



Chapter 6: Area-Wide Planning Process

Natural Resources Conservation Service (NRCS)

INTRODUCTION

Landscapes are complex assemblages of interactive patches, corridors, and matrices. They are continually being modified by humans to produce goods and services to meet social demands. The ecological and social dimensions of landscape function, structure, and change require an interdisciplinary approach to planning at an area-wide scale. The terms area-wide and watershed are used interchangeably when referring to planning scales larger than a site, farm, or ranch.

Planning at a landscape or watershed scale is not new in the United States. Pioneering theorists included planners, geographers, landscape architects, and wildlife biologists; prominent individuals included: Warren Manning *The Greater Birmingham District* (1919), Jens Jensen *A Greater Westside Park System* (1920), Benton MacKay *The New Exploration: A Philosophy of Regional Planning* (1928), and Aldo Leopold *Game Management* (1933). Contemporary theorists include Philip Lewis *Quality Corridors for Wisconsin* (1964), Ian McHarg *Design with Nature* (1969), Carl Steinitz, Richard Toth and colleagues *Honeyhill* (1969), Michael Soule and B.A. Wilcox *Conservation Biology* (1979), Richard Forman and Michel Godron *Landscape Ecology* (1986), Thomas Edwards and others *Gap Analysis: A Geographic Approach for Assessing Biological Diversity* (1993), and Daniel Smith and Paul Hellmund *Ecology of Greenways* (1993). A number of landscape planning methodologies have evolved from the efforts of these individuals and others which share many common tenets.

The NRCS planning process, a product of that evolution, as described in the *National Planning Procedures Handbook* (NPPH) affirms Hugh Hammond Bennett's 1947 soil and water conservation principles:

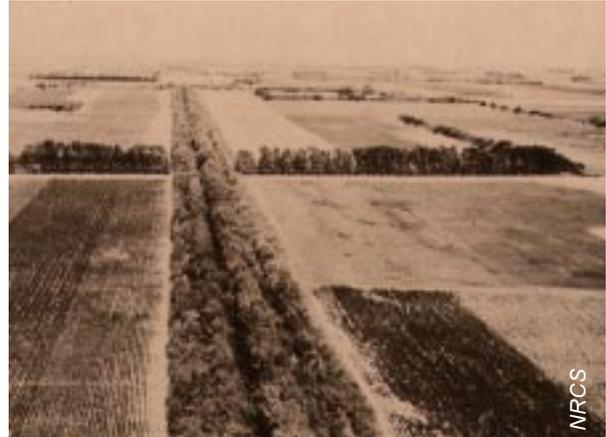
- Consider the needs and capabilities of each acre within the plan.
- Consider the farmer's facilities, machinery, and economic situation.
- Incorporate the farmer's willingness to try new practices.
- Consider the land's relationship to the entire farm, ranch, or watershed.
- Ensure the conservationist's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



Area-wide Scale



Conservation Scale



Bennett's principles acknowledged a need to understand natural ecosystems and cultural activities at both area-wide and conservation plan scales. The vast majority of conservation projects are at the farm, ranch, or community plan scale. However, it is increasingly important to address conservation issues on a watershed and ecoregion planning scale. A watershed is typically larger than 5,000 acres and smaller than 1 million acres.

There are several ways in which conservationists become involved in large-scale area-wide planning efforts, often referred to as the Coordinated Resource Management Process:

- Partnering with other federal agencies who have authorization to initiate watershed planning, for example, the Army Corps of Engineers, U.S. Forest Service, or U.S. Fish and Wildlife Service.
- Partnering with various state agencies, soil and water conservation districts, regional planning commissions, counties, or other governmental entities, which have legal authority to plan at large scales.
- Partnering with private conservation organizations or land trusts, such as Ducks Unlimited or The Nature Conservancy.
- Providing information and technical assistance to planning agencies and private consultants involved in large scale planning.
- Facilitating the planning process for developing watershed plans for individual landowners, groups of landowners, communities, watershed councils, or similar groups who request technical assistance.



PLANNING PROCESS

Coordinating planning projects at both the conservation plan scale and watershed scale requires a flexible planning process. The NRCS planning process described in the NPPH provides a useful framework for guiding the planning process at both large and small scales.

The iterative planning process identifies nine steps carried out in three phases. In the NPPH, each step specifies a planning standard, list of inputs, and a list of products. The planning standard sets the minimum quality level for each step. The list of inputs recommends information sources while the list of products describes the outputs of each step.

The area-wide planning process diagram (Figure 6-1) demonstrates how the planning process can be used for wildlife conservation at the area-wide planning scale. Because the focus of this publication is on wildlife, wildlife concerns will be emphasized in each planning step. The existing NPPH standards, inputs, and products for each of the planning steps will be referenced; however, the primary focus is on providing information necessary for applying this process to wildlife conservation.

GETTING STARTED

PREPLANNING: AREA-WIDE/WATERSHED SCALE

The NPPH provides an outline of how to proceed with preplanning activities at an area-wide scale. The *National Watershed Planning Manual* is also a useful reference. In addition, the planning facilitator should:

- Understand preconditions that can lead to watershed planning.
- Identify stakeholders.
- Generate local support for watershed planning.
- Establish trust among stakeholders.
- Organize an interdisciplinary, interagency, public/private planning team.

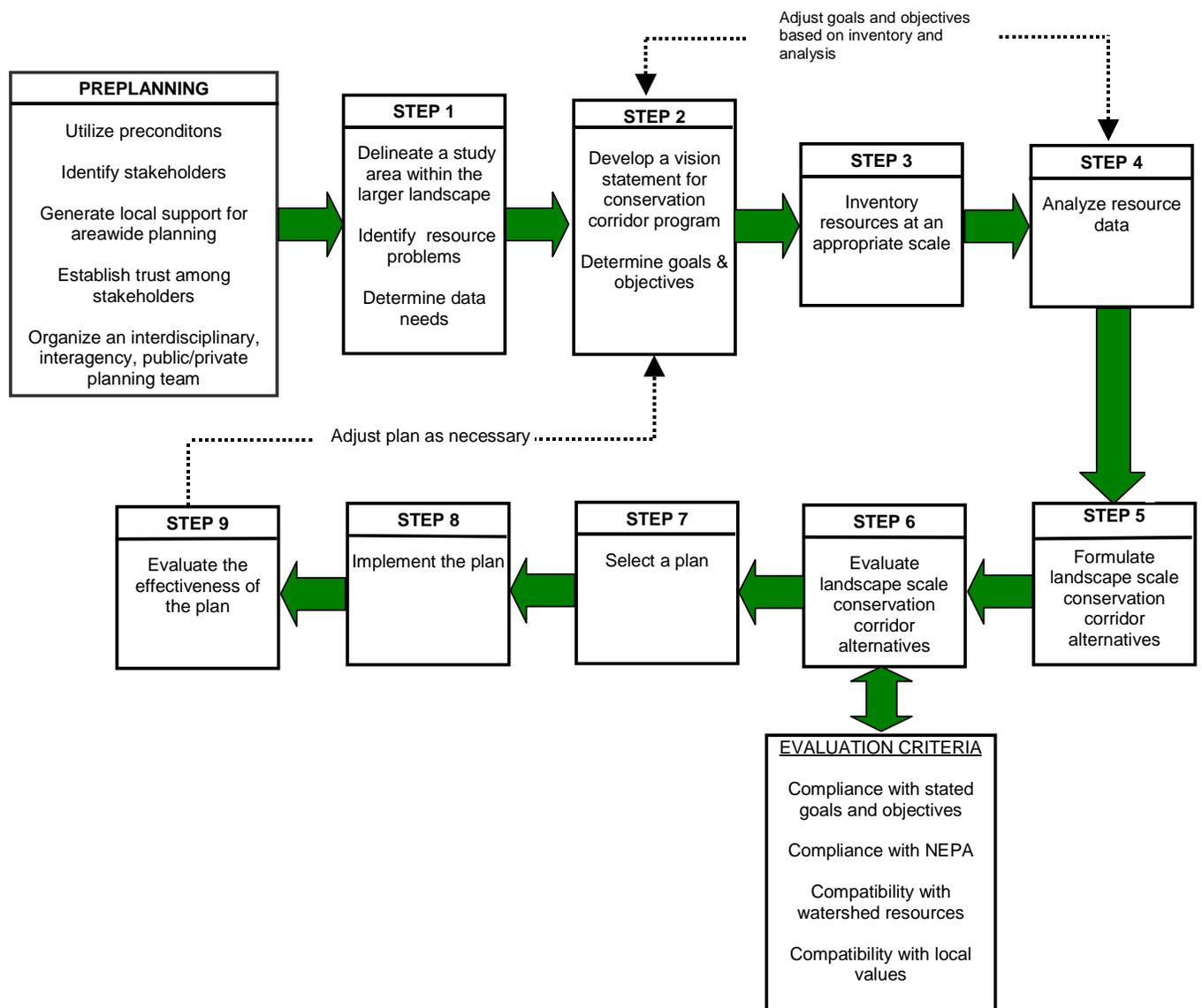


Figure 6-1: Area-Wide Planning Process Diagram

Preconditions

Sociologists have identified several different preconditions that can lead to planning projects. Some of the more common preconditions include:

- Crisis
- Mandate
- Incentives
- Leadership

Crisis is often the factor that initiates conservation planning. In the Midwest, the devastating floods of the mid-1990s created a public awareness of the role that wetlands play in reducing flooding. This new insight prompted numerous watershed scale efforts to restore natural hydrological functions. Plans proposed that filled and tilled wetlands be restored and conservation easements be acquired in floodplains.

Mandates, typically regulatory, require watershed or project scale planning to address specific issues or problems. For instance, water quality standards mandated by another federal agency may require farmers to address confined animal waste problems. NRCS field conservationists often use such mandates as an opportunity to create support for a comprehensive planning approach addressing water quality issues at a watershed scale.

Incentives are used extensively by the NRCS to promote the voluntary adoption of conservation practices. In a recent survey, NRCS biologists ranked incentives as the most important factor influencing a landowner's decision to participate in a conservation program. The USDA Wildlife Habitat Incentives Program (WHIP) provides cost-share assistance for private landowners to implement wildlife habitat development plans. Incentive programs are a useful tool for encouraging planning projects.

Leadership can come from public agencies, by private citizens, influential landowners, or conservation organizations. Area-wide planning may be promoted by a strong leader whose energy, personality, and vision can mobilize others to participate. In many cases, local conservationists will provide technical support to qualified leaders in other agencies or groups spearheading conservation planning in the watershed. In some cases, the conservationist may serve in this leadership role. District or NRCS Conservationists are often effective leaders because of the trust she or he has developed with many of the stakeholders in the watershed.

A combination of preconditions often will create the necessary climate for watershed conservation corridor planning. As preconditions become more conducive to watershed planning, the potential partners should take a proactive role by initiating a comprehensive planning effort.

Identify Stakeholders

Successful wildlife conservation planning at the area-wide scale depends upon bringing together interested stakeholders: landowners, citizen groups, Native American tribes, and government agencies to form a collaborative-based planning group. Collaboration-based planning is simply people pooling their resources to solve problems they could not address individually. A collaborative planning approach offers several benefits:

- Improve relationships between stakeholders
- Broad analysis of the problem improves the quality of the solution
- Parties retain ownership in the solutions
- Participation enhances acceptance of the solutions and willingness to implement
- Risk of impasse is minimized
- Cost-effectiveness is improved
- Potential for innovative solutions increases (Gray 1989)

Successful area-wide planning and implementation often depends on voluntary participation and cooperation, thus initial identification, recruitment, and involvement of the stakeholders is critical. Care must be taken not to overlook potential participants. Overlooking a particular stakeholder group can create animosity and eliminate some of the support necessary for plan approval and implementation.



Stakeholder groups, which may be involved in watershed planning, include:

- Landowners
- State conservation agencies
- Federal land agencies
- State wildlife/fish & game agencies
- U.S. Fish and Wildlife Service
- Farm Bureau
- Resource conservation and development councils
- Conservation and environmental groups
- State extension service
- County commissioners
- Native American tribes
- Local citizens
- Municipal and county planning agencies
- Soil and water conservation districts
- Recreation groups
- Developers and realtors

Identifying and recruiting stakeholders is an ongoing process. The initial group of stakeholders can be used to help recruit other parties that should be involved in the planning effort.

Generate Local Support for Watershed Planning

The leader of a watershed planning effort needs to build a foundation of local support. He or she should visit key representatives of each stakeholder group to generate support. Several aspects of the watershed scale planning process should be ensured during each visit:

- It is a locally driven collaboration-based process.
- It improves cost-effectiveness through partnering.
- It produces multiple benefits. (See Chapter 4)
- It is a proactive approach to problems and opportunities.

Locally Driven Process

General support for planning is enhanced when it is clear that the process will be locally driven and collaborative in nature. All of the stakeholders will be involved in helping shape plan alternatives. Local control of the process is the fundamental underlying concept.

Cost-effectiveness

Another benefit of collaborative planning is cost-effectiveness. Limited financial and personnel resources can be leveraged by partnering with other agencies and conservation groups.

Corridor Benefits

Support for watershed planning can be created by promoting the variety of benefits that area-wide planning in general and conservation corridors in particular provide (See Chapter 4). Different sets of benefits are important to different stakeholder groups. Explain the plant and wildlife conservation benefits that a watershed plan could provide to conservation groups and the increased crop yields and reduced soil erosion to landowners.

Proactive Approach

Potential participants in a planning effort should also understand that planning is a proactive approach that can be used to manage the impacts of current and future human development on watershed resources, wildlife populations in particular. More importantly, proactive watershed planning can optimize the conservation of natural, cultural, social, and economic resources in the watershed.



Establishing Trust

Skepticism and distrust among various stakeholders with differing values are commonly the result of stereotyping or previous negative experiences. Stakeholders must trust each other if the planning process is to move forward. Conservationists should consider utilizing a qualified facilitator to bring divergent groups together to negotiate a plan in good faith. Facilitators can increase trust among the stakeholders by:

- Being a good listener
- Being respectful of other's concerns
- Avoiding the use of unnecessary jargon
- Allowing each participant to share concerns and issues

The conservationist, whether facilitator or not, must be a good listener, respectful of all stakeholders' concerns. Good communication is essential to building trust. The conservationist should encourage stakeholders to use common terms in their presentations and discussions. The introduction of technical terms or jargon may confuse or alienate participants and should be avoided.

