

SOUTHWEST UTAH REGIONAL WILDFIRE PROTECTION PLAN



Prepared by the
Five County Association of Governments
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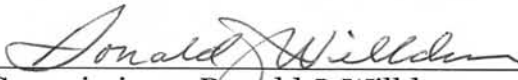
In cooperation with the
Color Country Interagency Fire Center
1748 West Kitty Hawk Dr.
Cedar City, UT 84720




Adopted October 2007

Plan Adoption

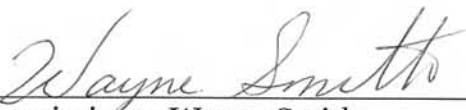
We, the undersigned, do hereby acknowledge and affirm that this Southwest Utah Regional Wildfire Protection Plan was adopted by the Five County Association of Governments Natural Resources Committee on this the 26th day of October, 2007.



Commissioner Donald J. Willden
Chair, Beaver County Commission




Commissioner Maloy Dodds
Chair, Garfield County Commission



Commissioner Wayne Smith
Chair, Iron County Commission



Commissioner Mark Habbeshaw
Chair, Kane County Commission



Commissioner James J. Eardley
Chair, Washington County Commission



Ron Wilson
Area Manager, Utah Division of Forestry, Fire & State Lands

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Executive Summary

Wildland fires are a natural part of the ecosystems of Southwest Utah and over the years have shaped the forests and rangelands. However, the forests and rangelands in Southwest Utah have been significantly altered, especially in the last 50 years or so, resulting in increased forest fuels and more closed forests that tend to burn more intensely than in the past. In addition, population growth has led to residential development occurring close to the forests and rangelands in what is called a wildland-urban interface area or "WUI".



Recent wildland-urban interface fire near the town of New Harmony in northern Washington County. Photo source: Utah Division of Forestry, Fire and State Lands.

To address these issues, a multi jurisdictional group of agencies, organizations, and individuals have collaborated to develop the Southwest Utah Regional Wildfire Protection Plan, hereinafter referred to as "SURWPP".

The purpose of the SURWPP is to be a tool in the effort to protect human life and reduce property loss due to catastrophic wildland fires in the communities and surrounding areas located in the southwest Utah counties of Beaver, Garfield, Iron, Kane, and Washington.

This plan has been created in recognition of firefighter safety and the existing potential for personal harm and property damage to residents living in the WUI areas of Southwest Utah. Although reducing the threat of wildland fires is the primary motivation behind this plan, managing the forests and rangelands for hazardous fuel reduction and fire resilience is a part of the larger picture.

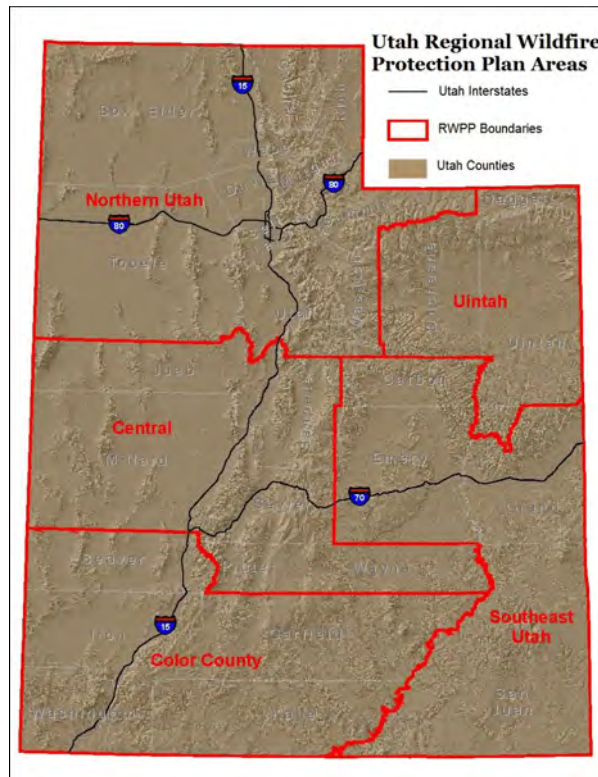
Residents and visitors alike want healthy, fire resilient forests that provide habitat for wildlife, recreational opportunities, and scenic beauty. As communities grow and as new communities are developed, urban areas encroach upon wildland ecosystems to create a situation where flammable wildland fuels are in close proximity to houses and community structures. This problem creates conflicts between a community and its wildland surroundings.

This planning process represents a portion of the long term investment that local, state and federal agencies are making to help protect natural resources, critical infrastructure,

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Illustration showing the state of Utah with the general area of southwest Utah highlighted.



Map of Utah illustrating the five geographical areas of the state where regional wildfire protection plans have been prepared.

community facilities, businesses and residential structures, and most importantly the lives of firefighters and the public.

This plan epitomizes a long-term commitment based on cooperation and communication between the state of Utah Division of Forestry, Fire and State Lands, federal agencies, local governments, and the interested public.

The SURWPP begins with an overview that includes the forests and associated lands at risk. This also includes the people, the Community Assistance Program, and the principles advocated in this plan. Each county in

Southwest Utah is analyzed, together with current fuel hazard reduction efforts.

The serious problem of invasive cheatgrass is discussed in detail in a report by Scott Tobler which is presented in its entirety in Appendix C.

The planning process includes convening of the decision makers, development of a "core" team of professionals, establishment of regional base maps, with comprehensive community risk assessments that include communities at risk, and local firefighting capabilities. The Plan concludes with an action plan and assessment strategies.

The most recent authority for community fire planning comes under the Healthy Forests Restoration Act of 2003 (HFRA). Title III of HFRA provides guidance for developing Community Wildfire Protection Plans (CWPP's). This project is developing a regionally-based plan we are calling a regional wildfire protection plan, or RWPP.

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Utah regions with a RWPP in place may receive significant benefits in the future should funding be appropriated through HFRA for fuels reduction and fire prevention. HFRA provides clear guidance for what should be developed in a Wildfire Protection Plan. The SURWPP is designed to address the CWPP requirements, along with guidelines and requirements in the FEMA Disaster Mitigation Act of 2000, the National Fire Plan, and other state and federal programs.

The SURWPP identifies and prioritizes issues related to wildfire prevention and fuel mitigation in the Wildland-Urban Interface areas of southwestern Utah on a large scale. The intent of this plan is to capture landscape level information. This plan is not intended to interfere with or take the place of state of Utah Community Fire Plan's process and results.

The SURWPP will result in defensible space reduction planning at a landscaping level. In addition to providing oversight and guidance in planning objectives, the heart of this plan is a collaborative effort to promote the interest, education, and long-term involvement within the residents of Southwest Utah in realizing the danger of wildfire and identifying strategies that will reduce the risk around their homes and in their communities.

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1.1 OVERVIEW OF REGIONAL AND COMMUNITY WILDFIRE PROTECTION PLANS

Wildland fires are a natural part of the ecosystems of Southwest Utah and over the years have shaped the forests and rangelands. However, the forests and rangelands in Southwest Utah have been significantly altered, especially in the last 50 years or so, resulting in increased fuels and fires that tend to burn more intensely than in the past. In addition, population growth has led to residential development occurring close to the forests and rangelands, in what is called the Wildland-Urban Interface or “WUI”.

To address these issues, a multi jurisdictional group of agencies, organizations, and individuals have collaborated to develop the Southwest Utah Regional Wildfire Protection Plan, hereinafter also referred to as “SURWPP”.

The purpose of the SURWPP is to be a tool in the effort to protect human life and reduce property loss due to catastrophic wildland fires in the communities and surrounding areas located in the Southwest Utah counties of Beaver, Garfield, Iron, Kane, and Washington.

This plan has been created in recognition of firefighter safety and the existing potential for personal harm and property damage to residents living in the WUI areas of Southwest Utah. Although reducing the threat of wildland fires is the primary motivation behind this plan, managing the forests and rangelands for hazardous fuel reduction and fire resilience is a part of the larger picture.

Residents and visitors alike want healthy, fire resilient forests that provide habitat for wildlife, recreational opportunities, and scenic beauty. As communities grow and as new communities are developed, urban areas encroach upon wildland ecosystems to create a situation where flammable wildland fuels are in close proximity to houses and community structures. This problem creates conflicts between a community and its wildland surroundings.

This planning process represents a portion of the long term investments that local, state and federal agencies are making to help protect natural resources, critical infrastructure, community facilities, businesses and residential structures, and most importantly the lives of firefighters and the public. This plan epitomizes a long-term commitment based on cooperation and communication between the State of Utah Forestry, Fire and State Lands, federal agencies, local governments, and the interested public. The SURWPP begins with an overview that includes the forests and associated lands at risk. This also includes the people, the Community Assistance Program, and the principles advocated in this plan. Each county in Southwest Utah is analyzed, together with current fuel hazard reduction efforts.

The planning process includes convening of the decision makers, development of a “core” team of professionals, establishment of regional base maps, with comprehensive community

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risk assessments that include communities at risk, and local firefighting capabilities. The Plan concludes with an action plan and assessment strategies.



The most recent authority for community fire planning comes under the Healthy Forests Restoration Act of 2003 (HFRA). Title III of HFRA provides guidance for developing Community Wildfire Protection Plans (CWPPs). This project developed a regionally-based plan we have called a Regional Wildfire Protection Plan, or RWPP.

Utah regions with an RWPP in place may receive significant benefits in the future should funding be appropriated through HFRA for fuels reduction and fire prevention. HFRA provides clear guidance for what should be developed in a Wildfire Protection Plan. The Southwest Utah RWPP is designed to address the CWPP requirements, along with guidelines and requirements in the FEMA Disaster Mitigation Act of 2000, the National Fire Plan, and other state and federal programs.

