Chapter 1: Introduction

Natural Resources Conservation Service (NRCS)

Figure 1-1: *The conservation corridors planted on this farm include field borders, vegetated terraces, grassed waterways, windbreaks, and forested riparian buffers. They have been carefully linked making this farm a haven for wildlife.*

BACKGROUND

Conservation corridors are linear strips of vegetation that differ from the adjacent surroundings and which function to conserve soil, water, plants, wildlife or fish resources. Natural corridors of woody and herbaceous riparian vegetation occurring along the edges of streams, rivers and lakes, are visually dominant in many landscapes. Windbreaks, field borders, roadsides, contour buffer strips and grassed waterways are introduced (planted) corridors found in agricultural landscapes. Corridors may also be created by disturbance, for example, a cleared powerline right-of-way. Both natural and planted corridors can be an ecological and aesthetic resource if properly managed and can yield significant benefits (value) to the landowner and society.

Corridors preserved or planted for soil and water conservation provide wildlife habitat for a variety of species. Riparian corridors are used by over 70% of all terrestrial wildlife species during some part of their life cycle, including many threatened and endangered (T&E) species. Corridors provide food and nesting, brooding, loafing, and protective cover for game and non-game wildlife. They also afford wildlife relatively safe access to adjacent resources and serve as travel ways for species dispersal and migration in our increasingly fragmented landscape.

Many birds and bats that either nest or roost in corridors are insectivorous, consuming thousands of insects that could damage crops and pester livestock. Others are important game species providing recreational opportunities and generating revenues that supplement rural economies.

The Problem

The quality and quantity of our nation's conservation corridors have been on the decline for the last several decades. Natural corridors are frequently squeezed by adjacent land uses or severed by roads, utilities, dams or other types of human development. Narrow and segmented corridors are less effective as travel lanes for wildlife dispersal and other ecological functions. Hundreds of miles of fence rows, windbreaks, and other planted corridors are removed annually to accommodate changing agricultural practices and suburban sprawl. Long neglected shelterbelts and windbreaks planted in the 1930s are dying out; few have been replaced. Many contour buffer strips, grassed waterways, and roadsides are planted in one species of grass. Single-species stands of introduced grass provide few wildlife benefits and are of little value as winter cover. Untimely mowing, heavy grazing, repeated burning, and spraying further reduce their habitat value.

While corridors decline, remnant fragments or patches of relatively large undisturbed habitat are also becoming less common, smaller, and increasingly isolated. In some cases they are no longer capable of supporting viable populations of native plants or wildlife. The resulting threat to plant and wildlife species diversity in all regions of the country has become a national concern. Many ecologists believe that connecting remnant habitat patches with corridors should be one part of a comprehensive plan to address this growing problem.


Dick Rol

Planning Area-Wide Solutions

The Natural Resources Conservation Service (NRCS) is committed to assisting in the revitalization and linkage of the nation's landscape corridors. The agency is actively promoting the preservation, enhancement, restoration, and reclamation and new plantings of conservation corridors at the watershed scale.

The following reasons are why the NRCS encourages establishment of conservation corridors:

- Corridors are a valuable resource to both the landowner and the public.
- The benefits of conservation corridors for wildlife habitat in particular are optimized when corridor systems are planned and established at a landscape or watershed scale.
- Corridors function most effectively when used in conjunction with other soil and water conservation measures in a conservation plan.
- Both ecological and economic principles must be applied to corridor planning, design, establishment, and management to optimize benefits and reduce negative impacts.


South Dakota State University

How corridors are arranged and connected within the larger landscape context determine their wildlife value. This principle provides land managers with a tool to effectively manage wildlife species diversity. It is the cumulative effect of corridor arrangement that influences wildlife population dynamics. Designing corridor systems is a task of creating strategic configurations across ownerships and land uses. The objective is to restore targeted ecological functions at watershed scales.

Opportunities exist in every state to plan, design and manage corridors, optimizing their multiple benefits. Thousands of acres of potential high quality habitat exist in roadsides, windbreaks, riparian areas, grassed waterways and other types of corridors.

Implementing a successful system of integrated corridors will require the cooperation of private landowners, local governments, private non-profit conservation organizations, and state and federal agencies working at both landscape and site-specific scales.

The NRCS is the USDA agency charged with providing technical assistance to private landowners who voluntarily wish to initiate an area-wide plan. NRCS conservationists play a key role in both promoting area-wide planning and facilitating the planning process once it is initiated. Landowners, farmers, ranchers, partnering agency personnel, and other proponents all share in the work. The NRCS *National Planning Procedures Handbook* provides a structure within which these tasks can be completed in an orderly and efficient way.