Trust among the various parties can also be developed during the planning process. All stakeholders should be encouraged to discuss their concerns in a group setting. This process can dissolve misleading stereotypes and build greater trust.



Organizing the Planning Effort

The project leader's next task will be to prepare for the initial planning meeting. Several key items need to be considered for organizing an effective planning effort.

- Meeting time and location
- Agenda
- Formalizing the planning effort
- Group structure
- Ground rules for meetings

Meeting Time and Location

Select a time for planning meetings that will allow the largest number of stakeholders an opportunity to attend. Ask each stakeholder about the dates and times most convenient for them. Match schedules and determine the best day and time. Typically, meetings will be held in the evening.

The meeting location is also important; it should be easily accessible for all participants. Agency offices should be avoided as meeting sites in areas where wildlife or other resource issues are controversial. A neutral meeting location like a library or school facility is usually a good alternative.

Agenda

A printed agenda, handed out to the participants at the beginning of the meeting is probably the most important tool for facilitating efficient meetings. An agenda helps keep the meeting focused and suggests to the participants that their valuable time will not be wasted. When participants feel that the process is unorganized, enthusiasm fades quickly.

In developing the agenda, the leader should have a clear understanding of what needs to be accomplished as well as realistic expectations of what can be achieved. It is often a good idea to establish time limits, in order to keep the meeting duration to a reasonable length. As a rule of thumb, initial meetings should not exceed 2 hours.

Formalizing the Planning Effort

Research on collaborative planning efforts suggest effective groups typically adopt some formal structure. A formal charter is not necessary but the group should have a clear mission statement. A mission statement outlines the broad purpose of the group so that it is clear what issues the group is going to address and what issues are outside its purview. In many cases, it may be appropriate to prepare a memorandum of understanding (MOU), outlining roles and responsibilities of the different participating groups. In addition, the group should have a title people can identify with, the Willow Creek Watershed Planning Committee, for example. There should be only one or two official points of contact that the public can call upon if there are any questions about the planning group. This helps prevent miscommunication. Groups also may wish to develop ways of reporting progress. Newsletters, mail-out brochures and web sites are examples of successfully used media.

Formalizing the planning process serves several key purposes:

- It demonstrates to the general public that this is an organized group of stakeholders with a specific function.
- It generates a sense of responsibility and commitment to the planning process; such that participants tend to feel an obligation to accomplish objectives.
- It is often necessary to acquire grants and other sources of funding.

Group Structure

Various models exist for structuring partnerships, but the following are some common elements found in many watershed planning groups:

- Coordinator
- Facilitator
- Steering committee
- Technical advisory committee
- Task groups

Coordinator

The coordinator serves as the leader of the planning effort and as a point of contact for the general public. The coordinator's main responsibilities are day to day administrative functions including funding coordination.

Facilitator

A neutral facilitator can often assist planning efforts where some issues are highly controversial. A facilitator can sometimes overcome the barriers of mistrust among the stakeholders. A good facilitator should also be skilled in planning and guiding meetings.

Steering Committee

The steering committee consists of individuals and organizations representing the range of viewpoints of those residing in the watershed. The steering committee often provides the main direction for the group.

Technical Advisory Committee

The technical advisory committee is usually made up of government representatives, private individuals, and organizations with technical expertise to advise the steering committee and answer technical questions.

Task Groups

Task groups are often employed in efforts that involve several resources or many stakeholders. For instance, different task groups might be assigned to address wildlife, water quality, agricultural resources or other specific issues.

In some situations, it may be useful to build upon existing planning structures and institutions. As an example, existing Resource Conservation and Development Councils (RC&D) offer an effective structure for watershed planning. Where local perception of existing institutions is negative, it may be advisable to begin with a new, independent organization. Whatever approach is taken, an effective group structure should be open, flexible, stable, and credible.



PLANNER'S TOOLBOX

Partnership Handbook. 1996. Published by the Water Resources Research Center, College of Agriculture, University of Arizona, Tucson, AZ. Available for download at <http://ag.arizona.edu/partners/>.

Pulling Together: A Land Use and Development Consensus Building Manual. 1994. Published by Program for Community Problem Solving. Ph. (202) 783-2961.

Facilitator's Guide to Participatory Decision-Making. 1996. S. Kaner et al. Published by New Society Publishers. Ph (800) 567-6772.

Ground Rules for Meetings

Area-wide planning will invariably touch on some sensitive and controversial issues and ground rules for meetings are frequently needed to guide participant conduct. Ground rules promote honest but diplomatic dialogue that does not threaten stakeholder relationships. There are different lists of ground rules that facilitators use in conducting meetings. The project leader should be familiar with *Robert's Rules of Order* and should have a copy on hand at each meeting. They will be needed when formal decisions are made. For general meetings and working sessions, it is probably best to keep the rules simple so they promote the free exchange of information and ideas.

Products

- Formalization of an interdisciplinary, interagency, public/private planning team.

SUMMARY

Activities in the preplanning phase are important steps for laying a solid foundation in the watershed planning process. The NPPH offers some guidance on working with individuals and groups.

In addition, the NRCS Social Sciences Institute is currently producing a series of publications to assist conservationists involved in planning partnerships. The series entitled *People, Partnerships, and Communities* includes information sheets on listening skills, running effective public meetings, conflict management, community leadership, etc. The conservationist can find out more about this valuable resource at <http://people.nrcs.wisc.edu/SocSciInstitute/>. A selection of other potentially useful resources can also be found in the Planner's Toolbox.



PHASE 1 COLLECTION AND ANALYSIS AT THE WATERSHED SCALE

Phase 1 involves:

- Identifying problems and opportunities
- Determining objectives
- Inventorying resources
- Analyzing resources

In Phase 1, the planning group works to reach consensus on the problems, opportunities, and objectives for the watershed plan. Frequently, a watershed planning project produces potentially significant environmental or social impacts affecting an endangered species, for example. In these cases, planning falls under the purview of the National Environmental Policy Act (NEPA). It is beyond the scope of this manual to discuss NEPA; however, numerous references are available.

The following discussion applies to those area-wide planning projects that do not require an EA or EIS. However, becoming familiar with the material in this Chapter will help the conservationists and the planning team in preparing an EA or EIS for a watershed plan, if it is needed.

STEP 1 IDENTIFY PROBLEMS AND OPPORTUNITIES

Planning Standard

The stakeholders' wildlife and wildlife habitat problems, opportunities, and concerns are identified and documented.

Discussion

The NPPH provides an outline for identifying problems and opportunities at a watershed scale. This section focuses on several of the key tasks:

- Delineating a planning area
- Creating a base map
- Identifying wildlife and wildlife habitat problems and opportunities in the planning area

Delineate Planning Area

Numerous criteria can be used to delineate a planning area. Each criterion has its advantages and disadvantages for wildlife conservation planning.

Political or Resource Administrative Criteria

Advantages

Political Boundaries

- Familiar boundaries for landowners; they suggest local control
- Reflect how many land-use decisions are made
- Define regulations and regulatory procedures
- May include functioning planning agencies and adopted plans

Water District Boundaries

- Familiar boundaries for landowners; they suggest local control
- Reflect how many water use decisions are made
- May include active planning committees and adopted plans

Conservation District Boundaries

- Familiar boundaries for NRCS
- Familiar boundaries for landowners and suggest local control
- Include active planning committees and adopted plans

Disadvantages

- Do not relate to physical landscape structure or ecological function
- Habitats may not conform to political or resource administrative boundaries
- Wildlife home ranges, migration, and dispersal do not conform to political or resource administrative boundaries
- Existing plans and regulations may not have adequately considered wildlife and wildlife habitat

Biological or Geographic Criteria

Advantages

Wildlife Species Ranges

- Reflect wildlife use of the landscape
- Critical for planning for wide-ranging species such as cougars and bears
- Emphasize values of landscape level planning for wildlife

Watersheds

- Define hydrological processes within the boundary
- Management practices are reflected throughout the watershed
- Define the location of critical riparian corridors
- State wildlife management units are often based on watersheds

Disadvantages

- Watersheds may cross several political boundaries
- Home ranges of many species are not well-known and would be time consuming and expensive to generate
- Home ranges of some species may include several watersheds
- Seldom is a single planning, administrative, or regulatory mechanism operative
- The necessary planning, administrative, and regulatory mechanism could be complex, cumbersome, and often conflicting
- Boundaries could be unfamiliar and confusing to landowners
- Suggest regional or state control; an unpopular concept with most landowners

The planning team will need to determine which type of planning boundary is most appropriate for the area-wide project they are working on. In many cases, watersheds are the most practical planning unit and are being used to delineate many planning boundaries. In Virginia, for example, NRCS has delineated approximately 500 watersheds averaging 53,000 acres in size for planning purposes.

Whatever criteria are used to establish the planning boundary, the planning area should be large enough to include the home ranges of all but the most wide-ranging wildlife species. The study area may occasionally need to be expanded to include the home ranges of important wide-ranging species.

Create a Base Map

Scale

During the process of delineating a planning project boundary, a base map should be prepared to help participants visualize the planning area. USGS 7.5-minute quadrangles at 1:24000 are often an appropriate scale for watershed planning projects. Large watersheds will require splicing together several maps. It should be noted that some quadrangle maps do not reflect current conditions, particularly in rapidly urbanizing areas and may need to be updated.

Context

The NPPH provides some guidance for preparing a base map. Key elements to include on the base map are:

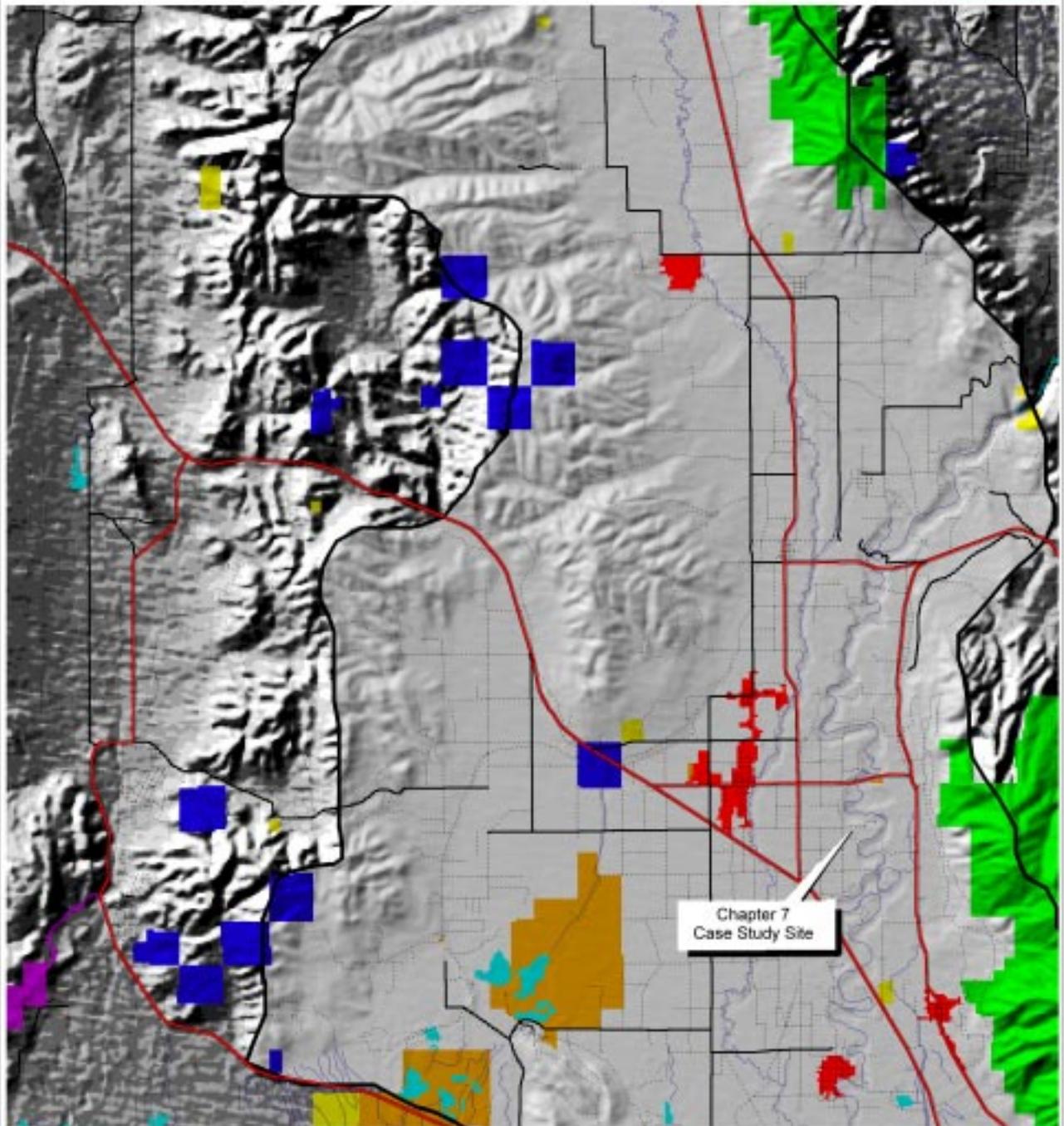
- Topography
- Hydrology
- Political boundaries
- Transportation and utilities
- General land ownership (public/private)

These elements should be displayed in simple graphic form maintaining clarity even when additional information is added or overlaid later during inventory and plan preparation steps. Figure 6-2 provides an example of a watershed base map. The planning boundary follows a watershed boundary except at the upper and lower ends where political boundaries were used. This was necessary because two counties in the study area chose not to participate in the planning project, a common problem in many watershed planning efforts.

The team will need to decide if it will produce hand drawn or computer-generated base maps to record inventory information and prepare plans. This decision will depend on resources available such as personnel, funding, and computer hardware and software.