This Regional Wildfire Protection Plan for Southwest Utah identifies and prioritizes issues related to wildfire prevention and fuel mitigation in the Wildland-Urban Interface areas on a large scale. The intent of this plan is to capture landscape level information. This plan is not intended to interfere with or take the place of state of Utah “Community Fire Plan” process and results. The Southwest Utah Regional Wildfire Protection Plan will result in defensible space reduction planning at a landscaping level. In addition to providing oversight and guidance in planning objectives, the heart of this plan is a collaborative effort to promote the interest, education, and long-term involvement within the residents of Southwest Utah in realizing the danger of wildfire and identifying strategies that will reduce the risk around their homes and in their communities.

The Southwest Utah Regional Wildfire Protection Plan (SURWPP) is one of five regional plans covering each of the wildfire planning and protection regions of Utah. The goal of each RWPP is to assist the region and its counties, communities, and government agencies in reducing the risk of catastrophic wildfires within that region.

Wildland fires in Southwestern Utah are well documented; yet in the past there has been limited awareness about the investment required to maintain sufficient fire protection.

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However, the scale of the community protection task is enormous. In short, many communities in Southwestern Utah are surrounded by massive amounts of accumulated fuel which must be removed or modified. Over the past decades, and updated by current Community Fire Risk Assessments, it has become clear that the possibility of a major disaster, in the form of uncontrollable wildfires has grown enormously. There is no other time in the area's recorded history with such a high potential for disaster.

1.2 OVERVIEW OF FEDERAL PROGRAMS FOR WILDFIRE MITIGATION

Summary of the National Fire Plan, the Healthy Forest Restoration Act of 2003, and FEMA Disaster Mitigation Act of 2000

The National Fire Plan of 2000 (NFP) was initiated by the Secretaries of the United States Department of the Interior (USDI) and the United States Department of Agriculture (USDA) to address the needs of firefighters, private land and home owners, and governmental land management agencies. The National Fire Plan (NFP) is not an actual document, but a nationally coordinated effort to protect communities and natural resources from the harmful effects of increasing wildland fire occurrences and severity in the United States. Acting as an umbrella the NFP established the purpose and goals, which are articulated and carried forward through the 10 Year Comprehensive Strategy (USDA 2001), the Cohesive Strategy for Protecting People and Sustaining Natural Resources (USDA 2001), and other supporting documents. The four primary goals of the National Fire Plan are:

1. Improve fire prevention and suppression.
2. Reduce hazardous fuels.
3. Restore fire adapted ecosystems.
4. Promote community assistance.

To provide a more detailed framework for accomplishing the goals of the National Fire Plan the 10-year Comprehensive Strategy was prepared in 2001 by the USDI, USDA, and the Western Governors Association. This strategy emphasizes a collaborative community-based approach to address wildland fire issues and identifies guiding principles and management actions for agencies to follow in implementing the National Fire Plan. The five guiding principles of the Comprehensive Strategy include:

1. Public and firefighter safety is the first priority in all fire management operations.
2. Prioritize hazardous fuels reduction where the negative impacts of wildland fire are the greatest.
3. Prevent invasive species and restore watershed function and biological communities through short-term stabilization and long-term rehabilitation.

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4. Restore healthy, diverse, and resilient ecological systems to minimize uncharacteristically severe fires on a priority watershed basis through long-term restoration.
5. Promote better fire prevention planning and action in local communities through technical assistance and cost sharing incentives.

As part of the NFP, the Cohesive Strategy for Protecting People and Sustaining Natural Resources was prepared in 2000 by the USDA. It projects the quantity and rate of fuel reduction treatments required on a landscape scale to restore fire adapted ecosystems and protect communities from increasing wildland fire. Under current conditions the Cohesive Strategy estimates fuel reduction treatments needed to increase five-fold in order to achieve the goals. It also concludes that treatments are needed both within and outside the Wildland-Urban Interface (WUI) areas.

The NFP, HFRA, and National Environmental Policy Act (NEPA) and FEMA's Pre-Disaster Mitigation Act of 2000, provided landmark legislation, guidance, and statutory incentives to several agencies, including the U.S. Forest Service (USFS,) the Bureau of Land Management (BLM,) and the Utah Division of Natural Resources through the Division of Forestry, Fire and State Lands. These agencies have joined together to confront the urgency of an unprecedented wildfire threat.

In December of 2003, President George W. Bush signed into law the HFRA of 2003. This legislation encouraged ground floor public participation during the development and assessment process and in working with state, federal and local leaders to decrease hazardous fuels and maintain environmental principles. The Healthy Forests Initiative gives guidance for the nation's forests and rangelands through the use of scientific principles to reduce the risk of catastrophic wildfires in or near communities, to help save the lives of residents and firefighting personnel, and to protect wildlife and nature's endangered species.

The purpose of the HFRA is to:

- Development of high priority forest health projects through public participation.
- Diminish complicated and involved environmental investigation procedures thus allowing federal land agencies to vigorously administer the land under their stewardship by using the best scientific techniques.
- Plan for and provide a more adequate appeal procedure by encouraging initial public participation near the beginning of the project planning process.
- Issue comprehensible directions for court conflicts aimed against forest health projects.

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The HFRA builds on existing efforts to restore healthy forest conditions near communities and essential community infrastructure by authorizing expedited environmental assessment, administrative appeals, and legal review for hazardous fuels projects on federal land. The act emphasizes the need for federal and state agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and it places priority on treatment areas identified by communities in their Community Fire Plans.

The HFRA has received strong support throughout the Five County area of Southwest Utah, at a local level, as well as from the State of Utah Forestry, Fires and State Lands; the Color Country Fuels Committee; the U.S. Forest Service and the National Parks Service; and other federal and state agencies.

The HFRA provides communities with a tremendous opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands and how additional federal funds may be distributed for projects under the Community Assistance Program for projects on non federal lands. A Community Fire Plan (CFP) is the most effective way to take advantage of this opportunity.

HFRA is also supported by the Southwest Utah Support Area (SUSA) representing the Bureau of Land Management. SUSA's purpose is to establish firefighter and public safety as their priority in all fire management activities, along with a collaborative effort to reduce wildfire risk to communities SUSA is a long-term commitment based on cooperation and communication among federal agencies and state agencies, local governments, Native American tribes, and interested private citizens. Included in the SUSA is a Fire Management Plan (FMP). Additional information on the Fire Management Plan is available through <http://fpa.nifc.gov>

This Fire Management Plan encompasses 5,141,154 million acres of Bureau of Land Management administered lands within the SUSA. Because the boundaries of the SUSA include federal, state, and private lands, an effective fire management program requires close coordination among local and regional jurisdictions. Information available in the FMA will help to refine and strengthen the ongoing fire management coordination efforts of the BLM, Arizona Strip Field Office, the United States Forest Service (USFS), Bureau of Indian Affairs (BIA), National Park Service, (NPS), and Utah Division of Forestry, Fire and State Lands.

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1.3 RWPP PLANNING PROCESS

A variety of agreements are currently utilized to coordinate the fire management program of the SUSA with the Dixie National Forest (DNF), Utah Division of Forestry, Fire and State Lands, National Park Service and the Bureau of Indian Affairs. The agencies jointly conduct mutual interest projects, within their authority, to maintain and improve fire management capabilities. The agencies and local governments are collaborating with the Five County Association of Governments to initiate this SURWPP. These efforts are part of the community assistance/protections planning efforts developed through public meetings within the region's Wildland-Urban Interface (WUI). Future projects may involve such activities as prescribed by fire/fuels management personnel, a detailed pre-suppression plan, preparedness preparations, rehabilitation of chemically and mechanically removed fuel areas, prevention and education to communities involved, and public affairs news releases.

Discussions prior to and during the development of the regional Fuel Management Plan (FMP) included federal, state, county, public, and tribal groups within the Southern Utah Support Areas (SUSA) which resulted in a coordinated FMP. At the federal level, the BLM conducted briefings and coordinated with the U.S. Forest Service and the USFWS. Information sharing among all the interested parties was of high importance to the SUSA, and has been a top priority since the preliminary and developmental stages of the Fire Management Plans of 2001 and 2003.

Several laws and Executive Orders exist to ensure that the BLM consults with federally recognized Native American tribes when planning a project or activity. The Southern Utah Support Areas invited the Paiute tribal staff to participate in the development of the Southern Utah Support Areas Fire Management Plan. The SUSA will continue to meet the federal trust guidelines. Government-to-government consultation with the BIA will be initiated through the Southern Utah Support Area early in any project planning process. Local sovereign Native American tribal governments and other interested groups will also continue to be informed and consulted as the information and strategies in the Fire Management Plan are updated.

The Federal Emergency Management Agency (FEMA) requirements under Title 44 CFR Part 201 of the Disaster Mitigation Act of 2000 have been adopted by the State of Utah and each of the five southwestern counties. This legislation specifies criteria for state and local hazard mitigation planning which require local and Native American tribal governments applying for Pre-Disaster Mitigation (PDM) funds to have an approved local mitigation plan. These may include county-wide or multi-jurisdictional plans as long as all jurisdictions adopt the plan. Eligible activities for funding include management costs, information dissemination, planning and technical assistance, and mitigation projects.

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A public informational meeting was held on July 7, 2004, in Cedar City, Utah to discuss the FMP and the planning process. Public comments were also solicited. The meeting helped provide the groundwork that resulted in developing the processes through which this plan was formulated.

To provide communities with guidance in developing a wildfire protection plan, the Society of American Foresters, along with the National Association of Counties, National Association of State Foresters, Western Governors' Association, and the Communities Committee developed a “how to” handbook entitled "*Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities*". That handbook outlined eight steps, shown in Table 1.1, for developing a CWPP, and provided guidance in preparing this Southwest Utah RWPP.

