Natural Resources Conservation Service (NRCS)

The general objectives, procedures, and data requirements for each phase and step in the methodology specified in *The Handbook* are presented below. Specific information for the Henry's Fork Agricultural Corridor follows and, where appropriate, is illustrated on maps or with drawings and photographs. Species lists and other lengthy reference data sets are included in the appendix.

Phase 1: Collection and Analysis at the Watershed Scale

Preconditions

Step 1 - Identify Problems and Opportunities
Step 2 - Determine Objectives
Step 3 - Inventory Resources
Step 4 - Analyze Resources

Hank Henry

The Henry's Fork - a blue ribbon trout fishery.

Preconditions

Preconditions are issues, mandates, incentives, or leadership within a watershed that can trigger planning activity and conservation projects. Conditions within the Henry's Fork watershed that have prompted present resource conservation efforts include:

- Increasing demand for residential development in scenic landscapes with diverse seasonal recreational opportunities.
- Declining farm and ranch economy.
- Incremental conversion of agricultural and ranch land and wildlife habitat to rural residential uses.
- Fragmentation of wildlife habitat patches and migration and dispersal corridors.
- Increasing pressure on fisheries within the watershed.
- Citizen concern about the loss of open space, recreation opportunities, and rural life style.
- Resource conservation leadership within the watershed from conservation organizations and government agencies.

In the West, these types of preconditions were once limited to high-profile destination resort areas like Jackson Hole, Wyoming and Sun Valley, Idaho. Now they are common in many rural western counties blessed with picturesque scenery, blue ribbon trout streams, and abundant wildlife. They create a formidable land use planning challenge for rural counties unaccustomed to the pressures of development and potential erosion of their rural lifestyle.

Hank Henry

Development pressure - a condition prompting planning.

Step 1 - Identify Problems and Opportunities

Development of a watershed scale list of problems and opportunities, vision statement, and specific objectives typically includes input from a diverse group of stakeholders including the general public. To fully comply with NRCS planning protocol and procedures detailed in *The Handbook*, public hearings and workshops would be held to obtain current public input. However, Fremont and Madison Counties have approved comprehensive plans based in part on direct public participation that reflects the values of those residing in the Henry's Fork watershed. Public input expressed in planning issues and plan objectives was used in the case study to generate a list of problems and opportunities. In addition, observations and information gathered during field studies; in publications from conservation organizations; and conversations with biologists, ecologists, foresters, other resource experts, and local residents were used to further describe problems and opportunities. Problems and opportunities obtained from the sources noted above are summarized below.

Hank Henry

Encroaching development.

Problems

- Increasing residential encroachment in the Henry's Fork corridor and the corridors of its main tributaries.
- Declining utility of the Henry's Fork and other vegetated corridors for wildlife movement due to fragmentation by residential development.
- Regulated water flow rates on the Henry's Fork disrupt historical seasonal flow patterns, particularly spring flooding; winter flows altered due to storage in reservoir.
- Cattle encroachment into the riparian zone with subsequent loss of bank vegetation along stretches of the river.
- Declining cottonwood forest vigor particularly downstream of St. Anthony with limited recruitment of new trees.
- High in-stream, mid-summer water temperatures in the Henry's Fork and tributaries during low-water years.
- Declining vigor of plant communities adjacent to irrigation canals.
- Roadside and railroad ROW are of limited habitat value in their present condition.
- Limited use of erosion-control conservation practices in upland agricultural areas.
- Increased recreation use on the Henry's Fork with a subsequent increase in conflicts between user groups and wildlife and recreationists.
- Declining scenic quality and pastoral setting.

Hank Henry

Undeveloped floodplain.

Opportunities

- The Henry's Fork corridor is still largely undeveloped.

- Henry's Fork Watershed Council, a diverse group of stakeholders, is actively engaged in addressing watershed conservation and economic sustainability issues.
- Several non-profit conservation organizations are working both independently and with government agencies to identify and conserve critical habitat patches in the watershed.
- County comprehensive plans acknowledge the value of open space, flood plains, and in the Fremont County plan, critical wildlife habitat.
- Canals, roadsides, rail rights-of-way, and utility easements provide potential corridor connectivity from the Henry's Fork corridor into the farm and ranch matrix.
- The NRCS, Ducks Unlimited, USFWS, IDFG and other conservation organizations have cost sharing programs for habitat conservation enhancement and restoration of riparian corridors and wetlands.
- Significant patches of quality wildlife habitat in the lower watershed are owned by government agencies or are under conservation easements.

"There are also a number of significant cooperative agreements not only among agencies but also between agencies and landowners to provide and protect wildlife habitat. For example,

"As my friend and I walked upstream and neared the car after a morning of fly fishing on the Henry's Fork, I noticed a sign, one I'd never seen before. It read:

2000 Acre Ranch for Sale
Ranchette Potential
Ryan's Realty
Last Chance, Idaho
208-421-7351

The sign was nailed to a corner post of any empty corral behind a vacant pasture next to the river. It spoke of change; change in the winds that swirled up and down the Henry's Fork, change that would test the strength of community. Would we embrace the opportunity to plan for change together, ranchers and realtors, fishermen and farmers? Would we be wise? Would we 'learn to read the book of external nature and the book of our own nature to discern common patterns and harmonies' as Dubos implored in *A God Within.* They are the substance of a truly sustainable future. Or would we each selfishly pursue our own satisfactions, ignoring the wisdom of the water speaking softly as it flowed past the post with the For Sale sign. The black-backed rainbow resting deep in the river behind "The Rock" requests that we all learn to discern common patterns and harmonies, listen to the river, and consult the God within - - so does the farmer and rancher."

Adapted from *Mid-Morning Fishing on the Henry's Fork – A Short Allegory about Passion, Process and Persistence in Planning* – Craig W. Johnson

the Sand Creek Habitat Management Plan that was written by the BLM in 1978 and signed by the BLM, IDFG, and Idaho Department of lands covers 432,000 acres of lands managed by those agencies. The primary objectives are:

- Provide and protect adequare winter habitat in sufficient quality and quantity to support a post season population of 2,000 elk for 5 months (the current number is approximately 3,000 wintering elk).
- Minimize harassment on wintering elk.
- Compile vegetative data on the entire area.
- Increase desirable browse species to support projected numbers of winter elk, deer, and moose.
- Provide increased thermal and escape cover for wintering elk and deer.
- Increase populations of sage and sharp-tailed grouse.
- Protect and enhance sharp-tailed grouse wintering areas to support increased populations.
- Determine degree of competition between livestock and wildlife for future planning.
- Provide increased season of use and distribution for all wildlife species.
- In addition to elk, provide winter forage for 350 antelope, 150 moose (there are approximately 500-600 present), and 1,200 mule deer (there are approximately 2,500 at present).
- Maintain the endemic tiger beetle.

In addition, the IDFG is involved in use trades with specific landowners that provide domestic livestock use of portions of IDFG lands in exchange for wildlife use (particularly big game) of approximately 25,000 acres of key winter range portions of private lands" (Aslett 2002).

There is considerable agreement among stakeholders on the conservation problems and opportunities in the watershed. Most stakeholders also share the belief that many of the solutions lie in reasonable regulations and in growing a sustainable economy--diverse, yet balanced--including farming and ranching, recreation, development, and service. The challenge for all stakeholders in the conservative political environment of south eastern Idaho will be to work together toward a sustainable future.

Capitalizing on the beauty, historical and emotional connectedness, and the free environmental benefits provided by the Henry's Fork corridor must be an integral part of any plan for a better future in the Henry's Fork watershed.

Step 2 - Determine Objectives

The main reason that stakeholders initiate watershed planning is because they wish to change the existing conditions to some desired future condition. Often they will develop a vision or goal statement, a short description of what they believe the future condition should be for the watershed. Objectives are road maps to desired future condition expressed in the vision statement. They should respond to wildlife conservation problems and opportunities identified in Step 1.

Craig Johnson

Stakeholders objective - maintain natural assets.

As noted, this case study retrieved citizen input from hearings and workshops previously conducted by local governments. Objectives in

Fremont and Madison County Comprehensive Plans related to natural resources including wildlife, open space, and recreation were assumed to reflect general public values. Objectives abstracted from Fremont and Madison County Comprehensive Plans include:

- Maintain the natural assets of the area.
- Protect existing farm operations.
- Protect and encourage the continuation of traditional and customary practices of cattle and grazing activities.
- Assure land use compatibility as development proceeds.
- Encourage a development pattern that discourages conversion of productive farm land, respects environmental limitations, and provides open space.
- Protect rights and enhance property values in balance with public health, safety, and general welfare needs.
- Improve and diversify the local economy.

The TRLT and its conservation partners represent objectives of a stakeholder with a specific interest in the conservation of soil, water, plant, and wildlife resources. Specific goals include:

- Identify landowners and priority properties with particularly high ecological values and public benefit.
- Develop compelling conservation and stewardship incentives for landowners.
- Increase awareness and appreciation of riparian corridors and wetlands.
- Develop and implement feasible conservation options to match each landowner's personal and financial needs.
- Practice and teach good stewardship of protected lands.

"The goal of this project (TRLT and partners Henry's Fork Agricultural Corridor Conservation Project) is to proactively assess and prioritize key lands for resource conservation at the landscape level within the Henry's Fork Agricultural Corridors study area. With proper analysis, we will objectively measure the conservation value of the areas within the landscape and identify critical areas to target future conservation efforts." Although not a vision statement, these goals represent a resource conservation strategy crafted by non-profit conservation organizations, government agencies, and other planning partners responsible for land and resource conservation in the watershed and endorsed by the local watershed council.

Step 3 - Inventory Resources

The intent of the resource inventory is to describe existing wildlife and habitat conditions within the project boundary. The inventory should investigate in greater detail the problems and opportunities identified in Step 1. It should identify the most important elements of wildlife habitat, significant corridors and supporting matrix, describe their condition, and determine the level to which they are protected. In addition, the inventory should produce a list of wildlife species present or predicted to be present and the status of their populations. These key inventory elements will form the basic structure of conservation plan alternatives developed in Step 5. Basic inventory data needs related to most watershed scale projects include:


Craig Johnson

Wildlife Habitat Data Needs

- GAP data (where available)
- Existing vegetation
- Condition of existing vegetation
- Historic 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
- Specific ranges for species of concern
- Water availability and historical watershed hydrology

UDWR

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 resides in the watershed)
- Population characteristics for species of concern
- Culturally important species (especially those tied to Native American or valuable to limited income groups for subsistence)

The data noted above were collected and when possible mapped using techniques described in the methods section and from data collected and shared by TRLT and partners. On the following page are several of the key GIS inventory maps, resolution 30 meters (Figure 8). Wildlife species lists acquired through IDFG are included in Appendix A. Existing data for vulnerable populations, population characteristics, and habitat conditions specific to the detailed study area were limited. Most of this information was gathered from conversations with IDFG biologists, biologists from Brigham Young University Idaho (BYUI), and infield investigations using procedures identified in *The Handbook* (Appendix B).

Hank Henry

Riparian habitat is home to many species.