Base Map

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Urban Areas
- Highways
- County Roads
- Railroads
- Streams

Ownership

- BLM
- Forest Service
- National Parks
- State
- USFW Refuge
- Water
- Private

Notes:

10000 0 10000 20000 30000 Feet



Figure 6-2

Computer Generated Maps

Computers can be an extremely useful tool for large scale planning because of their capabilities for storing, manipulating, and displaying large quantities of data. A Geographic Information System (GIS) is a particularly valuable computer tool for watershed planning. GIS is a collection of computer hardware and software designed to efficiently store, update, manipulate, analyze, and display all forms of geographically referenced information. GIS can be used to organize information in layers such as hydrology, topography, wildlife distribution patterns, and critical habitat areas. Unlike manual mapping systems, the drawing scale can be adjusted and data layers can be easily updated. The example base map was completed using GIS (Figure 6-2). Although the base map was printed on an 8-1/2" by 11" sheet, it could be printed on a larger sheet format to facilitate the placement of additional information. In many states, existing resource data are being converted to GIS formats. Planning team members from resource agencies should check availability of existing GIS data. For instance, the Automated Geographic Reference Center (AGRC) in Utah is consolidating data from various state and federal agencies and is organizing it into a GIS format. GIS maps are then made available to the public for planning purposes.

Hand Drawn Maps

If computer resources are not available, it will be necessary to prepare the base maps by hand. Hand drawn maps should be prepared using indelible ink on durable mylar or drawing film, so that blueprints or large format photocopies can be made and used during the planning process.

Problem and Opportunity Identification

The NPPH outlines a general process for identifying problems and opportunities. The key steps in this process include:

- Scoping
- Reviewing existing data
- Gathering preliminary expert opinion
- Verifying field data
- Making recommendations for studies (if necessary)
- Documenting of problems and opportunities

Scoping

Scoping involves direct communication with various publics and dialogue among planning team members. The purpose of scoping is the preliminary identification of problems and opportunities for wildlife conservation in the watershed. During scoping, it may become evident that the planning project warrants further environmental evaluation as required by NEPA. Other references should be consulted for preparing NEPA documents using proper procedures and formats.

Interdisciplinary Approach

Wildlife conservation at a watershed scale is complex and involves many interrelated resource issues. Consequently, identification of problems and opportunities requires an interdisciplinary approach that addresses ecological, cultural, social, and economic issues. It is particularly important that wildlife issues are addressed by a knowledgeable team with backgrounds in wildlife biology, terrestrial and aquatic ecology, and conservation biology. Together, they can identify the problems and opportunities of greatest significance to the wildlife resource. However, biologists and ecologists must interact with other team members; interdisciplinary planning is effective only when all participants work across disciplines to achieve a plan that is directed toward the conservation of desired resources. It is the planning coordinator's responsibility to keep the group focused on problem identification and not on premature solutions.

Problem Identification

During scoping meetings, the public and different stakeholders are given an opportunity to describe problems and opportunities from their perspective. This includes listening to experts, long-time residents, the general public, and various stakeholders. Scoping is an important time to interact with each other, identify issues of concern, and to build solid working relationships.

Public involvement from stakeholder groups that may seem reluctant to directly participate on the planning team must be nurtured. Input from these groups and the general public may be gained through surveys, informal one-on-one meetings, meetings with special interest groups, and open public meetings. Often perceived problems are identified in this process. These problems are real to the stakeholder and must be addressed. Research reports, studies, and expert testimony are tools that can be used to clarify the facts surrounding many of these concerns.

Opportunity Identification

In addition to identifying problems, the group should take a proactive approach and identify opportunities to enhance wildlife habitat and biodiversity. Unlike problems, opportunities do not place blame on any particular group within the watershed. Sometimes, an opportunity becomes the factor that rallies and sustains group support for a project. The group should reference Chapter 5 for ideas on identifying opportunities for improving conservation of wildlife in the watershed.

Group Watershed Tour

A watershed tour is a valuable scoping tool for identifying problems and opportunities. It provides an opportunity for team members to discuss perceptions of problems and possibilities in the watershed. It is best to schedule the tour after the initial planning meeting so that the public's concerns identified during scoping can also be addressed in the field.

The NRCS Social Science Institute has developed Rapid Resource Appraisal (RRA), a format for a daylong field trip and a set of activities that planning groups can use to quickly learn about the problems and opportunities in a watershed. The RRA (SSI 1997), which can be specifically tailored for wildlife issues, should be done shortly after scoping so all participants become familiar with the issues and their complexity. Field notes, photos, videos, etc. should be compiled during the tour to record conditions for future reference. A useful brochure on RRA can be found at the NRCS Social Sciences Institute web page described previously in this chapter.

Review Existing Data

The planning team should reference any previous work done in the watershed such as environmental impact statements, environmental assessments, planning reports, wildlife research projects, and thesis. Reference librarians can assist in locating these resources. In some states, GAP analysis data (as described in Chapter 5) may be available and should be utilized in identifying problems and opportunities.

Preliminary Expert Opinion

Biologists and ecologists on the planning team will be responsible for identifying the wildlife related problems and opportunities inherent in the pattern of patches, corridors, and matrix in the watershed. Although the pattern of these landscape features will be different in each watershed, there are relationships and land use practices common to most watersheds that should be identified including:

- How do wildlife utilize the pattern of landscape elements? Note in particular, patches with high biodiversity and corridors important for dispersal or migration.
- What existing patches or corridors are being managed for biodiversity?
- What land uses or management practices may be adversely impacting the habitat or conduit functions of existing patches and corridors?
- What land uses or management practices may be limiting wildlife species diversity or abundance?
- What patches could be linked with corridors to enhance biodiversity?
- What locations in the watershed have the potential to be restored as patches or corridors?

Biologists and ecologists should consolidate the information gathered during the scoping process and watershed tour and prepare a preliminary report of their findings.

In-field Verification

The planning team should schedule additional field trips to verify problems and opportunities identified in the preliminary expert opinion report. This provides another opportunity to refine the group's findings.

Recommendations for Studies

In many cases, existing data on wildlife populations and habitat for a particular watershed is limited. Field studies may be required before the team can begin preliminary documentation of the problems and opportunities. Additional data may be collected during the inventory step of this phase. Problems and opportunities will not be finalized until the resource data are analyzed in planning step 4.



Ron Nichols NRCS

Documentation

After problems and opportunities have been identified, they should be documented on the base map (Figure 6-3). The value of mapping the results is that it ties issues to specific locations within the planning area. Short reports should be prepared to supplement mapped data. The team should also document problem and opportunity areas with photographs for future reference. Photographs of the existing condition can also be extremely valuable during the evaluation of the implemented plan.

Products

- Mapping format, scale, precision, and role of technology
- Base map with planning boundary
- Preliminary identification of wildlife and wildlife habitat problems and opportunities documented on base maps and short reports



STEP 2 DETERMINE OBJECTIVES

Planning Standard

The planning group's objectives are clearly stated and documented.

Discussion

The NPPH provides an outline of how to determine objectives at a watershed scale. In addition, the planning group should:

- Develop a vision statement
- Establish objectives (desired future condition) for wildlife conservation and biodiversity

Develop a Vision Statement

The main reason that stakeholders initiate watershed planning is because they wish to change the existing conditions in the watershed to some desired future condition. The desired future condition defines the focus for the inventory, the benchmark for the analysis of existing conditions, criteria for formulating and evaluating alternatives and guidance for what conditions to evaluate and monitor. Often the planning team will develop a vision statement; a short description of what they believe the future condition should be for the watershed. This vision must be shared among all stakeholders and agreed upon by everyone in the planning effort.

The vision statement may be one general statement for all resources in the watershed or the group may decide to craft individual statements for each resource. In the later model, a specific statement would be prepared for the wildlife resource. A vision statement should clearly define the final destination of the planning effort. It will be the touchstone throughout the entire planning process.

The following is the vision statement for wildlife conservation from the Edisto River Basin Project in South Carolina:

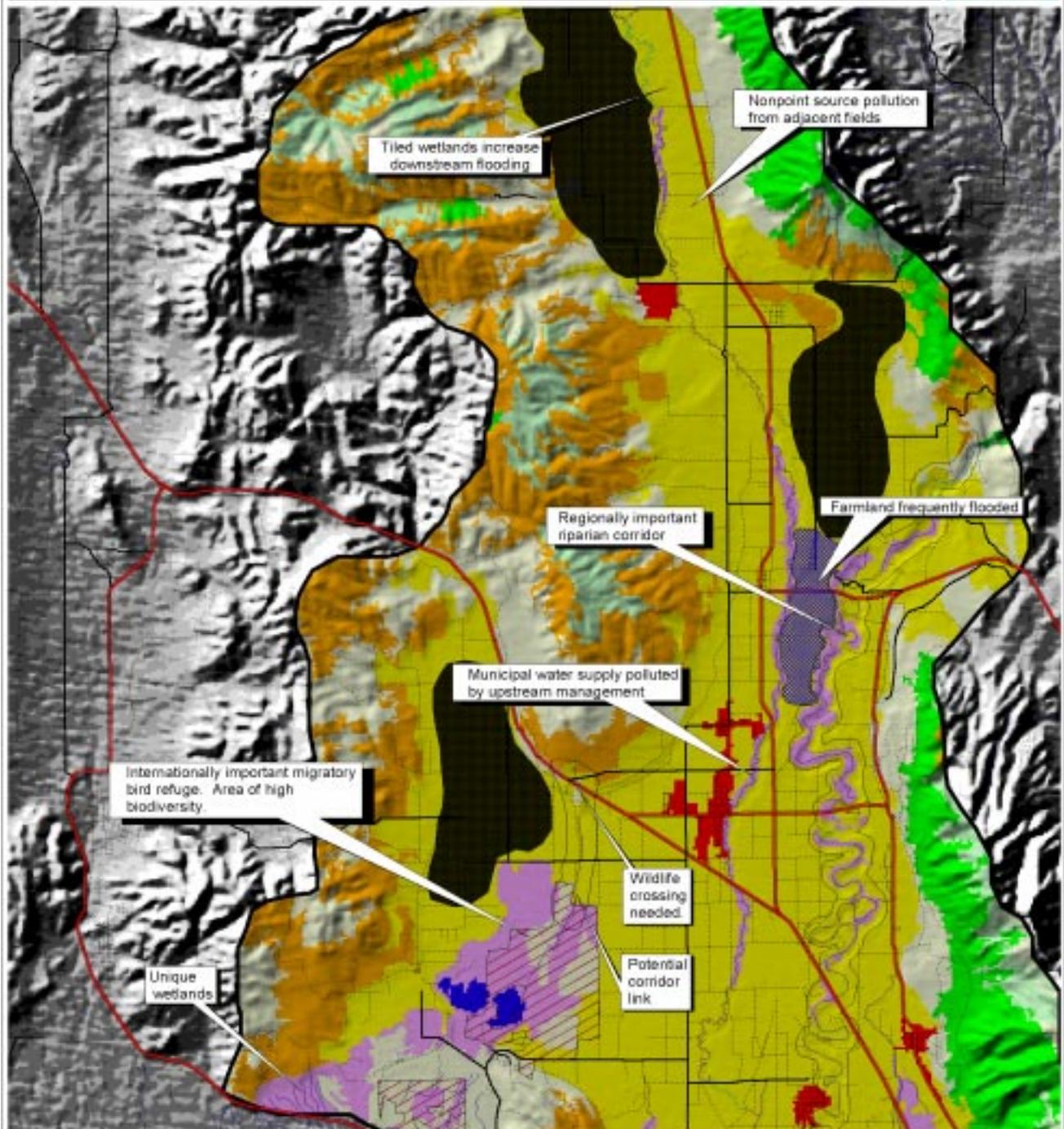
A Vision for Wildlife in the Edisto River Basin

Wildlife and wildlife habitat are important to enhancing the quality of life of people both inside and outside of the basin area. Because there is an abundance of good quality habitat, the committee sees that conservation of natural habitats and prevention of degradation is a significant opportunity within the Edisto Basin. ...Connectivity is believed to be essential for the long-term viability of a number of native species. For these reasons, maintaining and enhancing both large blocks of habitat and connectivity among habitats are important for sustaining regional wildlife diversity. (Beasley et al. 1996: pp. 186)



Problems & Opportunities

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Urban
- Highways
- County Roads
- Streams

Vegetation

- Coniferous
- Deciduous
- Shrub
- Grass
- Riparian/Wetland
- Agriculture

Miscellaneous

- Erodible soils
- Streambank erosion

Notes:

* Refer to report for further information on problems and opportunities in the watershed.

10000 0 10000 20000 30000 Feet



Figure 6-3

Determine Objectives

Objectives are road maps to desired future conditions expressed in the vision statement. Objectives are specific statements describing how the desired future will be achieved. The following are common attributes of an objective:

- Start with an action verb
- Specify a specific outcome
- Specify a time frame to reach the desired outcome
- Frame objectives in positive terms
- Make objectives specific and measurable for later evaluation
- Phrase objectives in a way that describes what is desired without prescribing a specific solution

Objectives for wildlife should respond to the wildlife conservation problems and opportunities identified in Step 1. Objectives may be revised as new information is generated during the inventory and analysis steps. The planning group should also be aware of any federal, state, or local laws related to wildlife that could affect the plan concepts and objectives.

When developing objectives, the principles discussed in Chapter 5 should be consulted. In addition, the following list of categories can serve as a guide for the development of a comprehensive set of objectives. The planning team may want to develop objectives for each category.

Objective Categories:

Habitat

- Matrix
- Patch
- Corridor

Wildlife

- Non-game
- Game
- Vulnerable

Other

- Educational
- Policy

It is important to develop both short and long-term objectives. To maintain stakeholder commitment to watershed planning efforts, some tangible objectives need to be achieved in a short time as well as results that may be realized 10 to 20 years in the future.

Documentation

The vision statement and objectives for the planning project should be recorded in a short report. It may be useful to prepare a brochure with highlighted objective statements, photographs, drawings, charts and other graphics depicting the desired future condition of the watershed. The brochure can be used for both promotional and educational purposes .

Products

- A vision statement (desired future condition)
- Measurable objectives for wildlife and wildlife habitat

STEP 3 INVENTORY RESOURCES

Planning Standard

Sufficient data and information are gathered to analyze and understand wildlife and wildlife habitat conditions in the planning area.

Discussion

The general intent of the resource inventory is to describe existing (benchmark) conditions within the project planning boundary. The wildlife resource section of an inventory should include a wildlife species component and a habitat component. When watershed plans require preparation of an EIS or EA, NEPA guidelines must be followed for inventorying wildlife. The wildlife resource inventory at a watershed scale should:

- Investigate in greater detail each problem and opportunity identified in Step 1
- Collect additional data as necessary in response to the vision statement and specific objectives established in Step 2
- Describe wildlife resources including: species diversity and abundance, threatened or endangered species and vulnerable populations
- Describe wildlife use of existing patches, corridors, and the matrix
- Describe general habitat conditions in patches, corridors, and the matrix

Information generated in the watershed inventory is useful for further defining the problems and opportunities identified in Step 1. Inventory information may also suggest the group's objectives need to be altered to more accurately reflect conditions within the project boundary.