Table 1.1 - Eight Steps for Developing a CWPP

- Step One:** Convene Decision-makers. Form a core team composed of representatives from the appropriate local governments, local fire authorities, and state agencies responsible for forest, fire, and hazard management.
- Step Two:** Involve Federal Agencies. Identify and engage local representatives of the USFS and BLM. Contact and involve other federal land management agencies as appropriate.
- Step Three:** Engage Interested Parties. Contact a broad range of interested organizations and stakeholders and encourage their active public involvement in plan development.
- Step Four:** Establish a Community Base Map. Work with decision-makers and stakeholders on a baseline map of the region that depicts the communities' WUIs, other inhabited areas at risk, forested areas that contain critical human infrastructure, and forested areas at risk of large-scale fire disturbance.
- Step Five:** Develop a Community Risk Assessment. Work with partners to develop a community risk assessment that considers fuel hazards; risk of wildfire occurrence; homes, businesses, and essential infrastructure at risk; other community values at risk (CVARs); and local preparedness capability. Rate the level of risk for each factor and incorporate into the base map as appropriate.
- Step Six:** Establish Community Priorities and Recommendations. Use the base map and risk assessment to identify local priorities for fuels treatments, opportunities to reduce structural ignitability, and other issues of interest. Clearly indicate whether priority projects are directly related to 1) protection of communities and essential infrastructure or 2) reduction of wildfire risks to other CVARs.
- Step Seven:** Develop an Action Plan and Assessment Strategy. Develop a detailed implementation strategy to accompany the CWPP, as well as a monitoring plan that will ensure its long-term success.
- Step Eight:** Finalize CWPP. Finalize the CWPP and communicate the results to regional and community leaders, decision-makers, and key partners.

Source: Society of American Foresters, 2004

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The Five County Association of Governments was contracted to help facilitate stakeholder and Core Team meetings, undertake a risk assessment, facilitate public meetings and compile public comments, and write the plan document.

Step One – Involved Local, State, and Federal Agencies

Stakeholders Advisory Committee

The initial step in developing this regional wildfire protection plan was the formation of an operating group with representation from local government, local fire authorities, federal land management agencies, and the state agency (Forestry, Fire and State Lands) responsible for wildland management. Together, these entities form the core decision-making team that is responsible for the development of this RWPP. The Stakeholder Advisory Committee must mutually agree on the plan's final contents. The stakeholders for this planning process are listed in Table 1.2.

Billie Dalton	Beaver County Commission
Sheriff Mark Gower	Iron County Sheriffs Office
Al Cooper	Community Support Officer, Utah Dept. of Emergency Services, Division of Homeland Security
Richard Holland	Fire Chief, New Harmony Fire Protection District
Mayor Bruce Harris	Glendale Town
Jim Hubble	President, Rainbow Meadows Water Users Assoc.
Jeff Hunt	Fire Chief, Enterprise City
Ken Johnson	Fire Chief, Cedar Mountain Fire Protection District
Ken Olson	Beaver City
Commissioner Clare Ramsey	Garfield County Commission
John Schmidt	Utah Forestry, Fire & State Lands
Brandon Smith	Fire Chief, Panguitch Lake Fire Protection District
Commissioner Wayne Smith	Iron County Commission
Anne Stanworth	Bureau of Land Management, Cedar City Office
Vicki Tyler	Coordinator, Color Country RC&D Council
Les Whitney	Chair, Beaver County LEPC

Core Team

Members of the Core Team share perspectives, priorities, and other information relevant to the planning process. Because of their on-the-ground experience, mapping capabilities, and knowledge of natural resource planning, these local land management professionals

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are key partners. In some landscapes, they are largely responsible for implementing the priorities established in this RWPP. The Core Team members are listed in Table 1.3.

Susan Bailey	State of Utah Forestry, Fire & State Lands
Paul Briggs	Bureau of Land Management
Walter Burdick	F.M.O., Bureau of Land Management
Bruce Fields	F.M.O., U.S. Park Service, Bryce Canyon National Park
Al Cooper	Community Support Officer, Utah Dept. of Emergency Services, Division of Homeland Security
Joseph Fluder	SWCA Environmental Consultants
Kevin Greenhalgh	U.S.F.S. Dixie National Forest
George Humphries	Beaver County Fire Warden
JoAnn Larsen	U.S.F.S. Fuels Planner
Earl Lavanger	Kane County Fire Warden
Susan Marzec	Bureau of Land Management
Mike Melton	F.M.O., State of Utah Forestry, Fires and State Lands
Vacant	F.M.O., U.S. Park Service, Zion National Park
Ryan Riddle	Iron County Fire Warden
John Schmidt	State of Utah Forestry, Fire & State Lands
Vacant	Washington County Fire Warden
Josh Soper	Garfield County Fire Warden
Jeramie Ybright	F.M.O., Southern Paiute Agency
Vicki Tyler	Coordinator, Color Country RC&D Council

Step Three – Engaged Interested Parties

Step Three involved encouraging local participation from interested organizations and stakeholders throughout the planning process. As early as possible, Core Team members contacted and sought active involvement from key stakeholders and constituencies such as:

- Existing collaborative forest management groups
- City/County Council/Commission members
- Resource Advisory Committees
- Local and /or state emergency management agencies
- Watershed councils

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Step Four – Developed GIS Maps

Using GIS technology and available data, as well as local expertise from the Core Team, a base map for each county was developed. A general ownership map for the region is presented as Map 1.2. A more detailed ownership map for each county is presented in Appendix A. The following were key outcomes of the digital mapping:

- Identified critical infrastructure at risk, i.e., major power lines, etc.
- Identified areas of extreme, high, medium or low wildfire risk by county.
- Identified, quantified and estimated values of residential structures when they were within a WUI area.

Step Five – Developed a Risk Assessment

- In an interagency effort, assembled a risk assessment that considered fuel hazards, risk of wildfire occurrences.
- Identified community values at risk.
- Identified local preparedness capability.
- Incorporated the risk levels into the maps where appropriate.

The risk assessment includes:

- **Fuel Hazards:** To the extent possible at a landscape scale, the Plan evaluated the vegetative fuels on federal and non federal land within or near CARs and the WUI areas. The Plan identified general areas where the condition of vegetative fuels is such that, if ignited, would pose a significant threat to the community or essential community infrastructure. State and federal resource planning documents were used as a valuable source of information on local forest and public land conditions.
- **Risk of Wildfire Occurrence:** Using historical data and local knowledge, the Plan identified common causes and relative frequency of wildfires in the regional area.
- **Residential Units and Essential Infrastructure at Risk:** The Plan categorizes all identified WUI's using risk rating of extreme, high, medium, or low on the base map. The plan does not segregate the residential structures into separate tables for low, medium, high or extreme risk. The plan does, however, quantify the acreages and percentage of each WUI that is in each level of risk.
- **Local Preparedness and Firefighting Capability:** The Plan contains information on local/county/regional structural fire and wildfire fighting capabilities and preparedness information. These are presented in Appendix B.

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Step Six – Established Focus Areas and Recommendations

The regional assessment and the base maps were developed through participation of the Core Team and local public participation. A key objective of these discussions was the development of focus areas for fuel treatment projects on federal and non federal lands in the WUI, along with recommendations for potential treatment methods for those areas.

Recommended priorities of the SURWPP:

- Improve wildland fire prevention and suppression safety
- Reduce hazardous fuels
- Improve restoration of fire dependent ecosystems
- Provide community assistance

Step Seven – Developed an Action/Strategic Plan

- Prioritized the values to be protected, and develop strategies to accomplish desired outcomes.
- Identified responsible parties and timetables to accomplish general goals.

Step Eight – Finalized the RWPP

The final steps in completing the Regional Plan will be to present the Plan to the Stakeholders Committee for concurrence. The Plan was presented to the Steering Committee of the Five County Association of Governments, the Natural Resources Committee and finally to each of the five County Commissions in southwest Utah for adoption and signature.

The serious problem of invasive cheatgrass is discussed in detail in a report by Scott Tobler which is presented in its entirety in Appendix C.

1.4 PROJECT BOUNDARY

Originally the State of Utah and the BLM planned on organizing the RWPP by Interagency Fire Center coverage area. To better address county or community funding requests, the Core Teams for each of the five regions were aligned by county boundaries. Thus, the Southwest Utah region encompasses the counties of Beaver, Garfield, Iron, Kane, and Washington. Also, contained within the boundaries of the southwest district are lands belonging to several recognized Bands of Paiute Indian Tribe of Utah.

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Map 1.1 illustrates the five county area of Utah comprising the area covered by this Southwest Utah Regional Wildfire Protection Plan that also identifies the County Seat of each County. Map 1.2 illustrates five county area of Utah and identifies the land ownership in the area covered by this plan.

1.5 PUBLIC INVOLVEMENT

A county commission meeting in each of the five counties was attended by staff of the Five County Association of Governments. The presentation made by staff was designed to educate the public about the goals of the plan and to solicit input from community leaders and the general public regarding wildfire issues and concerns. These commission meetings were conducted in the county seats of each of the counties covered by the RWPP.

The SURWPP project was introduced to the elected officials and the public during county commission meetings held during August and September of 2006 in each of the five counties. The following were the specific dates of those meetings:

- August 15, 2006 - Washington County Commission meeting
- August 28, 2006 - Garfield County Commission meeting; Kane County Commission meeting
- September 5, 2006 - Beaver County Commission meeting
- September 11, 2006 - Iron County Commission meeting

Throughout the process of developing this plan, the Core Team was involved. Numerous meetings were held, mostly at the Color Country Interagency Fire Center in Cedar City.