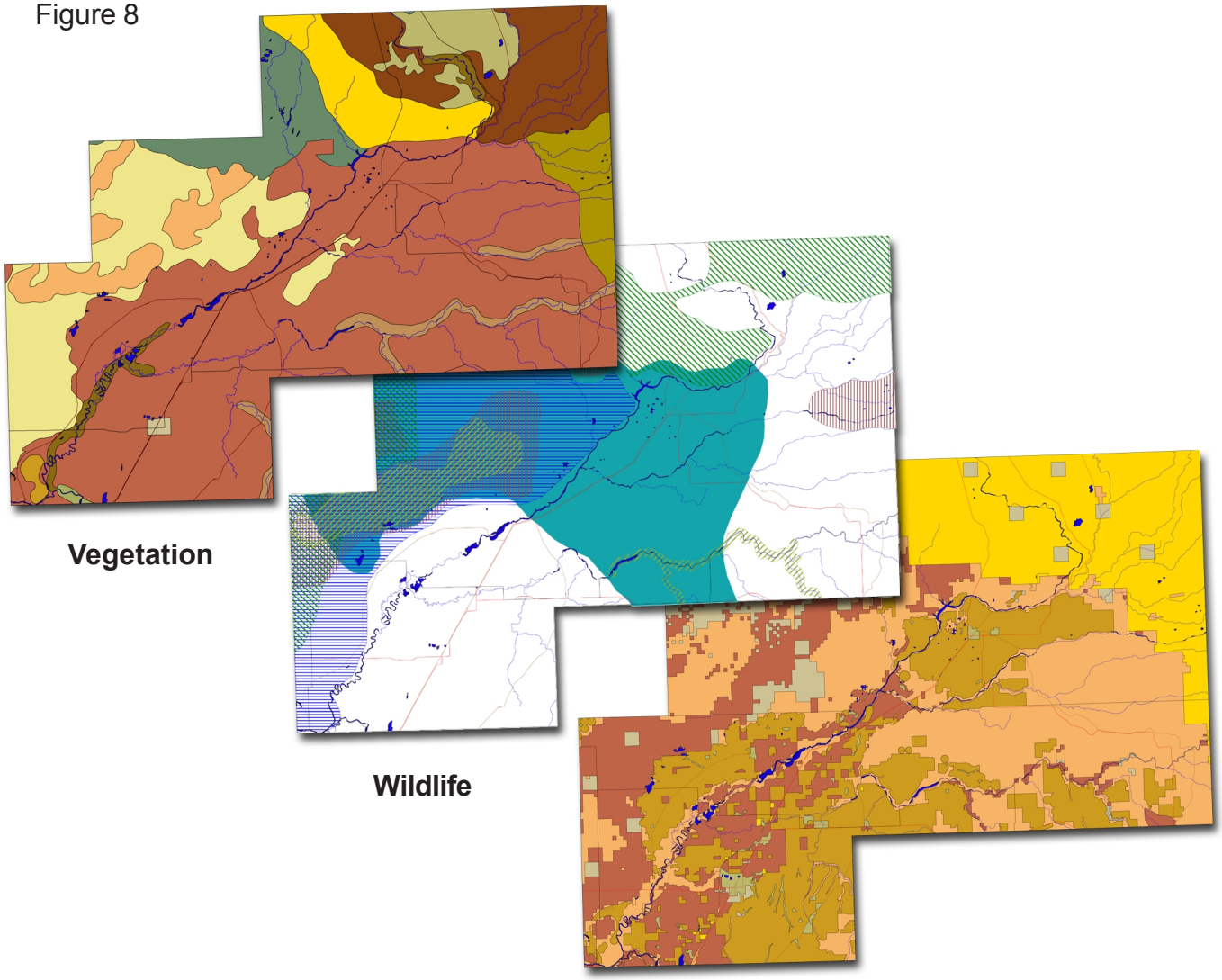
Mapped inventory data at the large study site scale depict a complex landscape mosaic, a pattern of patches, some of high habitat value, separated by agriculture, range, and other land uses. Not surprising, the greatest concentration of patches with the highest species diversity is located in the Henry's Fork floodplain or adjacent to the river and its main tributaries. Great Blue Heron (Ardea herodias), Bald Eagle (Haliaeetus leucocephalus), and Osprey (Pandion haliaetus) nesting sites exist along the lower reaches of the river. Mule deer (Odocoileus hemionus), moose (Alces alces), and elk (Cervus elaphus) migration corridors exist on the northern edge of the study area. Important wintering range is located to the north and west in the basalt plains and sand hills. Many of these patches are privately owned and some are jointly managed by IDFG through use exchanges. Some of the patches owned by government agencies or under conservation easement are not contiguous or linked by corridors.

Inventory data within the detailed study area

Sample GIS Data

Natural Resources Conservation Service (NRCS)

Figure 8



Vegetation

Wildlife

Land Uses

GIS DATA LAYERS USED IN CASE STUDY

Canals - Cities - County Boundaries - Dams - FEMA Flood Hazard Areas - Forest Service Boundaries Incorporated Places - Lakes - Land Uses - Management Areas - Land Ownership - Railroads - Rivers Major Roads - Secondary Roads - Slope (Topography) - State Boundaries - Streams - Streets Vegetation - Wetlands - Elk Habitat - Deer Habitat - Moose Habitat - Sage Grouse Habitat Sharptailed Grouse Habitat - Farmland - Ecologic Nodes - Gravel Mines - Debris Flows - Watersheds Digital Elevation Model

OTHER MAPPED DATA

Flood Control Districts - Ground Water - Climate - Lithology - Soils - Geology - Fish Habitat & Range

reveal a similar pattern. With the exception of lower reaches of the Henry's Fork, the riparian zone is narrow. Woody riparian vegetation along the banks is discontinuous, a pattern appreciably different than what was encountered by European trappers and Mormon settlers. Cottonwood stands are frequently fragmented and old with little recruitment of new trees except along the lowest reaches of the Henry's Fork. Many wetlands adjacent to the river have been impacted by unmanaged grazing. Patches of shrub-steppe of significant importance to sage and Columbian sharptailed grouse (Centrocersus urophasianus) and (Pedioecetes phasianellus) abut the Henry's Fork in the middle segment of the study area. The sharptailed grouse is a state species of concern.

Craig Johnson

Shrub-steppe supports rich species diversity.

The agricultural segment of the farm/ranch matrix along the entire corridor and aquatic vegetation in the river are important food sources for several species, in particular, migrating waterfowl. Small remnant patches of native shrub-steppe vegetation persist in the agricultural matrix. They are important refugia for both native plants and some species of wildlife.

Step 4 - Analyze Resources

In Step 4, inventory data collected on wildlife species and their habitat is analyzed. Wildlife experts on the planning team, referencing the relevant literature and utilizing information compiled on inventory worksheets, typically do the analysis. The intent of the analysis is to locate significant reserves/patches, corridors, special features and sites, gaps, and matrix elements in the watershed. In addition, the analysis should describe the general condition of species populations and their habitat. Issues regarding the relative accuracy and spatial precision of the data need to be resolved in this step.

The findings of the analysis process are recorded on a composite map. The analysis directly links the inventory with real resources, which will facilitate Step 5 – Formulating Alternatives. The principal investigators and research assistants analyzed the inventory data for the case study site. Analysis of watershed resources by TRLT and conservation partners that was used to prioritize "key lands for resource conservation," including lands of high ecological value, were incorporated in this analysis. Biologists, foresters, and wildlife managers familiar with the area reviewed the composite analysis map.

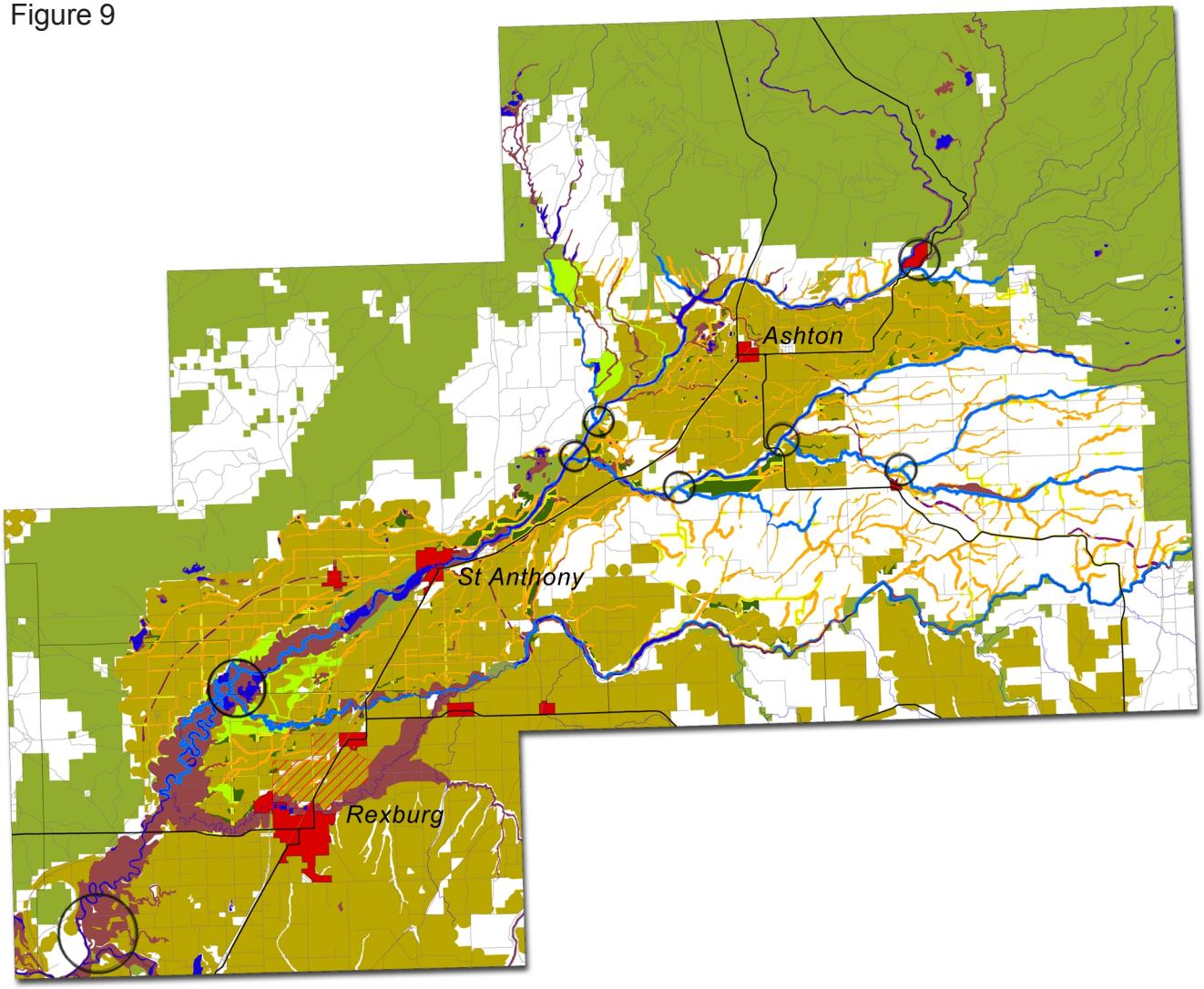
The analysis of inventory data verified many of the problems and opportunities identified earlier in the planning process. The analysis also confirmed what conservation biology literature suggests, in western shrub-steppe and montaine landscapes, riparian corridors are bastions of biodiversity (Figures 9-10). Corridors along the Henry's Fork and its main tributaries are the most important corridors in the study area. Significant ecological nodes occur where major tributaries join the Henry's Fork. Small contiguous intermittent streams, if managed for conservation, could extend corridor connectivity laterally into the uplands. In the upper reaches of the watershed, drainage swales could further extend connectivity to forested landscapes. The lower elevation floodplain cottonwood forest is a particularly significant element of the Henry's Fork corridor. Small patches of this floodplain forest are in public ownership providing some protection of habitat values.

The other significant corridor defined by tradition rather than topography is the deer and elk

Analysis of Conservation Corridors - Map 1

Natural Resources Conservation Service (NRCS)

Figure 9



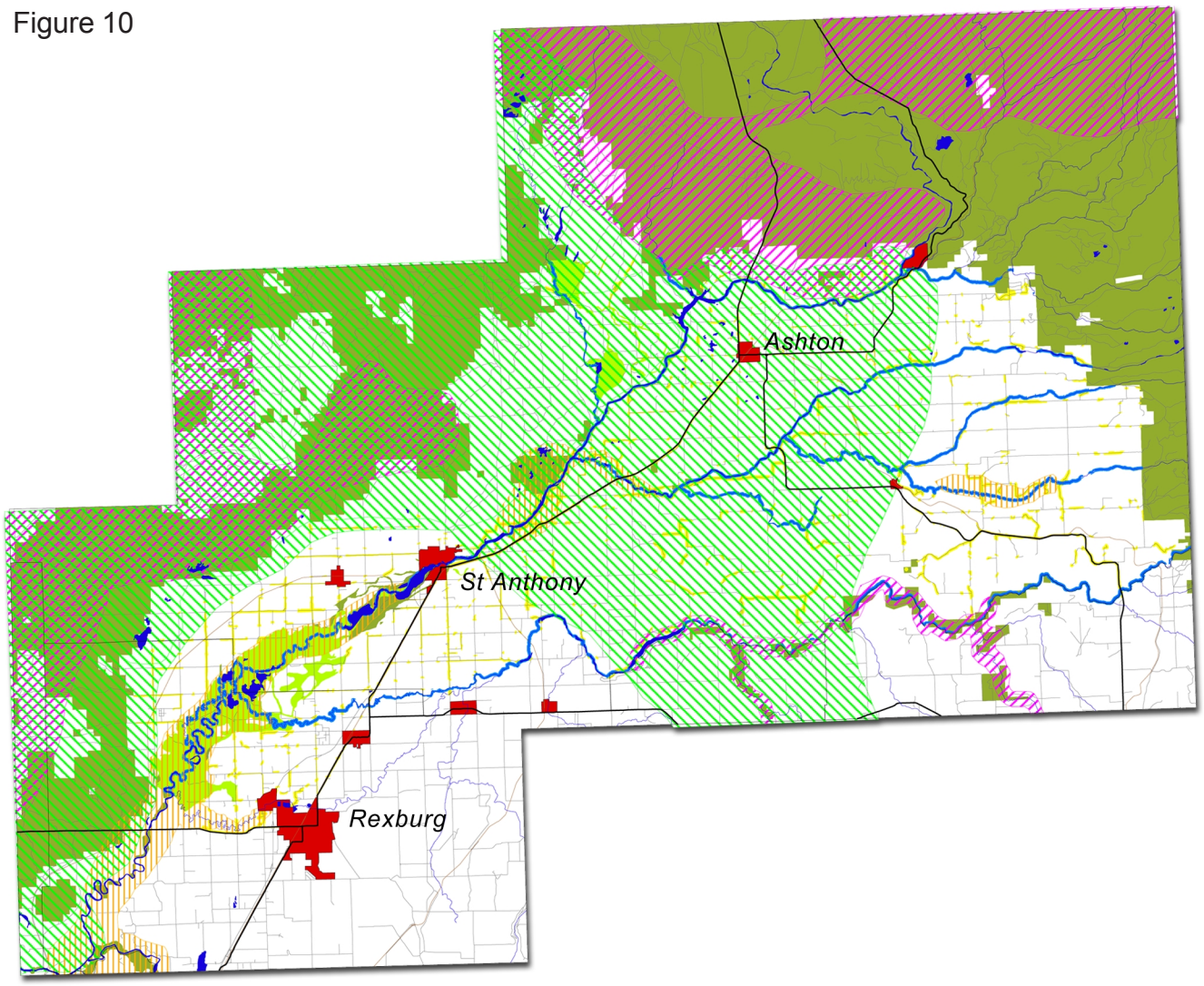
ANALYSIS OF CONSERVATION CORRIDORS LEGEND