Inventory Responsibilities

In many instances, the technical advisory committee or a similar subgroup of the planning effort will be responsible for the wildlife and wildlife habitat inventory. Participants on these committees generally have the best access to wildlife resource data since many will be biologists or other resource professionals. However, it is also important to involve other stakeholders when possible in the inventory process. Many long-term residents, local biology teachers, bird watchers, or environmental groups can offer valuable insight. Involving all of the stakeholders creates a sense of ownership in the process, leads to better input of information, and establishes a better group understanding of the wildlife resource.

Data Collection

The NPPH provides a general outline for inventorying resources at a watershed scale. Ecologists and biologists in consultation with other team members will specify the kinds of data required to adequately plan for the wildlife resource. Each watershed is unique, hence most data requirements will be watershed or area specific. However, some basic data needs relate to most watershed scale projects:

Wildlife Species Data Needs

- Wildlife present in the planning area
 - Non-game species
 - Game species
 - Threatened and endangered species (federal and state listed species)
- GAP data (where available)
- Vulnerable populations of a species
- Historical species (once present but no longer reside in the watershed)
- Population characteristics for species of concern
- Culturally important species (especially those tied to Native Americans or valuable to limited income groups for subsistence)

Wildlife Habitat Data Needs

- GAP data (where available)
- Existing vegetation
- Historical vegetation
- Wildlife species/plant communities relationships
- Land cover types
- Land ownership
- Habitat features
 - Patches with high biodiversity
 - Patches with vulnerable populations
 - Migration and dispersal corridors
 - Special areas (e.g., calving sites)
- Potential habitats
- Species ranges for species of concern
- Water availability and historical hydrology

The goals of the inventory process for watershed planning are to identify the most important elements of wildlife habitat at the landscape scale and determine the level to which they are protected. These key elements will form the basic structure of the conservation plan alternatives developed in later steps. A GAP analysis (described in Chapter 5) is useful for this purpose. The GAP map identifies areas with high levels of biodiversity that are currently not being managed for wildlife conservation (Figure 6-4).

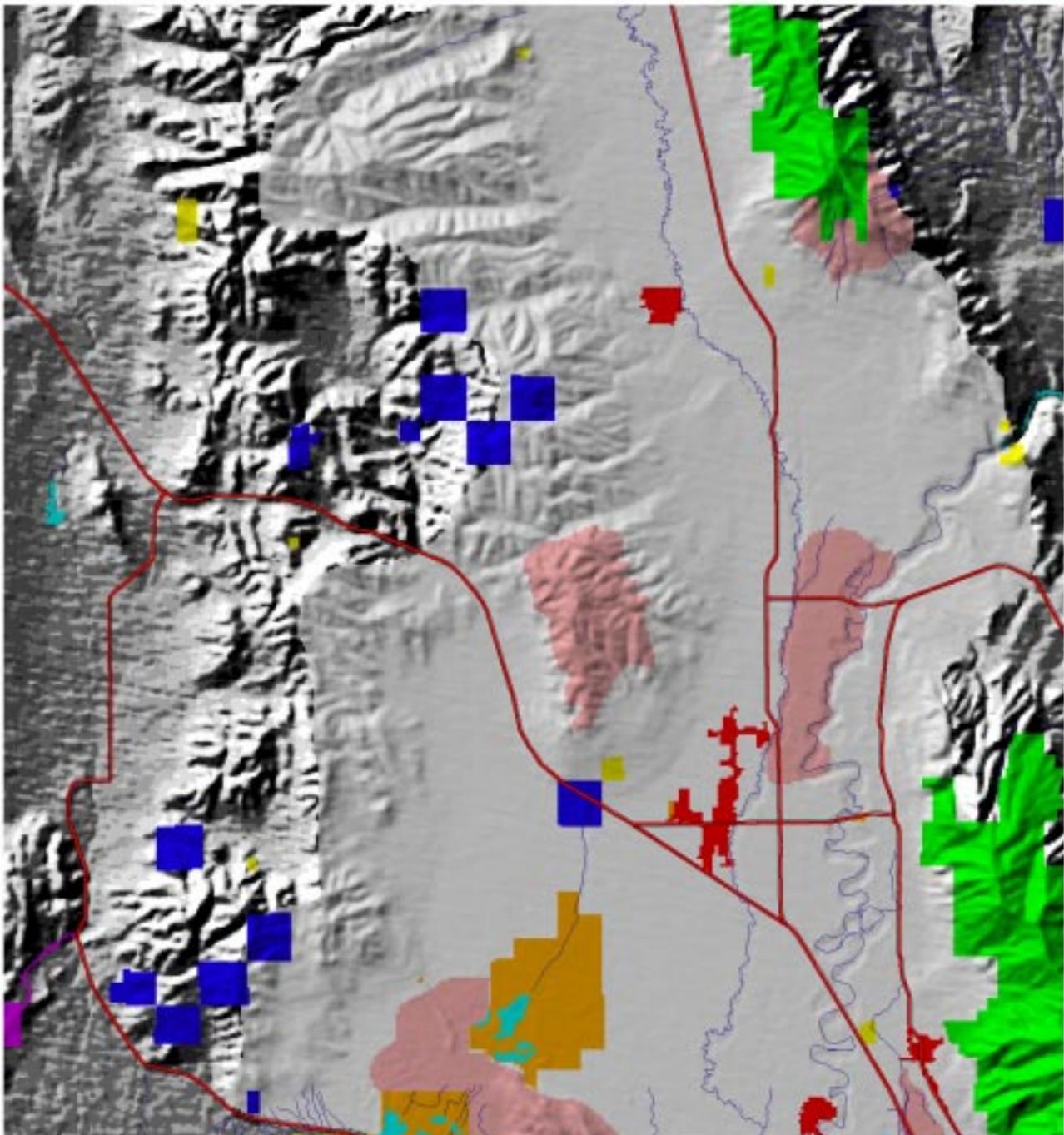
Documentation

All inventory data should be mapped at the same scale as the base map (Figure 6-5). This may require enlarging or reducing mapped information from different sources. For a watershed inventory, a convenient mapping scale is the 1:24000 USGS quadrangle map. It should also be noted that some data features such as corridors may have to be exaggerated in scale to be visible on the base map.

The biologists and resource specialists on the planning team should determine the specific types of inventory maps that need to be generated to depict the wildlife resource in the watershed. The categories and level of detail on the maps will vary depending on the regional context. A short report summarizing inventory results may also be appropriate.

GAP Map

Willow Creek Watershed Planning Project
 Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Highways
- County Roads
- Streams

Ownership

- BLM
- Forest Service
- National Parks
- State
- USFW Refuge
- Water
- Urban

GAP Analysis

- Private
- Gaps

Notes:

10000 0 10000 20000 30000 Feet



Figure 6-4

Inventory & Analysis

Willow Creek Watershed Planning Project
 Natural Resources Conservation Service

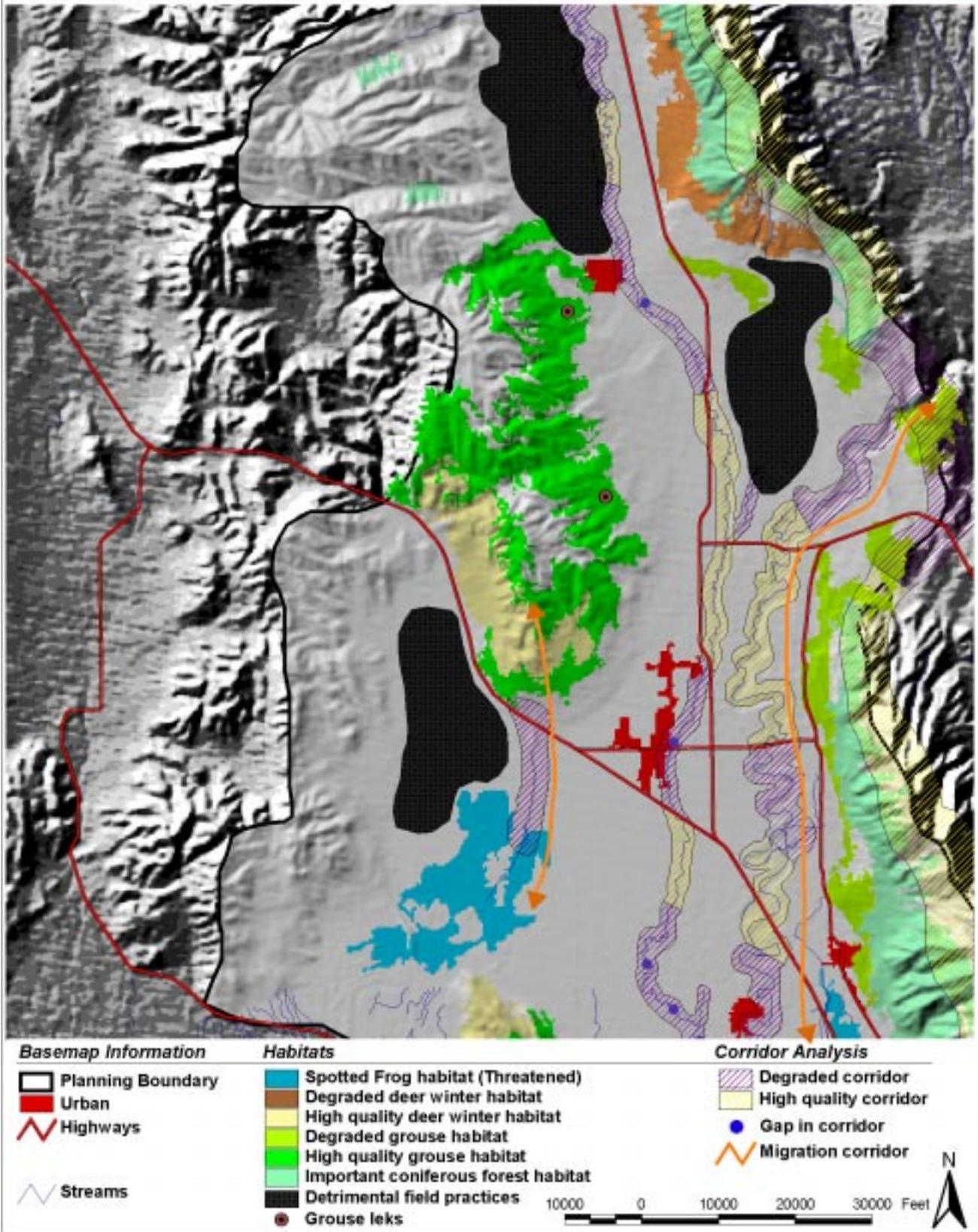


Figure 6-5

Products

- Detailed inventories of the planning unit
- Information on human considerations
- Identification of other ecological concerns, including wildlife issues
- Identification of cultural resources
- Identification of infrastructure physical features, such as roads, houses, fences, power lines, and other utilities
- Benchmark data for the planning area



STEP 4 ANALYZE RESOURCES

Planning Standard

The benchmark condition for the planning area 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 any resource problems are identified.

Discussion

The planning group must now interpret the inventory data for the watershed planning area. The NPPH outlines the basic procedures for Step 4 analysis. The professional expertise of team members and consultants (where necessary), discipline manuals, and inventory worksheets are critical resources in the analysis process at the watershed scale. Each resource inventoried in Step 3 will be analyzed in detail. The reports and maps prepared specifically for wildlife in the analysis step should:

- Depict the current condition of wildlife and habitat resources in the planning area
- Compare existing conditions with potential conditions
- Identify the causes of resource problems

Analysis of resources at the watershed scale is complex. An interdisciplinary team approach is necessary to conduct a thorough analysis that describes the interrelationships between resources. Biologists, ecologists, and other resource specialists should provide specific guidance for analysis of wildlife and wildlife habitat. Again, all stakeholders should be involved in the analysis process to the extent possible. Group involvement promotes better understanding of the wildlife resources, which will facilitate development of plan alternatives in Step 5.

Results of the analysis may suggest that some previously defined objectives may need to be eliminated or modified; some new objectives may be added. At the completion of Step 4 and Phase I the planning group should be in agreement on problems, opportunities, and objectives for the watershed plan.

The analysis of watershed wildlife resources will focus on the community level. Major issues include wildlife species diversity and abundance, critical habitat reserves/patches, linkages between major corridors and reserves/patches, and attributes of the matrix detrimental or beneficial to wildlife.

The intent of the analysis of wildlife resources at the watershed level is to:

- Locate key reserves/patches, corridors, and special areas with high levels of species diversity
- Describe the general status of wildlife populations or metapopulations of species of concern
- Describe the general factors limiting species diversity or species abundance
- Identify gaps in key corridors
- Identify which reserves/patches or corridors may be at risk
- Describe factors creating at risk conditions
- Identify other wildlife related issues based on project objectives

Analysis Questions

The analysis of wildlife related resources should answer the following key questions. Additional specific questions may be developed by the planning team based on objectives established by the group.

Wildlife Species Component

- What factors are limiting game and non-game wildlife species diversity and abundance?
- What wildlife populations are vulnerable to local extinction? What are the limiting factors for these vulnerable populations?
- Are there any threatened or endangered species? What are the limiting factors for these species?

Wildlife Habitat Component

- Which reserves/patches have the greatest species diversity?
- Which reserves/patches that have the greatest species diversity are in public ownership?
- Which corridors are essential to species migration or dispersal?
- Where are gaps in corridors that limit migration/dispersal?
- What existing corridors are at risk and for what reasons?
- Where should new corridors be placed?
- Where are potential habitats?
- What attributes of the matrix management or land use are detrimental or beneficial to wildlife? Where are they located?
- What natural disturbance factors have been altered (fire, grazing, insect control)?

Documentation

The answers to these questions should be documented in a short analysis report and on a composite map. It is important to synthesize the analysis information into concise, accurate, and easy to understand tables, graphs, and maps. A concise presentation of information will facilitate group discussion.