A public draft was presented by the staff of the Five County Association of Governments in June 2007 at “Open House” presentations advertised locally in each of the five counties of southwestern Utah. These were held in the following locations:

- June 11, 2007 in Beaver City
- June 13, 2007 in Kanab City
- June 15, 2007 in Cedar City
- June 19, 2007 in St. George City
- June 28, 2007 at Ruby’s Inn in Garfield County

The draft was also available online at www.fcaog.state.ut.us/wildfire.html. In addition to the open houses, the plan was presented to the Local Emergency Planning Committees

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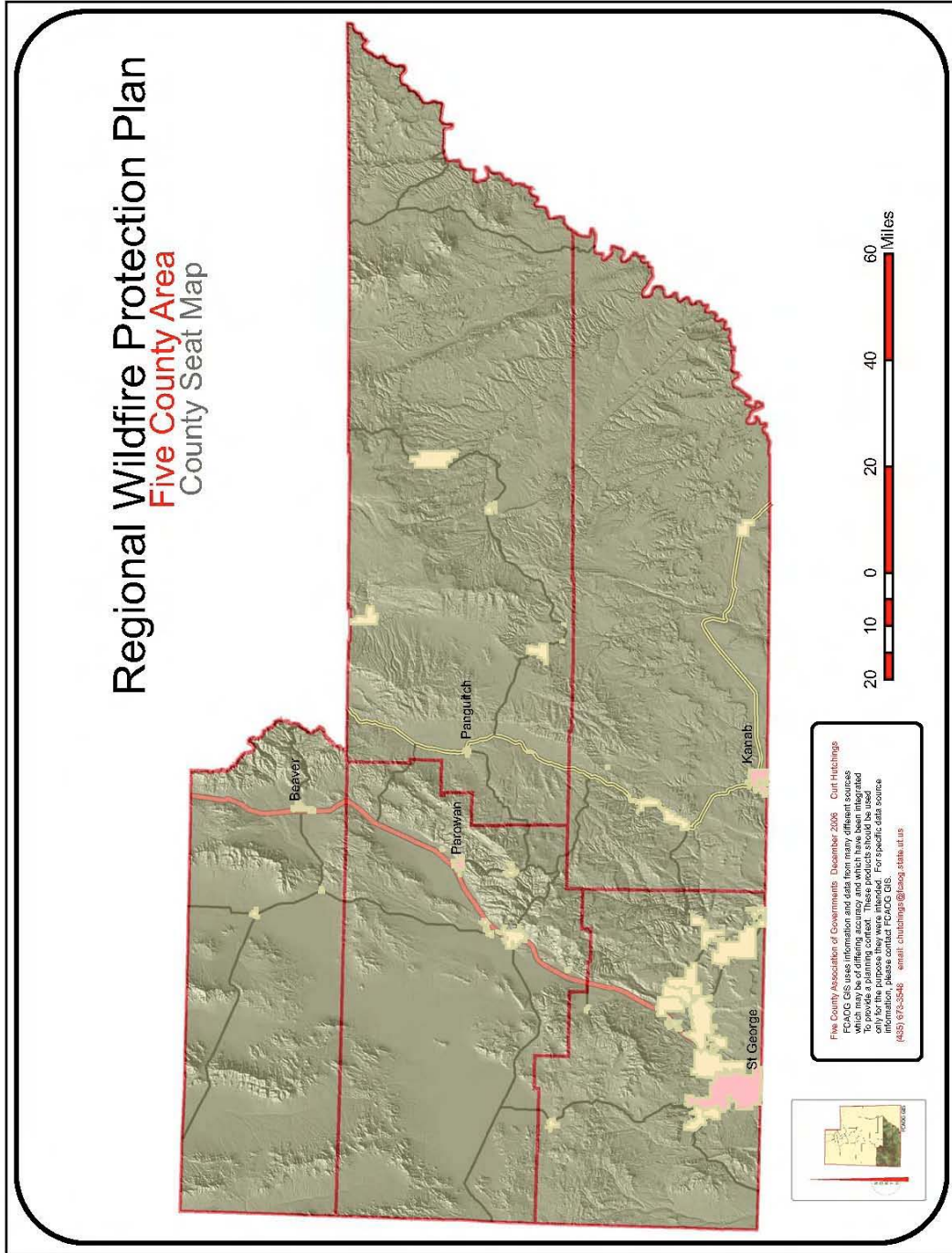
(LEPC) in each of the five counties. The meetings of the LEPCs coincided with the dates of the advertised open house meetings.

Comments were solicited from attendees at the open house presentations as well as at the LEPC meetings. The aforementioned web site also solicited comments and provided an e-mail address as well as alternatives to provide comments. Copies of comments received are provided in Appendix E.

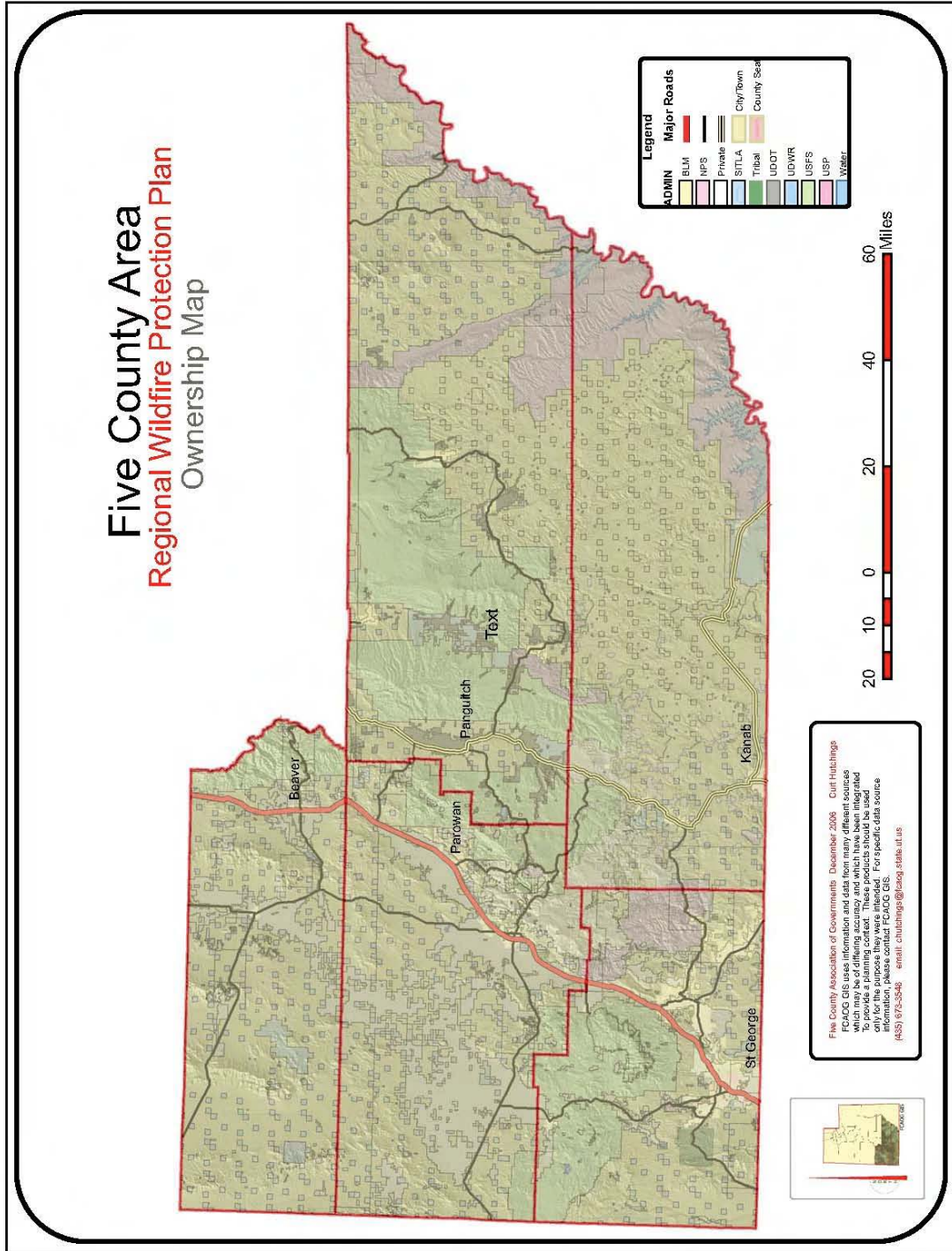
1.6 DEFINITION OF WILDLAND-URBAN INTERFACE (WUI) IN THE PLANNING REGION

Wildland fires pose a threat to residents, homes, infrastructure and firefighters when they occur near to and spread into the WUI, which is commonly defined as the geographic area where residential development intermixes with wildland or vegetative fire. Federal legislation, such as the National Fire Plan and the Healthy Forest Restoration Act, place a priority on defining risk in the WUI area. Under the HFRA, at least 50% of all funds appropriated for projects must be used within a defined WUI.

Map 1.1 County Seat Map



Map 1.2 - Regional Ownership Map



Chapter 1. Introduction

The Southwest Utah Regional Wildfire Protection Plan Core Team held several meetings and agreed upon a description of the Wildland Urban Interface (WUI) in southwestern Utah for the purposes of this document.

All categories of WUI zones are based upon location of Communities At Risk (CARs) and boundaries of "Level 12 Watersheds". The description of the watersheds used for this Plan (e.g. 12-digit HUC watershed) is based on the Hydrologic Unit Code (HUC) system, which is a standard watershed map system used by state and federal agencies. Watersheds in each mapping level are progressively subdivided into smaller watershed mapping levels, and with each subdivision, two digits are added to maintain a unique identifier code for each watershed. The 5th level (10-digit HUC) and 6th level (12-digit HUC) of watershed mapping are most relevant to individual National Forests. This Plan uses the 12-digit HUC. If a CARs community is located on the edge of a watershed, a 1.5 mile radius from the community was extended beyond the watershed boundary.