- Farmland
- Floodplain
- Major Riparian Corridors
- Wetlands
- Intermittent Streams & Canals
- Rangeland / Dryland farm
- Lands managed for conservation
- Remnants
- Ecological Nodes
- Other conservation areas
- Urban Impact Zone
- Roadsides
- Railroad ROW
- Cities

Analysis of Conservation Corridors - Map 2

Natural Resources Conservation Service (NRCS)

Figure 10



ANALYSIS OF CONSERVATION CORRIDORS LEGEND

- Major Riparian Corridors
- Wetlands
- Lands managed for conservation
- Roadsides
- Railroad ROW
- Cities
- Areas of high biodiversity
- Elk Winter Habitat
- Deer Winter Habitat
- Sage Grouse Habitat
- Sharptailed Grouse Habitat

Craig Johnson

Unmanaged grazing impacts wetlands.

migration route. Generations of animals have traveled this route; the tradition passed from adults to progeny. The continuity of the corridor is bisected by three lanes of US Highway 20--a dangerous crossing for wildlife. Introduced corridors, canals in particular, were also identified as important habitat elements in sections of the landscape dominated by farming and ranching.

The analysis also identified several non-riparian plant community patches that contribute to wildlife species diversity in the study area. Large patches of sage scrub/grassland support a wildlife community nearly as diverse as the community associated with riparian areas. Particularly significant are patches that have not been intensively grazed and continue to include a diversity of grasses and forbs. "The Sand Creek desert area west of the river and south of Big Bend Ridge is, 'one of the most productive shrub/grass wildlife ranges in eastern Idaho (IDFG 1999).' In addition, the sand dune complexes in the area are unique and very productive vegetative communities that provide significant wildlife habitat values. For example, the dunes and associated vegetation, particularly along the edges of active dunes, are major migration corridors for big game including elk, moose, and mule deer. They also serve as winter ranges in many areas due to the thermal cover and forage production. They are also home to the Idaho tiger beetle and the St. Anthony evening primrose, both listed under special classifications. Sharptailed grouse have numerous active leks in these areas" (Aslett 2002). Most of these patches persist in the northwestern and western quadrants of the study area. Similarly existing isolated remnant patches of shrub-steppe habitat within the agriculture matrix are refugia and "stepping stones" for migrating birds. Complexes of small wetlands and large isolated wetlands also contribute to biodiversity. Although relatively uncommon in the study area, they support waterfowl and other wetland-related species, adding to overall species diversity in the area.

Several factors in the study area are putting these wildlife resources at risk. In riparian corridors and flood plains, the lack of natural flooding cycles is perhaps the most important factor affecting the structural and species diversity of plant communities. The literature suggests this condition is common on rivers and streams throughout the Intermountain West. Loss of plant community richness adversely affects wildlife populations and species diversity. The growing impact of development is a second factor putting habitat patches and critical corridors at risk. In some areas, a third risk factor particularly for wetland, riparian, and sage/grassland ecosystems, is improper grazing.

There are 23 vertebrate wildlife species and two invertebrates that may utilize the study area and are listed as state species of special concern (see Appendix C). In addition, three birds (the bald eagle, whooping crane, and peregrine falcon) are federally listed as threatened or endangered. The status of populations of most other plant and wildlife species is not known. However, information from several studies done in the Intermountain West suggest that populations of some species of neo-tropical birds are declining.

The analysis identified several disturbed areas with potential for restoration including gravel pits and rock and gravel debris deposits from the Teton Dam break. Along the Henry's Fork and its tributaries, riparian habitat could be restored in many locations, particularly high banks in the lower segment.

Phase 2: Decision Support at the Watershed Scale

Step 5 - Formulate Alternatives
Step 6 - Evaluate Alternatives
Step 7 - Make Decision

Gary Bentrup

Riparian buffers protect water quality and fish habitat.

Step 5 - Formulate Alternatives

The Handbook recommends that the planning team develop a range of alternatives that address the problems, opportunities, and objectives identified in Phase 1. Alternatives should focus on the preservation, enhancement, and restoration of wildlife habitat. Some prototypical 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 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).

It is important that the multiple benefits of habitat conservation (erosion control, improved water quality, flood water storage, visual quality, and recreation) be elaborated in one or more alternative. It is also important to prepare a no-action alternative. The purpose of this alternative is to estimate the future condition of the watershed or detailed study area at some point in time if no specific actions are taken to address identified problems. It is often used as a yardstick against which the conservation benefits of other plan alternatives are measured.

The Handbook outlines a methodology for preparing wildlife conservation alternatives. Four steps are involved in an overlay process that uses the composite analysis map prepared in Step 4 as a base layer.

- Function – delineates the location of functional issues including wildlife habitat, erosion control, bank stabilization, flood storage, etc.
- Existing Habitat Resource Recommendations – makes general recommendations to preserve, enhance, or restore habitat resources and alleviate the cause or causes of habitat degradation.
- Potential Habitats and New Plantings – identifies patches and corridors in the watershed not presently managed for wildlife that could become a functional part of a watershed scale plan.
- Synthesis – combines the three previous layers identifying opportunities to connect reverses/patches, corridors, potential habitats, special areas and special features into an integrated plan using principles discussed in Chapter 5 of *The Handbook*.

Each alternative is depicted on a separate map. Additional non-graphic information is presented in a concise report with statistical information displayed in charts and graphs. Maps and data

will be used in Steps 6 and 7 – Evaluate Alternatives and Making Decisions.

This case study presents three alternatives. The emphasis of each alternative is described briefly below.

No-Action Alternative—depicts an estimated future condition for the watershed assuming minimum compliance with existing development codes, zoning, and other regulatory statutes. Ongoing conservation efforts of TRLT and partners are not shown because their location, configuration, and size are not known at this time.

Buffers Alternative—illustrates a conservation alternative that emphasizes generally accepted minimum riparian and wetland buffer widths for the conservation of fish and wildlife and other resources. Implementation of this alternative would require slight modifications to the existing development code.

Conservation Corridor Alternative—illustrates a conservation alternative based on principles detailed in the manual. It emphasizes the use of natural and introduced corridors to connect habitat patches by employing existing development code conservation options, NRCS practices, and collaboration with public and quasi public agencies and non-profit organizations.

Each alternative is described and the plan discussed in greater detail below. Plan enlargements and diagrammatic sections are also included to further clarify each alternative.

No-Action Alternative Description (A)

The No-Action Alternative is based on the assumption that existing land-use regulations, permitting standards, development codes, and environmental statutes in Fremont and Madison Counties will remain and be enforced. It also assumes that present development trends will continue and agricultural and ranching practices will remain essentially unchanged. In the No-Action Alternative, wildlife habitat conservation is an indirect result of the development process as well as farming and ranching activities. Neither county master plan designates specific areas for habitat protection in the case study area.

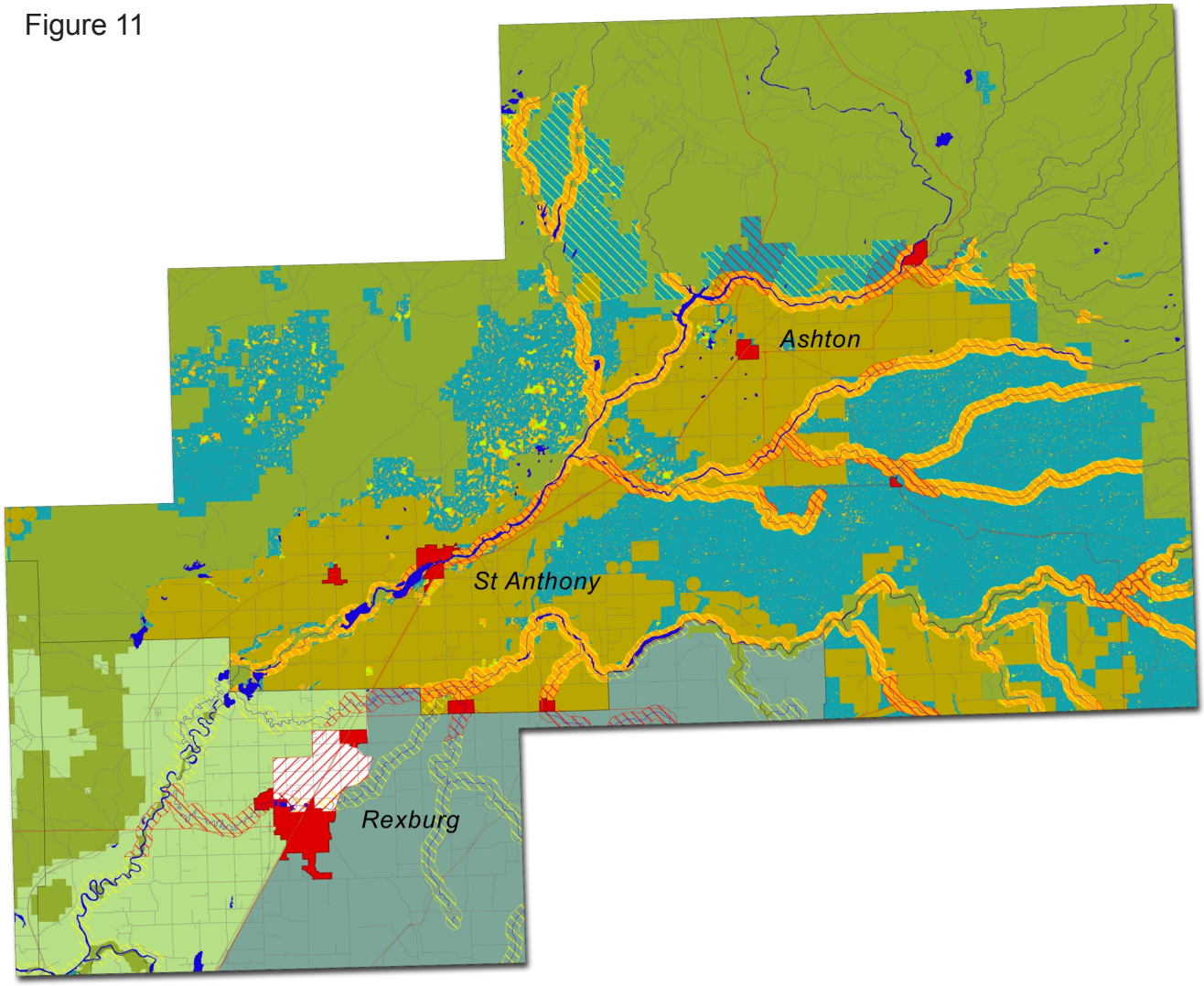
The model used to construct the No-Action Alternative Plan makes the following additional assumptions:

- A conservative estimate of land conversion to residential uses in both counties is 250 acres per year for the next 10 years.
- The majority of these new residential units in Fremont County will be second homes.
- Properties most likely to be developed in the near future are in river front locations or forested sites with distant views (amenity properties), both within one mile of an improved road.
- Existing patches of habitat managed for wildlife will remain.
- Landowners and developers will continue to develop properties using traditional lotting techniques at lot sizes permitted in the existing development code.
- Most residential buildings will be set back from streams at the minimum distance specified in the development code or closer if setback is not enforced.
- Residential landowners will continue to prefer and implement traditional landscaping (shade trees, ornamental shrubs, and manicured lawns) in setbacks as permitted by the development code.
- The number of dogs and cats (subsidized predators) in the study area will increase with increased residential development.

