the management system • A complete list of the type, amount, and timing of actions involved in the management system that may change as a result of the plan • Effects of the actions on the resources and human considerations, and • Impacts of each alternative in comparison to the benchmark.	• FOTG, Section V • Conservation Effects • Program Manuals
6. Identify NRCS programs, programs of other agencies, and other implementation and funding opportunities that may be available to implement the alternatives.	• Evaluate program and funding opportunities inside and outside of NRCS for potential implementation opportunities. • Develop a list of USDA programs with a brief description of each. • Solicit input from other agencies, stakeholders, and decisionmakers for additional programs or funding opportunities available.	• Stakeholder meetings • USDA and other Federal, State and local funding opportunity listings

	• Evaluate the potential for specific programs or other funding to implement proposed actions. • Record and review the information with the stakeholders.	

C. Step 7 – Make Decisions.—The decisionmakers and stakeholders reach consensus on their preferred alternatives and work with the planner to schedule the conservation system and practice implementation.

(1) Description

The decisionmakers determine which alternatives to implement and the planner documents the decisions. 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, NEPA documents, required cultural resources documents.

(2) General

The planner assists the decisionmakers in selecting conservation treatment alternatives. In this planning step, the planner reviews the conservation alternatives and the decisionmakers select one or more for implementation.

(3) Planning Standard

Plan alternatives are selected based on the decisionmakers' clear understanding of the impacts of each alternative. The selected alternative is recorded in the decisionmakers' plan.

(4) Inputs
(i) A set of evaluated alternatives
(ii) Conservation effects and impacts information

(5) Products
(i) Conservation plan document with the selected alternative, including potential program or implementation opportunities, and operation and maintenance
(ii) Record of public participation for areawide conservation plans
(iii) Environmental compliance documentation, including NEPA and NHPA.
(iv) Cultural resource documents, including findings and negative findings reports
(v) Revised conservation effects and impacts information

Figure 600-F11

What	How	Resources and Tools
1. Present the alternatives and evaluations.	• Review the alternatives and evaluation data from planning step 6 with the stakeholders. • Discuss the advantages and disadvantages of each alternative, including the social, cultural resource, economic, and ecological effect and constraint imposed by treaty; Federal, State and local laws; and regulations. Point out the beneficial and adverse impacts to aid the stakeholders in reaching a decision.	Decisionmaker and stakeholder meetings
2. Provide the opportunity for public response.	Prepare notices, and schedule public meetings to solicit public response.	• Public meetings • Mailings • Review of NEPA documents • Federal Register notices, as appropriate.

3. The decisionmaker makes decisions.	• If the decisionmakers choose one or more of the alternatives, proceed to item 4. • If the decisionmakers choose to implement only part of an alternative, planning assistance will continue on a progressive basis toward applying alternatives that meet planning criteria. Return to planning step 6 and evaluate the decisionmakers' selected portion. • If the decisionmakers do not choose one of the alternatives, yet are interested in exploring more options, return to one or more of the previous planning steps.	
4. Record the selected alternatives and schedule practices.	Complete the following items: • Record the selected alternatives as the planned systems. • Schedule practice application for implementation (This may include initiating the planning process for individual conservation plans within the areawide conservation plan). • Adjust effects and impacts, if needed. • Record assistance notes reflecting discussions with the decisionmakers not otherwise captured in the plan development. • Explain the interdependency of certain practices as practice scheduling is completed.	

600.53 Phase III – Application and Evaluation

A. Step 8 – Implement the Plan.—The areawide stakeholders or the decisionmakers of individual conservation plans implement the selected alternatives. The planner or technical expert provides the land manager with detailed practice implementation information, including engineered designs. Conservation staff will also provide practice layout, construction inspection, and certification. Each land manager directs the implementation of each practice. The planner provides encouragement to the stakeholders for continued implementation.

(1) Description

Implementing the plan includes providing technical assistance to plan and implement conservation practices that support the areawide plan 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 areawide or individual decisionmakers to assure proper functioning of practices following installation.

(2) General

(i) Implementing a plan is the process of carrying out the conservation treatments that make up the planned conservation systems. The decisionmakers must have a clear understanding of the selected alternatives in order to effectively implement the plan. The decisionmakers may be able to implement the plan without additional technical or financial assistance. Generally, additional technical assistance is necessary, and plan revisions are occasionally warranted. Additional information or documentation may be required by a specific financial assistance program. Thorough planning is essential for providing efficient and effective technical assistance, and minimizes plan revisions.

(ii) 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.

(iii) 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 areawide or individual decisionmakers.

(3) Planning Standard

The decisionmakers have adequate information and understanding to implement, operate, and maintain the plan alternatives. Practices implemented with NRCS technical assistance will be installed according to NRCS standards and specifications.

(4) Inputs
- (i) Conservation plan or areawide conservation plan
- (ii) Case file data
- (iii) Technical studies
- (iv) Environmental evaluations and documents
- (v) All necessary permits
- (vi) Statements of work
- (vii) Job sheets
- (viii) Conservation practice standards and specifications
- (ix) Conservation practice designs
- (x) Technical assistance
- (xi) Program requirements
- (xii) FOTG, Section IV

(5) Products
- (i) Conservation practices applied
- (ii) Resource management systems applied
- (iii) Communication with the stakeholders
- (iv) Updated plan document
- (v) Technical assistance notes
- (vi) Conservation contract where applicable

Figure 600-F12

What	How	Resources and Tools
1. Review the plan with the decisionmakers and update it to meet current conditions.	Meet with the decisionmakers to ensure that the plan continues to represent current conditions and will achieve the plan objectives. This activity may result in a plan modification.	
2. Develop an implementation strategy.	Work with the stakeholders to develop an implementation strategy. The extent of the strategy will depend on the complexity of the plan to be implemented. (2c) The decisionmakers decide 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. Where individual conservation plans will be developed and implemented in the planning area to carry out the areawide	The strategy should identify who, what, where, when, why, and how as appropriate. Specific items to consider include: • Form implementation committee from stakeholders • Environmental requirements and documentation • Detailed implementation schedule, funding programs or authorities, program or funding requirements, guidance, and procedures • Permits • Agreements (i.e., operation and maintenance, project)

	conservation plan, follow the guidance for developing a conservation plan under Subpart C, 600.20 – 600.29.	• Mitigation of lost environmental values • Land rights • Treaty rights • Practice design, layout, installation, inspection, and certification • Contracting

B. Step 9 – Evaluate the Plan.—Evaluate the effectiveness of the plan in solving the resource concerns as it is implemented and work with the stakeholders to make adjustments as needed.

(1) Description

The planner obtains information on the results of the alternative implementation, evaluates the effectiveness of the implemented plan to ensure that it is functioning as planned and achieving the objectives, identifies reasons for the lack of progress in plan implementation or variances in sequence completion, and, if applicable, revises the implementation schedule or modifies the conservation plan. Where the actual results differ from those anticipated, provide feedback into the planning process. This could include revision of planning 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 decisionmakers to continue plan implementation.

(2) General

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

(ii) 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.

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

(iv) The key to successfully evaluating the results of a plan is to take advantage of the synergistic effect of the decisionmakers, 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 nonagency partners, as appropriate.

(3) Planning Standard

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

(4) Inputs

(i) Copy of the conservation plan or areawide conservation plan
(ii) Results of previous evaluations
(iii) Onsite observation and data available from the decisionmakers
(iv) New or modified objectives or needs of the decisionmakers
(v) Appropriate new technology
(vi) FOTG, Sections I, II, III, IV, & V

(5) Products
(i) O&M reports
(ii) Outline of maintenance needs or other changes
(iii) A decision to update or revise the plan, if needed
(iv) Technical assistance notes indicating the effectiveness of the plan
(v) Case studies, if appropriate, following the guidance provided in the FOTG, Section V
(vi) Recommendations for changes in practice standards, specifications, or designs
(vii) Recommendations for changes in FOTG materials
(viii) A decision to revise or expand implementation strategies
(ix) Updated CPPE and guidance documents
(x) Environmental Management Systems (EMS)

Figure 600-F13

What	How	Resources and Tools
Determine if adjustments are needed for management practices or systems.	• Compare the actual effects of conservation efforts with the planned effects. • Determine the decisionmakers' satisfaction with, the conservation treatment applied and the technical assistance provided.	Consider the effects and satisfaction in terms of ecological, economic, and social factors considered important by the decisionmakers and NRCS.
Determine the need for a plan revision, development of a new plan of the plan.	• If the conservation plan needs revision, or a new plan is needed, repeat planning steps 1 through 7.	
Update the assistance notes.	• Enter assistance notes to capture planner and decisionmaker interaction.	
Conduct a case study, if appropriate.	• Follow the procedures in the FOTG, Section V. Utilize assistance from other agencies, etc., as appropriate.	FOTG, Input from stakeholders.

Part 600 – National Planning Procedures Handbook

Subpart G – Component Planning Technical Guidance

600.60 Guidance

A. Conservation plans may include component plans to provide greater detail in addressing one or more resource concerns. The following is a partial list of some examples of component plans and references to assist in developing them.

(1) Comprehensive Nutrient Management Planning (CNMP).—As a subset of a conservation plan that is unique to animal feeding operations (AFOs), a CNMP addresses natural resource concerns to the water quality criteria established in the FOTG.
   (i) NRCS policy on preparing CNMPs is located in the Title 190, GM, Part 405.
   (ii) NRCS policy on CNMP certification is located in the 180-GM, Part 409
   (iii) Title 190, Comprehensive Nutrient Management Field Handbook, Part 620
   (iv) National Instruction 190-304, "CNMP Technical Criteria"

(2) Nutrient Management Planning
   (i) 190-GM, Part 402
   (ii) National Instruction 190-302

(3) Integrated Pest Management Planning
   (i) 190-GM, Part 404
   (ii) Certified specialist in IPM, 180-GM, Part 409

(4) Prescribed Burn Planning

   190-GM, Part 413

(5) Irrigation Water Management Planning

   Title 210, National Engineering Handbook, Part 652, Chapter 10, "Conservation Management Systems and Irrigation Planning"

(6) Grazing Management Planning

   Title 190, National Range and Pasture Handbook

B. Some resource concerns have additional policy guidelines for addressing within a conservation plan.

(1) Addressing Invasive Species within the Conservation Plan

   190-GM, Part 414

(2) Addressing Pollinators within the Conservation Plan

   190-GM, Part 416

Part 600 – National Planning Procedures Handbook

Subpart H – Exhibits

600.70 Exhibit 1 – Sample Resource Concern Checklist

Tailor to Meet State, Tribal, Territorial or Local Needs

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

Checklist of Resource Concerns – *Examples in Italics*

Soil Erosion – Sheet and Rill, Wind, Concentrated Flow, Shoreline, Bank, and Channel

Concern	**Extent**
Sheet and Rill	*Visible rills in 50 percent of the crop fields*
Streambank	*Tillage operations within 5 feet of Streambank, few random trees*

Soil Quality/Health – Subsidence, Compaction, Organic Matter Depletion, Salts and Chemicals

Concern	**Extent**
Organic Matter Depletion	*Residue regularly harvested from corn fields for livestock bedding*

Water Quality – Excess Nutrients, Pesticides, Pathogens, Excess Salt, Petroleum, Heavy Metals, Excess Sediment, Elevated Temperature

Concern	**Extent**
Elevated Temperature	*Trout steam void of shade trees*

Water Quantity – Ponding, Flooding, Drifted Snow, Seeps, Inefficient Moisture Management, Inefficient Use of Irrigation Water

Concern	Extent
No evidence of a concern	

Air Quality – Particulate Matter, Greenhouse Gases (GHGs), Ozone Precursors, Odors

Concern	Extent
Odors	*Client reports neighbors complain when the manure pit is agitated*

Plants – Plant Productivity and Health, Inadequate Structure and Composition, Excessive Pest, Wildfire Hazard

Concern	Extent
Excessive Pest	*Noxious weeds present throughout pasture*

Animals – Wildlife Habitat Degradation, Inadequate Livestock Feed and Forage, Inadequate Livestock Shelter, Inadequate Livestock Water

Concern	Extent
Inadequate Livestock Feed and Forage	*Supplemental livestock feeding begins in June*
Wildlife Habitat Degradation	*Client interested in improving trout stream habitat*

Energy – Equipment and Facilities, Field Operations

Concern	Extent
Field Operations	*Client concerned about rising fuel costs, open to reduced tillage alternatives*

Human – Economics – Land, Labor, Capital, Management Level, Risk, Profitability, Other

Concern	Extent
Risk	*Client concerned about nutrient management regulations preventing historic nutrient application levels and timing*

Human – Social – Cultural Resource or Historic Property, Client Characteristics, Community Characteristics, Other

Concern	Extent
Community Characteristics	*Client's community prohibits participation in financial assistance programs. Limited to technical assistance.*

600.71 Exhibit 2 – Environmental Effects for Conservation Plans and Areawide Conservation Plans

A. Form NRCS-CPA-52, instructions and a worksheet can be found on the NRCS National Environmental Compliance Web site.

B. Copy of the blank form NRCS-CPA-52

U.S. Department of Agriculture Natural Resources Conservation Service NRCS-CPA-52 6/2010 **ENVIRONMENTAL EVALUATION WORKSHEET**					**A. Client Name:** **B. Conservation Plan ID #** (as applicable): **Program Authority** (optional): **C. Identification #** (farm, tract, field #, etc as required):	
D. Client's Objective(s) (purpose):						
E. Need for Action:	**G. Alternatives**					
	No Action √ if RMS ☐		***Alternative 1*** √ if RMS ☐		***Alternative 2*** √ if RMS ☐	
Resource Concerns						
In Section "F" below, analyze, record, and address concerns identified through the Resources Inventory process. (See FOTG Section III - Resource Quality Criteria for guidance).						
F. Resource Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	**H. Effects of Alternatives**					
	No Action		***Alternative 1***		***Alternative 2***	
	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC	Amount, Status, Description (short and long term)	√ if does NOT meet QC
SOIL						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
WATER						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC

F. Resouce Concerns and Existing / Benchmark Conditions (Analyze and record the existing/benchmark conditions for each identified concern)	H. (continued) *No Action* Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 1* Amount, Status, Description (short and long term)	√ if does NOT meet QC	*Alternative 2* Amount, Status, Description (short and long term)	√ if does NOT meet QC
AIR						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
PLANTS						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
ANIMALS						
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
		NOT meet ☐ QC		NOT meet ☐ QC		NOT meet ☐ QC
HUMAN - Economic and Social Considerations						

Special Environmental Concerns: Environmental Laws, Executive Orders, policies, etc.						
In Section "I" complete and attach applicable Environmental Procedures Guide Sheets for documentation. Items with a "•" may require a federal permit or consultation/coordination between the lead agency and another government agency. In these cases, effects may need to be determined in consultation with another agency. Planning and practice implementation may proceed for practices not involved in consultation.						
I. Special Environmental Concerns (Document compliance with Environmental Laws, Executive Orders, policies, etc.)	**J. Impacts to Special Environmental Concerns**					
	No Action		***Alternative 1***		***Alternative 2***	
	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action	Status and progress of compliance. (Complete and attach Guide Sheets as applicable)	√ if needs further action
•Clean Air Act		☐		☐		☐
•Clean Water Act / Waters of the U.S.		☐		☐		☐
•Coastal Zone Management		☐		☐		☐
Coral Reefs		☐		☐		☐
•Cultural Resources / Historic Properties		☐		☐		☐
•Endangered and Threatened Species		☐		☐		☐
Environmental Justice		☐		☐		☐
•Essential Fish Habitat		☐		☐		☐
Floodplain Management		☐		☐		☐
Invasive Species		☐		☐		☐
•Migratory Birds/Bald and Golden Eagle Protection Act		☐		☐		☐
Prime and Unique Farmlands		☐		☐		☐
Riparian Area		☐		☐		☐
•Wetlands		☐		☐		☐
•Wild and Scenic Rivers		☐		☐		☐
K. Other Agencies and Broad Public Concerns	***No Action***		***Alternative 1***		***Alternative 2***	
Easements, Permissions, Public Review, or Permits Required and Agencies Consulted.						

K. (continued) Other Agencies and Broad Public Concerns		*No Action*	*Alternative 1*	*Alternative 2*
Cumulative Effects Narrative (Describe the cumulative impacts considered, including past, present and known future actions regardless of who performed the actions)				
L. Mitigation				
M. Preferred Alternative	√ preferred alternative	☐	☐	☐
	Supporting reason			

N. Context (Record context of alternatives analysis)

The significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality.

O. Determination of Significance or Extraordinay Circumstances

Intensity: Refers to the severity of impact. Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

If you answer ANY of the below questions "yes" then contact the State Environmental Liaison as there may be extraordinary circumstances and significance issues to consider and a site specific NEPA analysis may be required.

Yes	No	
☐	☐	• Is the preferred alternative expected to cause significant effects on public health or safety?
☐	☐	• Is the preferred alternative expected to significantly effect unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?
☐	☐	• Are the effects of the preferred alternative on the quality of the human environment likely to be highly controversial?
☐	☐	• Does the preferred alternative have highly uncertain effects or involve unique or unknown risks on the human environment?
☐	☐	• Does the preferred alternative establish a precedent for future actions with significant impacts or represent a decision in principle about a future consideration?
☐	☐	• Is the preferred alternative known or reasonably expected to have potentially significant environment impacts to the quality of the human environment either individually or cumulatively over time?
☐	☐	• Will the preferred alternative likely have a significant adverse effect on ANY of the special environmental concerns? Use the Evaluation Procedure Guide Sheets to assist in this determination. This includes, but is not limited to, concerns such as cultural or historical resources, endangered and threatened species, environmental justice, wetlands, floodplains, coastal zones, coral reefs, essential fish habitat, wild and scenic rivers, clean air, riparian areas, natural areas, and invasive species.
☐	☐	• Will the preferred alternative threaten a violation of Federal, State, or local law or requirements for the protection of the environment?

P. The information recorded above is based on the best available information:

In the case where a non-NRCS person (i.e. a TSP) assists with planning they are to sign the first signature block and then NRCS is to sign the second block as the responsible federal agency for the planning action.

Signature (TSP if applicable)	Title	Date
Signature (NRCS)	Title	Date

The following sections are to be completed by the Responsible Federal Official (RFO)		
Q. NEPA Compliance Finding (check one)		
The preferred alternative:		**Action required**
☐	1) **is not a federal action** where the agency has control or responsibility.	Document in "R.1" below. No additional analysis is required
☐	2) is a federal action that is **categorically excluded** from further environmental analysis **and** there are no extraordinary circumstances.	Document in "R.2" below. No additional analysis is required
☐	3) is a federal action that has been **sufficiently analyzed** in an existing Agency state, regional, or national NEPA document **and** there are no predicted significant adverse environmental effects or extraordinary circumstances.	Document in "R.1" below. No additional analysis is required.
☐	4) is a federal action that has been sufficiently analyzed in another Federal agency's NEPA document (EA or EIS) that addresses the proposed NRCS action and its' effects **and has been formally adopted by NRCS**. NRCS is required to prepare and publish the agency's own Finding of No Significant Impact for an EA or Record of Decision for an EIS when adopting another agency's EA or EIS document. **Note: This box is not applicable to FSA.**	Contact the State Environmental Liaison for list of NEPA documents formally adopted and available for tiering. Document in "R.1" below. No additional analysis is required
☐	5) is a federal action that has **NOT** been sufficiently analyzed or may involve predicted significant adverse environmental effects or extraordinary circumstances and may require an EA or EIS.	Contact the State Environmental Liaison. Further NEPA analysis required.

R. Rationale Supporting the Finding	
R.1 Findings Documentation	
R.2 Applicable Categorical Exclusion(s) (more than one may apply)	

I have considered the effects of the alternatives on the Resource Concerns, Economic and Social Considerations, Special Environmental Concerns, and Extraordinary Circumstances as defined by Agency regulation and policy.