There are three categories (types) of WUI, the Interface, Intermix and Occluded. The risk assessment of specific Community at Risks (CARs) describes the category (Class) found at each CAR.

Category 1 – Interface

Structures directly abut wildland fuels. There is a clear line of demarcation between residential, business, and public structures & wildland fuels. Wildland fuels do not generally continue into the developed area. The development density for an interface community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department with the responsibility to protect the structure from both an interior fire and an advancing wildland fire.

Category II – Intermix

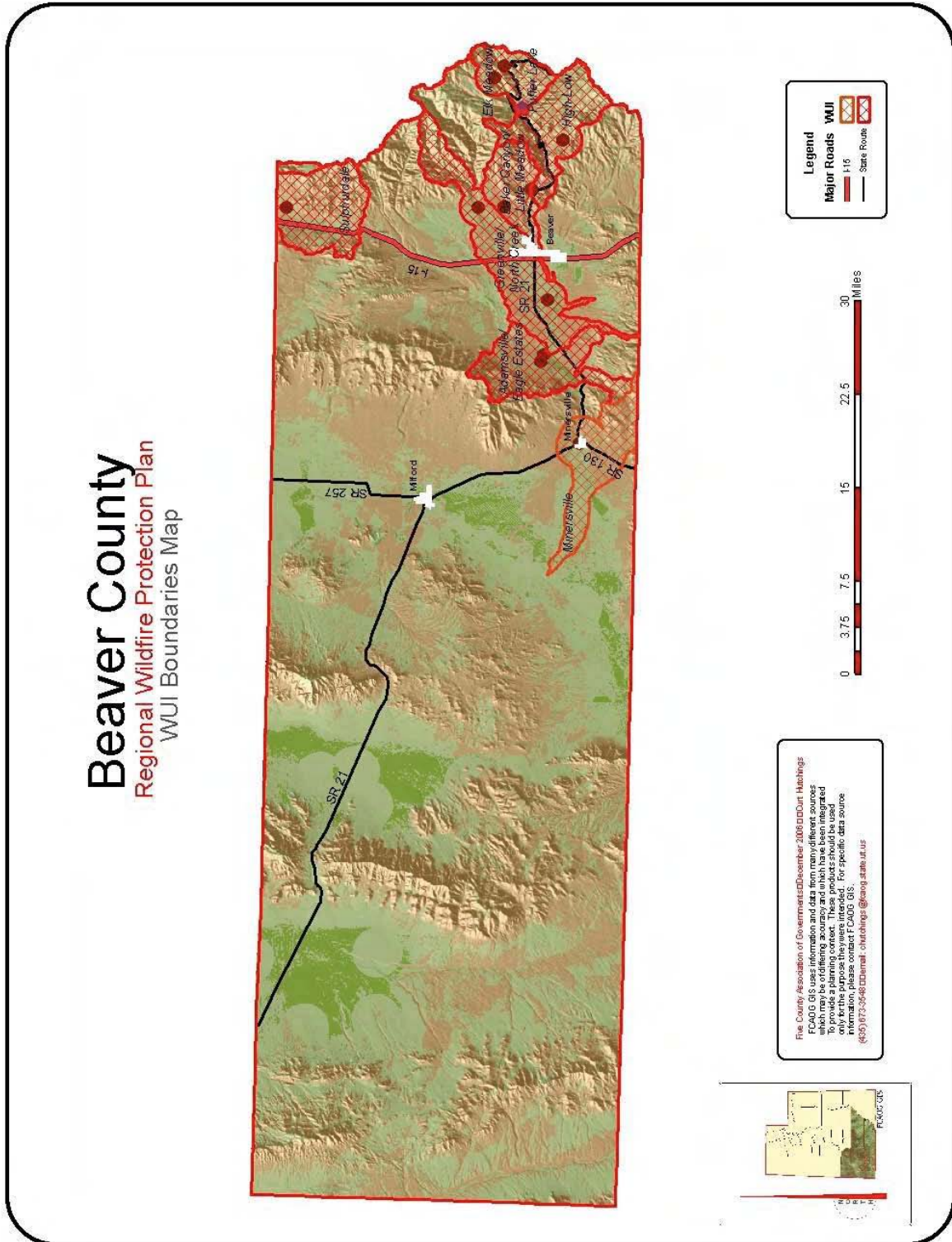
Structures are scattered throughout a wildland area. There is no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the Intermix ranges from structures very close together to one structure per 40 acres. Fire protection districts funded by various taxing authorities normally provide life and property fire protection and may also have wildland fire protection responsibilities.

Category III – Occluded

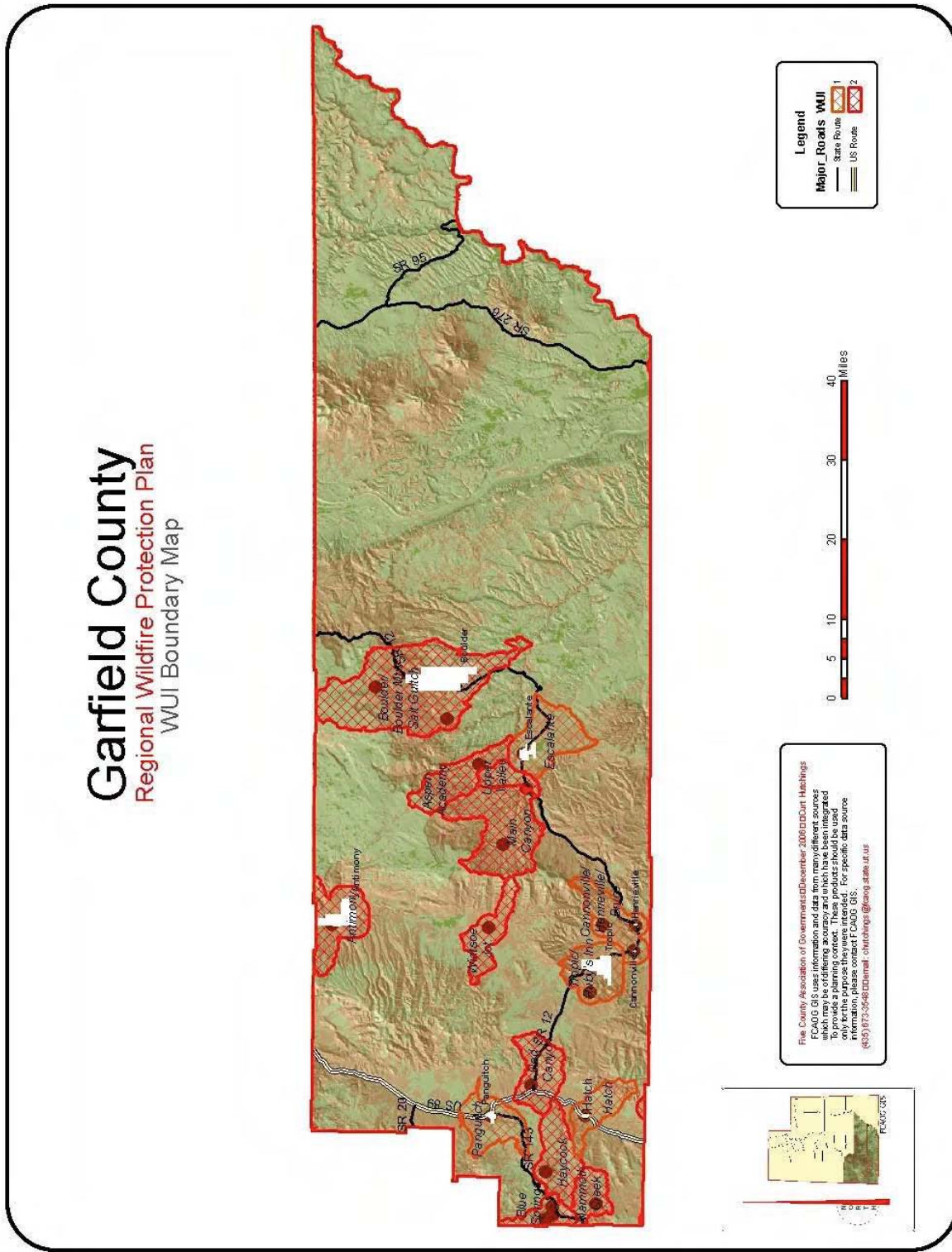
Generally exists in a situation, often within a city, where structures abut an island of wildland fuels (e.g., park or open space). There is a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in an interface community, but the occluded area is usually less than 1,000 acres in size.

WUI maps, which also identify the Communities At Risk, in each of the five counties, are presented in Maps 1.3 through 1.7.