The composite map would document the habitat condition for significant reserves/patches, corridors and the matrix in the watershed. It would also locate:

- Reserves/patches with threatened and endangered species or vulnerable populations
- Reserves/patches, corridors, special areas and special features at risk
- Potential habitats for restoration
- Reserve/patches with high biodiversity not presently being managed to preserve or enhance biodiversity (GAPS)
- Corridors used by wildlife for migration and dispersal
- Gaps in existing corridors
- Potential corridor locations that could facilitate dispersal between patches
- Special sites and features
- Field management practices detrimental or beneficial to wildlife

An example of a watershed composite analysis map is presented in Figure 6-5. The value of mapping the results of the analysis is that it ties the conclusions to specific locations within the planning area. The participants can see direct links to the inventory, analysis, and real resources, which will facilitate Step 5, formulating alternatives.



Products

- A complete statement of objectives
- An analysis of the benchmark condition of the planning unit and related areas
- A complete analysis of all resources inventoried
- Environmental evaluation
- Cultural resources evaluation
- Other program and legal evaluations
- Identification of the causes or conditions that resulted in the resource problems
- A complete definition of problems, opportunities, and concerns

PHASE 2 DECISION SUPPORT AT THE WATERSHED SCALE

Phase 2 involves:

- Formulate alternatives
- Evaluate alternatives
- Make decisions

In Phase 2, the planning team's task is to develop a range of plan alternatives that address the problems, opportunities and objectives identified in Phase 1. At the completion of Phase 2, the planning group will select a watershed plan that will be put forward for broader public review.

STEP 5 FORMULATE ALTERNATIVES

Planning Standard

Alternative plans (treatments) are developed to meet quality criteria and objectives of the watershed planning team.

Discussion

The NPPH outlines a general process for formulating watershed scale plan alternatives. The purpose of this section is to provide guidance for formulating alternatives that address wildlife conservation. The wildlife component of the watershed plan should be prepared by the entire planning team. It is assembled as a series of map overlays or layers. The base layer is the composite analysis map, which depicts existing habitat resources in the watershed. Subsequent layers illustrating proposed solutions to specific problems or opportunities are overlaid on the analysis composite base maps. Layers typically included:

Existing Habitat Resources – This base is a copy of the composite analysis map prepared in Step 4.

Function – This layer delineates the location of functional issues that need to be addressed by the watershed plan (i.e., wildlife habitat, floodplain management, erosion control, water quality issues).

Existing Habitat Resource Management – This layer delineates recommendations for preservation, enhancement, or restoration of existing habitat resources.

Potential Habitat and New Wildlife Plantings – This layer delineates major sites in the watershed that could be developed into wildlife habitat (new plantings for wildlife are shown on this layer).

Synthesis – This layer uses the concepts and principles discussed in Chapter 5 to integrate the three previous layers into an ecologically sound wildlife plan that responds to the unique resources of the watershed and the planning team's objectives.

First Layer – Function

Many references on planning theory recommend that initial planning studies focus on functional issues. Functional issues at the watershed scale usually include flooding, erosion control, and air and water quality protection; rarely do projects focus on wildlife resources alone. Typically functional issues are what motivated landowners and communities within a watershed to initiate the project. The problems and opportunities identified in Steps 1 through 4 reflect the issues of concern. The recommended process for addressing functional issues is:

- Review the group's objectives related to flood control, erosion control, air and water quality protection, etc.
- Identify the ecological functions of corridors or other conservation practices or combinations of practices that can be used to solve the problem or capitalize on the opportunity.
- Identify existing corridors that could be preserved, enhanced or restored to meet program objectives, solve functional problems, or capitalize on opportunities.
- Select new corridor types or management practices or combination of practices that provide necessary functions to meet objectives, solve problems or realize opportunities not addressed by existing corridors.
- Locate and map new corridor types, management practices or combinations of practices on the watershed base map.
- Repeat this procedure for each objective, functional problem, or opportunity.

When all the conservation practices and systems of practices necessary to meet the group's objectives have been located on the base map, a preliminary functional plan will have been completed (Figure 6-6). Starting plan development by addressing functional issues does not mean that wildlife issues are any less important; they are simply addressed more completely later in the process. Often wildlife habitat and corridor recommendations explored in layers 3 -5 will suggest necessary changes to the functional plan. The planning team will resolve potential conflicts by working toward compromise.

Second Layer – Existing Habitat Resource Recommendations

The general condition of critical patches, corridors, potential patches, and special areas and features was documented in the watershed analysis. The causes of the conditions were also identified. Both conditions and causes should be addressed in each plan. The following procedure for addressing habitat quality issues is suggested:

- Review the current condition of each patch, corridor, special area, or special feature as described in the analysis
- Review the wildlife analysis report to identify factors degrading these habitats or limiting species diversity or abundance
- Recommend ways to alleviate the cause or causes of habitat degradation or other factors limiting species diversity or abundance

General recommendations to preserve, enhance, or restore patches, corridors, or other habitat resources should be noted on the base map and linked directly to that resource (Figure 6-7). Specific management techniques for meeting these objectives should be keyed to the habitat resources on the map and discussed in detail in the implementation report (Step 8).



Third Layer – Potential Habitats and New Wildlife Plantings

The planning team should review the areas of potential habitat delineated on the analysis map and assess the possibilities of enhancing or restoring these areas. Consider the function that these areas could perform in addition to habitat. For example, farming in floodplains is common in many regions of the country. During wet years, crop production on these areas is marginal. Many farmers are either voluntarily selling these marginal lands to conservation organizations or participating in easement programs that return these sites to wildlife habitat. (See Iowa River case study pp. 6-39). Not only have these practices restored habitat for wildlife; they have also restored other hydrological functions that help mitigate downstream flooding.

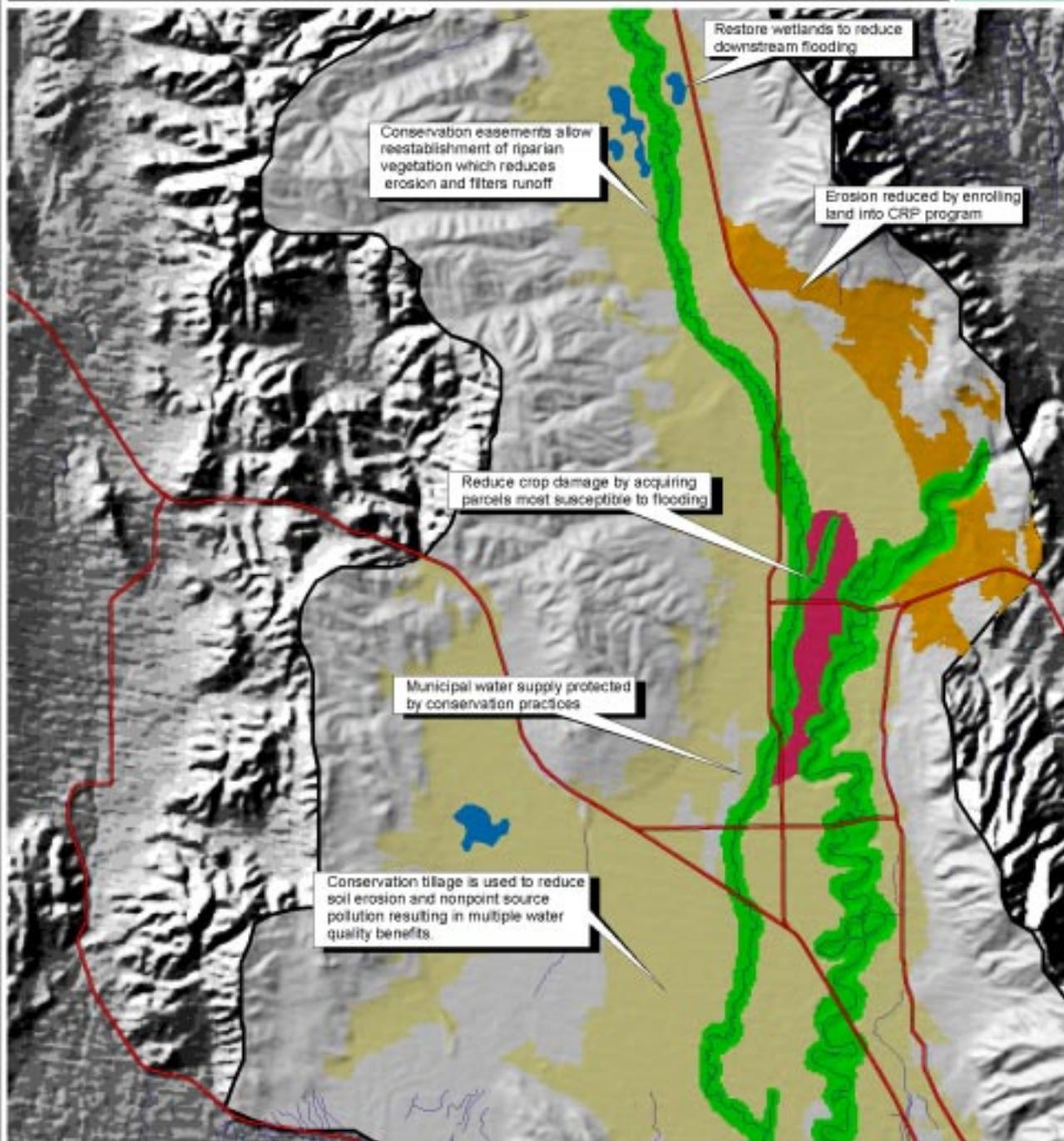
Easement corridors for railroads, highways, powerlines, pipelines, and other utilities provide real possibilities to link patches and other corridors across the watershed. If properly planted and managed, easement corridors can provide excellent habitat for many species. Similar habitat and linkage potential can reside in steep slopes, damaged soils, “waste” areas, and disturbed sites. Locate potential habitats worthy of development on the area-wide/watershed base map (Figure 6-8).

New wildlife corridor plantings at any area-wide scale should emphasize reconnecting reserves/patches within the watershed that were historically linked. They often will be located in riparian or upland corridors or areas that have been degraded over time. Occasionally large wildlife corridor plantings may be proposed in areas previously devoid of corridors to provide habitat or facilitate wildlife migration or dispersal. Plantings of this type are increasingly important because agriculture and urbanization have drastically altered the presettlement landscape pattern (See the Iowa River and Tensas case studies for examples). All new plantings should be based on the principles discussed in Chapter 5. Care should be exercised so that new plantings are compatible with normal farming or ranching practices. Locate all proposed new plantings on this layer.



Function

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Urban
- Highways
- Streams

Conservation Practices

- Conservation Easement
- Conservation Reserve Program
- Acquired floodplain
- Conservation tillage
- Restored wetlands

Notes:

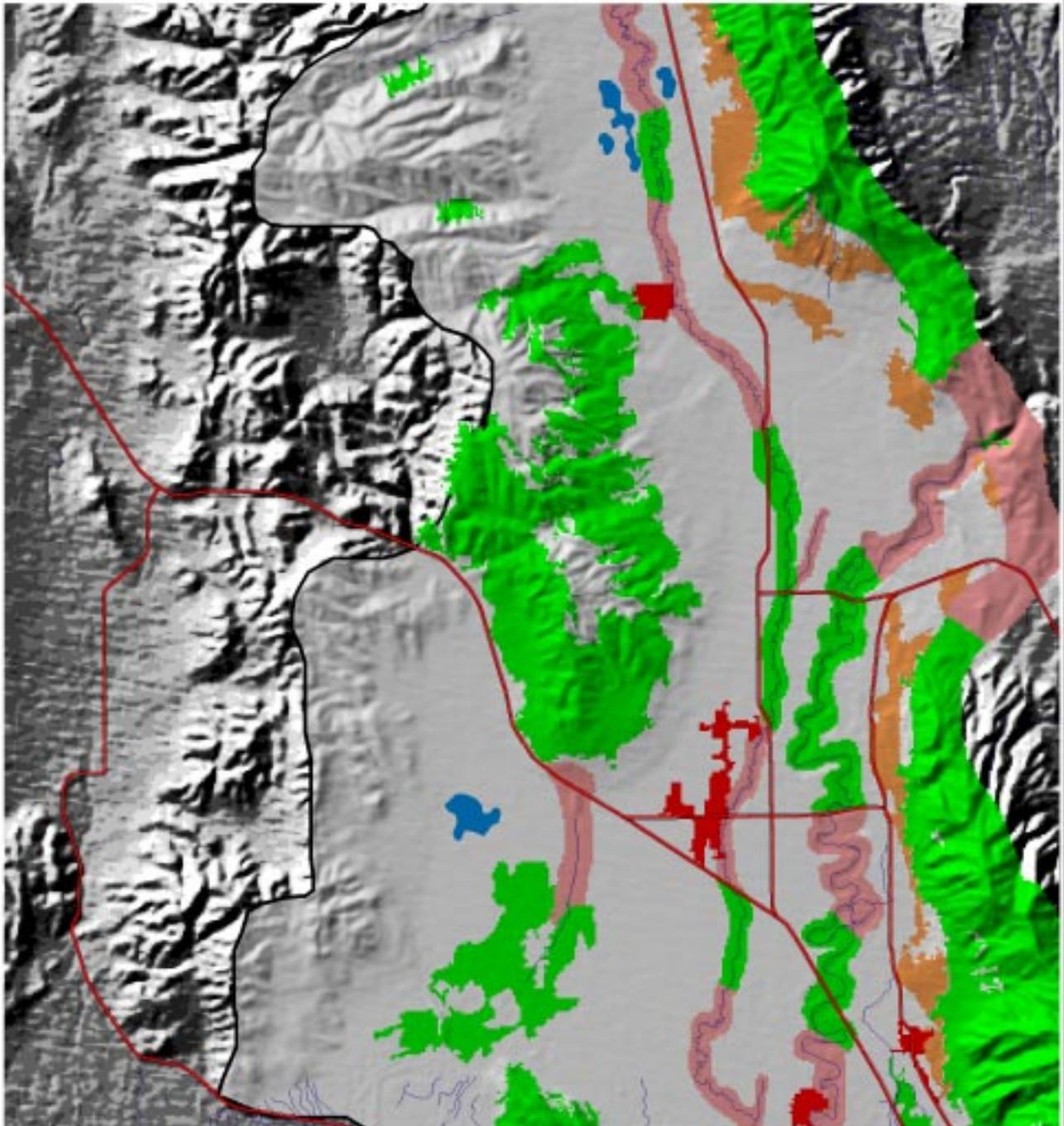
10000 0 10000 20000 30000 Feet



Figure 6-6

Habitat Resource Management

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Urban
- Highways
- Streams

Resource Recommendations

- Preserve high quality corridors and habitat patches
- Restore degraded corridors
- Enhance degraded habitat patches
- Restore wetlands

Notes:

* Refer to report for further information on resource management recommendations.