Jerry Fuhriman

Becoming familiar with the material in this handbook will provide the conservationist with:

- A review of the causes and consequences of habitat fragmentation.
- An overview of the types and ecological functions of corridors
- A summary of the benefits corridors provide landowners, communities, and the environment.
- Watershed scale wildlife corridor planning principles.
- Examples and case studies documenting the importance of planning systems of conservation corridors for wildlife at watershed scales.
- Illustrations and case studies showing how an individual farm, ranch, or community conservation corridor project can be knitted into an area-wide plan.


NRCS


Craig Johnson

A Planning Tool

This handbook has been designed for NRCS conservationists and other partners as a complement to the *National Planning Procedures Handbook*. It is a source of information about conservation corridors and their benefits and a reference for use in the field. This handbook emphasizes planning, designing, and managing corridors to optimize wildlife habitat. In addition, the handbook includes general plant community guidelines to enhance the habitat value of each NRCS corridor-type conservation practice.


Gary Bentrup

In addition, this handbook provides the conservationist with tools that facilitate conservation corridor planning at the area-wide, farm, ranch and community scales. As a field reference, the handbook includes:

Strategic Planning

- Strategies for organizing an area-wide planning team, establishing goals, and allocating responsibilities
- Procedures for preparing base maps
- A diagram of the National Planning Procedure process with emphasis on planning for wildlife
- Detailed descriptions of how to include wildlife conservation in each step of the planning process
- An area-wide inventory checklist that emphasizes wildlife habitat information
- A step by step description (with illustrations) of how to prepare plan alternatives
- A discussion of how to integrate individual farm, ranch, or community conservation corridor projects within an area-wide plan
- Lists of sources of watershed resource information

Technical

- Worksheets for evaluating the habitat condition of existing corridors
- Criteria for locating conservation corridors to optimize their habitat function
- Criteria for designing plant community structure for each conservation corridor type to enhance habitat value
- Procedures for evaluating the impact of conservation practices on wildlife populations

Partnerships are at the heart of all conservation initiatives linking land and people. They foster a cooperative environment promoting those factors necessary for success:

- Exchanging information, experience, and expertise
- Sharing responsibilities and tasks
- Involving a cross-section of community residents
- Planning and implementing projects across mixed ownership and jurisdictions
- Leveraging resources
- Building a sense of shared community

Trust, Cooperation, Implementation

Fundamentally, area-wide plans are templates delineating an integrated system of conservation corridors and practices at scales larger than an individual farm or corridor. They are seldom large single projects completed quickly. Rather, they are implemented incrementally one farm, ranch, or community open space at a time. The resulting cumulative effect contributes to the sustainability of the land and wildlife populations. Indeed many area-wide plans originated with an individual landowner or community that volunteered to work with a conservationist to plan, design, and install conservation corridors and employ conservation practices. Neighboring farmers or communities liked the conservation corridor projects they saw, sought NRCS assistance, and over time a system of conservation corridors spread across the watershed.

Building trust with landowners and community groups by working one-on-one is the traditional role of the conservationist and must remain at the very heart of the conservation corridor effort if it is to succeed.


Hedgerow Farms

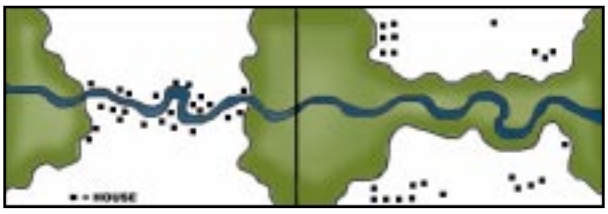
Corridors are only one piece of the conservation puzzle. The other important pieces are the various land management practices applied by farmers, ranchers, and communities to the natural resources on their land. **The long-term value of corridors is highly dependent on the health of the adjacent landscape and large patches of native vegetation.** Landowners and communities participating in land and water conservation programs using sustainable agricultural and other land use practices enhance habitat quality and quantity. The puzzle can be completed through public and private landowner partnerships, passing on to future generations the rich wildlife and scenic heritage our nation has come to cherish.

Case Study:

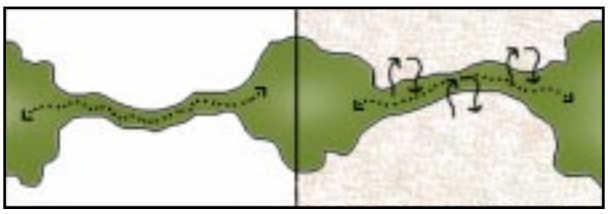
Possible futures for the Muddy Creek watershed

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

Natural Connectivity Should Be Maintained Or Restored.