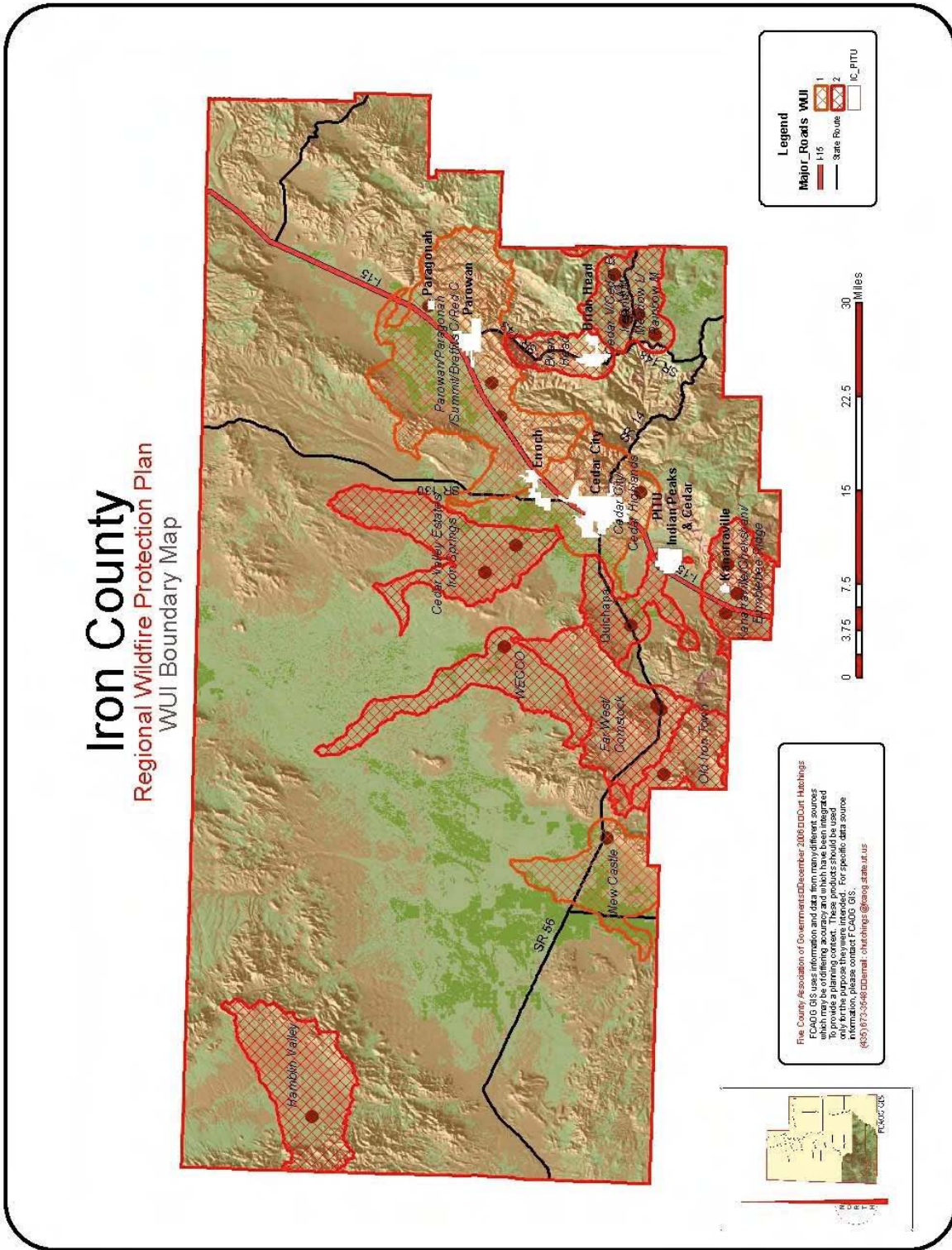
Map 1.3 - Beaver County WUI Boundary Map



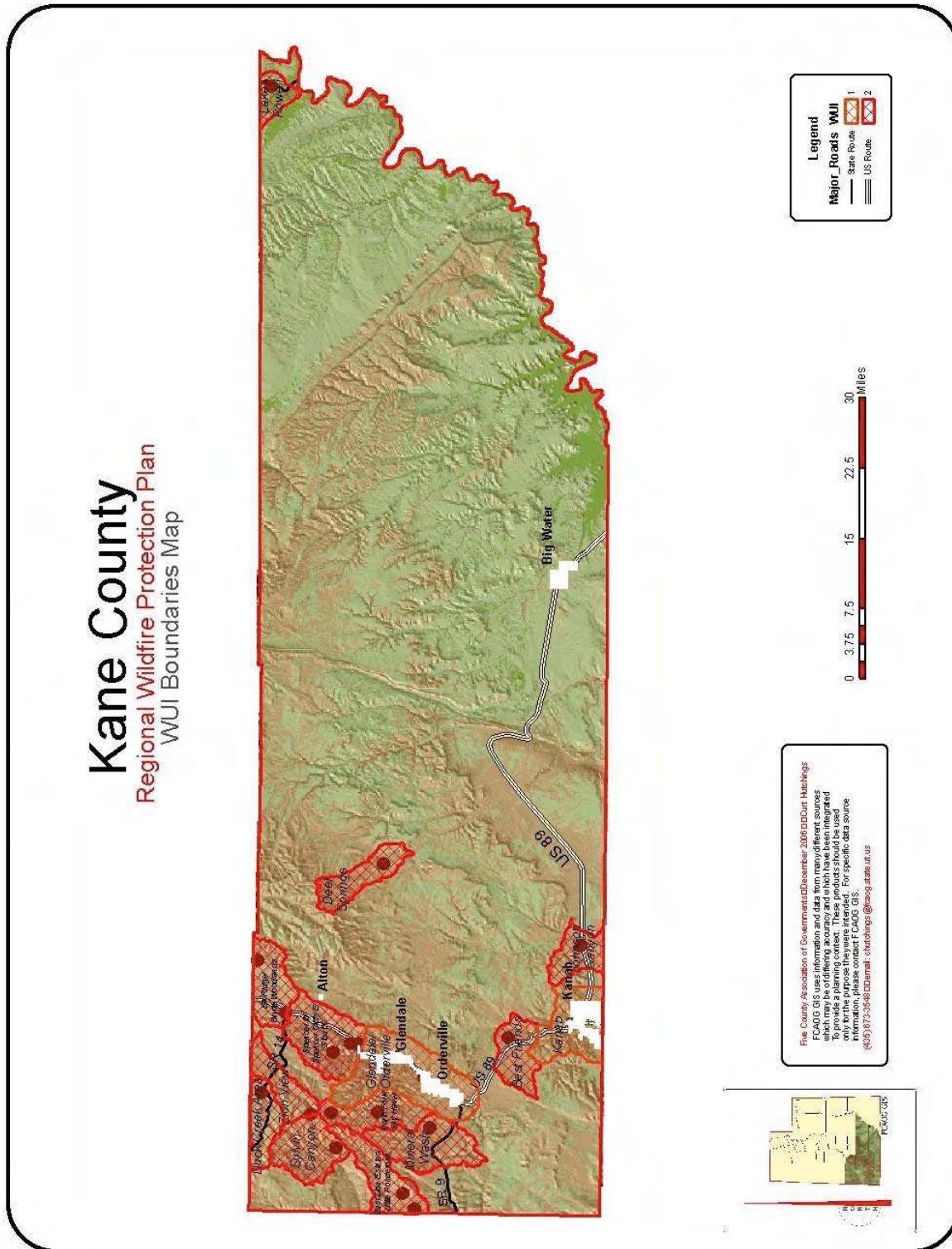
Map 1.4 - Garfield County WUI Boundary Map



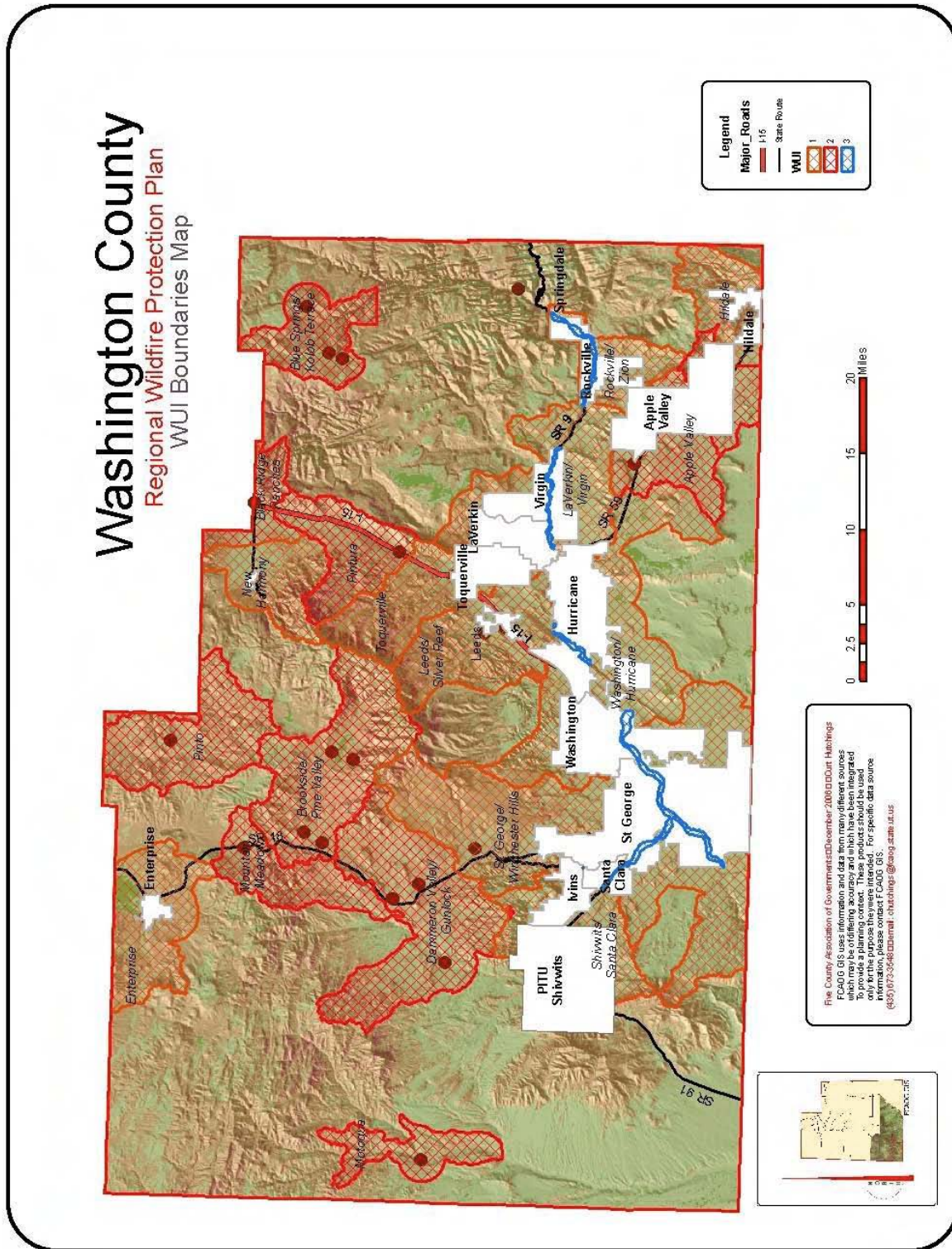
Map 1.5 - Iron County WUI Boundary Map



Map 1.6 - Kane County WUI Boundary Map



Map 1.7 - Washington County WUI Boundary Map



Chapter 1. Introduction

1.7 COMMUNITIES AT RISK (CARs)

Using National Fire Plan guidelines, the Utah Division of Forestry, Fire, and State Lands (UDFFSL) has worked with national and local wildland fire officials to create a statewide list of CARs. As of 2005, there were over 600 communities listed statewide and 148 are located in the southwestern Utah region.