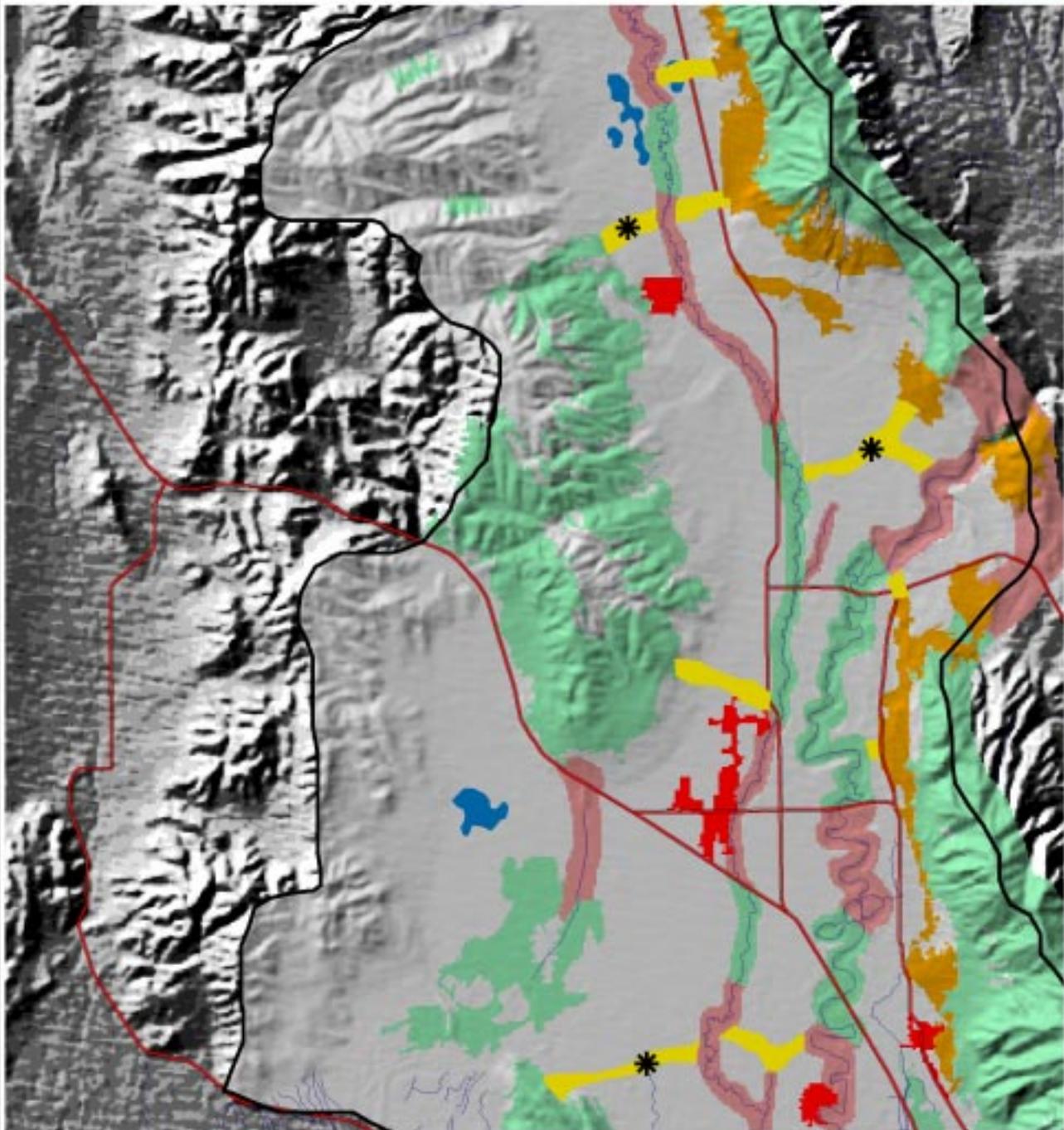
10000 0 10000 20000 30000 Feet



Figure 6-7

Potential Habitats & New Wildlife Plantings

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Basemap Information

- Planning Boundary
- Urban
- Highways
- Streams

Resource Recommendations

- Preserve high quality corridors & habitat patches
- Restore degraded corridors
- Enhance degraded habitat patches
- Restore wetlands

Potential Habitats

- New corridors
- Rehabilitated gravel pits

10000 0 10000 20000 30000 Feet



Figure 6-8

Fourth Layer - Synthesis

Synthesis involves combining the mapped information from all three layers. The pattern that emerges from overlaying all layers is often disconnected. It is a collection of implementation strategies, conservation practices and management recommendations, not yet a plan. The challenge for the planning team is to convert this collection of recommendations into a plan. The team needs to identify practical opportunities to connect reserves/patches, corridors, potential habitat patches, special areas, and special features into an integrated pattern. The intent is to optimize the value-

added benefits of connectivity. The planning team should reference these concepts and principles to help guide the plan development process.

In some instances, there will not be a practical way to link a reserve/patch or corridor; they will remain disconnected from the overall structure of the conservation plan but are still valuable as habitat.

The wildlife component of the area-wide plan that emerges from this synthesis should optimize habitat resources in the watershed.

Planning Habitat Concepts and Principles

The concepts and principles discussed in Chapter 5 are guidelines that the planning team can use to synthesize the three previous layers into an integrated wildlife habitat plan. They suggest locations, configurations, and linkages for corridors and patches in the watershed that would provide the greatest benefit for wildlife. These concepts and principles are applicable regardless of project scale and have been rephrased as planning directives to employ in this phase of the planning process.

Patches

- Preserve all large reserves/patches or introduce new large patches where practical
- Connect all reserves/patches, large or small, that were historically connected
- Do not subdivide existing reserves/patches
- Preserve clusters of small patches
- Preserve reserves/patches that are near each other
- Introduce new patches in areas devoid of habitat

Corridors

- Preserve continuous corridors; plant gaps in discontinuous corridors
- Preserve existing corridors that connect existing patches; pay particular attention to migration and dispersal corridors
- Introduce, where practical, corridor plantings to connect reserves/patches that were historically connected

- Preserve or introduce multiple corridor or “stepping stone” connections between reserves/patches that were historically connected
- Design new corridors to be as wide as practical; widen existing corridors where practical

Special Areas and Features

- Preserve all reserves/patches, corridors, special areas or special features inhabited by threatened and endangered species or vulnerable populations
- Preserve other special areas and features

Potential Habitats

- Develop potential habitats where practical
- Consider artificial structures to provide habitat when natural habitat has been degraded or destroyed (a watershed wide bluebird nestbox or bat house program for example)

Other Principles

- Address key impacts that create at-risk conditions for habitat in the watershed
- Recommend matrix management principles that benefit wildlife
- Recommend structural diversity in reserve/patch and corridor plant communities
- Recommend native plant communities

The planning team should adapt concepts and principles as necessary to meet project resource conditions and needs of specific wildlife species.

This will provide a framework for the combining of conservation practices. The planning team should take the preliminary plan into the field and review the general recommendations and patterns of patches and corridors. Adjustments to the plan should be made as necessary. The team should draw up the final base plan once all adjustments have been made (Figure 6-9).

Develop Alternatives

The team is responsible for considering various alternatives. Alternatives should focus on conservation functions, wildlife (diversity or target species) or other corridor benefits. However, each alternative must meet the objectives identified in Phase I. Some examples of alternatives are:

- A plan alternative or several alternatives using various conservation implementation strategies, management practices and recommendations to address functional problems and opportunities
- A plan alternative to optimize for wildlife species diversity
- A plan alternative to increase populations of a particular species, guild, or suite of species
- A plan alternative to optimize recreation, economic, or other corridor benefits
- A no-action alternative (required by NEPA)

Wildlife and conservation biologists and other resource specialists on the planning team should play key roles in making sure that each plan alternative addresses wildlife issues.

Some alternatives may emphasize wildlife. For instance, a wildlife biodiversity alternative may emphasize the preservation, enhancement, and restoration of habitats for all species native to the watershed. Other plans may choose to optimize a particular species. For example, one alternative could emphasize bobwhite quail. Such a plan would focus on factors limiting quail populations and would propose landscape scale habitat modifications to reduce limiting factors. Caution is required in preparing single species plans or other single focus alternatives. Without careful consideration of the entire plant and animal community in the watershed, implementing a single species plan could jeopardize overall biodiversity.

The NPPH requires that a no-action plan alternative also be considered. The purpose of this plan is to estimate the future condition of the watershed if no action is taken to conserve resources. New corridors would be planted and existing corridors would be removed at current rates. Trends in the condition of corridors and habitat patches would be assumed to continue. Proposed plans for roads, bridges, community development and other landscape modification would be assumed to be constructed. This alternative often depicts the worst case scenario for wildlife (Figure 6-10).

The planning team must agree that each alternative meets the group's objectives, with the exception of the no-action alternative. In addition, each alternative must comply with all relevant federal, state, and local regulations.

Documentation

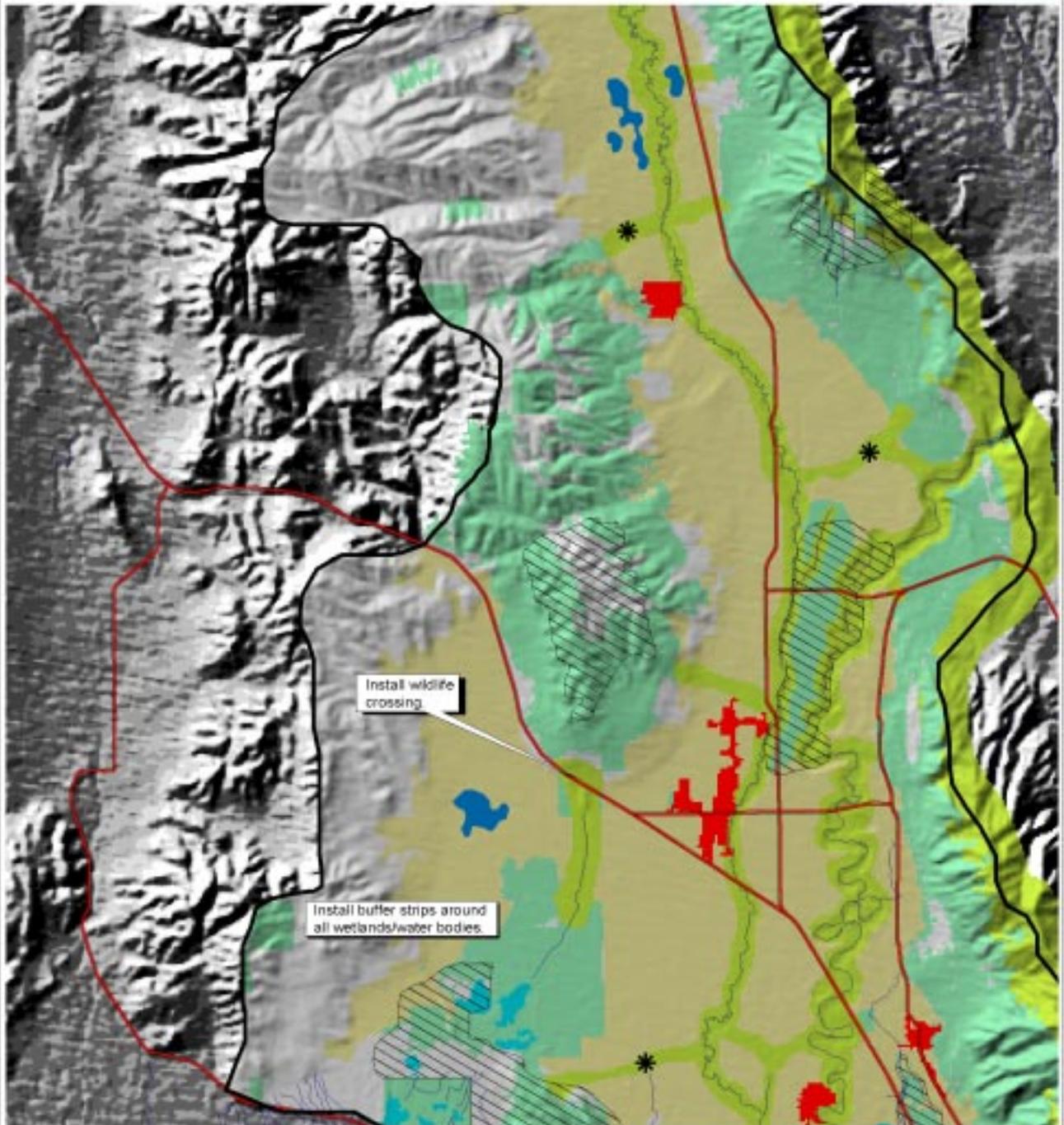
Any plan recommendations that can be shown graphically should be drawn on the watershed base map. Include other recommendations in a brief report. At least two alternatives for the wildlife component of the plan should address wildlife and wildlife habitat problems and opportunities identified in the analysis. Each wildlife alternative must meet the goals and objectives specified in Step 2.