S. Signature of Responsible Federal Official:

Signature	Title	Date

Additional notes

C. List of Special Environmental Concerns

Clean Air Act, Criteria Pollutants
Clean Air Act, Regional Visibility Degradation
Clean Water Act
Coastal Zone Management Areas
Coral Reefs
Cultural Resources
Endangered and Threatened Species
Environmental Justice
Essential Fish Habitat
Floodplain Management
Invasive Species
Migratory Birds
Prime and Unique Farmlands
Riparian Areas
Wetlands
Wild and Scenic Rivers

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Clean Air Act
Criteria Pollutants

CLEAN AIR ACT - Criteria Pollutants

"Criteria pollutants" for agriculture are excessive concentrations of particulate matter and ozone in the atmosphere that may adversely impact human health.

What is it?

Criteria pollutants are those contaminants in the atmosphere for which U.S. EPA has used health-based criteria to establish National Ambient Air Quality Standards (NAAQS). The U.S. EPA has currently promulgated NAAQS for six criteria air pollutants, but the primary criteria pollutants of concern for agriculture are particulate matter and ozone.

Why is it important?

The NAAQS are intended to represent the maximum concentration of a particular pollutant in the ambient air that will not adversely impact public health or welfare, which includes aesthetic, economic, and other non-health effects. Areas that are designated as nonattainment, meaning that concentrations of a criteria pollutant are not in compliance with the NAAQS, are subject to greater regulatory scrutiny than areas that are in compliance with the NAAQS (i.e., attainment areas). Sources that are considered to contribute to an area's nonattainment status will be subject to more stringent control and permitting requirements. Requirements for each nonattainment area vary and are tailored to the specific needs of the nonattainment area.

What can be done about it?

Ozone is not typically emitted directly from air pollutant emission sources. Rather, it is formed in the atmosphere by chemical reactions. As such, emissions of oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) are regulated as precursors to ozone formation instead. Particulate matter may be either emitted directly, such as dust or smoke, or formed in the atmosphere from other pollutants, such as ammonia, NO_x, VOCs, and sulfur dioxide (SO_2). Agriculture does not produce significant amounts of SO_2, so reducing emissions of directly-emitted particulate matter, NO_x, ammonia, and VOCs from agricultural sources will help to mitigate agriculture's contribution to concentrations of particulate matter and ozone in the ambient air.

Clean Air Act - Criteria Pollutants at a Glance

Problems / Indicators - Nonattainment area for ozone and/or particulate matter	
Causes	**Solutions**
• Dust emissions • Poor smoke management • Wind erosion • Ammonia release • VOC emissions • NO_x emissions	• Dust control, windbreaks • Proper smoke management • Maintain surface residue/cover • Proper manure management • Proper nutrient management • Follow state/local permitting guidance and procedures

Special Environmental Concerns

Clean Air Act
Regional Visibility Degradation

CLEAN AIR ACT - Regional Visibility Degradation

The Clean Air Act recognizes the issue of "regional visibility degradation" as excessive concentrations of particulate matter and other pollutants in the atmosphere that degrade visibility in national parks and other "Class I areas".

What is it?

Regional visibility degradation occurs when concentrations of particulate matter, oxides of nitrogen (NO_x), and sulfur dioxide (SO_2) in the atmosphere hinder the ability to view distant objects or vistas. Of these, the primary visibility-degrading pollutants of concern for agriculture are particulate matter and NO_x.

Why is it important?

Class I areas are areas of national or regional natural, scenic, recreational, or historic value that are given special protection under the Clean Air Act. One of these special protections is preservation of the visibility of scenic vistas within the Class I areas. EPA has developed the Regional Haze Rule that directs states to establish goals for improving visibility in national parks and wilderness areas. States are required to develop long-term strategies for reducing emissions of air pollutants that cause visibility impairment. The goals and requirements vary by state and by Class I area.

What can be done about it?

Reducing agricultural emissions that contribute to increased concentrations of particulate matter and NO_x in the air, especially from sources near a Class I area, will help mitigate agriculture's contribution to regional haze issues. These emissions include directly-emitted particulate matter, such as dust and smoke, and NO_x. Additionally, emissions of ammonia and volatile organic compounds (VOCs), as well as NO_x, can contribute to fine particulate matter formation in the atmosphere. Many common NRCS practices can be used address agriculture's contribution to regional visibility degradation by reducing emissions of these pollutants.

Clean Air Act - Regional Visibility Degradation at a Glance

Problems / Indicators - Regional haze and poor visibility of scenic areas	
Causes	**Solutions**
• Dust emissions • Poor smoke management • Wind erosion • NO_x emissions • Ammonia emissions • VOC emissions	• Dust control, windbreaks • Proper smoke management • Maintain surface residue/cover • Proper maintenance and operation of combustion sources • Proper nutrient and manure management • Reductions in pesticide use

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Clean Water Act

CLEAN WATER ACT AND WATERS OF THE U.S.

The Federal Water Pollution Control Act of 1972 is today known as the Clean Water Act (CWA). The U.S. Army Corps of Engineers (Corps) and the States administer the various sections of the CWA with the oversight of the Environmental Protection Agency (EPA).

What is it?

The CWA established several programs to regulate and reduce discharges of pollutants into waters of the United States (including wetlands). Although the list of pollutants is long, those most frequently associated with the term include fill material, sediment, excess nutrients, and harmful bacteria. Although the landowner is responsible for obtaining appropriate permits prior to project implementation, NRCS often assists to expedite the coordination process.

Why is it important?

Section 404 of the CWA is the section that most often affects NRCS activities, although consideration must also be given to Sections 401, 402, and 303. Close coordination throughout the planning process can prevent significant delays in processing the permit application.

Section 404: Established a permit program to regulate the discharge of dredged and fill material into waters of the U.S. Discharge of dredged or fill material into waters of the U.S. is prohibited unless the action is exempted or is authorized by a permit issue by the Corps or by the State.

Section 401: Requires that before a 404 permit can be issued for an activity, the State (or Tribe) in which the activity will occur must certify that the activity will not violate State water quality standards (Section 401 State Water Quality Certification)

Section 402: Establishes the National Pollutant Discharge Elimination System (NPDES) Program, which the States also administer. This requires a permit for sewer discharges and storm water discharges from developments, construction sites, or other areas of soil disturbance.

Section 303: Requires States, territories, and Tribes to identify "impaired waters" and to establish total maximum daily loads (TMDLs).

What can be done about it?

To effectively fulfill our Section 404 responsibilities to the CWA and to prevent project delays, coordination with the Corps, EPA and/or appropriate State agencies is essential. Along with ensuring that the landowner obtains appropriate permits, NRCS should also consider impacts of proposed actions on streams included on States' 303(d) lists and plan accordingly.

Clean Water Act and Waters of the U.S. at a Glance

Problems / Indicators - Potential discharges of pollutants into waters of the U.S.	
Causes	**Solutions**
• Ground disturbing activities near U.S. Waters • Riparian activities • In-stream/aquatic activities • Wetland conversions/alterations/land clearing • Water or waste discharges	• Maintaining adequate surface cover/residue • Follow permitting guidance and procedures • Consultation with USFWS and/or NMFS • Proper nutrient and pest management • Incorporate mitigation measures in conservation plan

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Coastal Zone Management Areas

COASTAL ZONE MANAGEMENT AREAS

Coastal zone management areas (CZMAs) are areas located within or near the officially designated "coastal zone" of a State. The National Oceanic and Atmospheric Administration's (NOAA's) Office of Coastal Zone Management approves coastal programs, and not all coastal States have a CZMA.

What is it?

CZMAs are: 1) coastal waters and adjacent shorelines, including the lands or waters inside and under those zones, and 2) areas that strongly influence adjacent coastal zones of the 35 States that have coastal zone management programs. Examples include "transitional" and intertidal areas, such as salt marshes, freshwater wetlands, and beaches, and also connecting waters, harbors, and estuarine areas, such as bays, shallows, and marshes, as well as those waters adjacent to the shorelines, including but not limited to sounds, bays, lagoons, bayous, ponds, and the estuaries themselves. CZMAs can extend seaward to the outer limit of the United States territorial sea (generally 200 miles). Inland, the coastal area extends only to the extent necessary to control land uses that have a direct and significant impact (effect) on coastal waters.

Why is it important?

Section 307 of the Coastal Zone Management Act specifies that actions or activities within the coastal zone done by a Federal agency or on behalf of or through a Federal agency must be consistent with the State's coastal zone management plan. Therefore, NRCS planning must be consistent with the State's coastal plan and be in concert with the goals, tenets, and objectives of that plan. On March 9, 1993, a letter was jointly signed by the Soil Conservation Service, the Agricultural Stabilization and Conservation Service, and the Extension Service setting forth the policies for enforcement and adoption of science- and technology-based land-management measures that eliminate or control nonpoint sources of pollution.

What can be done about it?

A current registry of CZMAs in each state should be kept in the Technical Guide. Guidance on nonpoint source pollution matters in the coastal zone is contained in EPA's "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" (EPA 840-B-92-002), issued in response to the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990.

Coastal Zone Management Areas at a Glance

Problems / Indicators - Proposed action is inconsistent with State's coastal zone management plan	
Causes	**Solutions**
• Soil Erosion (short and/or long term) • CAFO contaminates (or other point sources) • Improper nutrient and/or pesticide application • Improper livestock grazing management • Improper irrigation water management • Other point and non-point source pollution	• Residue Management • Cover Crops • Comprehensive Nutrient Management Plan • NPDES permit • Irrigation Water Management • Prescribed Grazing

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Coral Reefs

CORAL REEFS

The term "Coral reefs" is defined as the species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., Federal, State, territorial, or commonwealth waters), including reef systems in the South Atlantic, Caribbean, Gulf of Mexico, and Pacific Ocean. Coral reefs are also waters of the U.S. as defined in the Clean Water Act and are subject to Section 404 permit requirements.

What is it?

Coral reefs are among the most diverse and valuable ecosystems on Earth. They are extremely vulnerable to harmful environmental changes, particularly those resulting from human activities. One of the primary threats to U.S. coral reefs is pollution from land-based sources, including runoff of nutrients and sediments from watersheds adjacent to near-shore coral reef ecosystems. Present estimates are that 10 percent of all coral reefs are degraded beyond recovery; 30 percent are in critical condition and may die within 10 to 20 years, and if current conditions continue unabated another 30 percent may perish completely by 2050.

Why is it important?

Executive Order (E.O.) 13089, Coral Reef Protection, was issued in 1998 in recognition of the importance of conserving coral reef ecosystems. The E.O. created a Coral Reef Task Force whose membership is comprised of 11 Federal agencies, including the Secretary of Agriculture. The E.O. policy states that agencies will utilize their programs and authorities to protect and enhance the conditions of coral reef ecosystems and, to the extent permitted by law, ensure that any actions authorized, funded, or carried out by the agency will not degrade these ecosystems.

What can be done about it?

Maintaining current information regarding Local Action Strategies (LASs) that identify priority actions needed to reduce key threats to valuable coral reef resources is very helpful. Florida, Hawaii, Guam, the U.S. Virgin Islands, American Samoa, Puerto Rico, and the Commonwealth of the Northern Mariana Islands created specific local action strategies for select locally relevant threats. NRCS should ensure that proposed actions consider impacts to coral reefs and, as appropriate, include conservation considerations that would enhance this valuable resource.

Coral Reefs at a Glance

Problems / Indicators - Nutrient and sediment runoff from near-shore watersheds	
Causes	**Solutions**
• Soil Erosion (short and/or long term) • CAFO contaminates (or other point sources) • Improper nutrient and/or pesticide application • Improper livestock grazing management • Improper irrigation water management • Other point and non-point source pollution	• Residue Management • Cover Crops • Comprehensive Nutrient Management Plan • NPDES permit • Irrigation Water Management • Prescribed Grazing

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Cultural Resources

CULTURAL RESOURCES

In 1966, Congress passed the National Historic Preservation Act (NHPA) and directed all Federal agencies to establish a historic preservation program. NRCS has established policy, procedural references and guidance to comply with NHPA and several related authorities, including the American Indian Religious Freedom Act (42 U.S.C. Section 1996); Native American Graves Protection and Repatriation Act (25 U.S.C. Sections 3001-3013); Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments (2000); EO 13007, Indian Sacred Sites (1996); and a range of Executive Orders, Presidential memoranda, and secretarial memoranda.

What is it?

The term "cultural resources" as used by NRCS is considered equivalent to "historic properties" as defined by the NHPA (16 U.S.C. Section 470 et seq.) and regulations for compliance with section 106 of the NHPA (36 CFR Part 800). They include any prehistoric or historic district, site, building, structure, or object listed in or eligible for listing in the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior. They also include all records, artifacts, and physical remains associated with the NRHP-eligible historic properties. The term also includes properties of traditional cultural and religious importance to an Indian Tribe or Native Hawaiian organization that meet national register criteria. They may consist of the traces of the past activities and accomplishments of people.

Why is it important?

NRCS is required to consider the effects of our actions and undertakings on NRHP eligible cultural resources and historic properties in consultation with specific parties. Consultation with State historic preservation officers (SHPO), Tribal historic preservation officers (THPO) and Federally recognized Tribes, including Native Hawaiians, as appropriate, as well as other interested parties, is required when an agency action may alter the characteristics that qualify a historic property for inclusion in the NRHP. NRCS is also required to mitigate potential adverse impacts, for example through avoidance or minimization, as appropriate.

What can be done about it?

When protected cultural resources, such as contemporary cultural properties, traditional cultural values, landscapes, or features having religious importance, may be impacted, NRCS must consult with concerned parties to ensure that historic preservation issues and the views of the public are fully considered during project planning. The outcomes of consultation are documented according to the statutes and authorities under which the cultural resources are considered.

Cultural Resources at a Glance

Problems / Indicators - Potential impacts to cultural resources and/or historic properties ("Undertakings")	
Causes	**Solutions**
• Ground disturbing practices • Watershed/Area-Wide/Complex projects • Proposed land-use changes/conversions • Construction discoveries	• Complete cultural resources investigation for site • Initiate EARLY consultation with appropriate State/Tribal entity, as needed • Incorporate mitigation measures, as needed, in project design and specifications

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Endangered & Threatened Species

ENDANGERED & THREATENED SPECIES & STATE/TRIBAL SPECIES OF CONCERN

Consistent with legal requirement of the Endangered Species Act of 1973 and NRCS policy regarding State and Tribal Species of concern, NRCS is fully committed to supporting the conservation of formally designated Federal (including "candidate" and "proposed" species), State and Tribal species of concern.

What is it?

When Congress enacted the ESA in 1973, it made several findings regarding the disappearance of various plant and animal species of the United States, the importance of these species to the Nation and its people, and the obligation of the Federal Government to conserve to the extent practicable the various species of fish, wildlife, and plants facing extinction. NRCS policy (190-GM, Part 410) also requires consideration of impacts to species protected by State or Tribal laws or regulations.

Why is it important?

Section 7(a) of ESA requires NRCS, in consultation with and with the assistance of the US Fish and Wildlife Service (USFWS) and/or NOAA National Marine Fisheries Service (NMFS), to advance the purposes of the Act by implementing programs for the conservation of endangered and threatened species, and to ensure that its actions and activities do not jeopardize the continued existence of threatened and endangered species or result in the destruction or adverse modification of the species' critical habitat. NRCS must also consult with State and/or Tribal entities when considering impacts to species of concern protected by State or Tribal laws or regulations.

What can be done about it?

In working with landowners, NRCS planners should identify and recommend alternative actions to avoid or minimize adverse impacts to at-risk species that are present or may be present within the project area and to benefit these species whenever possible. NRCS must make an initial effects determination for any endangered or threatened species, designated critical habitats, proposed species or habitats, candidate species, or State or Tribal species of concern protected by State or Tribal law or regulation. Once the effects determination has been completed, there may be a need to initiate consultation with the USFWS or NOAA-NMFS that would result in the development of negotiated "reasonable and prudent measures" (RPMs) to mitigate potential negative impacts.

Endangered & Threatened Species & State/Tribal Species of Concern at a Glance

Problems / Indicators - Potential negative impacts to Federal, State, and Tribal Species of Concern	
Causes	**Solutions**
• Land use changes/conversions • In-stream and upland restoration projects • Ground disturbing practices • Timing of project implementation • Management activities in occupied habitat	• Mitigation to eliminate potential impacts during planning process • Consultation with USFWS and/or NMFS • Incorporate RPMs and conservation measures into project specifications • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Environmental Justice

ENVIRONMENTAL JUSTICE

Executive Order 12898, issued February 11, 1994, requires each Federal agency to make environmental justice a part of its mission. Agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and Indian Tribes.

What is it?

The term "environmental justice" means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on proposed Federal actions. Furthermore, the principles of environmental justice require that populations are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by government programs and activities affecting human health or the environment.

Why is it important?

Environmental justice must be addressed throughout the U.S., its territories and possessions, the District of Columbia, and the Commonwealths of Puerto Rico and the Mariana Islands. These issues encompass a broad range of impacts covered by NEPA, including impacts on the natural or physical environment and related social, cultural, and economic impacts.

What can be done about it?

The primary means to attain compliance with environmental justice considerations are: 1) assessing the presence of environmental justice communities in a project area that may experience disproportionately high and adverse human health or environmental effects, and 2) the inclusion of low-income, minority, Tribal, or other specified populations in the planning process. There may be a need to develop separate Government to Government consultations to address any environmental justice issues for Tribal Governments (contact your State American Indian Emphasis Program manager). The USDA Departmental Regulation (DR) 5600-002, Environmental Justice, provides detailed determination procedures for NEPA and non-NEPA activities and suggests social and economic effects to consider when assessing whether there are disproportionately high and adverse human health or environmental effects to environmental justice communities in a project area.

Environmental Justice at a Glance

Problems / Indicators - Disproportionately high or adverse impacts to specific populations	
Causes	**Solutions**
• Land use changes/conversions • Area-wide/watershed/complex projects • Projects involving broad scope of impacts – local/regional/national • Controversial projects • Human health or environmental effects that may be disproportionately high or adverse	• Collect demographic data from EPA, Census Bureau, other sources • Initiate early government-to-government consultation with Tribes, as necessary • Conduct public meeting(s) • Conduct specific outreach to EJ communities • Create Agreements, as needed

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Essential Fish Habitat

ESSENTIAL FISH HABITAT

The Magnuson-Stevens Act was originally enacted in 1976 and amended several times, the latest of which was 2006. It is the primary law governing marine fisheries management in the U.S. In 1996, the Act was amended to incorporate essential fish habitat (EFH) and rules were published in the Federal Register. It calls for heightened consideration of fish habitat in resource management decisions and direct action to stop or reverse the continued loss of fish habitats. The National Marine Fisheries Service (NMFS) implements and enforces the management measures through fisheries management plans.

What is it?

Essential fish habitats (EFHs) are areas identified as being vital for sustaining marine or anadromous fish populations. They include the waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. As amended in 1986, the Magnuson Act requires regional fisheries management councils to evaluate the effects of habitat loss or degradation on their fishery stocks and take actions to mitigate such damage.

Why is it important?

The act requires cooperation among NMFS, the councils, fishing interests, Federal and State agencies, and others in achieving the EFH goals of habitat protection, conservation, and enhancement. NRCS must consult with NMFS regarding any action or proposed action that may adversely affect an EFH.

What can be done about it?

Information of all EFH areas in each applicable state is located in Section II of the FOTG. NRCS must first assess whether a proposed action or alternative will result in short or long-term disruptions or alterations that may result in an "adverse effect" to EFH. If yes, NRCS may first consider if and how the action or alternative can be modified to mitigate potential adverse effects. If that is not possible, NRCS will have to consult with NMFS to determine measures to conserve such habitat. Following consultation, NRCS is responsible for detailing the measures that will be taken to mitigate any adverse effects to EFH and explain reasons for any actions inconsistent with the NMFS EFH recommendations.

Essential Fish Habitat at a Glance

Problems / Indicators - Potential negative impacts to essential fish habitat	
Causes	Solutions
• Land use changes/conversions • In-stream and upland restoration projects • Ground disturbing practices • In-stream work/practices • Timing of project implementation	• Mitigation to eliminate potential impacts during planning process • Consultation with NMFS • Incorporate conservation measures into project specifications • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Floodplain Management

FLOODPLAIN MANAGEMENT

Executive Order (E.O.) 11988, Floodplain Management, was signed by President Jimmy Carter on May 24, 1977. NRCS policy on floodplains (190-GM, Part 410, Subpart B, Section 410.25) reflects the requirement of the E.O. that decisions by Federal agencies must recognize that floodplains have unique and significant public values.