Manage The Matrix With Wildlife In Mind.



Case Study: Possible Futures for the Muddy Creek Watershed

This case study illustrates a process for planning at a watershed scale and the role that landowners and communities can play in developing alternative plans for land conservation and development.

This report documents a two year case study research endeavor exploring how human population growth and land use change in the Muddy Creek watershed of Benton County, Oregon may influence biodiversity and water quality. The case study illustrates a framework for helping local communities create alternative scenarios for land conservation and development. The project employed previously existing information and relied on the regular participation of local stakeholders to produce a series of mapped possible future scenarios depicting land use in the watershed in the year 2025 (Figure 1). The possible futures were evaluated for their effects on biodiversity and water quality using best available information, ecological and hydrological effect models.

The biodiversity evaluative model measured the change in potential habitat area for each of the 234 breeding species, in each future scenario and the past, by calculating the ratio of future or past habitat area to the present habitat area. The water quality evaluative model, a non-point pollutant source/geographic information system model, simulated a series of five storm events to calculate the mean pollutant load for each of the five possible futures, present and past. The model assessed volume of surface flows and levels of total suspended solids, phosphorus and nitrate, using field data collected from base line flows and two storm event flows monitored in 1996.

Results from the biodiversity model show that all native species have at least some habitat in all future land use scenarios. However, if land use trends in the watershed continue unchanged (Plan Trend Future) or become more highly developed over the next 30 years (Moderate and High Development Futures), there will be an increased risk to the abundance of the 212 existing species, particularly birds, mammals, and amphibians. Of the 220 species native to the watershed throughout its recent history, 26 species have lost more than half of their habitat since 1850. Under the High Development Future, 12 species are estimated to lose more than half of their present habitat in the next 30 years. Only 2 species – the California condor and marbled murrelet – are common to both lists. This acceleration and shifting of risk from one set of species to another suggests that the kinds of habitat changes from past to present are different than those envisioned in the possible futures (Figure 2).

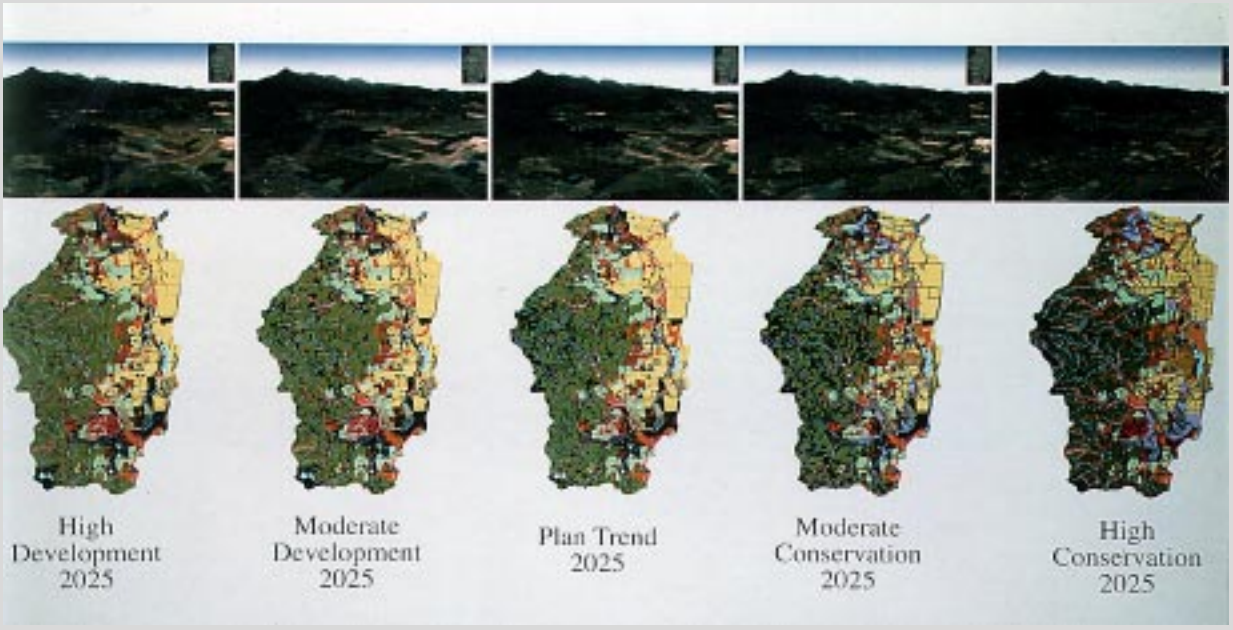
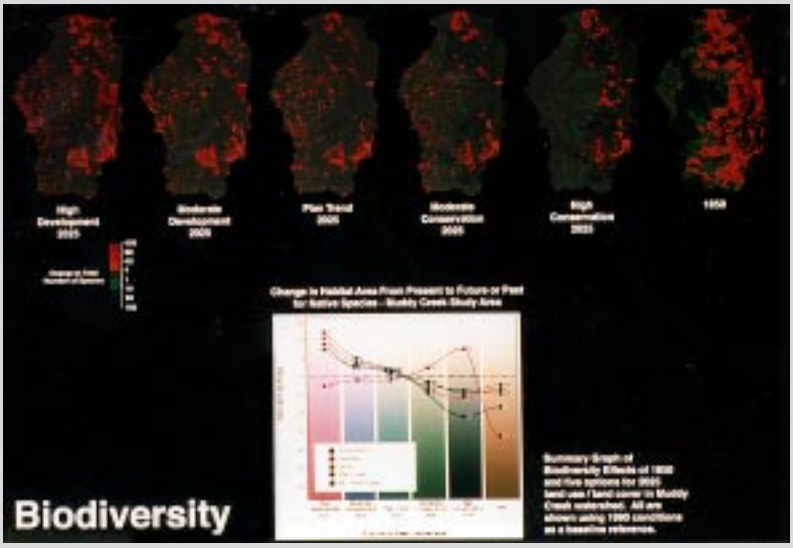