No Action Alternative (A)

Natural Resources Conservation Service (NRCS)

Figure 11



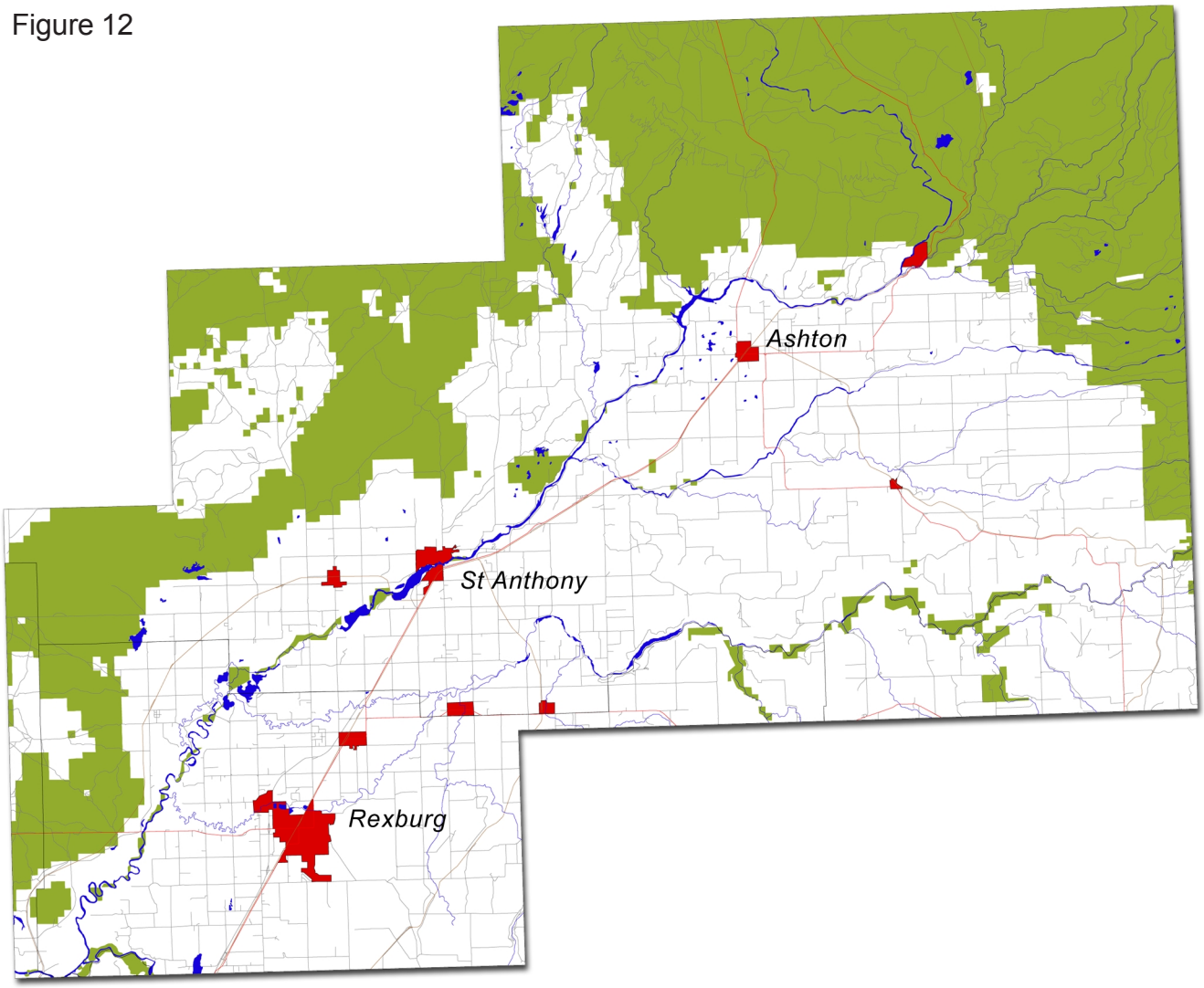
NO ACTION ALTERNATIVE LEGEND

- Residential, average density 1 unit per 40 acres
- Residential, average density 1 unit per 25 acres
- Residential, average density 1 unit per 10 acres
- Residential, average density 1 unit per 2.5 acres
- Lands managed for conservation
- Agriculture Transition Variable Density
- Urban Impact Zone
- Agriculture
- Amenity properties (river frontage or long views)
- High development probability properties

No Action Alternative (A)
Lands in Conservation

Natural Resources Conservation Service (NRCS)

Figure 12



NO ACTION ALTERNATIVE LEGEND

Existing lands managed for conservation

- TRLT and conservation partners will continue to acquire habitat or negotiate conservation easements and cooperative management agreements on high-priority habitats and other resources in the study area, but locations are unknown and thus cannot be mapped.
- The condition of vegetation in natural corridors will continue to decline and remain essentially unchanged or decline in introduced corridors.

These assumptions are based on a review of the literature, discussions with planning professionals and NRCS and IDFG personnel, a cursory evaluation of real estate activity in the study area, and an assessment of recent residential development along the Henry's Fork and in similar settings, South Fork of the Snake River, Big Wood River and Cub River in Idaho, the Madison River in Montana, and Bear River in Utah.

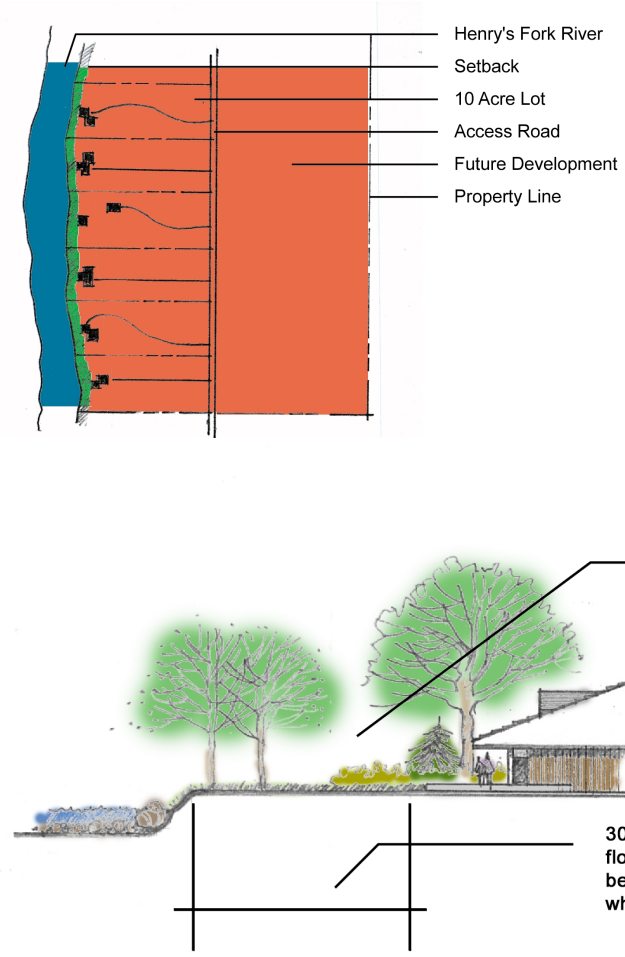


Figure 13 - The plan and section illustrate a typical building setback as permitted by the existing Fremont County Development Code on the middle segment of the Henry's Fork.

No-Action Alternative Discussion

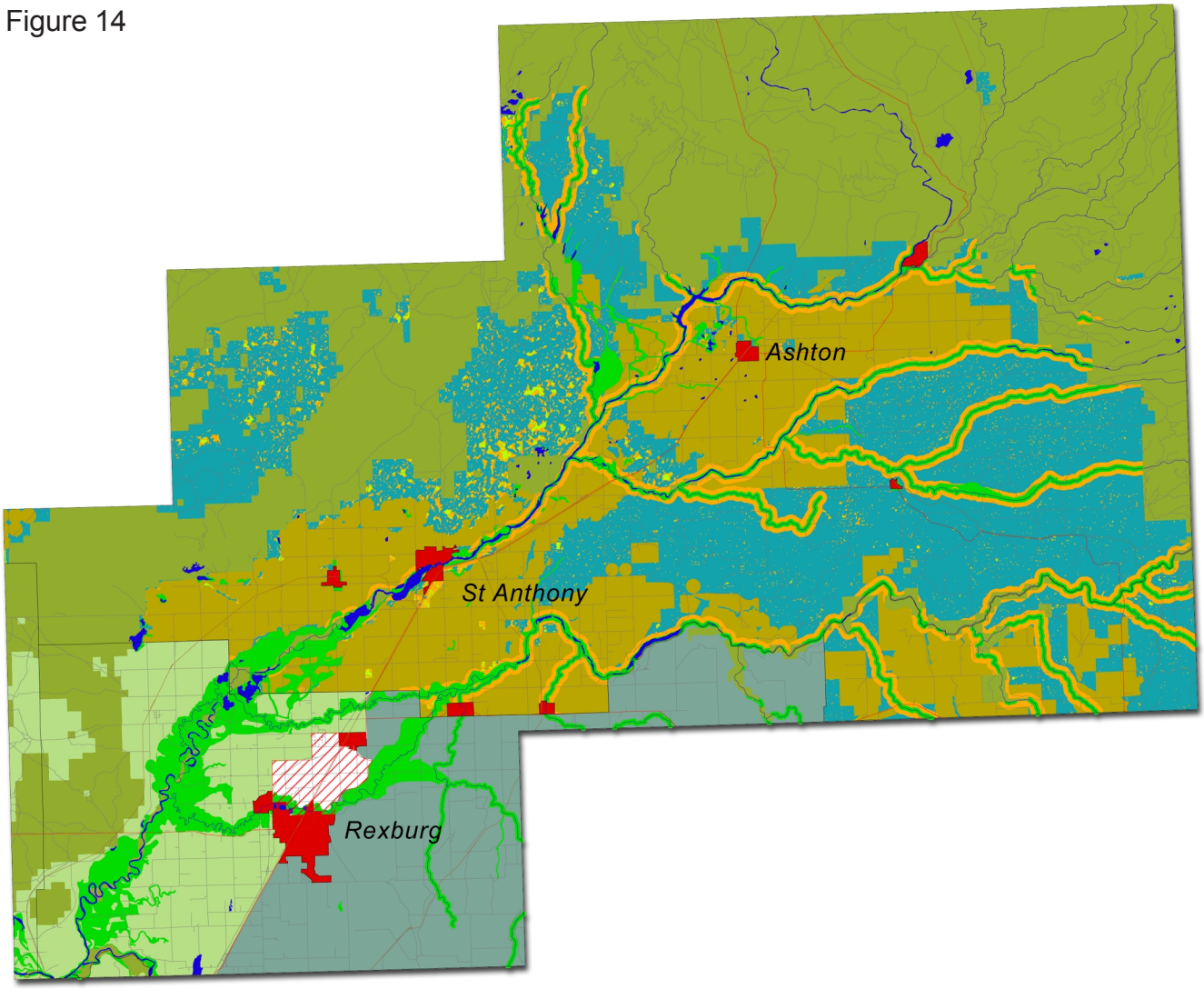
The pattern of land uses depicted in the No-Action Alternative Plan reflects residential densities permitted by existing county master plans, existing habitat patches managed for wildlife, and an estimate of those areas most likely to be converted to residential uses (Figure 11). Estimated land conversions are based on modeling assumptions described above.

The Henry's Fork and its tributaries, wooded areas, and areas backing on federally owned land (amenity properties) are the most attractive properties for conversion to residential development. These properties are most likely to develop in the immediate future if they are within one mile of a paved or improved road. This pattern of land conversion is already underway. When this pattern is projected as a development trend and compared to the Analysis Map prepared in Step 4, the conflicts become evident. The properties in the study area most attractive to developers are also among the most important for wildlife, riparian corridors, and the big game migration corridor at the base of the plateau. Given the assumptions noted above, riparian corridors would be subdivided into 10-acre lots and sections of the migration corridor into 25- or 40-acre lots depending on site characteristics. Development of less attractive 40-acre properties in productive farm land and adjacent to wetlands could also occur incrementally but in a more random fashion.