What is it?

Floodplains are defined as lowlands or relatively flat areas adjoining inland or coastal waters, including at a minimum areas subject to a chance of flooding of 1 percent or greater in any given year. The "base" floodplain is set equal to the "100-year" floodplain (the so-called "1-percent chance floodplain"). The "critical action" floodplain is defined as the 500-year floodplain (the "0.2-percent chance floodplain") where certain facilities are present, such as a school, hospital, nursing home, utility, or a facility producing volatile, toxic, or water-reactive materials. Floodplains may be shown on maps produced by the Federal Emergency Management Agency (FEMA) and on NRCS watershed plans and floodplain management studies.

Why is it important?

The objectives of E.O. 11988 are to avoid, to the extent possible, the long- and short-term adverse impacts associated with occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development where there is a practical alternative.

What can be done about it?

Through proper planning, floodplains can be managed to reduce the threat to human life, health and property in ways that are environmentally sensitive. Most floodplains contain areas with valuable assets that sustain and enhance human existence. Some of these assets are agricultural and forest lands, food and fiber, fish and wildlife, temporary floodwater storage, parks and recreation, and environmental values. NRCS provides leadership and takes actions where practicable to conserve, preserve, and restore existing natural and beneficial functions and values in base (100-year) floodplains as part of the technical and financial assistance program that it administers.

Floodplain Management at a Glance

Problems / Indicators - Potential negative impacts to floodplains	
Causes	**Solutions**
• Land use changes/conversions in floodplain • Ground-disturbing project within floodplain • Infrastructure development in floodplain • Activities requiring a NPDES permit • Construction of flood walls, dikes, etc., for purpose of flood control	• Consult HUD/FEMA flood insurance maps and/or other available floodplain data • Mitigation to eliminate potential impacts during planning process • Incorporate conservation/mitigation measures into project specifications, as needed • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Invasive Species

INVASIVE SPECIES

Executive Order (E.O.) 13112, Invasive Species (February 3, 1999) directs Federal agencies to "prevent the introduction of invasive species, provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause." NRCS policy (190-GM, Part 414) is consistent with this E.O. and also requires that no action be authorized, funded, or carried out that is believed or likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere.

What is it?

The National Invasive Species Council (NISC) and Invasive Species Advisory Committee (ISAC) were formed to define how the objectives of the E.O. will be carried out. As defined in E.O. 13112, invasive species are species, not native to a particular ecosystem, whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species may include all terrestrial and aquatic life forms, including plants, animals, fungi, and microbial organisms. NRCS policy further defines a plant species as "invasive" only when it occurs on the Federal or State-specific noxious weed list or a list developed by the State-specific Department of Agriculture with their partners and approved by the State Technical Committee which prohibits or cautions its use due to invasive qualities.

Why is it important?

Invasive species are reducing the economic productivity and ecological integrity of our Nation's lands and waters. The rate of introduction of such species has risen markedly in recent years with costs to society growing commensurately. Invasive species harm native species and their habitats, degrade renewable resources, and diminish productive capacity of agricultural lands including cropland, forestlands, rangelands, and pasturelands. They negatively impact a wide variety of human activities and needs.

What can be done about it?

Recognizing and addressing the presence of invasive species is an integral part of the conservation planning process and implementing NRCS policy and any existing county, State, or Federal regulations concerning noxious and/or invasive species. At a minimum, the conservation plan includes: 1) an inventory of invasive species; 2) a map outlining the affected areas; 3) identification of control/restoration strategies; and 4) analysis of their impacts.

Invasive Species at a Glance

Problems / Indicators - Presence of invasive species	
Causes	**Solutions**
• Land use changes/conversions without appropriate vegetative cover plan • Ground-disturbing projects • Improper livestock grazing management • Restoration projects (upland and aquatic) without appropriate measures to ensure vegetative cover • Accidental transport and introduction via equipment	• Critical Area Planting • Pasture and Hayland Planting • Prescribed Grazing • Streambank & Shoreline Protection • Restoration & Management of Rare & Declining Habitats • Integrated Pest management • Establish monitoring protocols

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Migratory Birds

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Executive Order (E.O.) 13186, Responsibilities of Federal Agencies to Protect Migratory Birds, requires NRCS to consider the impacts of planned actions on migratory bird populations and habitats for all planning activities. The Bald and Golden Eagle Protection Act of 1940, as amended, also prohibits the take of bald and golden eagles and their nests.

What is it?

Migratory birds are essentially all wild birds found in the United States, except the house sparrow, starling, feral pigeon, and resident game birds, such as pheasant, grouse, quail, and wild turkeys. Resident game birds are managed separately by each State. A list of migratory birds is found in 50 CFR Part 10. There are also other requirements protecting certain migratory birds. The Bald and Golden Eagle Protection Act (BGEPA) provides protection to all Bald and Golden Eagles by prohibiting all commercial activities and some noncommercial activities involving bald or golden eagles, including their feathers or parts.

Why is it important?

The MBTA fully protects all migratory birds and their parts (including eggs, nests, and feathers). Thus, the act makes it unlawful, unless permitted by regulation, for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird, including feathers, parts, nests, or eggs. This prohibition applies to Federal agencies as well as private individuals. Also, under the BGEPA, the "taking" of bald and golden eagles and their nests is prohibited. The definition of "take" under this law includes disturbance.

What can be done about it?

MBTA, BGEPA, and E.O. 13186 require NRCS to consider the impacts of planned actions on migratory bird populations and habitats for all planning activities. This may require cooperation with the U.S. Fish and Wildlife Service if the action will result in a measurable negative effect on migratory bird populations. If, for example, a proposed action can potentially kill or injure a migratory bird resulting in an intentional or unintentional "take" to the birds, nests, or eggs, or disturbance of eagles or their nests will occur, conservation measures must be considered to mitigate adverse impacts.

Migratory Birds at a Glance

Problems / Indicators - Proposed action may adversely impact migratory birds	
Causes	**Solutions**
• Land use changes/conversions • Ground-disturbing projects • Vegetation management during the nesting season • Land clearing or obstruction removal • Sod-busting • Forest harvest activities	• Timing of practice installation/harvest • Prescribed Grazing/timing of grazing • Cooperation with USFWS to establish conservation measures • Restoration & Management of Rare & Declining Habitats • Establish monitoring protocols • Avoidance of specific areas/setbacks

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Prime and Unique Farmlands

PRIME AND UNIQUE FARMLANDS

The Farmland Protection Policy Act (FPPA) was passed by Congress as part of the Agriculture and Food Act of 1981 (Public law 97-98). The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

What is it?

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary of Agriculture. It may include lands currently used to produce livestock and/or timber. **Unique farmland** is land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables. **Farmland that is of statewide or local importance other than prime or unique farmland** is used for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, with the approval of the Secretary of Agriculture.

Why is it important?

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency, including NRCS.

What can be done about it?

NRCS must use the criteria provided in regulations found at 7 CFR Section 658.5 to identify and take into account the adverse effects of Federal programs on the protection of farmland. As well as evaluating the effects of our own actions upon farmland, NRCS must assist Federal agencies to consider alternative actions, as appropriate, that could lessen such adverse effects on farmland conversion to nonagricultural uses. NRCS uses a land evaluation and site assessment (LESA) system to establish a farmland conversion impact rating scores. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level.

Prime and Unique Farmlands at a Glance

Problems / Indicators - Proposed farmland conversion	
Causes	**Solutions**
• Proposed land use changes/conversion of agricultural lands • Ground disturbing/land clearing activities • Construction of infrastructure projects • Exurban development	• Conduct LESA for conversion impact score • Share result with cooperating Federal agency proposing action (normally for NEPA analysis) • Offer alternatives (relocation) for consideration if adverse impacts to prime, unique, or locally important agricultural lands

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Riparian Areas

RIPARIAN AREAS

NRCS policy (190-GM, Part 411) requires NRCS to integrate riparian area management into all plans and alternatives. Although Federal law does not specifically regulate riparian areas, portions of riparian areas, such as wetlands and other waters of the U.S. may be subject to Federal regulation under provisions of the Food Security Act, Clean Water Act, NEPA, and State, Tribal, and local legislation.

What is it?

Riparian areas are ecotones that occur along streams, rivers, lakes, ponds, and wetlands. They are distinctively different from the surrounding lands because of unique soil and vegetative characteristics that are strongly influenced by free or unbound water in the soil. Riparian ecosystems occupy the transitional area between the terrestrial and aquatic ecosystems. Typical examples include floodplains, stream banks, and lakeshores. Riparian areas may exist within all land uses, such as cropland, hay land, pastureland, rangeland, and forestland.

Why is it important?

Although riparian areas constitute only a fraction of the total land area, they are generally more productive in terms of plant and animal species, diversity, and biomass. Riparian areas are vital components of the ecosystems in which they occur and are extremely important for flood attenuation, hydrologic function (water quantity, quality, and timing), and fish and wildlife diversity. NRCS policy requires conservation plans to maintain or improve water quality/quantity as well as fish and wildlife benefits. It also requires the development of alternatives when the client's objectives conflict with the conservation of these areas.

What can be done about it?

Conservation planning in riparian areas requires special considerations. A resource problem within the riparian area may be the manifestation of upland management decisions. Planners working with riparian areas should consider soils, the present plant community, the site potential, geomorphology of both stream and the watershed, hydrologic regime, fish and wildlife needs, the management of the upland areas of the watershed, and the producer's objectives. For supplemental guidance relating to riparian areas, see *NRCS/RCA Issue Brief 11 (USDA-NRCS. August 1996)*.

Riparian Areas at a Glance

Problems / Indicators - Degraded riparian area	
Causes	Solutions
• Improper livestock grazing management • Presence of invasive species • Stream channel modifications • Stream channel aggradation or degradation • Structural modifications (e.g., diversions, ditches, dam, etc.) • Land use/vegetation changes	• Streambank and Shoreline Protection • Stream Crossing • Riparian Forest Buffers and/or Herbaceous Cover • Critical Area Planting • Fence/access control • Prescribed Grazing • Integrated Pest Management

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Wetlands

WETLANDS

Executive Order (E.O.) 11990 requires that Federal agencies take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the beneficial functions of wetlands when "providing federally undertaken, financed or assisted construction and improvements." NRCS policy for implementing the E.O. can be found at 190-GM, Part 410, Subpart B, Section 410.26. In addition, activities that impact wetlands often require a Clean Water Act, Section 404 permit from the Corps. Activities in wetlands that occur in the 100 or 500-yr floodplain are also subject to review under NRCS floodplain management policy (190-GM Section 510.25).

What is it?

Wetlands are defined differently within various Federal and State programs and for identification, delineation, and classification purposes. NRCS wetland protection policy defines wetlands as areas, natural or artificial, that have hydric soil, hydrophytic vegetation, and indicators of wetland hydrology. Generally, wetlands include swamps, marshes, bogs, many bottomland hardwood areas and similar areas.

Why is it important?

It is the policy of the NRCS to protect and promote wetland functions and values in all NRCS planning and application assistance. NRCS activities must comply with E.O. 11990, Protection of Wetlands, and with NRCS policy for protection of wetlands. Wetlands serve a variety of significant biological functions important to the food chain, general habitat, and nesting, spawning, and rearing sites.

What can be done about it?

Since wetlands are highly variable and can be dry for most of the year, wetland delineation training is important. If wetlands will be impacted by a proposed activity, NRCS will identify whether practicable alternatives exist that either enhance wetland functions and values, or avoid or minimize harm to wetlands. If such alternatives exist, the client will be given the opportunity to select one of those alternatives. If the client selects a practicable alternative, the NRCS may continue technical assistance for the conversion activity as well as the development of the mitigation plan. If a practicable alternative is not selected, NRCS may assist with the development of an acceptable mitigation plan, but no further financial or technical assistance for the wetland conversion activity may be provided.

Wetlands at a Glance

Problems / Indicators - Wetlands with impaired functions	
Causes	**Solutions**
• Past or current draining • Removal of native vegetation • Presence of invasive species • Changes in local hydrology • Dredge and fill activities • Adjacent stream channel modifications • Pollution from point sources (e.g., CAFO)	• Wetland Restoration • Tree/Shrub Establishment • Riparian Forest Buffers and/or Herbaceous Cover • Shallow Water Development and Management • Fish Passage • Incorporate 404 Permit conservation measures into planning design

United States Department of Agriculture
Natural Resources Conservation Service

Special Environmental Concerns

Wild and Scenic Rivers

WILD AND SCENIC RIVERS

The National Wild and Scenic Rivers Act of 1968 (Public Law 90-542) was created by Congress to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. A listing of designated streams and stream segments can be found on the National Park Service's Wild and Scenic Rivers Web site.

What is it?

Rivers may be designated by Congress or, if certain requirements are met, the Secretary of the Interior. Each river is administered by either a federal or state agency. Designated segments need not include the entire river and may include tributaries. For federally administered rivers, the designated boundaries generally average one-quarter mile on either bank in the lower 48 states and one-half mile on rivers outside national parks in Alaska in order to protect river-related values. Designated rivers are classified as wild, scenic, or recreational.

Why is it important?

The designation of a river or river segment under the Wild and Scenic Rivers Act provides legal protections from adverse development and provides a mechanism for management of the river's resources. In addition to the river segments designated as wild and scenic, many more segments are believed to possess one or more outstanding or remarkable natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential directive, and related CEQ procedures, all Federal agencies must also seek to avoid or mitigate actions that would adversely affect one or more National River Inventory (NRI) stream segments.

What can be done about it?

Federal agencies must consider the values of these segments prior to taking actions that could exclude them from future wild, scenic, or recreational status. Generally, timber harvests and agricultural operations on privately owned lands are unaffected in wild, scenic, and recreational river designations. However, some activities may require permits or may be covered under special provisions of the management plan. Each designated river has a Federal river manager who may assist and cooperate with States or local organizations, landowners, and individuals to plan, protect, and manage river resources. The assistance may include limited financial assistance.

Wild and Scenic Rivers at a Glance

Problems / Indicators - Proposed action may adversely impact a designated river or river segment	
Causes	**Solutions**
• Land use changes adjacent to river segment • Riparian modifications • Changes in local hydrology (e.g., adjacent wetland draining activities) • Dredge and fill activities • Pollution from point sources (e.g., CAFO)	• Mitigation during the planning process • Wetland Restoration • Riparian Forest Buffers and/or Herbaceous Cover • Forest Harvest Management/BMPs • Prescribed Grazing • Consult with NPS to coordinate mitigation plan

600.72 Exhibit 3 – System Effects Worksheet

Example System Effects Worksheet.—This example shows the effects of an alternative system on a cropland field for seven identified resource concerns.

Management System Options		Client: Ira Farmer Land Use: Crop						
		Soil Erosion		Soil Quality/Health Degradation		Water Quality Degradation		Degraded Plant Condition
Field or PLU	3/Conservation Practices	2/Sheet, Rill and Wind	Concentrated Flow : Classic Gully and Ephemeral	Organic Matter Depletion	Compaction	Excess Nutrients in Groundwater	Excess Nutrients in Surface Water	Excessive Plant Pressure
5	Alternative #1	4/						
	Crop Residue Use 20%	+2	+1	+1	0	-1	2	0
	Terraces (Storage) Underground Outlet	+5 0	+3 0	0 0	-1 0	-1 0	0 0	0 0
	Contour Farming	+4	+2	+2	0	-1	+3	0
	Nutrient Management	0	0	+2	0	+5	+5	+1
	Integrated Pest Management	0	0	0	+1	+5	+5	+5
Meets Planning Criteria?		Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

2/ Enter identified resource concerns.

3/ Develop alternative systems by listing combinations of practices logically used to address an identified resource concern on a given land use.

4/ Express the effects of selected practices. Refer to CPPE matrix located in FOTG, Section V.

Effects on the **problem**:

- Substantial Improvement +5
- Moderate to Substantial Improvement +4
- Moderate Improvement +3
- Slight to Moderate Improvement +2
- Slight Improvement +1
- No Effect 0
- Slight Worsening -1
- Slight to Moderate Worsening -2
- Moderate Worsening -3
- Moderate to Substantial Worsening -4
- Substantial Worsening -5

600.73 Exhibit 4 – Relationship of the Planning Process and FOTG

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

Planning Process		**FOTG**
Step 4	Analyze Resource Data	Sections I, II, III, and V Reference Material Soils Information Guidance Documents Conservation Effects
Step 5	Formulate Alternatives	Sections II, III, IV, and V Soils Information Resource Management Systems Guidance Documents Conservation Practice Descriptions Conservation Effects
Step 6	Evaluate Alternatives	Sections I, II, III, IV, and V Conservation Practice Physical Effects (CPPE) Matrix Reference Material Soils Information Resource Management Systems Predictive Tools and Models Practice Standards Conservation Effects
Step 7	Make Decisions	Section V Conservation Effects
Step 8	Implement Plan	Section IV Practice Standards and Specifications
Step 9	Evaluate Plan	Sections I, II, III, IV, and V Conservation Effects Case Study Potential new data for some or all sections

600.74 Exhibit 5 – Relationship of the Planning Process and RMS Tools

Planning Process	Tools	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		Documentation of land uses, resources, resource considerations, resource concerns, practices, and site-specific effects

Planning Process	Tools	Actions
Phase II		
Step 5 Formulate Alternatives		Combining conservation practices into systems that adequately treat identified resource concerns
Step 6 Evaluate Alternatives	CPPE, System Effects Worksheet CED	Determination and display of the expected effects of options
Step 7 Make Decisions	CED	Use of the CED by the client to evaluate options and select desired option

Planning Process	Tools	Actions
Phase III		
Step 8 Implement Plan	N/A	N/A

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

600.75 Exhibit 6 – Resource Concerns and Planning Criteria

A. List of Resource Concerns

SOIL EROSION

- Sheet, Rill, & Wind Erosion
- Concentrated Flow Erosion (Classic Gully & Ephemeral Erosion)
- Excessive bank erosion from streams, shorelines, or water conveyance channels

SOIL QUALITY DEGRADATION

- Subsidence
- Compaction
- Organic Matter Depletion
- Concentration of Salts and other Chemicals

EXCESS / INSUFFICIENT WATER

- Ponding, Flooding, Seasonal High Water Table, Seeps, and Drifted Snow
- Inefficient Moisture Management
- Inefficient Use of Irrigation Water

WATER QUALITY DEGRADATION

- Excess Nutrients in surface and ground waters
- Pesticides transported to surface and ground waters
- Excess Pathogens and Chemicals from manure, bio-solids, or compost applications in surface waters and ground waters
- Excessive Salts in surface waters and ground waters
- Petroleum, Heavy metals, and other pollutants, transported to waters
- Excessive Sediment in surface waters
- Elevated Water Temperature

DEGRADED PLANT CONDITION

- Undesirable Plant Productivity and Health
- Inadequate Structure and Composition
- Excessive Plant Pest Pressure
- Wildfire Hazard, Excessive Biomass Accumulation

INADEQUATE HABITAT FOR FISH AND WILDLIFE

- Habitat Degradation (Food, Water, Cover/Shelter, and Habitat Continuity/Space)

LIVESTOCK PRODUCTION LIMITATION

- Inadequate Feed and Forage
- Inadequate Livestock Shelter
- Inadequate Livestock Water

AIR QUALITY IMPACTS

- Emissions of Particulate Matter (PM) and PM Precursors
- Emissions of Greenhouse Gases (GHGs)
- Emissions of Ozone Precursors
- Objectionable Odors

INEFFICIENT ENERGY USE

- Equipment and Facilities
- Farming/Ranching Practices and Field Operations

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Equipment and Facilities

Soil

Water

Air

Plants

Animals

Energy

Inefficient Use

Equipment and Facilities

Field Operations

INEFFICIENT ENERGY USE - Equipment and Facilities

The inefficient use of energy increases costs and dependence on non-renewable energy sources.

What is it?