Products

- A range of alternative plans developed by the planning team
- A short report summarizing the different plans



Synthesis



Basemap Information

- Planning Boundary
- Urban
- Highways
- Streams

Land Status

- Conserved / restored habitat patches. (includes federal and state lands)
- Conserved / restored / created conservation corridors
- Restored wetlands
- Conservation tillage
- Water
- GAP analysis parcels
- Restored gravel pits

10000 0 10000 20000 30000 Feet



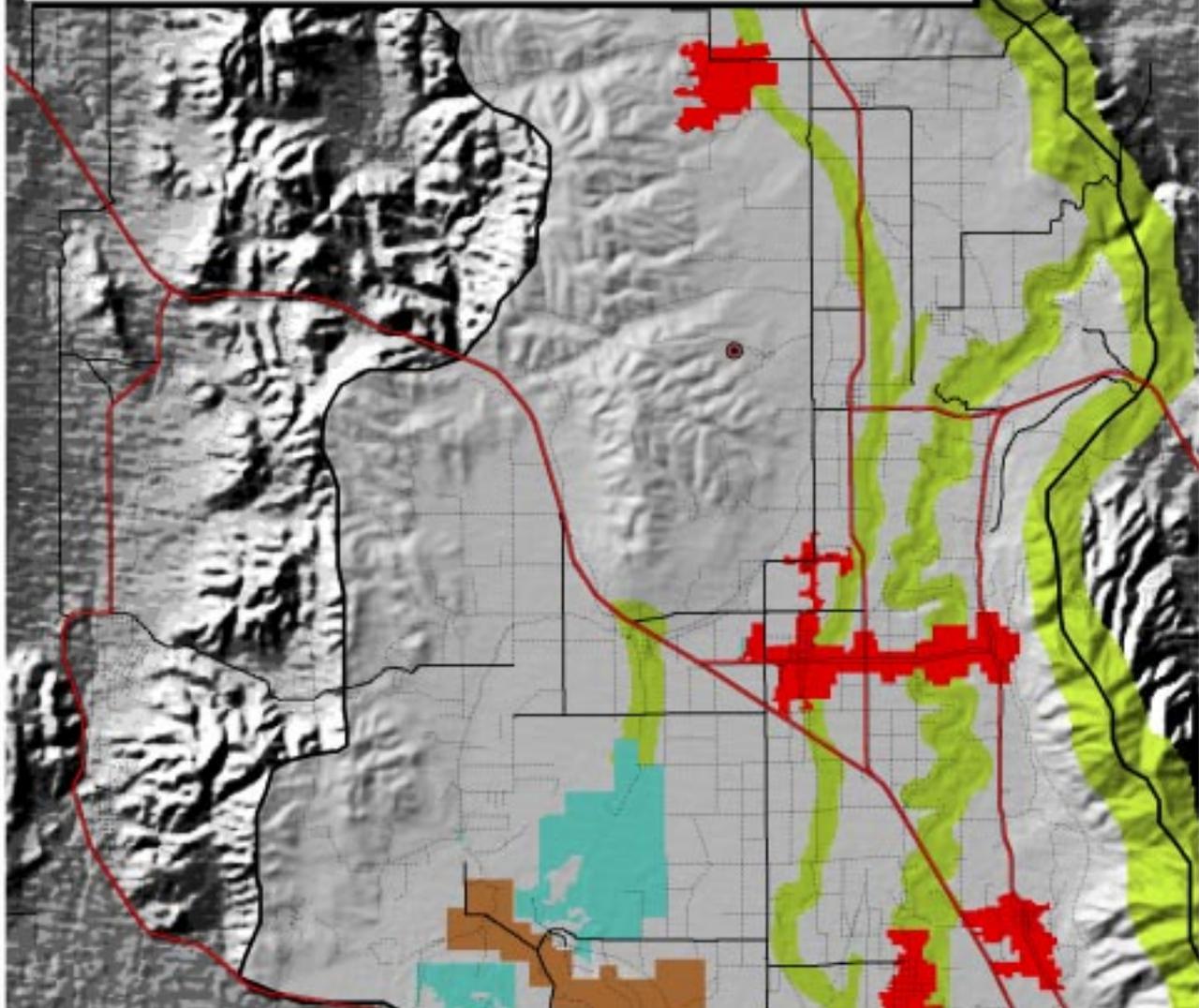
Figure 6-9

Build-Out

Willow Creek Watershed Planning Project
Natural Resources Conservation Service



Leks destroyed by development.
Regional migration corridor interrupted by development.
Riparian habitat degraded.
Wildlife refuge impacted by adjacent ORV use.
Increased erosion from conventional tillage.



Basemap Information

- Planning Boundary
- Urban
- Highways
- County Roads
- Streams

Land Status

- Wildlife Reserves
- Conservation Corridors potentially interrupted by development
- Extensive ORV use
- Remaining grouse leks

10000 0 10000 20000 30000 Feet



Figure 6-10

STEP 6 EVALUATE ALTERNATIVES

Planning Standard

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

Discussion

The planning team must now evaluate the watershed plan alternatives developed in Step 5. The NPPH outlines the basic procedures for evaluating alternatives.

Often, watershed planning projects address a variety of resource issues such as flooding, water quality, soil erosion, as well as wildlife conservation. Resource experts on the planning team will develop criteria to evaluate each resource issue for each of the plan alternatives. The purpose of this section is to focus on evaluating alternatives for the wildlife component of the watershed plan.

- Compare the wildlife component of the watershed plan alternatives against the habitat benchmark conditions as described in the analysis
- Compare the effectiveness of each alternative in meeting the stakeholders' wildlife related objectives
- Verify compliance with federal, state, and local statutes regulating wildlife or wildlife habitat

Evaluation Procedure

The following page offers an example of a watershed alternative plan evaluation worksheet that may be used for quantifying the potential impacts of each alternative on wildlife and wildlife habitat. This worksheet is similar in concept to the conservation effects for decision-making (CED) worksheet used by the NRCS to evaluate conservation plans. The Alternative Evaluation Worksheet A (pp 6-32) is based on principles and recommendations outlined in Chapter 5. Biologists and ecologists on the planning team can add other evaluation criteria as necessary to examine the unique wildlife aspects of each watershed. Results of the evaluation should be illustrated with graphs and matrices so the entire planning group can understand evaluation results and participate in the evaluation process.

Habitat

The length and area of habitat patches and corridors in each plan are approximated and compared against the existing benchmark condition in the watershed. Linkages between patches and corridors are also evaluated. Plans that preserve, enhance, restore, or create the most lineal feet of corridors, area of reserves/patches, and number of on and off-site linkages in the planning area would be ranked the highest for wildlife conservation.

Wildlife

Estimating the effects of habitat change on species diversity and abundance will require input from wildlife and conservation biologists on the planning team. A rough estimate of species abundance may be made by selecting a species as an indicator for each general habitat type (grassland, woodland, etc). Using the home range of indicator species as a unit of measure, abundance for this particular species can be roughly estimated. The area of patches and corridors that correlate to the species required habitat type would be divided by the home range size to determine the potential population of the species in the watershed. Species diversity can be assessed by using the GAP analysis process described Chapter 5. Plans that provide the greatest abundance and diversity of wildlife are given a higher ranking for wildlife conservation. Although these approaches do not take into account the quality of the habitat, they can provide a coarse assessment of the alternatives at a watershed scale.

After each alternative is evaluated, these can be compared against each other using the Alternative Evaluation Worksheet B (pp 6-33). This worksheet allows the group to quickly assess and discuss the strengths and weaknesses of each plan alternative. In planning projects that involve other resources, an overall evaluation matrix can be created that includes other ecological, social, and economic criteria in addition to wildlife.

Documentation

Documentation of Step 6 should include the evaluation matrices and a short report summarizing advantages and disadvantages of each alternative for wildlife conservation.

Products

- A set of practical plan alternatives compatible with planning group's objectives
- Graphs and matrices displaying the effects and impacts of various plan alternatives



NRCS

Area-Wide/Watershed Plan Alternative Evaluation Worksheet A

Completing this form will provide a general evaluation of the impact of each alternative on wildlife habitat and wildlife populations.

INSTRUCTIONS: Enter the alternative name or number in the space provided. Using a scale, measure the length or calculate the area for each criteria and record them in the matrix. Where requested check whether these figures have increased, remained the same, or decreased relative to the existing condition (benchmark). The last two criteria require the planning team to estimate the alternative's impact on wildlife. Each state is encouraged to develop criteria for making these estimates.

NAME OF PLANNING TEAM: _____
 PLANNING AREA LOCATION: _____
 PLANNING COORDINATOR: _____

ALTERNATIVE NAME : _____
EVALUATION

Criteria *	Increase	No Change	Decrease	Acres	Length	Number	Not Applicable
Total area of corridors in watershed							
Number of linkages to adjacent patches or corridors							
Total length of corridors in watershed							
Length of existing corridors in watershed							
	Preserved						
	Enhanced						
	Restored						
	Removed						
Total area of patches by plant community in watershed							
	Grass						
	Grass shrub						
	Riparian wooded						
	Riparian shrub						
	Riparian grass						
	Upland wooded (natural)						
	Upland wooded (introduced)						
Wetland							
Special areas preserved							
Other conservation measures (Specify)							
Estimated effects on species diversity							
Estimated effects on species abundance (Specify species)							

* Area and length measurements are approximate.

Comments: _____



NRCS

Area-Wide/Watershed Plan Alternative Comparison Worksheet B

Completing this evaluation form will provide a general comparison between alternatives.

INSTRUCTIONS: Review Evaluation Worksheet A for each alternative. Based on the review and discussion with team members, rate each of the first 9 criteria as excellent (green), good (blue), fair (yellow), or poor (red) for each alternative. The team needs to document the criteria used to develop the ratings. Place the appropriate color in the rectangle opposite the criteria and beneath each alternative. Repeat the process for the last 5 criteria - increase (green), remain the same (yellow), or decrease (red). States are encouraged to develop specific criteria for each of the general criteria categories on the worksheet. These criteria should accurately reflect habitat conditions in each state. In general, the alternative with the most green and blue rectangles will be the best overall alternative. Clearly, the relative importance of criteria will vary with each project. The planning team can proceed from this general evaluation to a more sophisticated and weighted numerical evaluation if sufficient quantifiable data are available.

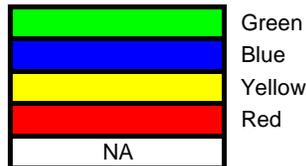
NAME OF PLANNING TEAM: _____
 PLANNING AREA LOCATION: _____
 PLANNING COORDINATOR: _____

EVALUATION

Criteria *	Alternatives		
	Alt. A	Alt. B	Alt. C
Meeting project wildlife objectives			
Protection of patches with high levels of biodiversity			
Protection of migration or dispersal corridors			
Corridor connections between patches			
New patches planted			
Corridors preserved, enhanced, or restored			
Special areas and features protected			
Potential habitats developed			
Matrix management benefiting wildlife			
* Estimated effects on species richness			
* Estimated effects on species abundance			
* Protection of threatened or endangered species			
* Protection of vulnerable populations			
* Other area-wide/watershed specific wildlife objectives (specify)			

KEY

Excellent
 Good
 Fair
 Poor
 Not Applicable



* Apply to last 5 categories

Increase
 Remain the same
 Decrease
 Not Applicable



Comments:

STEP 7 MAKE DECISION

Planning Standard

A watershed plan alternative is selected based on the planning group's clear understanding of the impacts of each alternative.

Discussion

Decision making at the watershed planning level may be the responsibility of:

- A particular stakeholder or agency
- The group as a whole

Those responsible for selecting an alternative for the area or watershed often depends on who initiated the planning process. In some cases, the group funding the project retains final decision making authority. In other cases, mandates or laws may require a certain agency to select the preferred alternative, for example the USFWS is responsible for alternative selection and approval where federally listed threatened and endangered species are involved.

In some cases, the decision making responsibility will be shared by the planning group as a whole. A group decision is particularly common in planning projects that do not have regulatory requirements. The only way these types of plans will be implemented is if a majority of stakeholders support the selected plan.

To avoid confusion and misunderstanding, the entire planning team should agree upon which decision making process will be used at the beginning of the watershed planning project. Some watershed planning groups use a majority vote system to select final plans. This democratic form of decision making is both familiar and comfortable to many planning participants. Problems can arise, however, when a minority within the group is adamantly opposed to the plan selected. Often compromise and revisions to the preferred plan are required before an acceptable plan emerges.

More and more groups are exploring consensus-based decision making. Consensus is reached when participants agree on a single alternative plan. The participants may not agree with all aspects of the plan, but they do not disagree enough to warrant opposition to the overall plan selected. Each party retains the right to veto a plan but that party assumes a responsibility to provide alternative components for the plan.

The goal of consensus decision making is to select a plan supported by everyone. This in turn increases the probability that



the plan can be successfully implemented. Plan selection by consensus also has its share of problems; it can lead to a stalemate or result in a weak, compromised plan. Frequently, wildlife are given a low priority in a consensus plan because wildlife issues are often controversial and difficult to arbitrate.

Documentation

The NPPH provides general guidance for preparing necessary products for this step. Documentation should include a short report with the final plan and a description of how the plan was selected. This report may also include potential program or implementation strategies. In cases where an EIS or EA is needed, formal NEPA documentation of the decision making process will be required.

Products

- The plan document with the selected alternative, including potential program or implementation opportunities
- Schedule of plan implementation
- NEPA documentation (when required)

PHASE 3 APPLICATION AT THE WATERSHED SCALE

Phase 3 involves:

- Implement plan
- Evaluate plan

In Phase 3, the planning team, agencies, private conservation organizations, communities, and others individually or collectively may be involved in the implementation of the plan. They may also be involved in the ongoing evaluation of the implemented plan and, where necessary, propose adaptive management.

STEP 8 IMPLEMENT PLAN

Planning Standard

The planning team has adequate information and understanding to implement a watershed plan.

Discussion

Strategies for implementing a watershed plan will vary with each project. For example, planning projects initiated by a crisis often have substantial financial support from federal and state programs; implementation proceeds rapidly. The Iowa River Project is a good case in point. Within 1 year of a major flood, land parcels or conservation easements within the Iowa River floodplain were purchased to allow natural restoration of riparian wetlands.

However, in general, watershed plans are implemented one farm, ranch, or community open space at a time. Frequently the key to implementing large scale farm, ranch, or community projects is outside assistance in the form of funding, materials, and volunteer help. The value of a watershed plan is that it offers coherent landscape structure and logical recommendations for integrating conservation plans at the landowner level. Over time, the watershed plan becomes reality with completion of numerous individual conservation plans. The NPPH and Chapter 7 provide some guidance on how to proceed with the implementation process at the conservation plan scale.

There are a variety of options for implementing a watershed scale plan including:

- Land acquisition
- Conservation easements
- Federal and state programs
- Zoning
- Voluntary participation

Land Acquisition

Land acquisition is among the best tools for protecting critical habitat areas identified in the watershed plan. Land can be acquired by federal and state agencies, private conservation organizations, and communities through programs, grants and other sources of funding. The acquired parcels can then be managed for wildlife by either private conservation organizations or government agencies. This approach offers a high level of protection for wildlife resources; it is especially

valuable for protecting critical habitats that may not be protected by other means. However, adequate funding for acquisition and particularly for long term management often limits this approach.