Buffers Alternative (B)

Natural Resources Conservation Service (NRCS)

Figure 14



BUFFERS ALTERNATIVE LEGEND

- Residential, average density 1 unit per 40 acres
- Residential, average density 1 unit per 25 acres
- Residential, average density 1 unit per 10 acres
- Residential, average density 1 unit per 2.5 acres
- Lands managed for conservation
- Conservation buffers and floodplain easement
- Agriculture Transition Variable Density
- Urban Impact Zone
- Agriculture

The predicted land conversion to residential uses that would occur under the No-Action Alternative would exacerbate the problems of habitat fragmentation. Several existing state and federally owned patches of habitat managed for wildlife would become increasingly isolated--separated by new residential development. It would also increase the size and number of gaps in existing riparian corridors. Some new wildlife conservation areas could be added through the efforts of agencies and nonprofit organizations. These properties may or may not be connected to other patches or corridors.

At a smaller scale, land conversions to residential uses could alter the structural characteristics of existing habitat. Replacement of native vegetation with traditional landscaping in required setbacks and along riparian edges could displace more sensitive native fish and wildlife species (Figure 13). Typically residential development increases populations of generalists species like sparrows, starlings, and robins. In addition, increased numbers of cats and dogs common in residential developments would likely increase wildlife losses due to predation.

Craig Johnson

Riparian vegetation removed for view slots and tranditional landscaping extended to the waters edge in the 50-foot setback.

The No-Action Alternative would diminish visual quality and the rural sense of place, particularly along the Henry's Fork and its tributaries. Those most directly affected would be farmers and ranchers, anglers, rafters, and other water-oriented recreationists.

Buffer Alternative Description (B)

The Buffers Alternative emphasizes conservation of riparian corridors, flood plains, and wetlands, three of the most important and at-risk habitat types in the study area. It is based on the premise that conservation buffers in these locations are a very cost-effective practice for conserving soil, air, water, plants, and wildlife. It is an alternative designed to accomplish conservation goals while minimizing the acreage removed from crop production and other uses. The Buffers Alternative is based on the same assumptions as the No-Action Alternative with one exception--to be implemented, it would require minor modifications to existing county ordinances and development codes.

Conservation Buffers are strips of native vegetation sited to achieve conservation goals; strip widths reflect recommendations in the literature and a response to general site conditions and wildlife species in the study area. The Buffers Alternative would provide a minimum level of planned wildlife habitat conservation and connectivity in the study area. It would represent a significant first public policy step toward a more comprehensive wildlife habitat conservation component to county master plans.

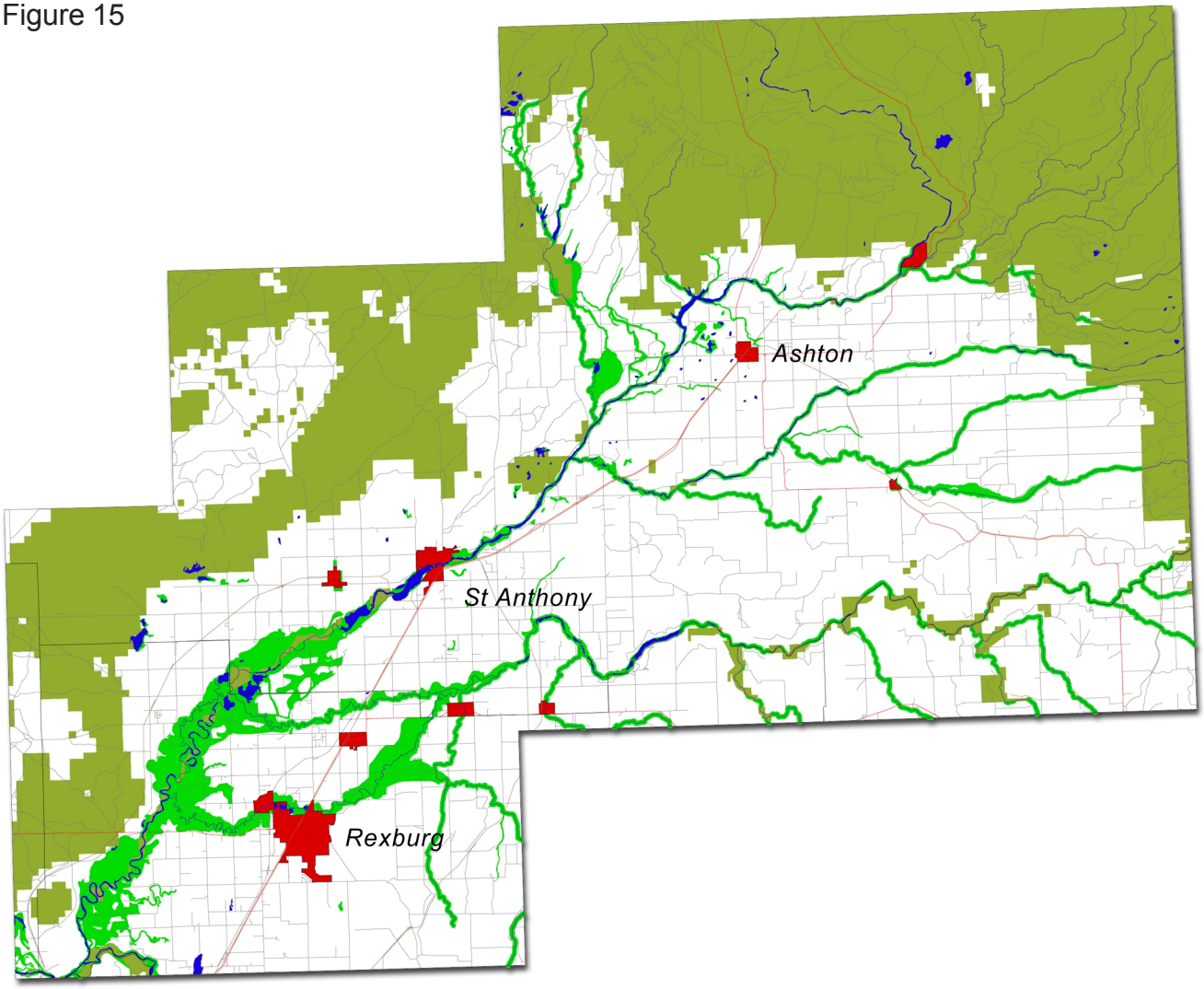
Buffers Alternative Discussion

The pattern of land uses depicted in the Buffers Alternative is the same as that shown in the No-Action Alternative with one exception--the introduction of conservation buffers. Conservation buffers would link the Henry's Fork with its main tributaries into an integrated network connecting U.S. Forest Service lands

Buffers Alternative (B)
Lands in Conservation

Natural Resources Conservation Service (NRCS)

Figure 15



BUFFERS ALTERNATIVE LEGEND

Existing lands managed for conservation

Conservation buffers and floodplain easement

on the plateau with lower elevation riparian and flood plain habitats (Figures 14-15). Wetlands in the study area would also be buffered to protect water quality and provide nesting and brooding habitat for waterfowl and other wildlife species. In addition to riparian and wetland buffers, this alternative also incorporates the entire flood plain into the plan. The lower flood plain supports the greatest diversity of species in the study area and is a major node in the Henry's Fork corridor. Although not optimum, the 100- to 150-foot minimum buffer width recommended in this case study is sufficient to facilitate migration and dispersal and function as habitat for many species particularly small perching birds. The buffers are also wide enough to function as nutrient sinks and sediment traps minimizing adverse impacts generated by adjacent land uses. This will further protect water quality and the fishery.

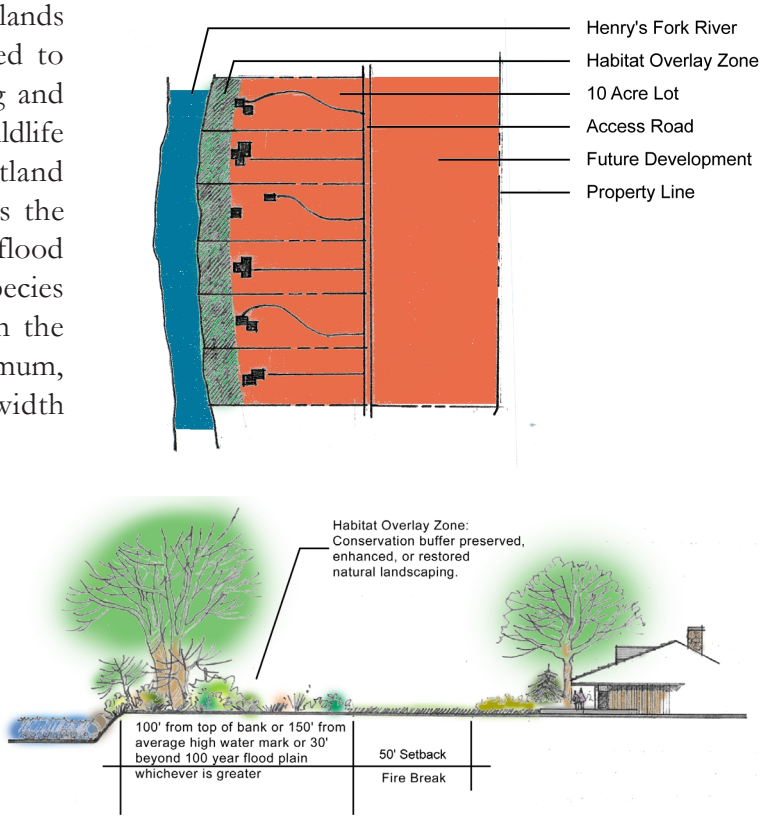


Figure 16 - The plan and section illustrate the conservation easement overlay and the building setback proposed by the Buffers Alternative.

It is important to note that there is substantial evidence in the literature to support the concept of variable buffer widths. Variance from the 100-foot minimum used in this study could be a response to stream order, bank slope, adjacent land use, specific wildlife species needs, and other site specific conditions. Refinements to recommended minimum corridor width should be explored as conservation efforts continue in the watershed.

The Buffers Alternative would integrate public lands in the lower flood plain into a unified habitat patch by incorporating, through flooding easements, all privately owned flood plain land into the plan. However, it would do little to integrate other conservation properties. This alternative would not conserve the big-game migration corridor or winter range or sage and sharptailed grouse habitat. These properties would be subject to potential incremental conversion to other uses. As in the No-Action Alternative, land in riparian corridors and land adjacent to wetlands outside the buffer zone would be available to be subdivided into residential lots. The vegetated buffer and deeper building setback in this alternative would reduce the level of visual impact of development described for the No-Action Alternative. The increased cover provided by the buffer could also reduce wildlife losses due to predation by dogs, cats, and natural predators.

The Buffers Alternative would require the counties to adopt a wildlife habitat overlay zone or similar conservation strategy for corridors along the Henry's Fork, its main tributaries, and wetlands in the study area (Figure 13). The overlay would not change existing zoned land uses, but would regulate some land management activities and provide incentives to preserve,

enhance and restore habitat value within the zone. The overlay zone regulations would be applied only when working landscapes were proposed for conversion to residential development. However, farmers and ranchers engaged in crop and livestock production would be encouraged to voluntarily adopt overlay zone setback guidelines. Voluntary exclosure of cattle from riparian areas is already a reality; several ranchers in the watershed have fenced their livestock out of riparian areas. The NRCS and other conservation organizations have programs that assist landowners interested in exclosure projects.

Craig Johnson

Native shrub steppe and riparian vegetation is maintained in the 100-foot setback.

Conservation Corridor Alternative Description (C)

The Conservation Corridor Alternative is based on the precept that resource conservation is most effective and economical when conservation of landscape function and structure is planned first. Development and other land-use activities are then integrated with the resource conservation plan. This type of proactive planning for wildlife conservation seeks to retain, to the extent possible, critical habitat patches and connecting corridors. It also seeks to minimize fragmentation of habitat and working landscapes and strives to optimize connectivity. The Conservation Corridor Alternative targets inclusion of habitats and migration and dispersal corridors for federally listed threatened and endangered species, state-listed species of concern, and other species of local interest as identified by the conservation planning partners already working in the Henry's Fork watershed (Appendix C). The Conservation Corridor Alternative also acknowledges the importance of the agricultural matrix (prime farm and range land) as a habitat component for many species.

Procedures and principles detailed in *The Handbook* and listed below were used to generate the Conservation Corridor Alternative Plan.

Patches

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

Corridors

- Preserve continuous corridors, restore gaps in discontinuous corridors.
- Preserve existing corridors that connect existing patches, pay particular attention to migration and dispersal corridors.
- Introduce, where practical, corridor restoration 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 opportunity permits; 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 including aquatic where opportunity permits.
- Consider artificial structures to provide habitat when natural habitat has been degraded or destroyed (e.g., a watershed-wide bluebird nestbox or bat house program).

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 adapted concepts and principles as necessary to meet project resource conditions and needs of specific wildlife species. The Conservation Corridor Alternative assumes that most land-use changes in the near future will occur on properties with high amenity characteristics. It also assumes that developers of these properties will utilize conservation-oriented options in existing codes and zoning.