Inefficient energy use occurs whenever facilities, equipment, or machinery operate more hours than needed to meet production goals. It may also occur when facilities, equipment, or machinery become worn out, outdated, or are poorly controlled or maintained.

Why is it important?

High energy prices have put considerable pressure on the U.S. economy. High input costs and the inability to set prices leave the agricultural sector with limited options to be economically viable. Reducing energy use helps our nation to be energy independent and reduces costs, helping producers stay competitive in the marketplace.

What can be done about it?

There are two ways to reduce energy related production costs: 1) increase energy efficiency of the operation and 2) increase use of energy sources produced on the farm. For increased energy efficiency, NRCS Energy Estimator and Assessment tools gauge potential energy savings for a wide variety of efficiency upgrades. If these tools show energy saving opportunities, or if there are concerns about energy use and cost, NRCS staff will likely recommend an energy audit. During an energy audit, energy experts evaluate the farming operation and recommend changes to improve energy use. Common recommendations include changes to lighting, ventilation, heating and cooling of livestock facilities, drying/curing, milk cooling, irrigation pumping, and manure handling. An energy analyst evaluates the age and condition of facilities, equipment, and machinery, and how they are operated and maintained. For on-farm renewable energy, the Energy tools provide a similar gauge of renewable energy resources. NRCS staff can help identify ways, for example, to better use solar and wind resources, take advantage of geothermal or micro-hydropower potential, and use waste for bio-energy to leverage increased efficiency efforts.

Equipment and Facilities at a Glance

Problems / Indicators - Unacceptably high energy costs	
Causes	**Solutions**
• Unvented, propane-fired heat poultry houses • Throttling valves to control water flow • Using incandescent or T12 lights	• Convert to radiant heating • Add a Variable Frequency Drive, and upgrade inefficient pump and/or motor • Upgrade to T8, LED, or CFL lighting

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Field Operations

Soil

Water

Air

Plants

Animals

Energy

Inefficient Use

Equipment and Facilities

Field Operations

INEFFICIENT ENERGY USE - Field Operations

The inefficient use of energy increases costs and dependence on non-renewable energy sources.

What is it?

Inefficient energy use occurs whenever equipment or machinery operates more hours than needed to meet production goals. It may also occur when equipment or machinery becomes worn out, outdated, or poorly controlled.

Why is it important?

High energy prices have put considerable pressure on the U.S. economy. High input costs and the inability to set prices leave the agricultural sector with limited options to be economically viable. Reducing energy use helps our nation to be energy independent and reduces costs, helping producers stay competitive in the marketplace.

What can be done about it?

Money can be saved and energy dependency can be reduced by improving the efficiency of field operations, and by adopting practices that help reduce energy-intensive inputs, such as soil amendments, fertilizers, or pesticides. For improved efficiency, Natural Resources Conservation Service (NRCS) staff will most likely start by evaluating field operations used to till, plant, cultivate, and harvest crops. This assessment helps identify steps to take to reduce field operations or improve efficiency. The NRCS Residue Management Energy Estimator tool can be used to estimate potential energy savings associated with changes in tillage, cultivation, and fertilizer use. By using a guidance system on tractors and equipment, application overlaps can be reduced and application rates can be optimized to account for variability in soil types, elevation, soil chemistry, fertility, and productivity within fields. These steps can reduce the need for fuel, fertilizer, herbicide, and insecticide, and save money. For reduced inputs, adoption of Integrated Pest Management techniques of prevention, avoidance, monitoring, and suppression can reduce pesticide and fuel use and lower environmental risk. Substituting manure for commercial fertilizer, or using nitrogen-fixing legumes as cover crops or in crop rotations can reduce the use of fossil fuel-based commercial fertilizer. Tractor operations are likely to increase, but usually money is saved. Overall energy use is lower because less natural gas will be used to produce commercial nitrogen fertilizer (that was not purchased).

Field Operations at a Glance

Problems / Indicators - Unacceptably high energy costs	
Causes	**Solutions**
• Unnecessary trips across the field • Overlap when applying fertilizer, pesticides • High use of commercial fertilizer	• Switch to conservation tillage • Use Global Positioning System guided spraying equipment • Incorporate nitrogen-fixing legumes into rotation or as cover crop

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Feed and Forage

LIVESTOCK PRODUCTION LIMITATION - Feed and Forage

Feed and forage quality or quantity is inadequate for nutritional needs and production goals of the kinds and classes of livestock.

What is it?

Livestock require five major classes of nutrients: energy, protein, minerals, vitamins, and water. All five are essential for normal health and production. Next to water, the greatest requirement is for energy, followed by protein, with minerals and vitamins needed in very small amounts. Without adequate energy from feed or forage, utilization of all other nutrients is impaired.

Why is it important?

Providing sufficient feed and forage helps to ensure animal health and performance. To sustain the resource base, it is critical to balance the required feed and kind of forage with the number and type of animals in the operation. Stocking rates must be adjusted and supplements provided, as needed, for livestock grazing pasture or rangeland. Improving animal feed and forage can improve livestock productivity and farm income.

What can be done about it?

Applying the principles of forage production for livestock requires an understanding of how plants interact with soil and climate, as well as understanding the nutritional needs of the animals. Prescribed Grazing is the management of grazing land to adjust intensity, frequency, timing, and duration of grazing and/or browsing to meet the desired objectives for the plant communities and the grazing and/or browsing animal. A proper system manages animal number, grazing distribution, and length and time of grazing periods to provide grazed plants sufficient recovery time for regrowth and plant health. Feed and forage balance sheets and forage growth curves are used to make decisions about stocking rates and timing of grazing rotations based on plant growth and animal demands. Fencing and placement of livestock water can facilitate proper grazing management. Conservation practices, such as Forage and Biomass Planting and Forage Harvest Management, provide guidance to improve the forage base to support the prescribed grazing system.

Feed and Forage at a Glance

Problems / Indicators - Feed and forage not adequate to support the livestock operation	
Causes	**Solutions**
• Insufficient livestock feed • Overstocking of livestock • Inadequate distribution of livestock grazing • Poor feed quality • Weed, insect, or disease problems	• Prescribed grazing systems • Adequate water distribution • Production of high quality feed and forage • Forage analysis for nutrient quantity and quality

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Livestock Shelter

LIVESTOCK PRODUCTION LIMITATION - Livestock Shelter

Livestock lack adequate shelter from climatic conditions to maintain health or production goals.

What is it?

Natural vegetation or landscape features are not adequate to provide shelter for livestock during periods of severe climatic circumstances.

Why is it important?

Livestock performance is reduced during periods of high heat or extreme cold weather. Providing sufficient shelter to offset these climatic conditions can be beneficial to animal performance and health. Without adequate upland shelter, livestock may seek shelter in low-lying areas, such as streams, which may cause riparian area deterioration and/or water quality issues.

What can be done about it?

Shelters or windbreaks can be provided using natural vegetation or constructed sanctuaries to give animals sufficient protection from harsh climatic conditions. When livestock shelter is constructed or planted with ample buffer distances from riparian areas or water bodies, and in locations not susceptible to runoff and erosion, environmental risks associated with livestock concentration are minimized. Further, use of portable structures that are periodically moved helps prevent areas of heavy use and increased erosion possibilities.

Livestock Shelter at a Glance

Problems / Indicators - Vegetative, landscape, and/or structural options for livestock shelter do not exist; livestock are exposed to severe climatic conditions	
Causes	**Solutions**
• Exposure to extreme wind and cold in system that supports tree growth • Historical shelterbelt is partially functioning • Exposure to extreme wind and cold in area where plant options are limited or temporary shelter is preferred	• Permanent windbreak establishment using native or naturally occurring plant materials • Renovate partially existing shelter belt • Portable season-long fabricated shelter

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

ANIMALS

Livestock Water

LIVESTOCK PRODUCTION LIMITATION - Livestock Water

Quantity, quality, and/or distribution of drinking water are insufficient to maintain health or production goals for the kinds and classes of livestock.

What is it?

Water is an important but often overlooked nutrient for livestock. Water makes up over 98 percent of all molecules in the body and is necessary for regulation of body temperature, growth, reproduction, lactation, digestion, lubrication of joints, eyesight, and as a cleansing agent. Livestock water requirements are influenced by several factors, including rate of gain, pregnancy, lactation, activity, type of diet, feed intake, and environmental temperature.

Why is it important?

Water quality for livestock consumption can be detrimental based on several parameters, such as nitrates, sulfates, salinity, bacteria, pH, pesticides, and total dissolved solids. Water quantity and distribution of suitable water sources can affect livestock based on the basic need to meet daily intake requirements and issues related to grazing patterns and travel distance to water that may result in surplus/deficient forage availability and excessive/insufficient plant utilization. All of these ultimately affect livestock health and resource stability.

What can be done about it?

Water quality concerns, for both livestock health and the environment, can be addressed by limiting livestock access to ponds and water bodies or by installing watering facilities. Proper layout of water facilities will provide more even distribution of grazing that will enhance forage utilization. Animals do not graze or utilize areas that are remote from water sources and the size of the facility should be designed to avoid crowding. Having watering sites as evenly distributed as possible in a grazing system will help circumvent overused or underused areas of the pasture.

Livestock Water at a Glance

Problems / Indicators - Lack of water, poor water quality, poor distribution can affect livestock health	
Causes	**Solutions**
• Water availability is limited • Spring area trampled by livestock • Livestock in stream or pond creating potential health concerns	• Inventory, evaluate, and plan watering system for livestock type • Develop spring for livestock water and outlet for wet area for native plants and wildlife • Establish select watering points and construct watering facilities to move livestock away from streams and ponds

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Plant Pests

DEGRADED PLANT CONDITION - Plant Pests

Excessive pest damage to plants including that from undesired plants, diseases, animals, soil borne pathogens, and nematodes.

What is it?

Plants provide food for many forms of life. Human beings and grazing animals depend on plants for food. It is important to note that large numbers of other much smaller creatures, such as insects and their larvae, also feed on plants. Other plants, fungi, bacteria, and viruses use plants as a host during part of their life cycle. Generally, these interactions are normal, predictable, and benign. However, we apply the term "pest" to any animal, insect, bacteria, or virus when any of these interactions become unbalanced and unacceptable plant damage results. Pests can also take the form of any organism that competes for space, nutrients, or water (e.g., weeds). Pests can vary from place to place, crop to crop, year to year.

Why is it important?

For plants to produce the expected yield, preferred products, or desired environmental outcomes, they must be protected from unchecked animal, weed, insect, and disease pests.

What can be done about it?

Management is the key to keeping damage from plant pests within tolerable limits. Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. Set Thresholds - Before taking any pest control action, set a point at which pest populations or environmental conditions indicate that pest control action must be taken. Monitor and Identify Pests - Not all insects, weeds, and other living organisms require control. Identify pests accurately so appropriate control decisions can be made in conjunction with action thresholds. Prevention - As a first line of pest control, manage to prevent pests from becoming a threat. Rotate crops and select pest-resistant varieties. Control - If pest control is required, evaluate control methods for effectiveness and risk. Use less risky pest controls first, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then employ additional pest control methods such as targeted spraying of pesticides. Use broadcast spraying of non-specific pesticides only as a last resort.

Plant Pests at a Glance

Problems / Indicators - Animal, insect, and/or disease damage, or competition from common weeds or invasive plants substantially reduces yield or growth	
Causes	**Solutions**
• Plants suffer from attacks by pests or disease • Weeds or invasive plants out compete desired crop	• Use Integrated Pest Management to employ early detection, avoidance, and treatment of pests • Consider brush management, vegetative weed control, mulching, or prescribed grazing or burning

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Plant Productivity and Health

PLANTS

Soil

Water

Air

Plants

- Degraded Plant Condition
  - Plant Productivity and Health
  - Structure and Composition
  - Plant Pests
  - Wildfire Hazard

Animals

Energy

DEGRADED PLANT CONDITION - Plant Productivity and Health

Plant productivity, vigor and/or quality negatively impacts other resources or does not meet yield potential due to improper fertility, management or plants not adapted to site.

What is it?

Plants established in the wrong climate or soil may be under stress and may never thrive, no matter how much fertilizer or water you supply. Natural events, such as drought, or mismanagement can cause plant stress. Plants under stress are more susceptible to disease and insect damage. Symptoms of poor plant vigor and health may include slow growth, discoloration of leaves, wilting or drooping of foliage, leaf drop, leaves covered with a sticky substance, and/or brown colored roots.

Why is it important?

For plants to produce the expected yield, preferred products, or desired environmental outcomes they must be adapted to the site on which they are growing, provided with the appropriate amounts of nutrients, water, and sunshine, and protected from unchecked animal, weed, insect, and disease pests.

What can be done about it?

Management is the key to maintaining plant productivity and health. Check that the desired plant is suited to the climate and soil type. Set realistic yield goals based on soil productivity information, historical yield data, climatic conditions, level of management, and/or local research on similar soil and cropping systems. The NRCS Web Soil Survey (http://websoilsurvey.nrcs.usda.gov) is an excellent source for information about soils and their limitations for growing various crops. University Extension agents are a great resource for learning about the nutritional, cultural, and management practices needed to keep plants healthy and productive. The Nutrient Management practice will specify the amount, timing, and method of application of nutrients needed to achieve realistic production goals. The Integrated Pest Management practice will specify techniques to detect, avoid, and treat pests and diseases. Some causes of poor health and vigor may require the use of cover crops, the adoption of new crop rotations, or changes to tillage methods to address soil quality issues, such as soil compaction, poor drainage, low organic matter, or the presence of contaminants in the soil.

Plant Productivity and Health at a Glance

Problems / Indicators - Yield or growth is substantially less than expected, plants are disease and/or pest-ridden, plants fail to thrive	
Causes	**Solutions**
• Plants receive inadequate nutrition during critical growth periods • Plants fail to thrive due to poor soil conditions • Plants wilt, freeze or rot even during normal climate conditions	• Use nutrient management to address the form, rate, placement, and timing of nutrient application • Consider crop rotations, deep rooted cover crops, drainage, and deep tillage • Consider alternate crops or different plant varieties

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Structure and Composition

DEGRADED PLANT CONDITION - Structure and Composition

Plant communities have insufficient composition and structure to achieve ecological functions and management objectives. Inadequate structure and composition also includes degradation of wetland habitat, targeted ecosystems, or unique plant communities.

What is it?

A stand of plants and associated organisms (bacteria, fungi, animals) that share a defined area or environment lack the diversity, density, distribution patterns, and three-dimensional structure necessary to produce the preferred products or desired environmental outcomes.

Why is it important?

If landowners hope to achieve their production or environmental objectives, it is critical that they understand and work with the processes that affect structure and composition of plant communities. The interaction between plants, other organisms, and environmental factors such as soil, climate, and topography influence how a plant community functions to cycle nutrients, capture and release water, protect and build soil, nurture wildlife, or produce useable products.

What can be done about it?

Addressing inadequate structure and composition is a complex problem that varies with the natural plant community that is desired. All human activities have the potential to impact natural communities, whether it is land use changes, drainage activities, controlling fires, or the introduction of different animal and plant species. Activities can include removal of unwanted plants to provide more space for desired species to increase in number or size. Desired plants can be reintroduced that are missing from the community. Practices such as grazing, mowing, fertilization, and burning can be used to promote and/or repress growth of target plants to attain the desired structure and composition.

Structure and Composition at a Glance

Problems / Indicators - Inadequate structure and composition	
Causes	**Solutions**
• Stress, disease and/or mismanagement reduces and/or eliminates key components of plant community • Plant community is allowed to grow to late succession stage and fails to produce desired habitat for wildlife and/or insects that depend on early succession habitat • Invasive species outcompete desired plants creating a monoculture • Loss of fire regime	• Employ or modify use of cultural practices (e.g., grazing, burning, mowing) • Treat or remove vegetation to reestablish early seral stage habitat • Exterminate invasive species, reestablish desired plant community, and utilize integrated pest management techniques to maintain stand

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

PLANTS

Wildfire Hazard

DEGRADED PLANT CONDITION - Wildfire Hazard

Accumulated plant residue (biomass) creates wildfire hazards that pose risks to human safety, structures, plants, animals, and air resources.

What is it?

All plants produce litter from leaves, stalks, or stems. Normally, this residue is either left to decompose and nourish the next generation of plants and animals, or it is harvested and used for straw, mulch, bio-fuel, pulp, etc. When the rate of utilization and/or decomposition is slower than the rate of biomass production, residues can accumulate to the point of becoming a fire hazard.

Why is it important?

While fire is an important and often beneficial part of the natural ecosystem, uncontrolled or "wild" fire poses a threat to life, health, and property. In addition, the secondary effects of wildfires, including erosion, landslides, introduction of invasive species, and changes in water quality, are often more disastrous than the fire itself.

What can be done about it?

The amount of flammable biomass can be reduced to decrease the incidence of wildfires; the distribution of biomass can be manipulated to influence the direction and rate at which wildfires spread; and precautionary steps can be taken to protect life and property to lessen the impacts of wildfires.

Wildfire Hazard at a Glance

Problems / Indicators - Excess biomass, biomass distribution, lack of preparedness	
Causes	**Solutions**

• Overstocked forest increases the risk of fire outbreak
• Unbroken expanse of flammable biomass increases the risk of the spread of fire
• Lack of a plan on how to respond to fire increases risk to life and property
	• Thin excess trees and brush
	• Treat or remove vegetation, debris, and detritus
	• Create and implement a wildfire plan:
	  • post fire control agency phone numbers
	  • locate and map water sources
	  • map out evacuation routes
	  • equip vehicles with fire fighting tools

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Concentrated Flow Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

Shoreline, Bank and Channel Erosion

Soil Quality Degradation

Water

Air

Plants

Animals

Energy

SOIL EROSION - Concentrated Flow Erosion

Untreated classic gullies may enlarge progressively by head cutting and/or lateral widening. Ephemeral gullies occur in the same flow area and are obscured by tillage. This includes concentrated flow erosion caused by runoff from rainfall, snowmelt, or irrigation water.

What is it?

Ephemeral and classic gully are forms of erosion created by the concentrated flow of water. They are easily identified through visual observation. An ephemeral cropland gully is larger than a rill and smaller than a classic gully. They usually result from the junction of rills that form a dendritic (branching or tree-like) pattern of channels. Ephemeral gullies usually appear on cultivated fields during the planting or growing season, but are temporarily removed by cultivation. Ephemeral gullies can reappear at or near the same location on a yearly basis because the surface topography of the field does not change appreciably. Classic gully erosion generally occurs in well defined drainage ways and generally is not obliterated by tillage. In some situations, headcuts are present and aid in advancing the gully upstream.

Why is it important?

Concentrated flow erosion removes surface soil, which often has the highest biological activity and most soil organic matter. Nutrients removed by erosion are no longer available to support plant growth on-site, and when they accumulate in water, algal blooms, lake eutrophication, and high dissolved oxygen levels can occur. Deposition of eroded materials can obstruct roadways and fill drainage channels. Gullies can impact farm operations by creating barriers that change traffic patterns and create hazards that can damage farm equipment.

What can be done about it?

Ephemeral erosion can be controlled using a conservation cropping system that includes residue management. High residue crops and maintaining soil cover throughout the year are effective means for controlling ephemeral erosion and aid in the control of classic gully erosion. Gully formations can be difficult to control if remedial measures are not designed and properly constructed. Correcting concentrated flow erosion involves mitigating the damage and addressing the cause. The cause of increased water flow across the landscape must be considered and the corrective action usually requires a system of conservation practices. Conservation tillage and cropping practices that increase water infiltration into the soil result in less runoff and protect land from erosion.

Concentrated Flow Erosion at a Glance

Problems / Indicators - Branching or tree-like pattern of rills, gullies, headcuts	
Causes	Solutions
• Bare or unprotected soil • Excess runoff • Inadequate outlet for water	• Residue Management • Cover Crops • Terraces • Grassed Waterway • Grade Stabilization Structure • Lined Waterway or Outlet • Water and Sediment Control Basin

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Sheet, Rill and Wind Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

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SOIL EROSION - Sheet, Rill and Wind Erosion

Detachment and transportation of soil particles caused by rainfall runoff/splash, irrigation runoff, or wind that degrades soil quality.