Conservation Easements

Conservation easements involve purchase of development rights for land parcels with significant habitat value. To many landowners, easements are preferable over fee simple sale of their land. With a conservation easement, the owner retains title to the land and can maintain previous land uses. Some conservation easements can be more restrictive and specify both acceptable land uses and land management practices for the parcel.

In exchange for not developing the land or for modifying land management practices, the owner receives cash payments and tax benefits. If the land is sold, the easement remains in place. For example, an easement along a riparian corridor may still allow the rancher to use the area; however, the corridor may never be developed into homes or other built structures. Purchasing easements may allow funding resources to be used more efficiently than outright acquisitions; however, management control over the area is usually reduced.

Federal, State, & Other Incentive Programs

A wide range of federal and state programs, such as the USFWS Partners in Wildlife Program, offer assistance for protection and restoration of wildlife habitat on private lands. This includes USDA programs such as Wildlife Habitat Incentive Program, Wetland Reserve Program, and the Conservation Reserve Program. Many of these programs are directed at individual landowners and offer incentives such as cost sharing. They are often cost effective ways of preserving, enhancing, and restoring habitat for wildlife. NRCS and other agency personnel should be consulted on programs available for wildlife conservation.

Voluntary Participation

Voluntary participation in wildlife conservation projects should be a component of every implementation plan. The effectiveness of this approach depends upon demonstrating the benefits of conservation practices to landowners and communities. Demonstration projects and field tours are ways to demonstrate success and influence individuals to participate in conservation projects.

One of the main purposes of a large-scale wildlife planning effort is to consolidate resources and to share responsibility for wildlife conservation. All stakeholders can participate in implementing the plan. Sharing responsibility also can lead to creative funding

opportunities. Many private foundations base their funding on evidence the project has involved public participation and has broad based support. Potential funding and assistance partners are covered in Chapter 8.

Zoning

Zoning controls location and management of land uses. It is a power given to local governments only. It can be a useful and cost-effective tool for protecting wildlife habitat over a large area. For instance, zoning may protect critical riparian habitat by restricting development in floodplains. An advantage of this approach is reduced costs for the county or community. Local governments are challenged to create publicly acceptable zoning plans. In addition, coordinating zoning regulations across several political boundaries can be extremely difficult. Enforcement of regulations, particularly those related to resource management, can also be troublesome and expensive.

Documentation

Communication and coordination between stakeholders should be documented in a short report so each stakeholder group is clear about their responsibilities for implementing the plan. Funding sources should also be identified and secured.

Products

- Communication and coordination between the stakeholders
- A description of tasks to be completed by the various stakeholders
- Funding sources documented



STEP 9 EVALUATE PLAN

Planning Standard

The planning group determines if implementation results are meeting the ecological, economic, and social objectives and resolving conservation issues in a satisfactory manner. Resource impacts that are different than those predicted are fed back into the watershed planning process.

Discussion

Evaluation of the implemented plan is an often overlooked but necessary component of the watershed planning process. The purposes for evaluating the watershed plan as implemented include:

- To ensure that wildlife habitat in the watershed is functioning as intended
- To estimate wildlife response to the watershed plan
- To disseminate evaluation data and inform stakeholders
- To initiate adaptive management where resource responses are different from predicted

Evaluation of the watershed plan occurs at two levels; the watershed and conservation plan levels. Many components of the watershed plan will be implemented through individual conservation plans (see Chapter 7). The cumulative evaluations of conservation plans will provide a partial assessment of the watershed plan.

An evaluation at the watershed scale also is necessary. This evaluation can provide a valuable overview of the condition of wildlife resources in the watershed. Otherwise, positive results from a few individual conservation plans may bias overall results if other watershed areas are experiencing significant negative impacts to wildlife. Evaluations of both watershed and conservation plans will provide the most realistic picture of the condition of wildlife resources.

Evaluation Techniques

Evaluation strategies should be based on objectives established in Step 2. In many cases, the objectives will include wildlife species and habitat components. Biologists on the team will be responsible for designing an evaluation scheme addressing these components. Habitat condition evaluation will determine the ability of the resource to support wildlife. Specific techniques should be developed by the planning team to evaluate different habitat types.

Biologists also should develop approaches for evaluating wildlife populations at a watershed scale. These techniques can be expensive and it is best to take advantage of ongoing surveys. Federal and state wildlife agencies conduct game and non-game species inventories. Much of these data are collected based on wildlife management units (often watersheds are used for unit boundaries) that can be correlated directly to the project area. Participants on the planning team from these agencies can provide more information. Although these sources of data may not reflect specific responses to the plan, they can illustrate overall trends of different wildlife populations in the watershed.

Other long term wildlife surveys often exist, for example, postal carriers in Kansas have voluntarily counted wildlife during 4 weeks every year for the past 30 years. The Audubon Society conducts an annual Christmas Day bird count and high school students have successfully monitored invertebrate populations in streams. Other conservation organizations also conduct informal wildlife surveys.

Dissemination of Evaluation Data

Data collected in the evaluation can be used to educate the public about the value of planning at a watershed scale and benefits to wildlife of implementing conservation practices. For example, a watershed planning group in Idaho holds an annual watershed conference and celebration open to the public. This event provides an excellent opportunity to inform the public about wildlife in the watershed and to demonstrate the value of conservation practices to the wildlife resource. Events like this can stimulate landowners to initiate wildlife conservation plans on their farm or ranch or in their community. It is important to report failures as well as successes and indicate what adaptive management practices are being employed to alleviate problems.

Adaptive Management

Several years of evaluation data may indicate wildlife responses to the watershed plan are different than predicted. Adjustments to the plan may be necessary. It is important for the planning team to emphasize that wildlife planning is an ongoing process and that modifications will be necessary. Once the plan has been implemented and evaluation procedures are in place, the planning group can probably meet on a less frequent basis. However, the group should continue to function so that adaptive management can be implemented as necessary. It also is important that the entire stakeholder group remain involved in the evaluation process. Not only does this reinforce ownership in the overall planning process, it also lessens the chance stakeholders will disagree over results.

Documentation

Evaluation data should be compiled into a short report with most of the data presented in easy-to-understand graphs and charts. The final portion of the report should address any necessary adaptive management recommendations. The report should be distributed to the entire planning group and should be available to the public.

Products

- Evaluation report summarizing results of the wildlife monitoring
- Recommendations for changes
- Updated area-wide/watershed plan





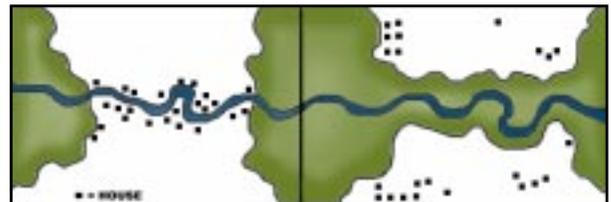
Dave De Geus

Case Study:

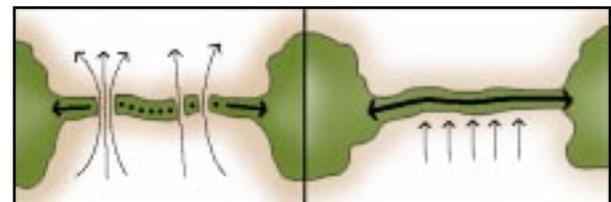
IOWA RIVER CORRIDOR PROJECT

Corridor Planning Principles discussed in Chapter 5 that are exhibited by this case study include:

NATURAL CONNECTIVITY SHOULD BE MAINTAINED OR RESTORED.



CONTINUOUS CORRIDORS ARE BETTER THAN FRAGMENTED CORRIDORS.



Many landowners in the project area looked forward to owning and managing easements for wildlife, timber, and recreation. However, others did not have a strong enough interest in owning wetland easements to justify the expense and time involved in managing such areas. This group of landowners approached NRCS officials and asked if they could sell all of their remaining land rights. Because the NRCS does not have the capability to own or manage land, they asked the U.S. Fish and Wildlife Service (USFWS) to consider assisting these landowners.

The USFWS evaluated the wildlife and recreational potential of the corridor and agreed to assist some landowners desiring a total buyout. The USFWS will also provide annual revenue sharing payments to county governments to offset most of the property tax revenues derived from lands formerly held by private landowners. Lands acquired by the USFWS will become part of the National Fish and Wildlife Refuge System and will be open to the public for a variety of outdoor recreational activities. The Nature Conservancy is assisting in the development of a GIS database system for the project area.

Accomplishments to date include:

- Ninety-one of 250 landowners have enrolled 11,600 acres in EWRP and WRP easement programs.
- Wetland restorations are underway. Earthwork is 75% complete and grass seedings should be completed in 1998.
- Thirty-five landowners have agreed to sell over 9,400 acres to the USFWS, making the Corridor Project the largest USFWS refuge in Iowa outside of the Upper Mississippi River NWR.
- The Soil and Water Conservation Districts and the project coordinator have formed a non-profit corporation to assist in wetland restoration and future conservation and development efforts.
- Over 25 project partners are assisting with project monitoring efforts, providing needed supplies, equipment, (e.g., GIS assistance, nesting structures, grain drills), and assistance in project planning.

Figure 4:
Iowa County farm field after wetland restoration.



As the floodplain wetlands are restored, the project should provide the following benefits:

- Improved water quality in the Iowa River for citizens using the river for drinking water and recreation
- Additional flood storage, thereby lowering flood peaks and damage
- Additional recreational/tourism opportunities for residents of central and eastern Iowa
- Increased habitat available for game and non-game wildlife
- Opportunities to stimulate economic development and tourism

The project partners realize floodplain management is an ongoing process and additional options should be available for landowners. The partners are sharing resources, ideas, and personnel to develop additional options for sustainable management of floodplain lands, including improved grazing systems, forage and timber management, and alternative crops such as crayfish, native grasses, flowers, and willows for baskets and furniture. The Iowa River Corridor Project clearly demonstrates a sustainable system of floodplain land use can achieve both economic and ecological goals.

For more information on the project, contact:

*Dave De Geus
Iowa River Corridor Project Office
Iowa County SWCD
435 N. Highland, Box 210
Williamsburg, Iowa 52361
Tel. (319) 668 – 2359*

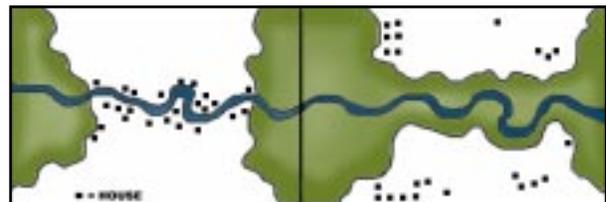
The information for this case study was abstracted with permission from the Iowa River Corridor Project Information Series, prepared by the Iowa River Corridor Project Partnership.

Case Study:

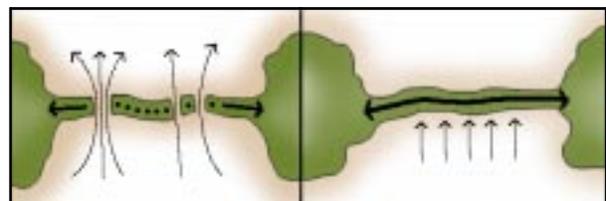
**LOWER RIO GRANDE VALLEY WILDLIFE
CORRIDOR**

Corridor Planning Principles discussed in Chapter 5 that are exhibited by this case study include:

**NATURAL CONNECTIVITY SHOULD BE
MAINTAINED OR RESTORED.**



**CONTINUOUS CORRIDORS ARE
BETTER THAN FRAGMENTED
CORRIDORS.**



Case Study: Lower Rio Grande Valley Wildlife Corridor

This case study illustrates how the NRCS in cooperation with other government agencies and private non-profit conservation organizations have collaborated to develop a 275-mile long conservation corridor plan. A variety of wildlife species including several threatened or endangered species will be some of the beneficiaries of this exciting project.

The lower Rio Grande River from Falcon Dam to the Gulf of Mexico is the only source of drinking and irrigation water for more than 1 million people (Mexican and U.S. residents) and 0.5 million acres of U.S. agricultural land. Unfortunately, rapid human population growth and intensive development for international trade and agriculture on the lower 275 miles have severely degraded the riparian ecosystem.

The lower Rio Grande twists and turns; each river bend alternates from high, sloughing, vertical banks to gently sloping stretches with remnants of floodplain forests. Most of this stretch has banks, which have been severely damaged by intensive grazing or cleared for bridges, homesites and industrial parks. Refuse and sewage are dumped into the river in numerous locations.

Although less than 5% of the original habitat of the lower Rio Grande Delta remains, species diversity in the region continues to be high (1100 plants and 600 vertebrates). Habitat connectivity is critical for many of these species, including the federally listed endangered ocelot and jaguarundi.

To conserve this unique area, the U.S. Fish and Wildlife Service (USFWS) established the Lower Rio Grande Valley National Wildlife Refuge. The refuge's goal is to create a continuous wildlife corridor along the 275-mile stretch of river. In addition, the USFWS, Texas Parks and Wildlife Department (TPWD), National Audubon Society, and the Nature Conservancy of Texas (TNC) have acquired tracts for protection.

In 1996, the Natural Resources Conservation Service (NRCS), USFWS, and National Fish and Wildlife Foundation (NFWF) entered into an agreement to use funds from the USDA's Wetland

Reserve Program (WRP) and a NFWF grant to purchase permanent easements along riparian areas and wetlands on private lands. These easements will link areas owned by public agencies and private conservation organizations.

Under WRP eligibility criteria, wetlands currently in agricultural production and riparian corridors up to 600 feet wide can be accepted. Cropland will be planted to species of trees and shrubs that USFWS, TPWD, and TNC are using in their restoration programs. Riparian areas already in desirable vegetation may only require fencing, or as a minimum, placement of WRP boundary signs.

The easement acquisition process is ongoing and expected to continue throughout the life of WRP. Land ownership patterns along the river dictate that several easements must be acquired in succession to link any two existing protected areas. All partners are attempting to identify interested landowners with eligible lands and encouraging them to participate in this program to increase and improve wildlife corridors along the Rio Grande River.

For additional information contact:

*Larry Ditto, Project Leader
Lower Rio Grande Valley NWR Complex
U.S. Fish and Wildlife Service
320 N. Main St., Rm 225
McAllen, TX 78501
(210) 630-4636*

This case study was written by Gary Valentine (NRCS) and has been included in this document with his permission.