Conservation Corridor Alternative Discussion

Preserving the ecological integrity of the Henry's Fork and its main tributaries is key to this alternative strategy for wildlife conservation in the watershed. The Conservation Corridor Alternative integrates the surface drainage system within the study area including the lower Henry's Fork floodplain and its tributaries into a connected network conserved through conservation easements (Figure 17). The Henry's Fork, Fall River, Conant Creek, and North Fork of the Teton form the structural backbone of this alternative. Corridor boundaries were delineated on 1:24000 USGS quad sheets and referenced against County Soil Surveys. The network structure is extended to capture existing wetlands and patches of upland habitat such as the Sand Creek Wildlife Management Area and Chester Wetlands that are presently managed for wildlife. It could be configured to connect high-priority patches of habitat acquired by TRLT and planning partners in the future.

Craig Johnson

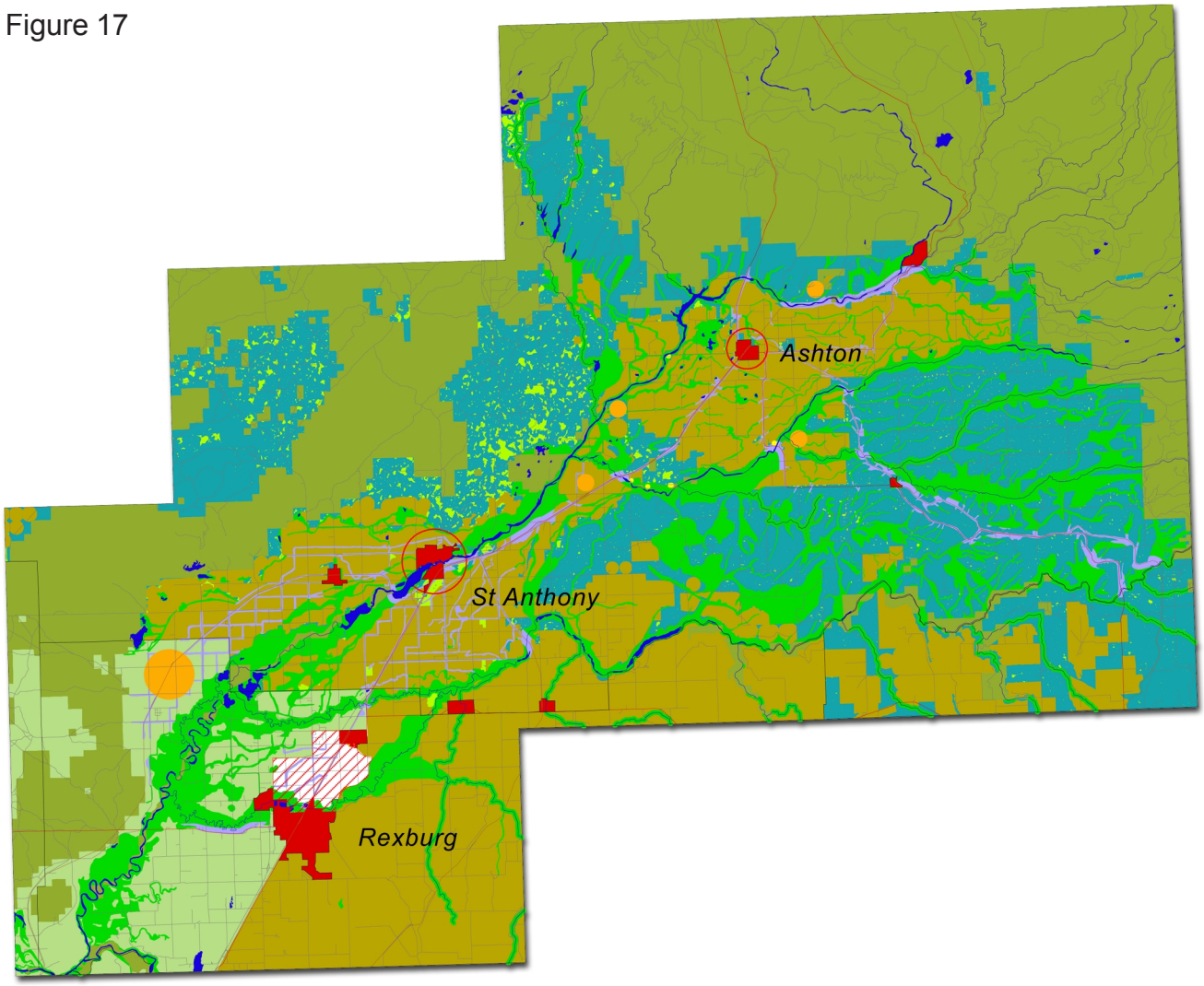
The ecological and visual integrity of the riparian corridor is preserved in the conservation corridors alternative.

NRCS conservation practices such as grassed waterways, riparian buffers, field borders, and CRP would be key in integrating smaller drainage ways and intermittent streams in upper reaches of the watershed. In addition, the Conservation Corridor Alternative includes protection of the deer and elk migration corridors and winter range as delineated by IDFG. These resources are

Conservation Corridors Alternative (C)

Natural Resources Conservation Service (NRCS)

Figure 17



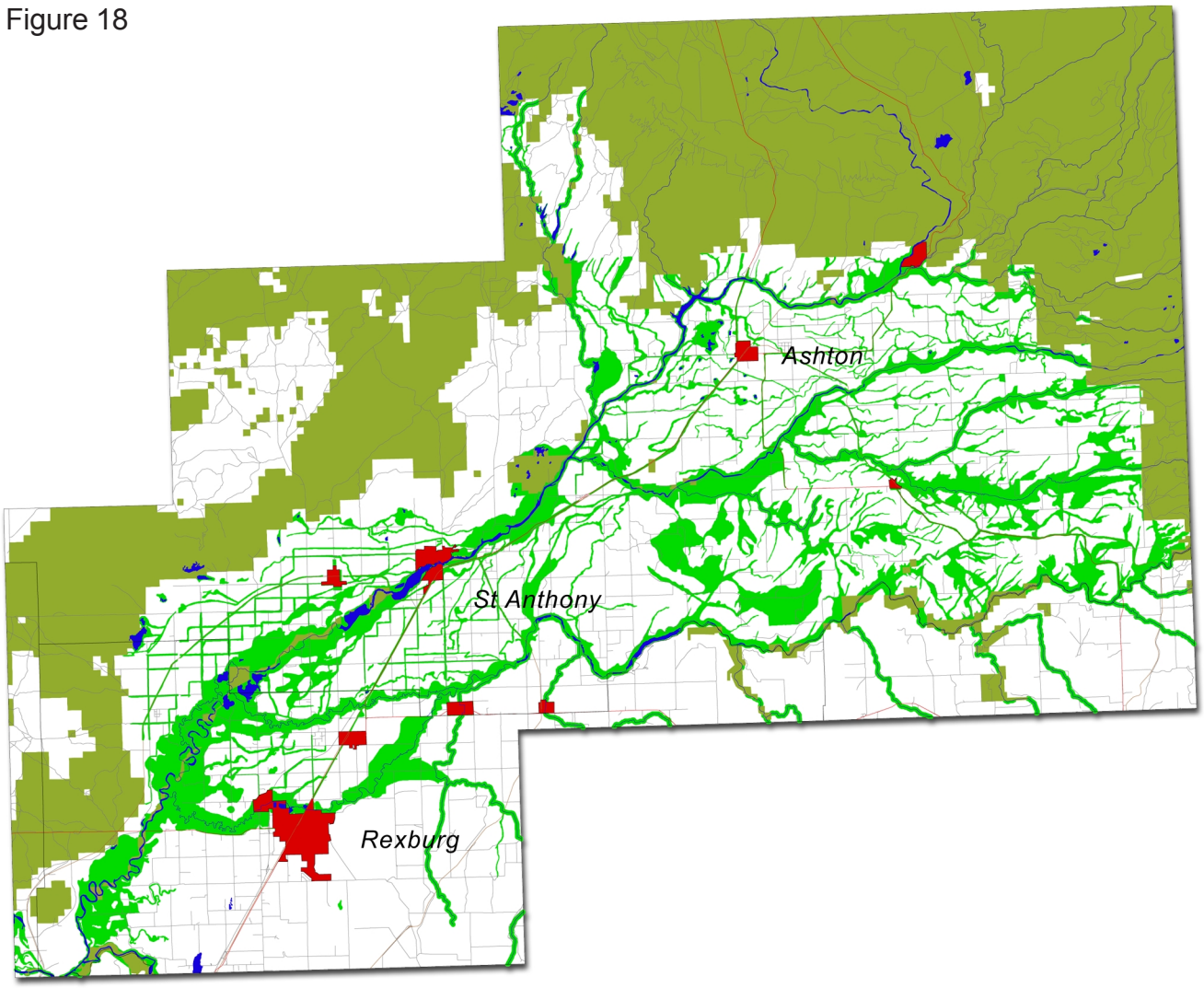
CONSERVATION CORRIDORS ALTERNATIVE LEGEND

- Agricultural trust lands
- Other private lands managed for conservation
- Conservation corridors and floodplain easements
- Introduced Corridors (roadsides, rail ROWs, etc.)
- Other
- Lands presently managed for conservation
- Targeted growth areas (apprx. 2,200 acres in rural residential clusters)
- Sites for restoration
- Agriculture Transition Zone
- Urban Impact Zone

Conservation Corridors Alternative (C)
Existing Lands in Conservation, Conserved Remnants and Conservation Corridors

Natural Resources Conservation Service (NRCS)

Figure 18



CONSERVATION CORRIDORS ALTERNATIVE LEGEND

- Existing lands presently managed for conservation
- Conservation corridors, introduced corridors, and conserved remnants

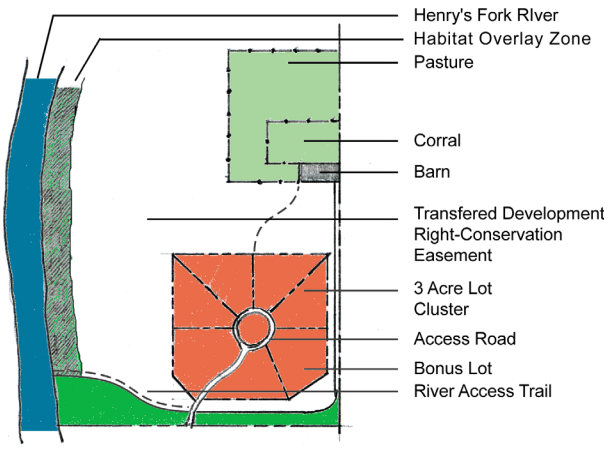
critical to deer, moose, and elk, which summer in higher elevation national forests and parks.

Equally important is conservation of shrub-steppe habitat for sage and Columbian sharptailed grouse, both species with declining populations across much of their historic range. These conservation areas are identified on Figure 17 as other private lands managed for conservation. Habitat conservation on these lands would require the collaboration of ranchers and farmers cooperatively managing working landscapes across property lines. By modifying current range and farmland practices, proactive improvement of habitat for these species could forestall or preclude federal listing of these species in the study area. They could also enhance range conditions for livestock and areas for crop production. Remnant patches of native vegetation within the agricultural matrix are integrated into the plan and, where practical, linked to the network of corridors. Remnants are important refugia for native plants and wildlife in working landscapes.

The Conservation Corridor Alternative would utilize two planning tools--transferable development rights and clustering to conserve riparian corridors and other critical habitats--many of which are amenity properties sought by developers. These incentive-based conservation options are available to developers in Fremont County and detailed in the development code. In this alternative, development rights are transferred from critical habitats to other portions of a landowners' property or to other properties (Figure 17). Residential units configured in thoughtfully designed groups would be clustered on sites distant from critical habitat (Figure 19). Transferring development rights and clustering allows developers to modestly increase housing density while protecting habitat resources. Theoretical locations for clustered residential development near amenity areas are illustrated on the plan. Selection of the best actual locations for residential clusters is beyond the scope of this project.

St. Anthony and Ashton are proposed as targeted growth areas in the Conservation Corridor Alternative; they are comparable to areas of city impact in the Fremont County plan. Concentrating a majority of new residential development in these areas would reduce county/city infrastructure and service costs; conserve wildlife habitat, cropland, and rural character in the hinterland; and could stimulate revitalization of existing commercial areas.