What is it?

Wind or water erosion is the physical wearing of the earth's surface. Erosion is not always readily visible, even when soil loss exceeds unsustainable levels. Symptoms of soil erosion by water may be identified by small rills and channels on the soil surface, soil deposited at the base of slopes, sediment in streams, lakes, and reservoirs, and pedestals of soil supporting pebbles and plant material. Water erosion is most obvious on steep, convex landscape positions. Symptoms of wind erosion may be identified by dust clouds, soil accumulation along fence lines or snowbanks, and a drifted appearance of the soil surface.

Why is it important?

Erosion removes surface soil material (topsoil), reduces levels of soil organic matter, and contributes to the breakdown of soil structure. This creates a less favorable environment for plant growth. Loss of only 1/32 of an inch can represent a 5 ton/acre soil loss. In soils that have restrictions to root growth, erosion decreases rooting depth, which decreases the amount of water, air, and nutrients available to plants. Erosion removes surface soil, which often has the highest biological activity and greatest amount of soil organic matter. Nutrients removed by erosion are no longer available to support plant growth on-site, and when they accumulate in water, algal blooms, lake eutrophication, and high dissolved oxygen levels can occur. Deposition of eroded materials can obstruct roadways and fill drainage channels. Blowing dust can affect human health and create public safety hazards.

What can be done about it?

Soil erosion can be avoided by maintaining a protective cover on the soil and modifying the landscape to control runoff amounts and rates. To avoid water erosion, include high residue, perennial, and sod crops in the cropping system, grow cover crops, manage crop residues, and shorten the length and steepness of slopes. To avoid wind erosion, keep soil covered with plants or residue, plant windbreaks, use stripcropping, increase surface roughness, cultivate on the contour, and maintain soil aggregates at a size less likely to be carried by wind.

Sheet, Rill and Wind Erosion at a Glance

Problems / Indicators - Changes in soil horizon thickness, soil deposition in fields and water, and decreased organic matter	
Causes	**Solutions**
• Bare or unprotected soil • Long and steep slopes • Intense rainfall or irrigation events when residue cover is at a minimum • Decreased infiltration by compaction	• Residue Management • Crop Rotation • Cover Crops • Terraces • Contour Farming • Stripcropping • Windbreaks

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Shoreline, Bank and Channel Erosion

SOIL

Soil

Soil Erosion

Sheet, Rill and Wind Erosion

Concentrated Flow Erosion

Shoreline, Bank and Channel Erosion

Soil Quality Degradation

Water

Air

Plants

Animals

Energy

SOIL EROSION - Shoreline, Bank and Channel Erosion

Sediment from banks, shorelines or conveyance channels threatens to degrade water quality and limit use for intended purposes.

What is it?

Stream stability is an active process, and while streambank erosion is a natural part of this process, it is often accelerated by altering the stream system. Streambank erosion is that part of channel erosion in which material is eroded from the streambank and deposited at the base of the slope or in the channel. Streambank erosion is usually associated with erosion of the streambed. It occurs along perennial, intermittent, and ephemeral streams.

Why is it important?

The benefits of proper streambank stabilization go far beyond preventing loss of land and keeping sediment out of streams. Streambank erosion increases sediment in the stream degrading water quality and resulting in the loss of fertile bottomland. The quality of wildlife habitat is impacted both on land and in the stream. Streambank erosion increases the stream's sediment load and changes its shape and function. When this happens the stream loses its ability to transport sediment which causes it to become wide and shallow. The stream channel can become braided, quality habitat is lost and the increased sediment can reduce overall biological productivity.

What can be done about it?

Determining the cause of accelerated streambank erosion is the first step in solving the problem. Development in the watershed often alters the stream equilibrium by changing rainfall-runoff relationships. Many of the traditional methods of dealing with streambank erosion, such as rock revetments, are expensive to install and maintain. While hard solutions are often needed to protect infrastructure, these treatments may solve the problem at the expense of habitat and stream corridor aesthetics. There are some promising developments in the area of streambank stabilization and stream restoration. Greener and more natural treatment alternatives are being more widely adopted. Soil bioengineering practices, native material revetments, combinations of rock and vegetation, and in-stream structures help to stabilize eroding banks. These techniques can be used to move a stream toward a healthy, stable and self-maintaining system.

Shoreline, Bank and Channel Erosion at a Glance

Problems / Indicators - Eroding Banks, degrading streambed, and manipulated stream channels	
Causes	**Solutions**
• Increased runoff due to land use changes in the watershed • Eroding or unstable streambanks • Exposed tree roots along banks • Large runoff events • Degraded riparian areas • Uncontrolled livestock access	• Bank armor and protection • Soil bioengineering practices • In-stream structures • Native material revetments • Riparian areas with native or locally adapted vegetation • Control livestock access to the water bodies

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Natural Resources Conservation Service

Resource Concerns

SOIL Compaction

SOIL QUALITY DEGRADATION - Compaction

Management induced soil compaction resulting in decreased rooting depth that reduces plant growth, animal habitat and soil biological activity.

What is it?

Compaction occurs when soil particles are pressed together, reducing pore space between the particles and pushing out the air normally located there. It is manifested as an increase in bulk density. A severely compacted soil can become effectively impermeable. Soils are either naturally compacted (heavy, clay soil) or compaction is caused by management activities. Compaction is assessed using measurements of bulk density, penetration resistance, porosity, and root growth patterns.

Why is it important?

Compaction reflects the soil's ability to function for structural support, water and solute movement, and soil aeration. It may cause restrictions to root growth, and poor movement of air and water through the soil. Compaction can result in shallow plant rooting and poor plant growth, influencing crop yield and reducing vegetative cover available to protect soil from erosion. By reducing water infiltration into the soil, compaction can lead to increased runoff and erosion from sloping land or waterlogged soils in flatter areas. In general, some soil compaction to restrict water movement through the soil profile is beneficial under arid conditions, but under humid conditions compaction decreases yields.

What can be done about it?

Long-term solutions to soil compaction problems revolve around decreasing soil disturbance and increasing soil organic matter. A system that uses cover crops, crop residues, perennial sod, and/or reduced tillage results in increased soil organic matter, less disturbance and reduced bulk density. Additionally, the use of multi-crop systems involving plants with different rooting depths can help break up compacted soil layers. Grazing systems that minimize livestock traffic and loafing, provide protected heavy use areas, and adhere to recommended minimum grazing heights reduce bulk density by preventing compaction and providing soil cover.

Compaction at a Glance

Problems / Indicators - Bulk density, penetration resistance, porosity, root growth patterns	
Causes	**Solutions**
• Working wet soil • Excess traffic, machinery or livestock • Heavy machinery • Repeated tillage at same depth • Poor aggregation • Low organic matter	• Avoid working wet soil • Reduce traffic/tillage operations, rotate • Use controlled traffic patterns • Subsoil or rip compacted areas • Diversify cropping system • Use conservation tillage • Grow cover crops • Add animal manures • Use non-compacting tillage

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Natural Resources Conservation Service

Resource Concerns

SOIL Organic Matter

SOIL QUALITY DEGRADATION - Organic Matter

Soil organic matter is not adequate to provide a suitable medium for plant growth, animal habitat, and soil biological activity.

What is it?

Soil organic matter is carbon-rich material that includes plant, animal, and microbial residue in various stages of decomposition. Live soil organisms and plant roots are part of the carbon pool in soil but are not considered soil organic matter until they die and begin to decay. The quantity and composition of soil organic matter vary significantly among major ecosystems. Soil in arid, semiarid, and hot, humid regions commonly has less organic matter than soil in other environments.

Why is it important?

Many soil properties impact soil quality, but organic matter deserves special attention. It affects several critical soil functions, can be manipulated by land management practices, and is important in most agricultural settings across the country. Because organic matter improves soil structure and enhances water and nutrient holding capacity, managing for soil carbon can enhance soil productivity and environmental quality, and it can reduce the severity and costs of natural phenomena, such as drought, flood, and disease. In addition, increasing soil organic matter levels can reduce atmospheric CO_2 levels that contribute to climate change, and improved soil quality reduces dust, allergens, and pathogens in the air. Ground and surface water quality improve because better structure, infiltration, and biological activity make soil a more effective filter. For example, organic matter may bind pesticides, making them less active.

What can be done about it?

The most practical way to enhance soil quality, and as a result air and water quality, is to promote better management of soil organic matter or carbon. Practices that increase organic matter include: leaving crop residues in the field, choosing crop rotations that include high residue plants, using optimal nutrient and water management practices to grow healthy plants with large amounts of roots and residue, growing cover crops, applying manure or compost, using low or no tillage systems, and mulching.

Organic Matter at a Glance

Problems / Indicators - Compaction, slaking, soil crusting, crop moisture stress, poor soil structure	
Causes	**Solutions**
• Soil disturbance • Intensive tillage systems • Low crop biomass (surface and subsurface) • Burning, harvesting or otherwise removing crop residues	• Diverse, high biomass crop rotations • Cover crops • Reduced tillage • Rotational or prescribed grazing • Perennials in rotations • Maintain crop residues on soil surface • Use of animal manure and compost • Water table management

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Salts and Chemicals

SOIL

Soil

Soil Erosion

Soil Quality Degradation

Subsidence

Compaction

Organic Matter

Salts and Chemicals

Water

Air

Plants

Animals

Energy

SOIL QUALITY DEGRADATION - Salts and Chemicals

Concentration of salts leading to salinity and/or sodicity reducing productivity or limiting desired use. The resource concern is also applicable to concentrations of other chemicals impacting productivity or limiting desired use.

What is it?

Salinity is a process by which water-soluble salts accumulate in the soil. Saline soils are indicative of inadequate drainage to leach salts from the soil or upward migration of salt from shallow ground water. Sodic soils are high in sodium relative to concentrations of calcium and magnesium. Salinity or sodicity occurs naturally or may result from management practices. Soil formed on parent material high in salts, such as marine deposits, and with inadequate drainage, will be high in salts. Fertilizers, soil amendments (gypsum, lime), and manure may contribute to salinity problems, as well. Applications of saline and/or sodic water without adequate leaching or in the presence of a high water table will increase soil electrical conductivity over time, eventually resulting in saline soil. Soils can also become saline through the process of saline seeps.

Why is it important?

Since few plants grow well on saline/sodic soils, cropping options on these soils may be limited. Salts in the soil can negatively affect water uptake by plants, and saline soils tend to inhibit germination and plant emergence. Growth patterns in cropped fields can be poor, with spotty stand establishment. Under severe salt stress, herbaceous crops appear bluish-green. Leaf tip burn and die-off of older leaves in cereal grains can result from salinity or related drought stress. Salinization degrades the quality of shallow ground water and surface water resources, such as ponds, sloughs, and dugouts.

What can be done about it?

Reducing the severity and extent of soil salinity is accomplished primarily with recharge and discharge water management. Recharge management is used on areas that contribute excess water to the soil and includes decreasing infiltration of excess saline/sodic water and irrigation to maintain salts at a level below the root zone. Discharge management is used on areas where excess water comes to the soil surface and includes growing salt tolerant crops, reducing deep tillage and eliminating seepage.

Salts and Chemicals at a Glance

Problems / Indicators - White crusting of soil, irregular crop growth, and lack of plant vigor	
Causes	**Solutions**
• Naturally occurring in soils with high concentrations of soluble salts, e.g., sodium, calcium, and magnesium sulfates • Inadequate drainage to leach salt from the soil • Upward migration of salt from shallow ground water • Application of saline and/or sodic water	• Proper use of irrigation water • Use of salt-tolerant crops • Removal of excess water from recharge areas • Maintenance of the water table at safe levels • Use of cropping and tillage systems that promote adequate infiltration and permeability • Reducing deep tillage

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Natural Resources Conservation Service

Resource Concerns

SOIL Subsidence

SOIL QUALITY DEGRADATION - Subsidence

Loss of volume and depth of organic soils due to oxidation caused by above normal microbial activity resulting from excessive water drainage, soil disturbance, or extended drought. This excludes karst / sinkholes issues or depressions caused by underground activities.

What is it?

Subsidence is a gradual lowering of the surface elevation of an organic soil, or a reduction in the thickness of organic matter. Organic soils (Histosols) are those that are predominantly organic soil materials. They are commonly called bogs, moors, or peats and mucks. The most important cause of organic soil subsidence is a process commonly termed "oxidation." A high water table creates anaerobic conditions that slow the breakdown of organic materials. The balance between accumulation and decomposition of organic material shifts dramatically when soil is drained. Oxidation under aerobic conditions converts the organic carbon in the plant tissue to carbon dioxide gas and water. Aerobic decomposition under drained conditions is much more efficient thereby causing the loss of organic matter.

Why is it important?

Soil subsidence is usually irreversible. The natural rate of accumulation of organic soil is on the order of a few inches per 100 years; the rate of loss of drained organic soil can be 100 times greater, up to a few inches per year in extreme cases. Thus, deposits that have accumulated over hundreds of years can disappear relatively quickly in response to human activity. In time, the remaining organic material becomes diluted through the incorporation of the organic layer into the mineral subsoil. This reduces the productivity of the soil.

What can be done about it?

Once oxidation depletes the organic matter, it generally cannot be restored. The oxidation rate of organic matter can be minimized by managing water table levels to reduce aeration. In non-crop situations, keep the water table as close to the soil surface as possible. During the cropping season, maintain the water table at the optimum level for the crop being grown. Use cover crops to keep the soil covered and to return organic matter to the soil.

Subsidence at a Glance

Problems / Indicators - Loss of volume and depth of organic soils	
Causes	**Solutions**
• Drainage • Cultivation / Soil disturbance	• Water table management • Diverse, high biomass crop rotations • Cover crops • Reduced tillage • Perennials in rotations

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER Nutrients

WATER QUALITY DEGRADATION - Nutrients

Nutrients (organics and inorganics) are transported to receiving waters through surface runoff and/or leaching into shallow ground waters in quantities that degrade water quality and limit use for intended purposes.

What is it?

Water bodies require nutrients, such as nitrogen and phosphorus, to be healthy, but too many nutrients can be harmful. Many of our nation's waters, including streams, rivers, wetlands, estuaries, and coastal waters, are affected by excess nutrients. The effect of nutrients for a given water body depends on its ecoregion and the source of nutrients.

Why is it important?

High levels of nitrogen and phosphorus in waters can produce harmful algal blooms. In turn, these blooms can produce "dead zones" in water bodies where dissolved oxygen levels are so low that most aquatic life cannot survive. This condition in water bodies is referred to as hypoxia.

What can be done about it?

Management is the key to protecting water quality from excess nutrients. Nutrient management shall specify the source, amount, timing and method of application of nutrients on each field to achieve realistic production goals, while minimizing movement of nutrients and other potential contaminants to surface and/or ground waters. Realistic yield goals shall be established based on soil productivity information, historical yield data, climatic conditions, level of management and/or local research on similar soil, cropping systems, and soil and manure/organic by-products tests. Areas contained within established minimum application setbacks (e.g., sinkholes, wells, or rapidly permeable soil areas) should not receive direct application of nutrients. Nutrients may also be lost due to erosion, runoff, irrigation and drainage, so applicable practices should be installed to address these concerns.

Nutrients at a Glance

Problems / Indicators - Algae blooms, mass death of fish or aquatic organisms, dissolved oxygen concentrations, hypoxia	
Causes	**Solutions**
• Overusing fertilizer (both residential and agricultural usage) • Erosion of nutrient-laden soil • Rainfall flowing over cropland, animal feeding operations and pastures, picking up animal waste and depositing it in water bodies • Low organic matter	• Use nutrient management to address the form, rate, placement and timing of nutrient application • Grow cover crops • Use crop rotations • Increase crop diversity

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER Pathogens

WATER QUALITY DEGRADATION - Pathogens

Pathogens, pharmaceuticals, and other chemicals are carried by soil amendments that are applied to the land and are subsequently transported to receiving waters in quantities that degrade water quality and limit use for intended purposes. This resource concern also includes the off-site transport of leachate and runoff from compost or other organic materials of animal origin.

What is it?

Many potential pathogens (disease-causing microorganisms) can be found in manure. These pathogens include bacteria, protozoa, and viruses. If effected soil amendments are not adequately treated and contained, pathogens may enter ground or surface water posing a potential risk to human and animal health.

Why is it important?

Pathogens can be transmitted to humans directly through contact with animals and animal waste or indirectly through contaminated water or food. Human illness and death has resulted from exposure to pathogens from livestock and poultry manure. Pathogens can also be transmitted to domestic and wild animals with similar results.

What can be done about it?

The most effective tool in eliminating pathogens from manure, from both practical and economic standpoints, is time. If manure is allowed to sit undisturbed in storage or in soil, the concentration of pathogens will decrease with time as they die off or are overgrown by native microbes. Managing manure for pathogens is approached in two phases: 1) collection and storage and 2) land treatment. In the collection and storage of manure, pathogens can be addressed by biological control (composting, anaerobic digesters, etc.), chemical methods, and control of runoff and leaching. It is also important to manage livestock access to streams, rivers and water bodies. Land application is commonly a critical process in manure management. Pathogens from manure can threaten humans who are exposed to runoff, have direct contact with manure, or consume food or water contaminated with manure. Application rate and seasonal conditions are important factors contributing to the transfer of pathogens from lands where manure has recently been applied to nearby surface water. Managing the rate, timing and method of application of manure are critical elements in managing for pathogens. Keeping a buffer zone or setback distance between manure application areas and water bodies is a common practice that greatly decreases the transport of pathogens to those water bodies.

Pathogens at a Glance

Problems / Indicators - Storage, handling, and application of manure, bio-solids, or compost	
Causes	**Solutions**
• Collection, handling and storage of manure • Land application of manure	• Biological treatment (anaerobic storage, composting, anaerobic digesters) • Vegetative filter strips, setbacks and buffer zones • Managing livestock access to water • Managing the rate, timing, and method of application of manure

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER

Salts

WATER QUALITY DEGRADATION - Salts

Irrigation or rainfall runoff transports salts to receiving waters in quantities that degrade water quality and limit use for intended purposes.

What is it?

Salinity is a process by which water-soluble salts accumulate in the soil and water. Nearly all waters contain dissolved salts and trace elements, many of which result from the natural weathering of the earth's surface. In addition, drainage waters from irrigated lands and effluent from city sewage and industrial waste water can impact water quality. In most irrigation situations, the primary water quality concern is salinity levels since salts can affect both the soil structure and crop yield. Most salinity problems in agriculture result directly from the salts carried in irrigation water.

Why is it important?

Salinity increases the cost of treating water for drinking, reduces the availability of water for irrigation, and renders farmland useless, costing the economy millions each year. Salinity is an ecological factor, influencing the types of organisms that live in a body of water. It influences the kinds of plants that will grow either in a water body, or on land fed by irrigation water or groundwater. If water containing too much salt is applied during irrigation, salt tends to build up in the soil, reducing the amount of water available to plants. Salts in the soil increase the efforts by plant roots to take in water and can make water unavailable to plants at higher salt levels. Few plants grow well on saline soils; often restricting options for cropping in a given land area.

What can be done about it?

Salinity as a water quality issue is addressed through soil management activities. Reducing the severity and extent of salinity is accomplished primarily with recharge and discharge water management. Recharge management is used on areas that contribute excess water to the soil and includes decreasing infiltration of excess saline water and irrigation to maintain salts at a level below the root zone. Discharge management is used on areas where excess water comes to the soil surface and includes growing salt tolerant crops, reducing deep tillage and eliminating seepage.

Salts at a Glance

Problems / Indicators - White crusting of soil, irregular crop growth, and lack of plant vigor	
Causes	**Solutions**
• Naturally occurring in soils with concentrations of soluble salts, such as sulfates of sodium, calcium, and magnesium in the soil • Inadequate drainage to leach salt from the soil • Upward migration of salt from shallow ground water • Application of saline water	• Proper use of irrigation water • Use of salt-tolerant crops • Removal of excess water from recharge areas • Maintain the water table at a safe levels • Use cropping and tillage systems that promote adequate infiltration and permeability • Reducing deep tillage

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

WATER Sediment

WATER QUALITY DEGRADATION - Sediment

Off-site transport of sediment from sheet, rill, gully, and wind erosion into surface water that threatens to degrade surface water quality and limit use for intended purposes.