Figure 1: *Five mapped possible future scenarios depicting land use in the watershed in the year 2025.*



Additional information can be obtained via the Internet at http://ise.uoregon.edu

This case study was prepared by David Hulse[1], Joe Eilers[2], Kathryn Freemark[3], Denis White[4] and has been included in this document with their permission.

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Figure 2: *An assessment of the possible impacts of future scenarios on biodiversity.*

Results from the water quality model show increases in volume of surface water runoff and total suspended solids under the Moderate and High Development Futures in sub-basins undergoing significantly increased residential development or having a high percentage of area in erosive soils on steep slopes (Figure 3). Crops located on steep slopes were the greatest contributors of total suspended solids and total phosphorus in the agricultural lowlands. Land uses on gentle slopes or in natural vegetation were the lowest contributors of total suspended solids and total phosphorus.

In summary, if the residents of the Muddy Creek watershed desire a future presenting no greater risk to biodiversity and water quality than the present pattern of land use, then they should plan toward a future with a land use pattern between the Plan Trend Future and the Moderate Conservation Future for biodiversity protection, and between the Moderate Conservation and the High Conservation Future for water quality protection.

Figure 3: *An assessment of the possible impacts of future scenarios on water quality.*

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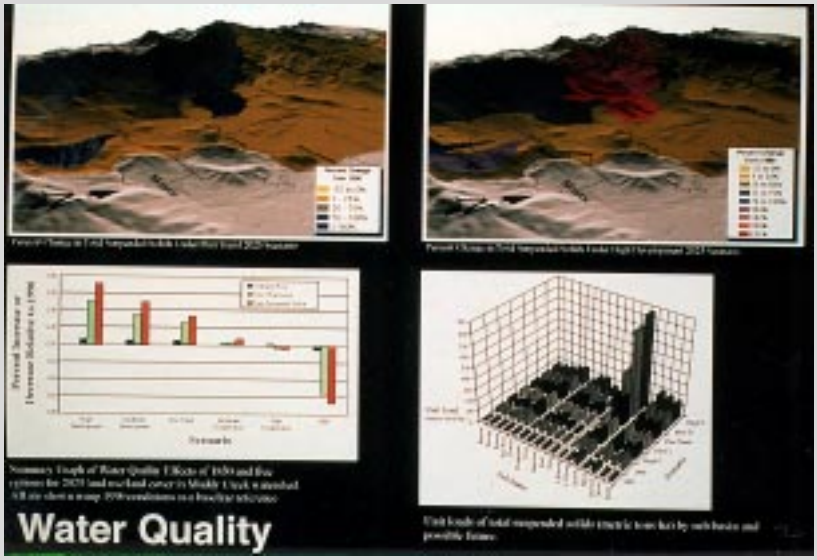
These graphics are not intended for detailed scrutiny. Detailed information is available at the Internet address noted above.

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