The Color Country Fuels Committee (CCFC), comprised of representatives from state and federal fire management programs in southwest Utah, has been nationally recognized for its work in hazardous fuel treatments. Beginning in 2000, the CCFC undertook an intensive assessment of the 148 identified communities at risk (CARs) in the Color Country fire management response area. These assessments have been the foundation for prioritizing fuels treatments, determining focus areas, and targeting the development of Community Wildfire Protection Plans within the Color Country Interagency Fire Management area.

The CCFC compiled data that included standardized internal and external risk assessments, digital photos, maps, and other information to prioritize hazardous fuels target areas and to aid in suppression efforts. A large amount of data was generated through this process, housed at local offices and at the Color Country Interagency dispatch center. In 2004, the Committee chose to organize and centralize the data by creating a database which could be accessible to all agency partners and all field offices in Color Country. The original assessments and the Community Fire Plans that have been generated from them are housed at the Interagency Dispatch Center in Cedar City.

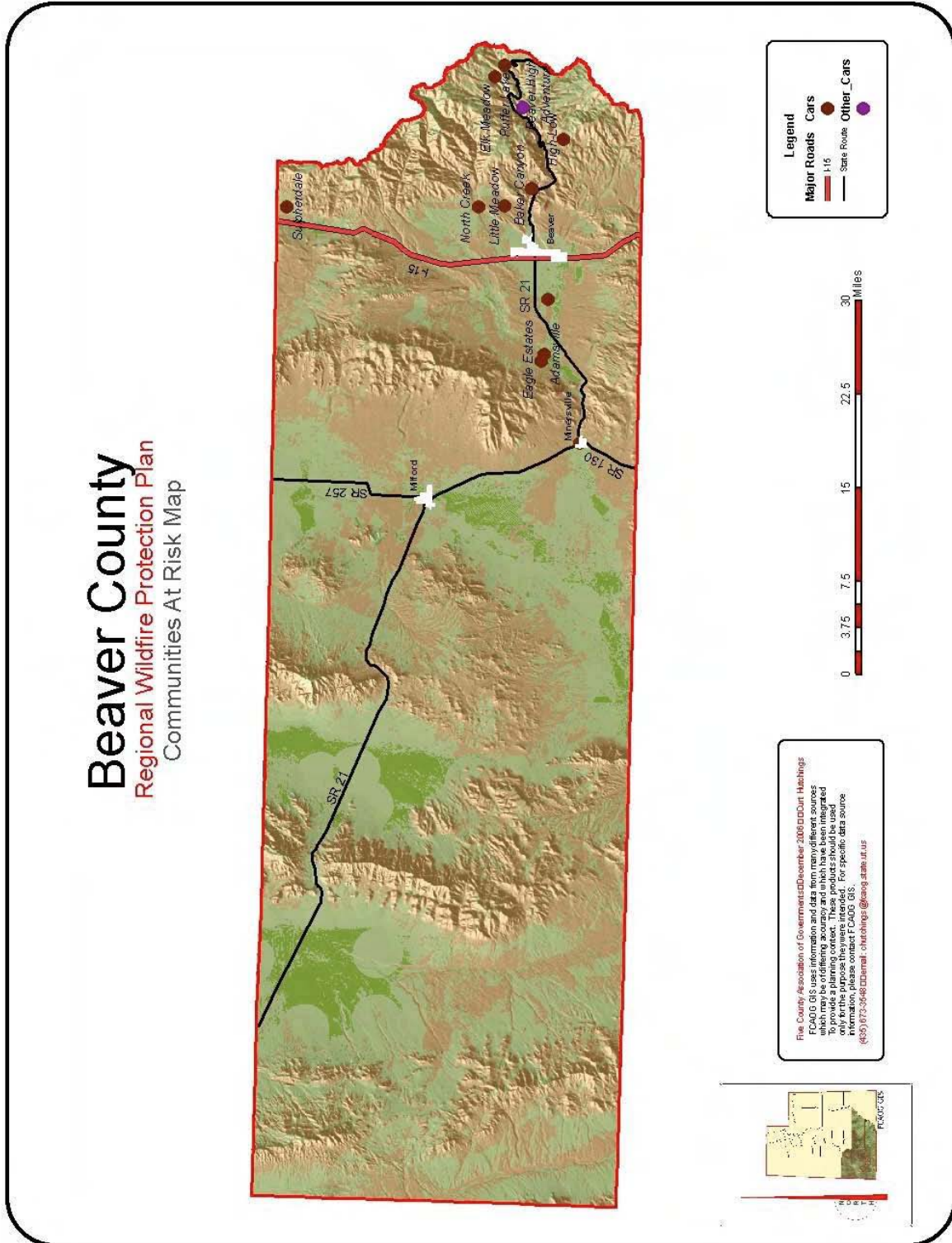
Each CARs was given a score ranging from 0 (no risk) to 12 (extreme risk) based on the sum of multiple risk factors (e.g., fire history, local vegetation, firefighting capabilities) analyzed in every area. The scoring system allows Utah's fire prevention program officials to assess the relative risk in a given area of the state and open communication channels with these communities to help them better prepare for wildfire.

A list of the CARs in southwestern Utah region is presented in tables 1.4 through 1.8. Maps 1.8 through 1.12 identify the general location of the Communities At Risk in each of the five counties.

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Adamsville	7
Baker Canyon	11
Eagle Estates	7
Elk Meadow	12
Greenville	8
High-Low	9
Minersville	7
North Creek	10
Puffer Lake	9
Sulpherdale	11

Map 1.8 - Communities At Risk in Beaver County



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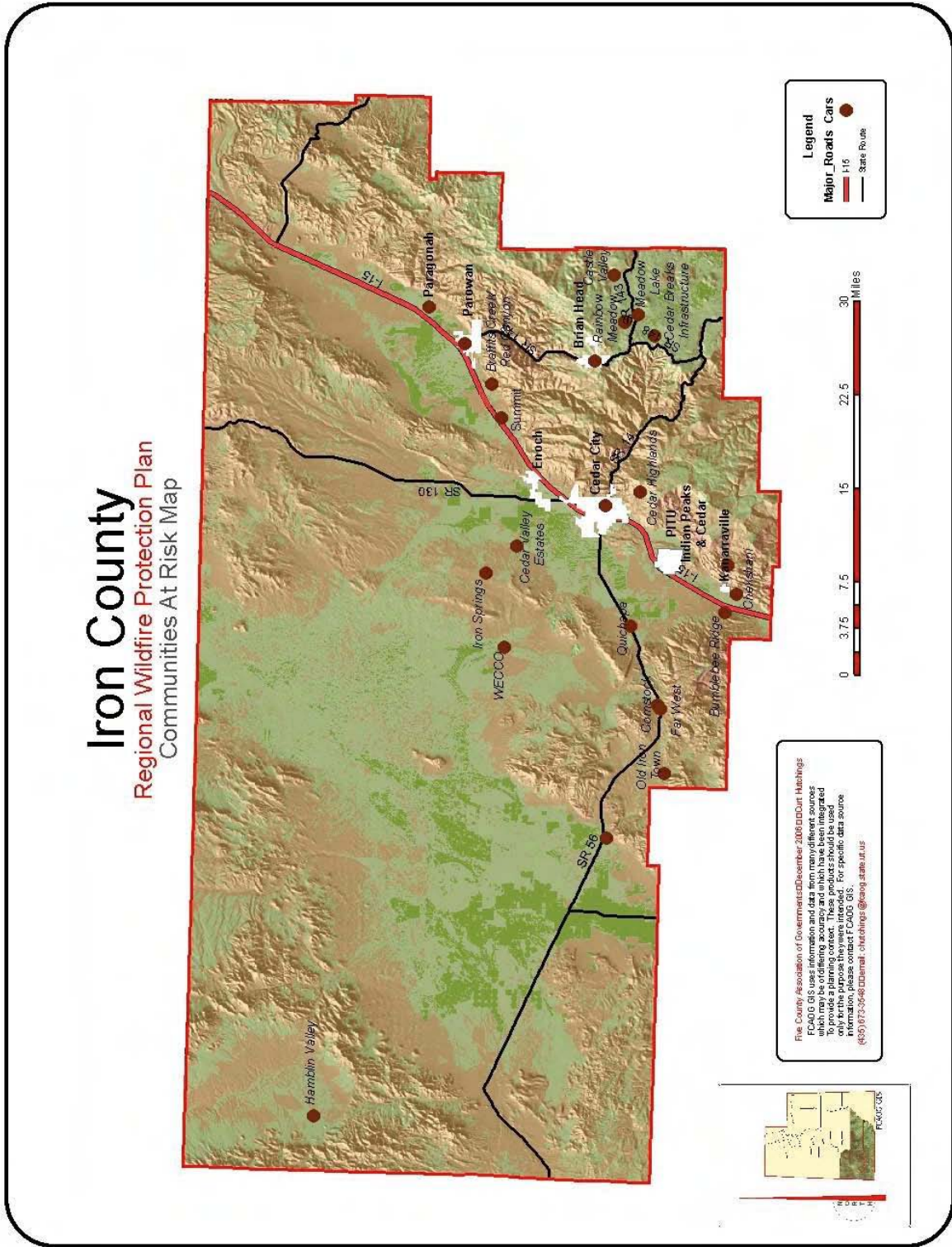
Antimony	8
Aspen Academy	8
Blue Spring	10
Boulder	9
Boulder Mtn.	7
Cannonville	7
Escalante	8
Forest Gardens	6
Hatch	8
Haycock	7
Henrieville	7
Main Canyon	9
Mammoth Creek	12
Panguitch	8
Panguitch Lake/Beaver Dam/Clear Creek	10
Red Canyon	9
Ruby's Inn	9
Salt Gulch Ranch	7
Tropic	10
Upper Valley	8
Widtsoe Jct.	8