What is it?

Wind or water erosion is the physical and chemical wearing of the earth's surface and is a natural ecosystem process. Problems arise when excess fine sediment enters surface water at rates and volumes greater than under natural conditions, resulting in turbidity and sedimentation. Typically, erosion related to human activities generates excessive sediment and should be controlled to acceptable levels.

Why is it important?

Sediment can have a significant impact on water quality and aquatic habitat. Not only does sediment carry nutrients and pesticides that can negatively impact water quality, but the physical characteristics of sediment can clog stream channels, silt in reservoirs, cover fish spawning grounds, and reduce downstream water quality. Sediment makes the water more turbid and restricts light penetration into the water, which impacts the ability of aquatic plants to perform photosynthesis. Suspended sediments can clog the gills of aquatic organisms and cause death. Sediment build up on the stream bottom can lead to the suffocation of fish eggs and macro invertebrates and impact natural spawning. Additionally, with an increased amount of particles in the water, dissolved oxygen levels may be reduced due to elevated water temperatures. Excessive sediment also impacts coastal area water quality as it can smother and kill coral tissue and reduces light levels and food supplied to the coral by symbiotic algae.

What can be done about it?

The issue of excessive sediments for water quality is managed by addressing the source and/or transport of soil. Controlling the source of soil erosion involves maintaining a protective cover on the soil and modifying the landscape to control runoff amounts and rates. Specific practices include growing perennial crops in rotation or as permanent cover, growing cover crops, managing crop residue, shortening the length and steepness of slopes, and increasing water infiltration rates. Controlling the transport of soil into water bodies involves buffers and edge of field treatments. Specific practices include grassed waterways, field borders, filter strips, and riparian forest/herbaceous buffers.

Sediment at a Glance

Problems / Indicators - Cloudy or muddy water, stream/water body soil deposition	
Causes	**Solutions**
• Bare or unprotected soil • long and steep slopes, • Intense rainfall or irrigation events when residue cover is at a minimum, • Decreased infiltration by compaction	• Residue management • Crop rotations with high biomass crops • Cover crops • Terraces • Strip Cropping • Windbreaks • Buffers and filter strips to address the transport of sediment

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Elevated Water Temperature

WATER QUALITY DEGRADATION - Elevated Water Temperature

Surface water temperatures exceed State/Federal standards and/or limit use for intended purposes.

What is it?

Temperature has an important influence on water chemistry. As water temperature rises, there is a corresponding decrease in the availability of oxygen, carbon dioxide, and other gases important to aquatic life. Elevated water temperature also results in increases of dissolved minerals that can further degrade water quality. In some areas, Federal and/or State law regulate the temperature of surface water.

Why is it important?

Water temperature has extremely important ecological consequences. The metabolic rate of organisms rises with increasing water temperatures, resulting in increased oxygen demand. This is coupled with the reduced amount of oxygen that is available as the water temperature increases. During extended periods of warming, water may lose its potential to support healthy populations of fish and other aquatic organisms and may even kill desired species or lead to a change in species diversity. Warm water also has the potential to increase the presence of dissolved toxic substances that may restrict the suitability of water for human use.

What can be done about it?

There is actually very little an individual landowner can do to cool surface waters. Most conservation actions designed to address water temperature issues reduce additions of heat energy. Heat can enter surface water through direct sunlight and by the air directly above the water. Reestablishing or protecting riparian vegetation is often the first step to address water temperature issues. While riparian vegetation does not cool the water, on small water bodies it can block much of the sun and keep the air in direct contact with the water surface cooler. Groundwater inflow and outflow, precipitation, runoff, and evaporation are also responsible for heat energy exchange. Water entering a water body from below ground flows tends to be much cooler than the surface water. Actions that conserve or increase shallow groundwater may increase the amount of cool water entering a water body. The sediment load of a water body also plays a role in water temperature. When the sediment load increases, water tends to spread out over a larger area. Shallow, wide channels provide more surface area for solar energy to enter the stream, potentially increasing water temperature. In addition, turbidity raises water temperature because the suspended particles absorb the sun's heat. Actions to reduce sediment reaching a water body will help reduce warming of surface water.

Elevated Water Temperature at a Glance

Problems / Indicators - Water temperature exceeds legal standard, threatens the health of aquatic organisms, or limits the intended use by the client.	
Causes	**Solutions**
• Surface water unprotected from direct sunlight • Little or no groundwater contribution to water body • Sediment laden runoff reaching water body	• Reestablish riparian vegetation • Brush management, residue management, terraces to reduce transpiration, evaporation and/or increase infiltration of upland water • Buffers and filter strips to intercept sediment

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Ponding, Flooding, Other Excess

WATER

Soil

Water

- Excess Water
  - Ponding, Flooding, Other Excess
- Insufficient Water
- Water Quality Degradation

Air

Plants

Animals

Energy

EXCESS WATER - Ponding, Flooding, Other Excess

Surface water or poor subsurface drainage restricts land use and management goals. Wind-blown snow accumulates around and over surface structures, restricting access to humans and animals.

What is it?

Water can flood or pond and restrict plant growth and land use. Water may flow into or around buildings if they are constructed over or near a spring or seep. If the soil has a dense layer, especially a layer of clay, flow of water through the soil may be restricted and water may pond.

Why is it important?

Flooding and ponding impacts plant grow and land use. Plant growth is essential for improving soil quality and increasing soil organic matter. Saturated soils increase the likelihood of diseases, significant losses of soil nitrogen due to denitrification and leaching of nitrate N, and soil damage due to heavy equipment. Seeps and high water tables must be taken into account for conservation plantings and when evaluating sites for construction. Excess water can affect structures and slope stability while drifting snow may prevent access to livestock or farmsteads. Drifting snow can block access.

What can be done about it?

Using a systems approach can help address excess water. Strategies include managing for drainage, conveyance, and multiple uses for crops and wildlife. Drainage systems must be compatible with crops grown, field layouts, and cultural practices such as crop rotation and cultivation. System choices include open ditches, tile drains, mole drains, and land forming for increased surface runoff. Planned systems can include diverting excess water and infiltration basins combined with roof runoff management systems. Restored and enhanced wetlands can also be key components in water management.

Ponding, Flooding, Other Excess at a Glance

Problems / Indicators - Little to no established vegetation due to excess water, wet areas due to restrictive soil layers, flood prone buildings and structures	
Causes	**Solutions**
• Ponding and seeps • Stormwater runoff • Flood prone areas	• Drainage management and structures for water control • Roof runoff structures and capture for reuse methods • Floodplain management • Wetland restoration or enhancement • Windbreak placement for protection and to provide access

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Inefficient Use of Irrigation Water

WATER

Soil

Water

Excess Water

Insufficient Water

Inefficient Moisture Management

Inefficient Use of Irrigation Water

Water Quality Degradation

Air

Plants

Animals

Energy

INSUFFICIENT WATER - Inefficient Use of Irrigation Water

Irrigation water is not stored, delivered, scheduled and/or applied efficiently. Aquifer or surface water withdrawals threaten sustained availability of ground or surface water. Available irrigation water supplies have been reduced due to aquifer depletion, competition, regulation and/or drought.

What is it?

Inefficient use of irrigation water impacts on- and off-site water quantity and quality. Irrigation systems and water management practices can waste water and negatively affect farm profitability.

Why is it important?

Irrigated agriculture is essential in meeting the nation's food and fiber production needs. Agriculture is the nation's largest water user, accounting for more than 85% of the nation's annual water consumption. Emerging problems that further complicate resource protection and water allocation include: serious long-term drought conditions, critical ground water declines occurring in agricultural production areas, saltwater intrusion into ground water supplies, and competition for water among a multitude of water users, including power generation, drinking water supplies, minimum stream flows, etc.

What can be done about it?

Solutions are available to address many of the competing water resource needs. Choices generally include conservation of the water used, conversion to other crops that utilize less water, and conversion to other sources of water. Conserving water could include improvements in irrigation water use efficiencies, off stream storage of water during periods of excess runoff, water re-use and water recycling, and ground water recharge.

Inefficient Use of Irrigation Water at a Glance

Problems / Indicators - Irrigated crops, plant stress, insufficient water supply	
Causes	**Solutions**
• Open earthen ditches • Irrigation water allowed to run off of fields • Losses due to improper system design, installation, or maintenance	• Line ditches or install pipe; improve water transport systems • Manage applications to reduce runoff; tailwater return systems • Audit system and retrofit or replace where warranted

United States Department of Agriculture
Natural Resources Conservation Service

Resource Concerns

Inefficient Moisture Management

WATER

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Energy

INSUFFICIENT WATER - Inefficient Moisture Management

Natural precipitation is not optimally managed to support desired land use goals or ecological processes.

What is it?

In dryland conditions, management of available water is critical to production and to maintain natural systems.

Why is it important?

Water is important to farming and natural systems. In cropland, poor yields may be related to an insufficiency of soil moisture rather than an insufficiency of rainfall. Inefficient moisture management can result in increased runoff and reduced soil moisture. In some grassland systems, available water can be tied up by brush.

What can be done about it?

Managing residue and cover will aid in utilizing available soil moisture. Establish mulch and residue management systems to conserve soil moisture. New weed control techniques and tools, along with cover crops can help manage available water for crops. Minimize soil compaction to maintain water movement through the soil by reducing soil hydraulic properties such as infiltration. In some grassland systems, brush management can help restore a natural water regime. Using plants that are more tolerant of drought conditions is an effective measure in optimize existing soil moisture.

Inefficient Moisture Management at a Glance

Problems / Indicators - Dryland farming in low rainfall areas	
Causes	**Solutions**
• No soil cover in the winter to prevent moisture loss • Excess soil tillage and disturbance destroys soil organic matter and structure • Unchecked brush growth creating potential for less available moisture for desired plants	• Cover Crops • Mulch or No-till farming systems • Brush Management

600.76 Exhibit 7 – Example Products (Reserved)

600.77 Exhibit 8 – Example Plan (Reserved)

600.78 Exhibit 9 – People, Partnerships, and Communities

People, Partnerships, and Communities

The purpose of the People, Partnerships, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics

USDA Natural Resources Conservation Service

Social Sciences Team

Developing and Maintaining a Network

What is a Network?

A network is a system of relationships in which people exchange information and resources to achieve common goals or serve common interests. Networks are easy to join or leave and tend to be informal. However, networking can also take place through planned meetings. These meetings may or may not meet regularly and may or may not pursue joint initiatives.

Networking is a process for expanding resources while maintaining your organizational autonomy. For most, the motivating factor for being in a network is the access to valuable information and the expertise of others in the group. With more people involved, creativity and options increase. Networks can also provide a strong support system.

Why Should I Network?

The Conservation Partnership at all levels can use networking to enhance its involvement with various customer sectors, including expansion of contacts to include non-traditional customer groups. Networking also helps to identify and meet customer needs. It promotes understanding of groups and their respective missions. Networking can raise people's awareness of their relationship to the environment and community. Networking can keep The Conservation Partnership's diverse customer base aware of its stake in the USDA.

Financial advisors suggest that we put aside 10 percent of our income as an investment for our future needs, including retirement. What investments in the form of time and people contacts are you making for the future of conservation work? With a decreasing percentage of the population actively involved in farming, it is in the best interest of groups and agencies that once considered agriculture their primary customer to expand their definition of "customer" to include a broader base. A diverse network of people that know and support our mission will help to sustain that mission even as technology changes the world and the way that work gets done. What if you spent just one or two percent more of your time in building

Why Should I Network, con't.

relationships, public relations, or marketing your agency or organization to people who currently do not know you? You would certainly increase the size of your network. This type of social investment will yield stronger public support both now and in the future.

With Whom Should I Network?

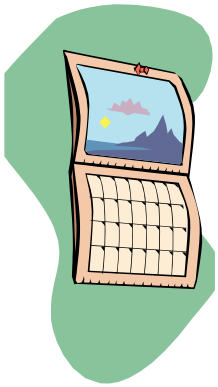
Answer the following questions to help you identify people and organizations that share your goals and that might benefit from participation in your network.

1. **Who shares our issue?**
2. **Who shares our customers?**
3. **Who has resources we need?**
4. **Who needs our resources?**
5. **Who has a similar mission / vision?**
6. **Who might be a "resistor"?**

Assemble a list to include community leaders and representatives from organizations outside traditional conservation groups. Evaluate who in different sectors of the community should be part of your network. Remember to scan your Rolodex and/or address book. Acting on these lists can expand your network.

When Should I Network?

Prepare in advance. Start networking now! It is important to establish your network before you need it. Building a network takes time and requires you to be proactive. Do not wait until the last minute to start building a network. Waiting until



the need is crucial can reduce your effectiveness and integral community leaders may be less available or receptive. If you wait until the last minute, your contacts may consider you a "user" rather than a colleague.

Steps in Building a Network

To help yourself prepare for networking, outline your goals. Decide what outcomes you want from the network relationships and, from there, determine who are potential network members. Prospective members must believe there will be some benefit to them to be part of the network and to actively participate. In a network, resources are shared on a reciprocal basis. ("I'm willing to share with you because you share with me.")

An important step is an information exchange. Discuss mutual interests and determine what you can do for each other. At an initial meeting bring one or two key information pieces, such as a brochure that outlines your Agency's or organization's mission, purpose, and main services or activities. Do not be hesitant to identify potential resources for them in your growing network. Explore with them aspects of their networks and the contacts they have.

Once networking has begun, decide the mode(s) of communication for keeping in contact. Some potential ways to maintain contacts in a network are telephone calls, face-to-face visits, e-mail, newsletters, listserves, presentations, meeting attendance, fairs, etc. Follow up regularly so that members of the network do not lose the feeling or awareness of an active connection. Consider developing a time schedule to remain on track. In the beginning, more frequent contacts may be appropriate- but once established, impersonal or personal contacts every few months should be sufficient to maintain a relationship.

Keep track of your networking contacts with a Rolodex or a computer. In addition to names and numbers, it is helpful to note the role of the contact in their organization and the nature of their needs as well as their resources. Noting the date and content of the most recent contact will help you determine the timing for follow-up. In order to maintain the networking relationship, continuing contact is important even if various people in the network are not involved in an active issue.

Create Opportunities for Networking

Join a club or organization that will expand your network. Be selective, target your networking where you see new opportunities to expand awareness of your agency or organization's expertise or to build a partner- ship. Perhaps your objective might be to diversify your contacts and future clientele.

Consider hosting a local Chamber of Commerce "after hours" networking event, as was done by a Michigan USDA Service Center. Provide updates of your activities with public officials, such as county commissioners, city officials, the mayor, school superintendents, chamber of commerce executives, or other community leaders. If you sponsor an exhibit, be friendly and outgoing to the customers your exhibit attracts.

Ask professional colleagues, members of organizations to which you belong, and acquaintances to introduce you to their friends and people with whom they work. It is usually easy to establish a rapport with a friend of a friend. Volunteer to help on a community event or project. At a professional group meeting assume a leadership role if needed. Again, target those relationships you want to build and the opportunities you have to cultivate awareness.

Create Opportunities, con't.

Develop a program that raises awareness about the Agency's mission and your activities. Select at least two community groups who are unfamiliar with your agency or organization. Contact the president of the organization and offer to provide a 5, 10, or 30-minute presentation. Consider PTAs, senior citizen groups, local union groups, National Association for the Advancement of Colored People, neighborhood associations, watershed groups, civic organizations and church groups.

Characteristics of a Person Who Networks Effectively

Above all, networking is an attitude – yours and the other person or organization. It is a "win-win" perspective. A successful networker is always open to conversations with people about what they need and then is willing to share resources, information, and contacts.

As you get others to see you, NRCS, and The Conservation Partnership as helpful resources, they will tell others about you, and your functional network will expand. People in your network will be there when you need their support for the development and implementation of conservation initiatives. To be most effective in networking a person needs to relate well to diverse people, listen to others, accept their ideas, be optimistic, and develop good oral and written communication skills.

"I use not only all the brains I have, but all I can borrow."
-Woodrow Wilson
28th U.S. President

How to Manage Conflict in Networks

People will disagree and networks are not immune from conflict. After accepting that conflict may happen, provide the opportunity for the conflicting parties to explain their respective viewpoints and support efforts for a joint resolution. It is also helpful to give honest feedback to minimize areas where conflict may erupt. Often the problem can be worked out if everyone participates in a discussion of the situation and looks for the common ground on which to build a consensus. If this does not work, a mediator may be needed to help clarify each party's responsibilities and assist with settlement of differences. It is important to work on only one conflict at a time. If multiple issues are being addressed, the focus can get clouded and make a satisfactory conclusion more difficult.

Tips on Maintaining an Effective Network

Networking involves repeated interactions among people in an effort to build rapport and trust. You need to invest your time in order to gain benefits from a network. Remember, the heart of networking is awareness, communication, and mutual benefits.

1. Network with everyone all the time.
2. Don't neglect your existing networks.
3. Seek out the most useful contacts.
4. Join professional associations, civic groups, or other local groups and devote time and energy to them.
5. Make sure the group is the right organization for you.
6. Follow up, follow up, follow up!
7. Develop or distribute informational pamphlets that you think will be of interest.
8. Get on newsletter distribution lists.
9. Create your own newsletter.
10. Keep in touch by e-mail and other methods. Don't just contact people when you need something.
11. Share information with others in your network. Consider exchanging reports, announcements, brochures, books, tapes, or videos with others in your network.
12. Offer your services, attend, co-sponsor, and sponsor conferences, workshops, seminars, lectures, field days, and annual meetings.
13. Present papers or give presentations to traditional and non-traditional customers.
14. Read local, as well as national and international newspapers, and journals. Many key individuals are discovered and then contacted through local publications.
15. Develop joint training opportunities or projects.
16. Keep your message focused and upbeat.
17. Say "thank you"! An e-mail message works, but a hand-written note of thanks is more effective.

Examples of Networks

It is not the title of a group but, rather, the form of relationships that evolve and the purpose of the exchange that determines whether the team form is a network, a partnership, or a collaboration. Here are some examples of networks:

- Professional colleagues in and outside your organization that you approach for information
- Breakfast update sessions, open houses, coffee circles, or a Chamber of Commerce's Business After Hours meeting that you attend and that are held by elected officials or organizations for the purpose of sharing information
- Ongoing network meetings you convene with community members to regularly exchange ideas or information
- Persons you telephone, e-mail, or otherwise make contact with on a frequent basis to gain perspective, get feedback, and share ideas
- Networking groups or organizations you might join and whose monthly or occasional meetings you attend, such as Ducks Unlimited, Pheasants Forever, Rotary Club, Chamber of Commerce, Business and Professional Women, Jaycees, General Federation of Women's Clubs, Lions Club, or other civic or special interest groups including environmental or conservation groups.

Where do I find more information?

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People, Partnerships, and Communities

The purpose of the People, Partnership, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics.

USDA Natural Resources Conservation Service

National Science & Technology Consortium

Social Sciences Institute

Locations:

North Carolina A&T State University

Colorado State University

Grand Rapids, Michigan

Royersford, Pennsylvania

University of Arizona

Charleston, South Carolina

University of Wisconsin

Requesting and Preparing for a Meeting with a Community Leader

Meetings generally are held to achieve a purpose or goal. The success or failure of a meeting depends on whether you achieve the objectives you had hoped to complete. Thus, because your objectives are usually different, you cannot set up a meeting the same way every time.

Why should you use this information?

The success of your meeting and the future of your relationship with the community leader could depend on how you request the meeting, how well you prepare for it, and how well you succeed in having the meeting benefit both the leader and yourself.

Who should use this information?

Anyone who plans to schedule or attend a meeting with a community leader can benefit. People who want to build relationships with a community leader of an association, organization, or group will find this information useful.

Community organizations

Community leaders include, among others, elected and appointed officials and formal and informal figures of community organizations. There are many different kinds of community organizations. Some are very formal groups with paid members and elected officers and perhaps paid staff. Other organizations may be informal groups with no paid members, officers, or staff. Titles may also vary. The president of one organization may be a volunteer, but in another organization the president could be a paid staff member. Community leaders often belong to multiple associations that range from formal and officious to informal and familiar.