Privately owned irrigated farm and ranch land is the dominant land cover type in the study area; its preservation is given high priority in both the Fremont and Madison county master plans and by TRLT and planning partners. This plan



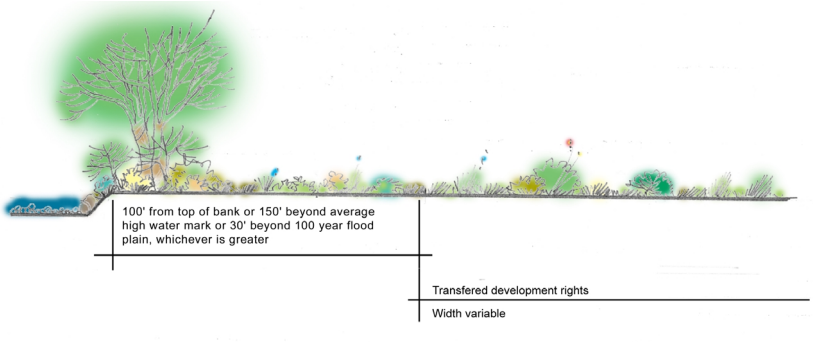


Figure 19 - The plan and section illustrate transfer of development rights from critical riparian habitat to a less sensitive location.

proposed protection of these lands through agricultural trust programs. Crop and range lands are also an important habitat component for many wildlife species. The Conservation Corridor Alternative recommends the implementation of soil management practices for each soil type in the study area as detailed in the NRCS Soils Surveys for Fremont and Madison Counties. Other specific NRCS conservation practices such as living snow fences, contour grass strips, and cross-wind trap strips are also recommended. Selection of the best conservation practices or suite of practices for a farm or ranch must be site-specific and involve the landowners and NRCS personnel.

Implementation of best soil management practices and conservation practices would minimize impact to existing habitats and conserve productive soil, a critical resource for wildlife (see Farm and Ranch Scale Planning Initiatives pp. 41). Conservation-oriented management of prime farmland will have a greater impact on fish and wildlife habitat in the foreseeable future than the management of any other land use in the study area.

The Conservation Corridor Alternative also incorporates introduced corridors, (canals, railroads, highways, county roads, and powerline right-of-ways). Research suggests that in fragmented landscapes, such as the Henry's Fork study area, introduced corridors are important as conduits for wildlife movement, migration and dispersal, and as habitats for many species. Incorporating introduced corridors extends corridor benefits into the farm and ranch matrix.

Corridors, whether natural or introduced, are of greatest value to wildlife if they are populated by structurally diverse communities of native plants, comparable to historic vegetation in watersheds. Unfortunately, as noted in the resource analysis, much of the riparian and floodplain plant community is in decline; many introduced corridors are dominated by exotic vegetation. The Conservation Corridor Alternative recommends general restoration and enhancement of native plant communities within conservation corridor easements designated on the plans. Healthy communities of native plants in introduced corridors will reduce the spread of exotic weed species that are invading the watershed. Specific locations and recommendations for restoration and enhancement will require more detailed studies. Realizing the full habitat and connectivity potential of conservation corridors would require the cooperation of all conservation partners in the watershed, Idaho Department of Transportation, county road departments, utility and irrigation companies, and private land owners.

Craig Johnson

Infrequent flooding reduces plant community diversity.

Step 6 – Evaluate Alternatives

In Step 6, alternative plans are compared to benchmark conditions to evaluate their responsiveness to problems, opportunities, and plan objectives (Table 1).

Alternatives are also compared against each other based on a number of habitat, conservation biology, landscape ecology, and wildlife community criteria. In addition, the evaluation must verify plan compliance with federal, state, and local statutes regulating wildlife or wildlife habitat. Evaluation criteria are typically developed by resource experts on the planning team with general input from all stakeholders.

Graphic Plan Comparisons

Natural Resources Conservation Service (NRCS)

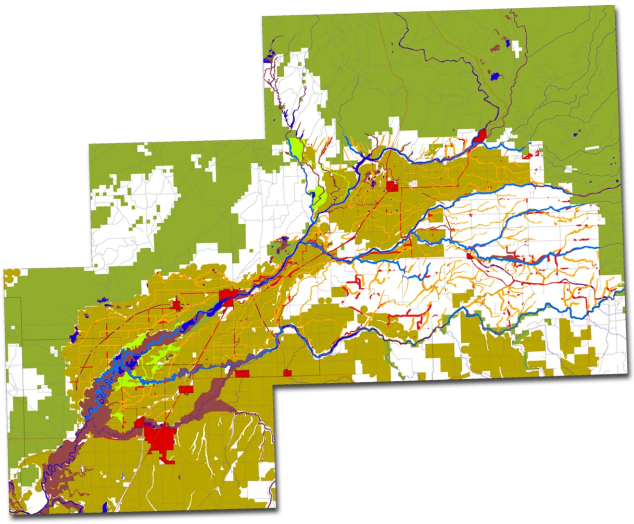


Figure - Existing Conditions.

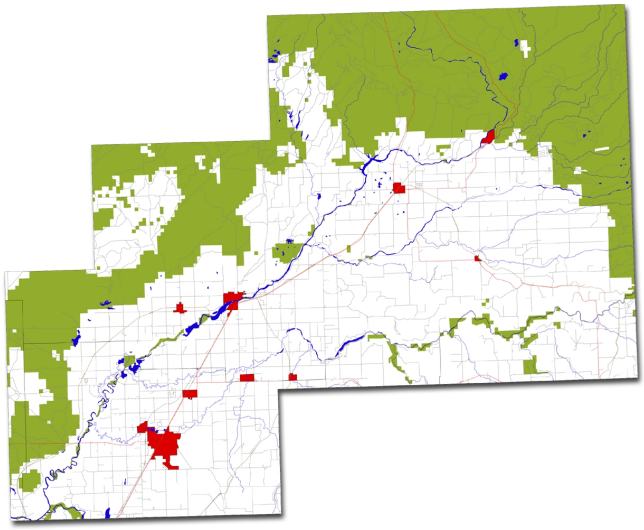


Figure - No Action Alternative.

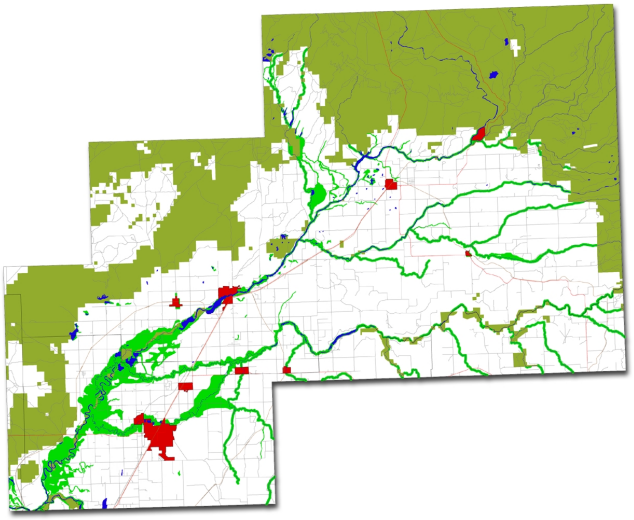


Figure - Buffers Alternative.

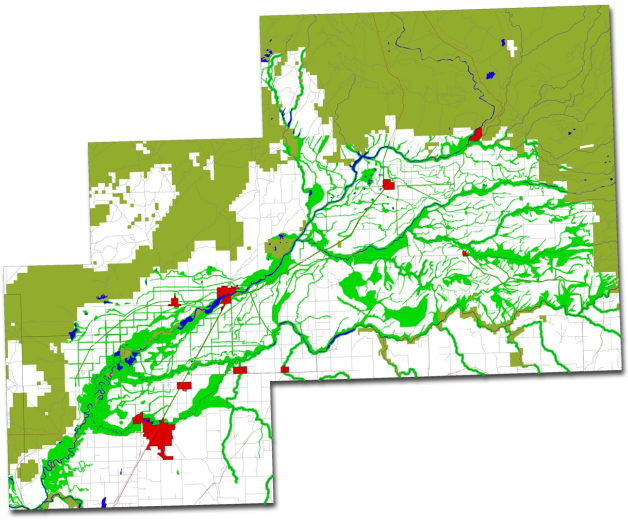


Figure - Conservation Corridors Alternative.

Tabular Comparisons - Lands in Conservation

Existing Conditions	
Total acres in study area	688,230 acres
Major riparian corridors	420 miles
Wetlands	14,860 acres
Lands managed for conservation	242,450 acres

No Action Alternative	
Miles of major riparian corridor protected	200 miles
Acres of wetlands buffered	1,990 acres
Land managed for conservation	242,450 acres
Acres of agricultural trust lands	acreage unknown
Acres of remnants conserved	acreage unknown
Acres of conservation buffers and floodplain easements	8,070 acres
Total acres of lands in conservation	242,450 acres

Buffers Alternative	
Miles of major riparian corridor protected	420 miles
Acres of wetlands buffered	14,770 acres
Land managed for conservation	242,450 acres
Acres of agricultural trust lands	acreage unknown
Acres of remnants conserved	acreage unknown
Acres of conservation buffers and floodplain easements	53,600 acres
Total acres of lands in conservation	296,050 acres

Conservation Corridors Alternative	
Miles of major riparian corridor protected	420 miles
Acres of wetlands buffered	14,870 acres
Land managed for conservation	242,450 acres
Acres of agricultural trust lands	155,900 acres
Acres of remnants conserved	58,900 acres
Acres of conservation corridors, introduced corridors, & floodplain easements	87,500 acres
Acres of other private lands managed for conservation*	131,550 acres
Acres of land for residential clusters	2,200 acres
Total acres of lands in conservation	520,400 acres

*Estimates of voluntary private land owner participation in conservation programs vary from 10% to 40% nationally (Hohnson 1999 unpublished data). Thus the total acreage figure for private lands in conservation would likely be substantially smaller than shown.

Table 1. Estimated comparisons among alternatives of various categories of conservation lands.

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: Henry's Fork Ag Corridor Habitat
PLANNING AREA LOCATION: Lower Henry's Fork Watershed
PLANNING COORDINATOR: Johnson - Toth

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

			* Apply to last 5 categories	
Excellent		Green	Increase	Green
Good		Blue	Remain the same	Yellow
Fair		Yellow	Decrease	Red
Poor		Red	Not Applicable	NA
Not Applicable	NA			

Comments:

Natural Resources Conservation Service - Conservation Corridor

Figure 16 - One of many evaluation worksheets (see Appendix D).

The evaluation worksheet (Figure 16 and Appendix D), taken from Chapter 6 of *The Handbook,* was used to evaluate both large-scale and detailed-scale alternatives in this case study.

The wildlife and habitat-specific problems and project objectives in the Henry's Fork watershed used as criteria in the evaluations are listed below. They have been abstracted from the discussion on pages 8-11.

Problems

- Fragmentation of existing habitat patches and corridors; principal cause, past and present agricultural practices and, more recently, residential development.
- Declining vigor of riparian and wetland plant communities; principal cause, several different land- and water-management practices.

Objectives

- Identify and conserve properties with high ecological values and public benefit.
- Delineate optimum corridor locations and configurations to mitigate the adverse effects of present and potential future fragmentation.
- Illustrate a range of development and conservation scenarios.

The evaluations were completed by the principal investigators and reviewed by biologists and ecologists with NRCS, IDFG, TRLT, HFF, and BYUI.

Lynn Betts NRCS

Figure - Evaluation is an interdisciplinary effort.

Step 7 – Make Decisions

In Step 7, one watershed plan alternative is selected based on the planning group's clear understanding of the impacts of each alternative. In most cases the decision-making responsibility will be shared by all in the planning group. Occasionally that responsibility is assumed by the organization or agency that funded the project. Planning groups are utilizing consensus-based decision making more frequently; participants may not agree on all aspects of the alternative selected but do not disagree enough to warrant opposition to its approval.

In cases where threatened or endangered species are involved, and formal consultations are

Craig Johnson

Getting decision makers on site improves the probability of their support.

required, the US Fish and Wildlife Service will respond to the action agencies' Biological Assessment with their own Biological Opinion. The Biological Opinion will identify "reasonable and prudent" conservation alternatives from which NRCS (or the consulting Federal agency) can select, or serve as the basis for negotiating other alternatives amenable to all parties." When implementation of an alternative would require changes to existing comprehensive plans, zoning ordinances, development codes, or performance standards, public hearings and approval by elected officials are necessary.

Case study plan alternatives were presented to the TRLT and their planning partners for review, critique, and comment. No specific alternative was selected. The case study alternatives were intended to illustrate a range of futures thus demonstrating the habitat planning and conservation value of the methodology and principles detailed in *The Handbook*. The alternatives also have inherent value. They depict plausible future scenarios for the watershed and can inform future resource conservation planning discussions and decisions in the Henry's Fork Agricultural Corridor. The Henry's Fork Watershed Council and other stakeholders in the watershed did use the information and procedures detailed in this case study to explore additional conservation alternatives as the process of watershed scale planning continues to evolve. Ultimately the decision to move forward with wildlife habitat conservation in the watershed rests with county residents as represented by their county commissioners.