How do you request a meeting?

Before you actually request or schedule a meeting, you should research the organizations and groups that the leader is associated with. You should know the size of the organizations, their priorities and key issues. Also, if the leader is elected, find out the length of their term of office. Finally, you should attempt to get some information about the leader's personal style. People have different styles of communicating and while one person may immediately want to discuss business, another may expect to start with social conversation such as the weather, crops, sports, etc. If you are unable to gather this kind of information about the person prior to the meeting, your best course is to follow

(continued on reverse side)

their lead. A future PPC will cover this in more detail.

You should also make sure the reason for the meeting really requires holding a formal meeting. If you gain the reputation of holding meaningless meetings, people will be less willing to attend future ones that you schedule. However, there is nothing wrong with a meeting specifically designed to introduce you and your organization to a community leader.

When you have determined your reason for holding a meeting, contact the office or person you wish to meet with to make an appointment. Have several dates in mind when scheduling a meeting in order to increase the likelihood that one date will be convenient for both parties. Also, be prepared to say what the meeting will be about and how long it will last.

If someone in your group/organization has a special contact/ relationship with whom you plan to have a meeting, consider having him or her attend the meeting. Or, you might request the person make an introductory telephone call on your behalf. For example, you are aware District Director Jones is a good friend of Rotary Club president Smith. You might ask Jones to call Smith and indicate you will be calling to schedule a meeting and the general purpose of your meeting.

You may be able to set up an appointment from an informal gathering — a town meeting or reception — which the community leader is attending. Introduce yourself, raise the topic, and ask "May I come and see you about this?" If he/ she says yes, you are now set to make a follow-up telephone call to schedule the meeting.

How do you prepare for a meeting?

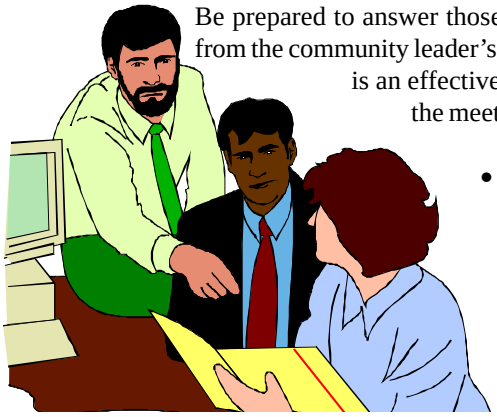
After you have scheduled a meeting date, it is important to properly prepare to make the meeting a success.

Be familiar with whom you will be meeting. You should know where their organization or agency stands on a topic so you can plan a strategy to present key issues. You would need to plan to take a different strategy if they were in favor of your view, than if they opposed it.

Never underestimate nor overestimate the intelligence of whomever you are meeting with. If you overestimate their intelligence or understanding of the issue they may not understand what you are saying or worse yet, misunderstand. You could also bore the audience if you underestimate their knowledge on the topic by telling them something they already know.

The following are some other important tips to remember when preparing for and attending a meeting with a community leader:

- Prepare an informal agenda for the meeting to meet all of your objectives. Put your most important points first in case that is all time permits.
- Be on time.
- Try to take a seat that will keep you at eye level with the community leader.
- Begin with a sincere pleasantry. Like all people, community leaders are put at ease by friendliness and praise. Do your homework. If appropriate, compliment the leader on a recent program or activity. Then, quickly get to the point.
- Establish your credibility. Sell yourself with proper attire, a firm handshake, and total command of your topic. If you are meeting with a community leader, you should dress similar to the way they do. For example, if you are meeting in the field you would not wear a suit. If you are meeting in an urban office, you will probably be more comfortable in business attire.
- There are three basic questions most people ask before a meeting. These questions are "Why am I here?", "What are we going to do in the meeting?", and "What's in it for me or my organization?" Be prepared to answer those questions from the community leader's viewpoint. It is an effective way to start the meeting.



- Keep your points brief, but concise. You don't want to bore your audience.
- Act with confidence even if you don't feel that way.
- Be a good listener. Keep an open mind to ideas presented to you. It helps establish a basis for your future relationship.
- When presenting your case, try to put a local spin on the story so those attending can see how the topic

(continued on next page)

relates to them.

- Bring materials about your watershed, district, RC&D, NRCS and/or the issue you plan to discuss. However, don't overwhelm the leader with materials.

- Avoid using jargon. Be prepared to present your case in terms your audience will understand.

- Don't interpret difficult questions as hostility. Try to anticipate inquiries and prepare responses.

How do you build relationships with community leaders?

- Bring your business card or offer those you are meeting with a number of ways they can stay in touch with you.

- After the meeting remember to send a "thank you" note and continue to stay in contact with those you met with — you never know when you may be working with them again. Promptly provide any information you promised to send.

- Reflect on the meeting. Consider what went well and make it a part of your next interaction.

- Think about your next meeting now. You want to build an effective long-term relationship. Community leaders don't like to hear from people only when they have a problem. Provide periodic updates on conservation activities.

Different meetings have different purposes. Each style of meeting may not be appropriate to meet all of your needs. When preparing for a meeting it is important to keep in mind the purpose or goal in order to prepare for the correct type of meeting. Listed below are five different types of meetings you might schedule with a community leader. The purposes of these meetings are also listed.

Fact Finding- collect specific kinds of data or studies.

Advisory- give or seek advise on policy, technical matters, programs, procedures, studies, and so forth.

Program- plan a program for specific events including demonstrations, a conservation fair, educational activities, etc.

Public Relations- keep the public informed about the purposes, goals, activities, and accomplishments of the organization or agency.

Coordinating- mesh the activities of two or more organizations, committees, or other groups.

Where do I find more information?

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http://people.nrcs.wisc.edu/socsciinstitute

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Are you interested in materials that assist you in implementing locally-led conservation? Or, are you curious about the products available from the Social Sciences Institute?

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People, Partnerships, and Communities

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USDA Natural Resources Conservation Service

Social Sciences Team

Understanding Community Power Structures

What is power in a community?

Power in a community is the ability to affect the decisionmaking process and the use of resources, both public and private, within a community or watershed group. Power is simply the capacity to bring about change. It is the energy that gets things done. All levels of The Conservation Partnership need to know about community power structures in order to more effectively implement and maintain locally led conservation initiatives. A community can be defined as a watershed, region, town, county, or other geographic or geopolitical boundary.

Examining the concept of power involves looking at the sources and structures that influence local communities and exploring the relationships that shape cooperative efforts. The conservationist who has a basic understanding of social power and who can identify the power actors in a community can enhance the opportunity for success in conservation initiatives.

Power is Not a "Dirty" Word

Often when people identify words they associate with power, negative responses dominate. Power is seen as manipulative, coercive, and destructive. A once-popular idea was that a few key people used power to block changes that benefited others, and that "nice" people stayed away from power. Attention focused on the idea of ***power over*** people. Increasingly, the concept of ***shared power*** is being recognized as representing a more sustainable and effective approach. Power, used in implementing locally led conservation, should be viewed as the ability of citizens and civic leaders to bring together diverse community members in initiatives that lead to real, measurable change in the lives of their community.

Issue 21, Updated May 2005

Why should you use this information?

A conservationist's ability to identify and understand the power structures in a watershed group or community and the relationships among the people that fortify them will significantly contribute to the achievement of conservation goals.

As you encounter issues that routinely challenge organizations, agencies, communities, regions, or states, it is important to ask questions such as:

- *Who seems the most powerful in this situation and why?*
- *What are the influences that might change the power structure in a group?*
- *What type of power do you and others working with you bring to the situation?*

CONNECTIONS

"Social networks have value – is the core idea of social capital theory. Just as a screwdriver (physical capital) or a college education (human capital) can increase productivity (both individual and collective), so too social contacts affect the productivity of individuals and groups.

Whereas physical capital refers to physical objects and human capital refers to properties of individuals, ***social capital refers to connections among individuals*** – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue." The difference is that "social capital" calls attention to the fact that civic virtue is most powerful when embedded in a dense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital."

Robert D. Putnam ***Bowling Alone, 2001***

What are the sources of community power?

Power can come from a variety of places. The following sources of power are not mutually exclusive and can be most effective when used in some combination. Conservationists who learn to recognize the power base(s) of a key leader or a community group can maximize the benefit that the power base can offer.

• **Connections** - the ability to network and build useful relationships with other powerful individuals and organizations. For example, occasionally one hears the expression, "S/he's really well connected.

• **Large numbers of people** - provide evidence of support for an idea. A recent increase in membership of a watershed group, for example, could have an impact on a county commissioner.

• **Rewards** - the ability to give recognition, visibility, money, or other tangible items. For example, an agency, a community foundation, county commission, or financially powerful individual or business may have monies or other assets that can be distributed to a conservation initiative that meets their mission or priorities.

• **Personal traits** - an individual's charisma, creativity, charm, leadership abilities or some combination of these characteristics can foster the respect and loyalty of others.

• **Legitimate power** - the position (office, title) of the leader. Usually, the higher the office, the more powerful the person. The city manager, for example, holds a higher position and has more power than the city engineer. Or, the chief of an American Indian tribe has traditional and legitimate power.

• **Expertise** - knowledge, skill, and talent, combined with respect for the skill. A district conservationist can bring valuable skills to a conservation initiative.

• **Information** - the ability to channel - or withhold - information. The mass media has this type of power.

• **Coercion** - the attempt to influence others using a negative style, such as using intimidation or manipulation. This contributed to the concept of power as a "dirty word" and is now less accepted.

Who are the people with power?

Social systems of all types - communities, political parties, etc. - have certain people or groups of people who control decisionmaking functions. These people can be called key leaders of power actors.

Even the most distressed community has some business activity. In addition, there is a combination of public and nonprofit institutions such as schools, parks, libraries, police stations, social service agencies, community colleges, and hospitals. These groups can and do influence the changes made in the community. Power actors or key leaders are the individuals who direct these organizations, either formally or informally.

When community social action projects initiated by change agents (conservationists, public action groups, etc.) fail, it is often because they did not recognize and/or appropriately involve key people in the community or the community at large. An individual concerned with one segment of the community, such as agriculture, may not know the key people in other segments of the community. The key people involved in community decisionmaking can vary depending on the issue.

Key people–*power actors*–are aware of and value their position. Most will work hard to keep it. They do this by either supporting or opposing projects and by providing or denying resources.

The key leaders' position often depends on:

- **What** the proposal involves
- **When** they were informed
- **How** they were informed
- **Who** informed them

How do individuals get power in a community?

Authority is the power held by a person in an elected or appointed "office." No matter who holds the office the authority is the same, unless the law changes. Presidents of the United States have had the same authority but have differed in their focus and their personal influence.

Influence is the power that resides with an individual or an organization based on a person's perception of their competence and ability. Their influence may be based on their skills in guiding and directing people, their specialized knowledge, their reputation, or their control of and/or access to money and resources (e.g., credit and jobs).

Those with the most power in a community have that power primarily because of their influence, not just their positions of authority, so we must find ways to identify power actors that do not depend on titles and offices alone.

In most communities, the following characteristics are most often identified as a basis for influence and power:

• past achievements • source of ideas • human relations skills • contact with others (in and outside of the community) • access to needed resources • influence within community organizations • past participation in community groups• length of residence in the community • occupation • education • control of jobs, wealth, credit, and mass media

Control of credit or jobs may involve local businesses such as banks, manufacturing plants, and the media. Evidence suggests that the control of credit, money, jobs, and mass media is very important when combined with other bases of influence.

What Is a Power Structure?

A ***power structure*** in a community or watershed group is key leaders (power actors) acting together to affect what gets done and how it gets done. However, the nature of the relationships among the individual power actors can vary from one community to another.

- Some communities have a power structure centered on one person who is surrounded by "lieutenants."
- Other communities have a small, tightly knit group – the power elite – that controls policy-making for the community.
- Another structure is the "split community." Examples include Republican-Democrat, Protestant-Catholic, liberal-conservative, labor-management, rural-urban, and others.
- The "power pool" involves a combination of all three. Essentially, there is a "pool" of 10 to 25 people who are the top community power actors.
- In some communities, tradition or elders are the powerful members.
- Finally, some culturally diverse communities base their power almost totally on democratic principles and unanimity.

The "power pool" may be the most common kind of power structure. The other structures are special cases found in communities with unique characteristics. The "power pool" has at least the following implications for conservationists and other change agents:

1. The same power actors may not be relevant to every issue, so each issue needs to identify appropriate power actors.
2. There are communication networks within the pool. A discussion with one or more power actors provides an indirect method for communicating a message to several other power actors. It also provides a means for communicating to other people in the community.
3. Members of the power pool change over time. In addition, the power of one individual relative to another may change, so the assessment of power actors cannot be viewed as a one-time task.

What Are Informal and Formal Power Structures?

There are two kinds of power structures: formal and informal. The formal power structure is easily recognized and includes elected and appointed government officials and leaders of civic organizations. The informal power structure, which exists together with the formal power structure, is harder to identify and may hold a greater influence over a community's development.

Four methods have been developed that will help conservationists identify the community's formal and informal power structures.

1. Positional method - This method merely involves making a list of key government and civic leaders. It is a simple, but flawed, approach. It presumes that people in official positions actually execute power, and it does not recognize those power actors who work behind the scenes and operate on the base of personal influence.

2. Reputational method - Ask knowledgeable citizens to list the most influential people in the community or watershed. The same names should reappear on several lists. People to interview should include chamber of commerce executives, city managers, utility managers, media executives, economic developers, and business executives, among others.

3. Decisionmaking method – Study the history of community decisionmaking to determine the power actors who actively participate in community actions. Sources of information include meeting minutes, press reports, and participant interviews. It is possible to determine members of a general power structure using this method, and whether specialized power structures exist that deal with single issues.

4. Social Participation method - Develop a list of active participants (officers, committee chairs, etc.) in voluntary associations. This method assumes that activists in organizations will be the same people who are active in community decisionmaking. This method is useful when determining future community leaders who are working their way up through volunteer participation.

For more information on identifying the key leaders in a community, refer to People, Partnerships, and Communities series, Issue 43, "Working With Community Leaders."

How Do You Put It to Work?

Successful implementation of natural resource goals cannot succeed without the active participation of the community power structure. By working together, everyone can benefit.

The following is a summary of the steps to take when assessing power structures and identifying key leaders in a community or watershed group.

- **Identify the members of both the formal and the informal power structures**

- **Find the important relationships.** Which people are personal friends? Who are adversaries, competitors, or antagonists? Who can effectively influence others?

- **Determine the kind of power the key leaders exercise** (refer to the "What are the sources of community power?" section). After determining what bases of power the leader uses, you can decide on an appropriate approach to take when working for or with them.

- **Establish trust and gain the confidence of key leaders.** Maintain a focus on each other's backgrounds, interests, values, and priorities. A climate of cooperation and trust is essential if a group expects the change process to sustain momentum.

- **Learn what motivates each member of the power structure.** Are they motivated by power, such as power over resources? Money? Do they have a desire for recognition, such as wanting to run for public office or other high profile position? Do they have a strong sense of social responsibility? What causes are "hot buttons" for them?

- **Ask leaders for their counsel and advice.** Obtain the support of key leaders before pursuing a course of action. It will make your job easier and the project will have a better chance to be successful.

- **Do not back key leaders and power actors into a corner.** Always provide a face-saving means for power actors to join with the initiative group despite any initial opposition they may have expressed.

Where to look for more information:

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- Tolbert, Charles et al. "Civic Community in Small-Town America: How Civic Welfare is Influenced by Local Capitalism and Civic Engagement." *Rural Sociology* 67, no 1 (March 2002): 90-113.

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Establishment

The Natural Resources Conservation Service established the Social Sciences Team (SST) in September 2004 in order to more fully integrate the social sciences into Agency programs and activities. The goal is to more effectively serve our rural and urban customers and to increase adoption of conservation.

Mission

The Social Sciences Team integrates customer opinion and field work with science based analysis to discover how the social and economic aspects of human behavior can be applied to natural resource conservation programs, policies, and activities.

Vision

The Social Sciences Team will be a recognized leader in developing and transferring practical social sciences technology to assist in the productive, equitable, and environmentally sound use of our global natural resources.

People, Partnerships, and Communities

The purpose of the People, Partnership, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics.

USDA Natural Resources Conservation Service

Social Sciences Team

Working with Community Leaders

Background

Identifying and working with community leaders can be extremely beneficial when promoting conservation through locally-led and watershed planning activities. It is even more crucial when working with underserved communities that have not previously worked with the Natural Resources Conservation Service (NRCS). The advantage of working with a community leader is that you will be working with someone who has already earned the community's trust. Gaining the community's trust will be a major hurdle for you to overcome. In some instances, it can take a period of months if not years for you to earn a community's trust. Identifying the right person/leader to work with you can help decrease the length of time it takes to accomplish your goals. The danger of not working closely with a community leader is he/she can easily hamper your efforts.

Leaders tend to stand out from other community members. Remember, the public is only marginally involved in most issues. Only about 5 percent of community members are directly involved in decision making and not even all of these people are community leaders. Indicators based on research suggest that leaders might possess some, but certainly not all, of the following characteristics: good at giving instructions, empathetic, talkative, persistent, self-confident, popular, and original/creative.

Methods of Identification

The first step in identifying a community leader is to consult with agencies and organizations who have successfully worked with the community. These organizations may include small farmer cooperatives, churches, county Extension Service, other USDA agencies, and land-grant universities. The Conservation District and Resource Conservation and Development board members are typically leaders themselves and they can be a source of information. They also can lead you to community leaders or to people who can help you determine who the leaders are in the community.

There are four traditional methods to identify a community leader. The methods are position, reputation, event analysis, and social participation. While the methods of identification are the same for traditional and non-traditional communities, the examples have been customized for small underserved communities.

(continued on next page)

In the **position method**, you identify people in authority. In small communities the local government officials may be mayors, sheriffs, or school board representatives. Keep in mind that all leaders do not have to be in positions of authority and this method fails to identify informal leaders such as respected elderly community members, parents, coaches, and athletes.

In the **reputation method**, you are looking for those members of the community who are the most respected. Different racial and cultural groups more than likely will identify someone from their group as a leader. It is unwise to ask someone from a majority group to identify a minority leader. Simply ask about five community members who they feel are "the three most respected people in the community." When you begin to hear the same names repeated you will know that these people are the leaders in this particular community.

In the **event analysis method**, leaders are those persons who most actively influence specific community decisions. Some people more consistently influence decisions by actively pursuing decisions they consider to positively influence the community.

The **social participation** method entails finding those persons who occupy positions of authority in the greatest number of organizations such as heads of community- based organizations. One example would be a person who is all of the following: District Supervisor, Rotary club officer, treasurer in the Veterans of Foreign Wars, church deacon, local president of the National Association for the Advancement of Colored People, and a member of the local school board.

The Importance of the Community Leader

You want to identify a leader with outstanding community leadership traits. He/she should want to work toward positive change in the community. He/she should be able to work with other people, encourage others, plan work, conduct meetings, bring forth new ideas, find resources, speak out for the community, seek information, listen attentively, and most importantly, persistently work on behalf of the community.

Once you have identified the leader(s) which you want to move forward with, the very crucial next step is to develop a strategy to help that person(s) understand and support natural resource management issues. Be prepared when you meet with the leader to educate the individual about how NRCS can provide services and resources that can improve the community's quality of life. Ultimately, you want that leader to serve as a spokesperson, a catalyst for change, and a bridge for you to establish a positive and productive working relationship with the whole community.

What Do You Want the Leader To Do?

1. Ensure that the leader buys into your plan by being available to answer questions, visiting successful farms, and establishing trust (refer to Gaining Trust with Small Farmers fact sheet)
2. Persuade him/her to adopt conservation practices and systems
3. Encourage the leader to host demonstrations, take farmers to farms with conservation plans, and share visual information such as pictures and videos
4. Sponsor group meetings
5. Be available to speak at official and unofficial community gatherings
6. Provide testimonials
7. Introduce you to other community leaders
8. Participate in locally-led and area-wide activities
9. Become acquainted with the Conservation District and Resource Conservation and Development board members
10. Provide you with feedback on your activities

People, Partnerships, and Communities

The purpose of the People, Partnerships, and Communities series is to assist The Conservation Partnership to build capacity by transferring information about social science related topics

USDA Natural Resources Conservation Service

Social Sciences Team

Why is Understanding Cultural Difference Important?

The Natural Resources Conservation Service, with offices across the continental United States, Alaska, Hawaii, and many US territories, is constantly working with people of different cultures. While much of working successfully with people of different cultures is best learned "on the job", there are some concepts and methods that have been shown to ease cross-cultural communications. Using such proven concepts and methods to work with people of other cultures will improve NRCS service delivery and build better relations with our expanding customer base.

American society is changing rapidly. We are witnessing a growing number of different ethnic and racial groups in America. This increase affects agriculture and NRCS in two primary ways: (1) there is an increase in the number of producers who belong to different cultural groups[1] and (2) the NRCS workforce is growing more culturally diverse[2]

What is "Culture"?

"Culture" is a term that is widely used, and misused, in America today. Newspapers, magazines, television, and the Internet all abound with discussions of different "cultures." Many things are called cultures that are really just small parts of everyday life, or the most recent focus of media attention. Culture provides an interpretive framework that affects all decisions that people make, all the time. When viewed from this perspective, it is obvious that the "fashion culture," or the "youth culture" are simply media tags for short-lived social phenomena. It is unlikely that many parents teach their children about the importance of a "corporate culture."

Culture, for the purposes of this discussion, may be defined as: "A complex, learned, shared, system of human behavior. Culture is taken for granted by its users, and participants in a culture assume that the codes, habits, customs, and understandings of their particular culture are "normal," relative to the behavior of members of other cultures."

Culture is learned, and may be thought of as something that is passed from one generation to the next. Stop for a moment and remember your childhood; think of instances in which you learned the "correct" way to behave, either formally, such as in Sunday school, or informally, such as when you were teased by friends for being "different." Think of the ways each type of learning influenced your behavior. These learned behaviors are all part of your culture, and determine many of the ways you relate to other people today. At the time you learned these "correct" behaviors, you probably didn't consciously question their "correctness" too much, and soon learned to assume that what you learned was "right," and that other kinds of behavior were "strange" or "wrong."

[1] www.ssi.nrcs.usda.gov/customdata/default.asp
[2]www.nrcs.usda.gov/intranet/FWP/diversirty.html

(What is "Culture" con't)

Everyone is a member of a culture. A person cannot simply cease being a member of the culture in which they were raised. All of the complex, basic, ideas of daily life, including conceptions of right and wrong, good and bad, correct and incorrect, were instilled in each of us as a child and most of these conceptions are reinforced on a daily basis. Just as it is impossible to simply cease being a member of a particular culture, it is equally impossible to simply "know" how members of other cultures will react to your actions.

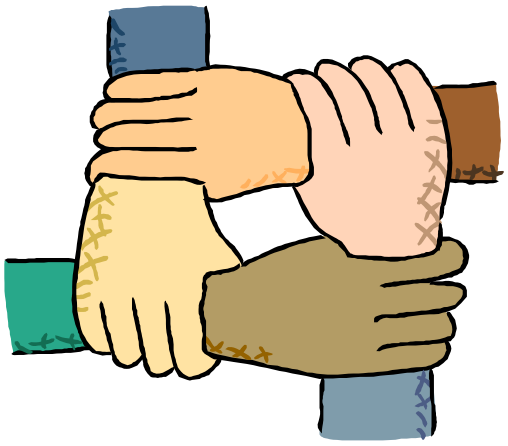
All of us tend to base our interactions with other people on what our culture tells us is "correct" behavior. One of the most fascinating things about cultural differences is the incredibly wide variety of "correct" responses to any given situation. A person can usually learn what members of another culture consider good or correct by careful observation, thoughtful behavior, and what most Americans consider "tact," or considerate, unassuming, interaction.

When Should This Information be Used?

Cultural differences should always be kept in mind when working with people who appear to think or behave differently than you do. What may appear to be "odd" or "wrong" to you may simply be a cultural difference. Keep in mind that your behavior may appear to be just as "wrong" to members of another culture. There is rarely any way to usefully define what is "right" and "wrong" when working with people of a different culture. The basic assumptions all people have of what is correct and incorrect are learned, and as such, vary widely between cultures. To attempt to "correct" the behavior of members of another culture based on your own assumptions is almost always seen as rude and overbearing.

Who Should Use This Information?

Any NRCS employee who works with people of other cultures should find this information useful. Additionally, partner organizations may find this information useful when establishing or expanding relations with other cultural or ethnic groups.



How Do You Work with People of Other Cultures?

Perhaps the most fundamental thing to remember when working with people of other cultures is that there is no "right" or "superior" culture. Your own culture is no more and no less than a way of interpreting the world. Every person's culture is valid, and no culture is "better" than another. Remember, value judgments are a direct result of what you learn is "good or bad," within the context of your culture. However, some social scientists feel that "extreme" elements of some cultures can be detrimental to the survival of the species and to basic human survival.

There are no specific methods of working across cultural lines that will apply in all situations with all people. There are, however, some general concepts and approaches that have been shown to be useful. Some of these are:

Look for "Common Ground"

While all cultures are basically different ways of viewing the world, there are usually common interests that may serve as starting points for discussion. Although a new client may be a member of another culture, that person may have an interest in natural resource management. Their ideas about what constitutes "good" management may differ from yours, at least initially, but this common interest is a good point at which to start discussions and the mutual learning process. In some instances, "common ground" may be difficult to find, particularly if someone's cultural background is very different from your own. In these instances, do your best to make sure the other person understands your perspective. This may very well include discussing things that may not be a normal part of day-to-day operations, such as private property rights and cash economies.

Become More Self-Aware

Your culture provides you with a "framework" that you use every day to determine very basic parts of your behavior. What you learned as part of your culture when you were growing up determines what is "wrong" or "different," or "bad." These culturally determined assessments of value are often made unconsciously. The next time you are working with someone from a different culture, try to "step back" and examine your own behavior. Are you making value judgments of the other person's behaviors or attitudes? Try and remember that the other person's behavior may be perfectly acceptable by his or her own cultural standards, but "bad," "wrong," "incorrect," or "offensive" to yours (and vice versa).

Working successfully with people of other cultures requires learning from all people involved in a situation. You must be willing to examine some basic ideas and explain them. You must also be open to new ideas and interpretations. People of other cultures will probably view things differ- ently than you do, and may have different ideas of what is important. They are not "wrong," and you are probably not "right," all the time. You must become more aware of the many ways in which your culture biases your viewpoints, and be willing to recognize and work around often very subtle, unconscious, stumbling blocks.

Be Careful of Your Assumptions

Your culture provides you with a whole series of assumptions about the way things are "supposed" to work. For example, your culture provides you with appropriate behavior to be used when meeting another person for the first time. You assess the person's status based on a number of factors, such as age, sex, appearance, physical size, or any combination of these things. Your greeting and response to the other person is subtly and completely influenced by what your cultural assumptions of what is an "appropriate" way to relate to the other person.

Most Americans think that shaking hands and smiling openly is an appropriate way to greet someone for the first time. This may not be the case; some Asian cultures do not encourage physical contact, and many cultures think that eye contact between strangers ranges from inappropriate to openly rude and challenging. Your cultural assumptions of "correct" behavior may not be those of the other person. Your behavior may seem too familiar, or not respectful enough. In turn, the other person's behavior may seem very "cold" to you. By becoming more aware of the assumptions that influence your behaviors, you will gradually become better able to work with people of different cultural and ethnic backgrounds. This awareness will also allow you to interact with members of other cultures in a more thoughtful, and less easily misinterpreted, manner.

Develop a Sense of Humor

Humor, and what is considered funny, often varies greatly between cultures. Anyone who works with people of another culture must, however, develop a "thicker skin." Often, remarks made in complete good faith are considered to be funny by members of other cultures, or worse, offensive. If and when this situation arises, remember that there may be no offensive intent involved. Responding in a good-natured manner, while being careful not to "make fun" of another person's culture, may be a good way to further relations.

It is also important to remember that the other person may be trying to use humor to bridge the cultural gap. If you "don't get" a joke, ask for an explanation, and take the time to try and see it from their perspective. This, and similar, tactics often result in great learning experiences, and gives everyone the opportunity to "lighten up."

Be Tolerant

Don't immediately assume what certain actions or types of "body language" mean. Physical, non-verbal, forms of communication are a very important and subtle part of culturally dictated behaviors. In modern America, speaking clearly, audibly, and often during a meeting is considered a sign of an "outgoing" and "successful" person. This type of "take-charge" personality is usually thought of as "good," regardless of what age the person may be, or what experience that person has. In many cultures, only those people of a certain age or level of experience are expected to voice opinions during meetings. To do otherwise would be considered presumptuous and overbearing.

If something that you do causes a misunderstanding, based on cultural difference, be patient. The situation may resolve itself, but if not, ask members of the other cultural group what would be the most appropriate course of action. Don't immediately assume that you can "fix" the situation by further unilateral action. If you are being made fun of, this actually may be an indication that the other group is accepting you, and your relationship is improving. Patience, tolerance, and good humor are valuable tools to have at your command when working cross-culturally.

Where can I find more Information?

The Social Sciences Team (SST) offers customized training for working with people of other cultures and societies. Members of the SSI staff will work with you to develop sources of data and training that are specific to your individual situation. For additional information contact

Additional resources on this topic include:

Module 2 of the NRCS National Employee Development Center training course Consultation with American Indian Governments, entitled "Cultural Differences," provides an extended discussion, with several examples and exercises, of how to work between different cultures. Contact

The Social Sciences Team offers a training course entitled "*Developing your Skills to Involve Communities in Implementing Locally Led Conservation.*" Developed in cooperation with Michigan State University and the Michigan State University Extension, Module 7 of this course "Preparing to Work with Underserved Audiences," will provide useful information to people working across cultural lines.

The Anthropological Lens: Harsh Light, Soft Focus. By James L. Peacock, Cambridge University Press, New York, 1986.

The Art of Crossing Cultures. By Craig Storti, Intercultural Press, 1990.

The American Anthropological Association. World Wide Web site: www.aaanet.org. Current information and multiple links to virtually all things anthropological.

The Society for Applied Anthropology. World Wide Web site: www.sfaa.net. This web site has the latest information and links to a wide variety of practical applications of anthropological methods and theories.

Issue 26, Updated June 2005

600.79 Exhibit 10 – Land Evaluation Site Assessment (LESA)

LESA is an analytical tool to assist Federal, State and local agencies in assessing, planning for, and preserving agricultural lands through land use planning policies, or other techniques. Use of LESA helps to strengthen the local economy through providing a sound basis to support property tax assessments, tax incentives and agricultural development programs.

LESA systems can be applied before or during the areawide planning process and provide systematic and objective procedures to access and rank sites for agricultural importance to assist land use and conservation decision making. LESA systems can address questions including—

- What lands uses should be designated for agricultural use in areawide or master plans, or zoning ordinances?
- How adjacent land uses impact farmlands
- How can agricultural land be consistently and objectively ranked into multiple land classes?
- Which farm sites should be given priority for purchase of development rights?
- What would be the potential impact to agriculture of proposed zoning changes
- Which infrastructure and development alternatives have the least impact on agricultural lands?

Although they are often grouped together, a LESA system consists of two distinct components: the Land Evaluation (LE) system and the Site Assessment (SA) system. The Land Evaluation system must provide a consistent methodology to evaluate and rank parcels of land, typically on the basis of their inherent agricultural production potential. LE systems are most often based on properties and conditions that are deemed to be steady over the long term and are typically grounded in soil attributes that related to agricultural productivity. In contrast, the Site Assessment (SA) component of the LESA system addresses this issues related directly to the particular site of interest and that change over shorter time periods. It provides a way to systematically assess the differences between multiple sites that may possess the same underlying level of soil productivity, but have different characteristics based on their location and the availability of related services (such as irrigation or transportation infrastructure).

The impetus to consider developing a LESA system for State or local use can come from various sources including State and local planners, planning commissions, local elected or appointed officials, USDA agency staff, conservation districts or other stakeholders. In all cases, developing a LESA system should be seen as a cooperative endeavor between many government and potentially non-government entities that are interested in and involved with land manager.

Regardless of the entity that takes the lead in the development of a LESA system, the first step in LESA development is to conduct t an assessment of potential users and applications for the system. There are federally mandated applications of a LESA system including the requirement in the Farmland Protection Policy Act (FPPA) that a LESA system be used to assess the potential impact of proposed farmland conversions. But, system developers should also identify other user needs and potential applications for the proposed LESA system. An appropriate initial assessment will lead to a better understanding of the existing relevant local, State and federal policies, and the funding and staff requirement for development and maintenance of the LESA system.

The most common process used to develop a LESA system begins with a decision by a State or local government jurisdiction that a new LESA system or an update to an existing LESA system is needed. Once that determination is made, a LESA committee is appointed to develop the system. The following steps are required to successfully develop and implement the system:

- Specify multiple factors that will allow soils to be ranked based on soil quality for the Land Evaluation (LE) component. The NRCS State office should assist in this step.
- Specify another set of factors relating to non-soil conditions for the Site Assessment (SA) component.
  - Develop a rating scale for each factor.
  - Assign weights to each of the factors.
  - Note that National Site Assessment (SA) criteria with weightings are provided in the FPPA (listed in Title 7 Code Federal Regulation Chapter VI – and replicated in the FPPA Handbook (*available on eDirectives*)

- Tally the weighted factors to obtain a LESA score for the sites analyzed.
- Prepare score thresholds for decision making.

In most cases, a Land Evaluation (LE) system is developed for an entire political jurisdiction (county or State) which rates soils from 0 (lowest quality) to 100 (highest quality). The Site Assessment (SA) protocol is then applied on a case-by-case basis to compare alternative sites. Another option is to use the SA criteria to develop ratings of a "standard" group of sites or of larger geographic areas. This method is preferred if decision makers are interested in comparing a large number of sites over a large geographic area (e.g. to support zoning and local/regional planning). Soil and other site factors can be systematically combining them to produce a score for each site and sites with similar scores can be group based on established thresholds for recommended actions.

LESA Committees

Because of the potentially wide ranging application of LESA information, the most successful LESA efforts nationwide have been those where state and local officials and other appropriate stakeholders have been directly involved in the identification and appointment of committee members. Ideally, the composition of the committee should provide a range of state and local expertise to help develop a sound LESA system. A well-accepted committee can also establish public creditability and political acceptability for the system. One of the key LESA concepts is to include knowledgeable people in formulating the local system. The expertise and experience of producers and those working on farms is essential in establishing an effective LESA system. Additionally, a person trained in LESA is essential to coordination of project activities and assisting the LESA committee in developing the system.

LESA Scaling and Evaluation Factors

The Land Evaluation (LE) component of the Land Evaluation and Site Assessment (LESA) system rates the soil based qualities of a site for agricultural use. The four most common kinds of classifications used for LE are:

- Land capability class (LCC)
- Soil productivity ratings such as National Commodity Crop Productivity Index (NCCPI)
- Soil potential ratings and
- Prime, Unique and Important farmland classifications

In most cases, NRCS staff or other soil scientists will play a major role in selecting and scaling LE factors. Although much of the LE formulation is technical in nature, decisions about relative weights of LE factors should be made by the committee. It is important that local stakeholders with recognized knowledge of agriculture participate in and understand the LE component in order to ensure that the system accurately reflects local circumstances. Local involvement throughout the process will also increase the perceived accuracy and legitimacy of the resulting rating/ranking system.

The LE component should meet the following objectives:

- LE should be understandable to policy makers and other users.
- LE should establish relative soil classes of soil-based quality to assist decision makers in setting priorities for sites to be protected for agricultural use.
- LE should be based on the best available data, in conformance with established NRCS procedures for soil classification systems.
- LE should give consistent results within the given area.
- LE should be appropriate for the level of government for which the LESA system will be used.

The Site Assessment (SA) system rates non-soil factors affecting the site's relative suitability and importance for agricultural use. In general SA factors are grouped into the following three types:

- SA-1 factors measure non-soil site characteristics related to potential agricultural productivity.
- SA-2 factors measure development or conservation pressures on the site.
- SA-3 factors measure other public values of a site, such as historical, cultural, scenic or environmental values.

That national list of factors and associated weighting factors can be accepted "as is" or can be changed to reflect location conditions and preferences.

If a local system is desired, SA committee should choose specific factors reflecting the purpose for which the LESA system is to be used. The SA committee must also decide how to combine the SA factors. Factor selection, combination and weighting will depend on the intended LESA use. There are however a number of important considerations to be used in selection, defining and weighting SA factors including:

- Weight factors so that the more desirable attributes indicate a stronger argument for keeping the site in agriculture.
- Develop definitions and instructions that are clear so that each user should obtain the same result when assessing the same site.
- Link factor weights to data and be sure that factor weights correspond to the range of data for the area.
- Generally select factors that apply to most sites.
- It is recommended that each factor be on a scale of 1-100 and then weighted for uniformity in scales and standardization in computation.

SA addresses a much broader range of considerations than LE. Between three and ten SA factors may be needed. Committees formulating SA should be aware that the more factors are included, the more costly it will be to apply the LESA system and the more difficult it will be to explain to stakeholders. Care should be taken to ensure that two or more factors are not measuring the same underlying concern in different ways.

Typically SA factors fall into three classifications:

- SA-1. Agricultural Productivity
- SA-2. Development Pressures Impacting a Site's Agricultural Use
- SA-3. Other Public Values Supporting Retention of Agriculture

The factors and weights should be accepted only if they, and the resulting LESA scores, make sense to local stakeholders and decision makers. With the help of the LESA committee, a proposed LESA system should be thoroughly field checked and adjusted accordingly before it is adopted.

Combining and Weighting LESA Factors

- Once LE and SA factors are selected and assigned a factor scale, the next task is to decide how to combine the factors into a LESA system. In most cases, sites are assigned one LE rating and one combined SA rating. This is the approach used within the purview of the the Farmland Protection Policy Act (FPPA). Other options for combining LE and SA factors can be used to better capture local preferences. The common alternative methodologies are: Integration of the LE and SA-1 factors into the basic system with separate suitability Ratings for SA-2 and Sa-3 factors.
- Integration of the LE and SA-1 Factors into the basic system with Detractor/Bonus Points for SA-2 and SA-3 Factors.
- Integration of LE, SA-1, SA-2 and SA-3 Factors into the LESA System.

The local committee must decide the approach that best fits the conditions.

Evaluating the LESA System

After the LESA committee has prepared a draft of the LE and SA factors, factor scales, and weights; and made a decision on how to combine the factors, it is essential that the system be evaluated before it is used to inform decision making. The process should include preliminary and field testing of the LESA system.

The following steps are recommended for the preliminary testing:

- Select a sample of sites representing the range of characteristic in the planning area.
- Evaluate the focus of the LESA system including factors, scales, and relative weights to ensure a good fit with the sites to be evaluated.
- Document the data sources for each factor.
- Evaluate the factors for redundancy.
- Evaluate the "reproducibility" of the LESA procedures and factors to determine if similar ratings are achieved by different reviewers.

- Evaluate the “relocalability” for the LESA procedures and factors to determine if similar ratings are achieved for different sites with similar characteristics.

Once preliminary testing is completed and any necessary adjustments are made, the system should be field tested by the committee. The overall goal is to achieve simplicity of use while including the maximum practicable information. The increasing availability of spatial referenced digital data (satellite photos, infrastructure grids, etc.) has made it much easier to evaluate the ratings that result from the application of a LESA system. However, the ready availability of this type of data does not eliminate the need for “on the ground’ testing and validation of any proposed LESA system.

Interpreting LESA Ratings for Decision Making

LESA scores can be used as a tool to help plan and set policy or make other land use decisions. While LESA scores may be arrayed, ranked and compared for several sites, it may be useful to devise thresholds for applying scores to decision making. It is important to note that LESA ratings are best used as a component of a multi-faceted system that takes into account this physical, economic and social aspects and likely impacts of current and future land management decisions.