Suggestions that would aid decision making in support of a local community developed plan similar to the Conservation Corridor Alternative or other watershed scale conservation plans include:

- Conduct a survey in both counties to determine residents' conservation priorities and to gain support for future action.
- Continue to work with private landowners to develop farm and ranch scale wildlife conservation plans and management strategies.
- Continue to use the Henry's Fork Watershed Council as a forum for the discussion of the multi-faceted aspects of resource conservation, and as a vehicle for communications, networking, and implementation.
- Continue the collaboration between non-profit conservation organizations, government agencies, and landowners in support of habitat and agricultural land conservation.
- Continue to offer workshops that describe to landowners and developers the economic and environmental benefits of various conservation-oriented land conversion options available within existing codes.
- Establish a research information clearinghouse to coordinate research efforts and share data.
- Increase communication and cooperation among stakeholders, and organizations, and planning departments in Fremont and Madison Counties.

Phase 3: Application at the Watershed Scale

Step 8 - Implement Plan
Step 9 - Evaluate Plan

For the case study to comply with NRCS planning protocol, Steps 8 and 9 of Phase 3 in the NRCS Planning Process remain to be completed. No single plan alternative was selected nor was a plan submitted for review by the planning partners, county planning commissioners, general public, or elected officials. Data findings, plan alternatives, and suggestions should become part of the on-going public dialogue that will continue to shape the implementation of habitat conservation in the Henry's Fork Agricultural Corridor. From the perspective of a fish or wildlife species, implementation and evaluation are the most important steps in the process; they cause positive habitat changes in the landscapes in which these species reside. Because of the importance of implementation and evaluation, a brief discussion of each follows.

Step 8 - Implement Plan

Strategies for implementing a watershed scale wildlife conservation plan will depend upon local politics and economics, non-profit conservation organizations involvement in the region, availability of federal and state assistance, local zoning, and the level of volunteerism. In general, watershed plans are implemented one farm, ranch, or community open space at a time. The value of a watershed scale plan is that it offers coherent landscape structure and logical recommendations for integrating conservation plans prepared at the landowner level. There are a variety of options for implementing a watershed scale plan including:

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

In most watersheds, a combination of these strategies is required to complete a project or realize a larger plan. Each of the strategies mentioned above is already being employed in varying degrees in the Henry's Fork watershed. Partnerships between non-profit conservation organizations and state and federal agencies continue to acquire property and easements with significant habitat value. State and federal agencies continue to offer technical assistance and cost-sharing habitat conservation programs to farmers and ranchers including the CRP, WHIP, EQIP, and others. Landowner participation in these programs is increasing, particularly in wildlife habitat conservation, and restoration-related programs. Existing zoning in both Fremont and Madison Counties acknowledges the value of habitat and wildlife in the watershed.

Richard Toth

Figure - A trail within a conservation easement.

Regulations on development on flood plains, and in Fremont County, steep slopes, hazard areas, and critical wildlife habitat afford wildlife and habitat a measure of protection. Less traditional incentive-based aspects of the Fremont County plan have even greater potential to conserve habitat and corridors. Fremont County landowners and potential developers can take advantage of incentive–based permit options such as transferable development rights and residential clustering. These features of the existing development code have the potential of directing development completely away from critical habitats, corridors, and prime farmland.

Conservation volunteerism is high in this watershed, particularly in the St. Anthony area. Local citizens value the Henry's Fork and its diverse amenities. River bank cleanup and trail construction are some of the recent volunteer activities coordinated by the Henry's Fork Foundation. The Henry's Fork Foundation has also been involved in organizing numerous riparian habitat restoration projects.

Although conservation education is not an implementation strategy, over the long term it is often the key to facilitating public support for wise resource management. Informing the general public, the development community, and elected officials about the social, economic, environmental and aesthetic value of fish and wildlife habitat, and connecting corridors is essential. Equally important is understanding the social and economic reality of farming, ranching, and land development in the watershed.

Local citizens hold strong opinions about private property rights. However, they realize that land-use changes like those now occurring in the watershed affect the entire community. The way to a sustainable future will require a balanced approach to achieve implementation, one that acknowledges the rights and responsibilities of landowners and the need to protect public health, safety, and general welfare. Implementation of resource conservation projects continues in the Henry's Fork Watershed; several have been described in this case study. The partnerships, communication network, and commitment are in place to continue evolving a watershed scale plan and implementing projects that contribute toward its realization.

Suggestions that would aid implementation of a plan like the Conservation Alternative include:

- Continue acquisition of property and easements on lands of high habitat value by TRLT and conservation partners.
- Utilize open public forums and community survey questionaires to document public support for openspace and habitat conservation initiatives.
- Adoption of a wildlife habitat overlay zone as recommended in the Buffers Alternative or similar conservation strategy applicable to all new development in corridors along the Henry's Fork and its main tributaries and other critical habitats identified and mapped as a first public policy step toward habitat conservation.
- Encourage landowners and developers to pursue transfer of development rights and clustering options to direct development away from critical habitats.
- Retain low road density and minimize river and creek crossings.
- Continue support of volunteer efforts within the Henry's Fork Corridor.
- Increase landowner participation in NRCS conservation planning and programs.
- Increase conservation outreach and education highlighting the multiple benefits that the Henry's Fork and tributaries provide the community.
- Design and implement a training program for local conservationists in riparian restoration techniques.
- Consider assembling an interdisciplinary team of experts and representatives from the Henry's Fork Watershed Council to research the feasibility of designed flood releases from Ashton Dam during high runoff years. Periodic flooding may be the most cost-effective way of restoring and sustaining the floodplain cottonwood forest below St. Anthony. A conservation or flooding easement for all floodplain property would be a prerequisite to such an investigation.

- Consider tax and building fee based incentive programs to encourage non-amenity oriented residential development within St. Anthony and Ashton, proposed target growth areas.

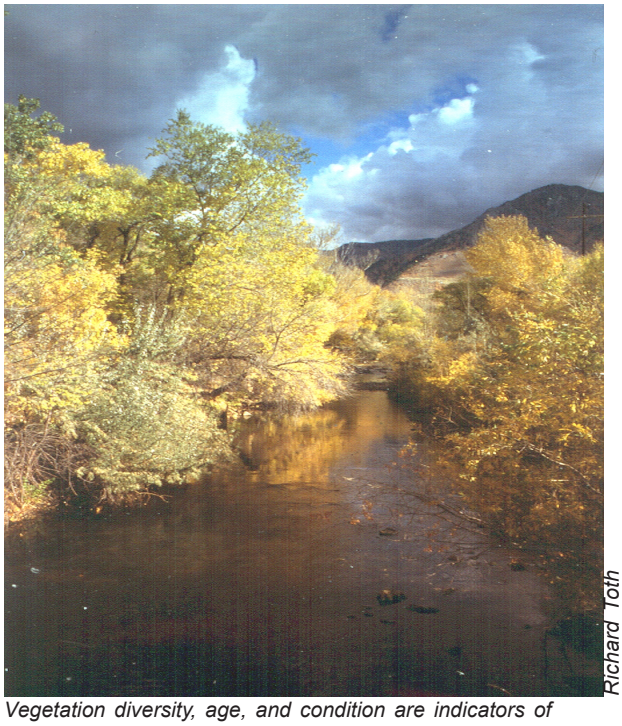
Step 9 - Evaluate Plan

Evaluation of an implemented plan based on plan objectives established in Step 2 is an often-overlooked but necessary component of the watershed planning process. The purpose of the evaluation is to estimate the condition of habitats and changes in wildlife demographics.

A plan evaluation requires baseline data against which past plan performance can be compared. A good GIS database will provide documentation of general patch, corridor, and matrix conditions at the watershed scale. However, collecting more detailed data on the condition of habitat and wildlife populations of specific patches or corridors can be expensive. When possible, use on-going surveys conducted by state and federal agencies. Breeding bird surveys conducted by the USFWS and Christmas bird counts conducted by the Audubon Society and records kept by amateur naturalists can also be valuable sources of information. Although some of the data collected may not reflect specific wildlife responses to the implemented plan, they can illustrate overall trends in population and habitat

Craig Johnson

Water quality and sustained fish populations are useful measures of plan performance.



Richard Toth

Vegetation diversity, age, and condition are indicators of habitat vigor.

conditions in the watershed. Data collected over several years may suggest that the watershed scale plan or smaller conservation plans within it are not functioning as predicted; adaptive management may be necessary.

Within the Henry's Fork study area there is considerable geographic information delineating natural resources and land use patterns. The GIS database compiled by the TRLT and this case study provide good documentation of general resource patterns at the watershed scale. With annual updates of the database, changes in the land-use patterns, ownership, management, and size, location and configuration of habitat patches and corridors can be assessed.

Detailed fish and wildlife habitat and population data within the Henry's Fork watershed are limited. Some data regarding species composition, demographics, diversity, and other indicators of health and vigor are available for threatened and endangered species, some state species of concern, furbearers, and game species. However, only limited information exists for most non-game species and for the condition of

habitats for most species in the corridor. The Henry's Fork Foundation is conducting several fisheries research projects in the middle reaches of the Henry's Fork that will produce useful data. IDFG is undertaking a study of habitats and populations that will greatly enhance the wildlife database in the study area.

Suggestions that would aid plan evaluation and, if necessary, adaptive management (if a plan similar to the Conservation Corridor Alternative were adopted) include:

- Design an evaluation protocol including permanent plots for monitoring changes in habitat conditions (see Appendix B), fish and wildlife populations, and community composition for each of the three river reaches in the study corridor.
- Continue to utilize monitoring data compiled by state and federal agencies.
- Train volunteers, for example, local experts, BYUI biology students, Audubon Society members, FFA, and 4H members to conduct monitoring activities. Interested land owners often make good monitoring volunteers.
- Conduct annual monitoring evaluations and tie data to GIS database.
- Update files annually.
- Share monitoring data with all planning partners, county governments, and the general public.
- Continue to celebrate conservation successes with the public.
- Utilize existing conservation planning partnerships to develop adaptive management strategies as necessary; keep the public informed.

A well-developed evaluation/monitoring plan involves experts and trained volunteers including landowners. Many of those involved will take ownership in the project and become strong conservation advocates.

Craig Johnson

Farm and Ranch Scale

Natural Resources Conservation Service (NRCS)

Chapter 7 in *The Handbook* details habitat planning at the scale of a farm or ranch. This case study focused on watershed scale planning for wildlife habitat conservation. However, as mentioned earlier, it is on the farm and ranch that project plans are implemented and managed as habitat. A brief discussion of some NRCS conservation practices that can be applied at the farm, ranch, and community open-space scale projects in the Henry's Fork study area follows.

Many NRCS conservation practices afford the opportunity to extend the habitat and connectivity benefits of corridors into the agricultural and open-space matrix. These conservation practices are typically located in upland settings, ideally situated to reduce soil erosion and intercept pollutants before they reach natural corridors, wetlands, or streams. Conservation practices can be grouped into either grass/forb or woody species-dominated structure. When installed, these practices are lineal in nature and function as introduced corridors in the landscape as illustrated below.

Introduced Grass/Forb Corridors
- Field borders (1)
- Field buffers
- Filter strip
- Conservation cover pasture/hayland planting
- Grassed terraces (4)
- Vegetated ditches/canals
- Grassed waterways (5)
- Grass/legume rotation

Introduced Woody Corridors
- Riparian forest buffer (3)
- Hedgerows
- Windbreaks (2)
- Shelterbelts
- Tree and shrub planting

Technical advice and funding is available to farmers, ranchers, and communities who choose to participate in developing a conservation plan for their property. Often these plans include introduced corridors. Typically, farmers and ranchers, in cooperation with NRCS personnel, select and install conservation practices that reduce soil erosion and improve water quality. Introduced corridors generally constitute a small portion of the total acreage in agricultural regions; however, if properly located and designed, their value to wildlife far exceeds that of adjacent cropland. A detailed discussion of how to increase the habitat value of conservation corridors can be found in *The Handbook*.

The habitat benefits of introduced corridors are expanded significantly when they are connected to natural patches and corridors managed for wildlife conservation. Increased use of conservation practices in the Henry's Fork Agricultural Corridor would conserve soil and water resources and enhance wildlife habitat in the watershed. Many of these practices were used in the previously described Conservation Corridors Alternative. NRCS personnel in Fremont and Madison Counties are actively involved in resource conservation in the watershed and welcome the opportunity to share their technical expertise. Examples are illustrated below.

NRCS, Gary Bentrup, Craig Johnson