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Hamblin Valley	8
Braffits Creek/Red Canyon	8
Brian Head	11
Bumblebee Ridge	10
Castle Valley	10
Cedar City	6
Cedar Highlands	10
Cedar Valley Estates	7
Chekshani	10
Comstock	11
Far West	11
Ireland Meadow	10
Iron Springs	11
Kanaraville	9
Meadow Lake	8
New Castle	8
Old Iron Town	11
Paragonah	8
Parowan	8
Quichapa	12
Rainbow Meadow	10
Summit	9

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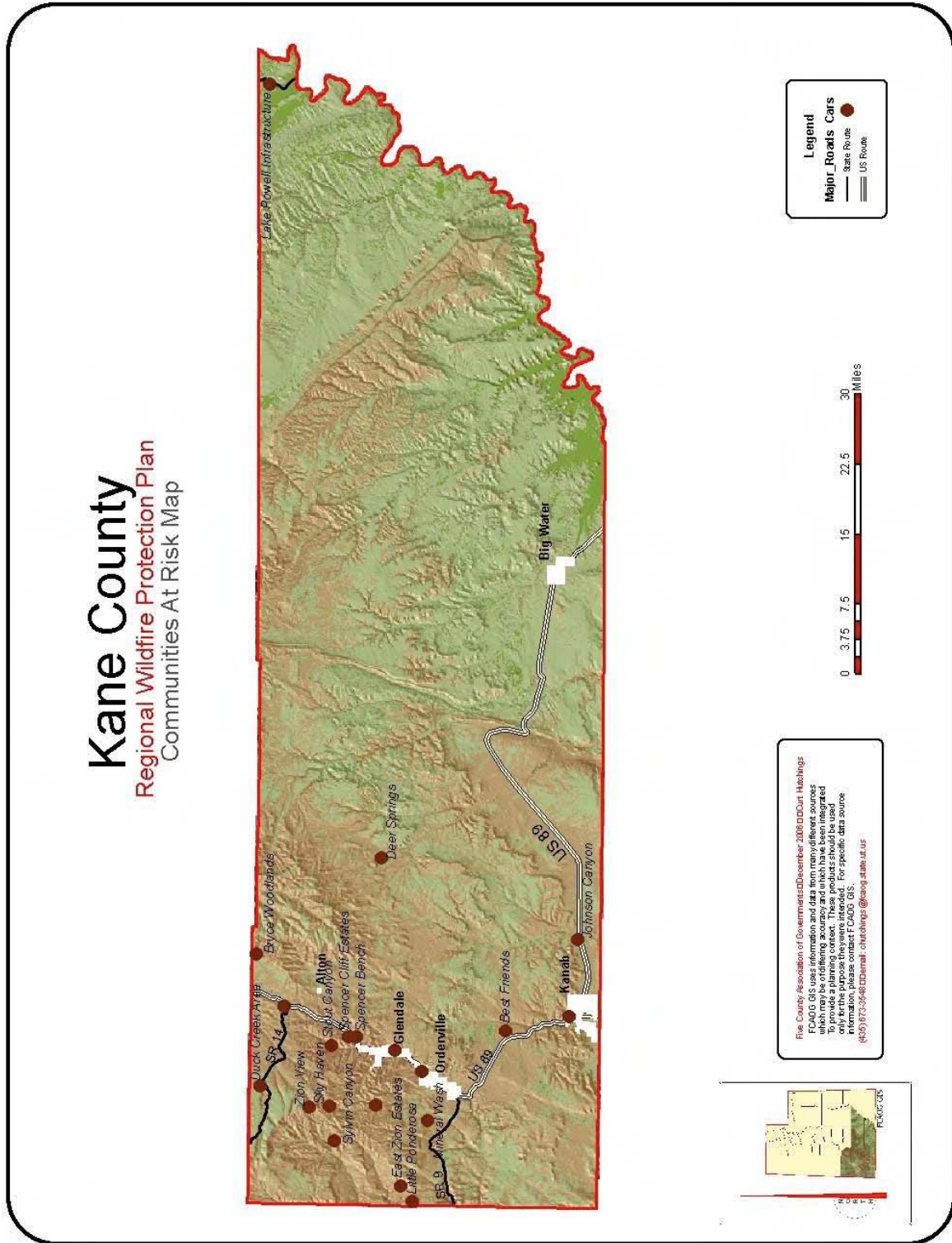
Map 1.10 - Communities At Risk in Iron County



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Best Friends	10
Bryce Woodlands	10
Deer Springs	9
Duck Creek Area	11
East Zion Estates	11
Elk Ridge	11
Glendale	10
Johnson Canyon	8
Kanab	7
Little Ponderosa	10
Mineral Wash	9
North Fork Drainage	11
Orderville	8
Sky Haven	10
Spencer Bench	10
Spencer Cliff Estates	10
Stout Canyon	11
Sylvan Canyon	10
Zion View	11

Map 1.11 - Communities At Risk in Kane County



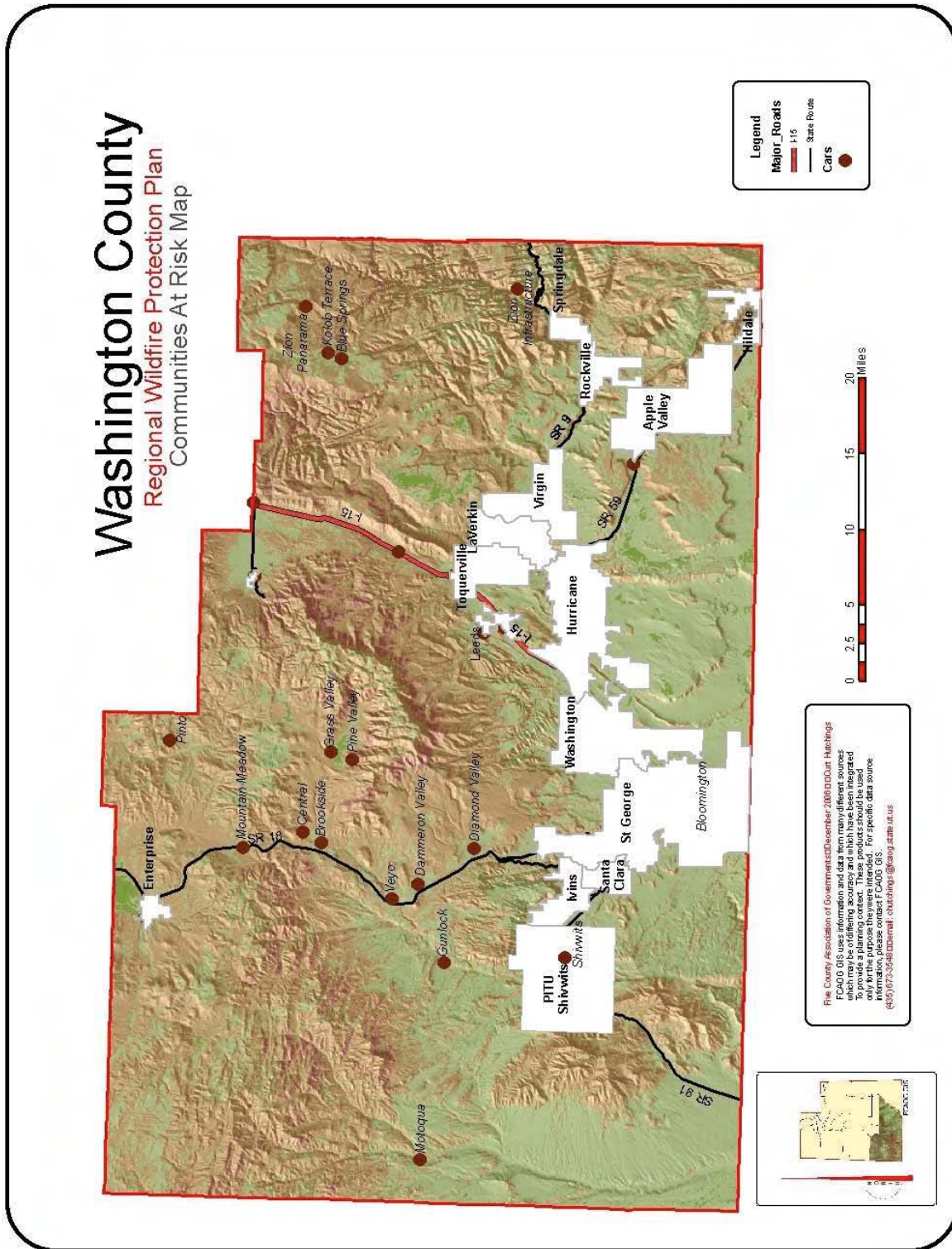
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Anderson Jct.	9
Apple Valley	7
Black Ridge Ranches	10
Bloomington	9
Blue Springs	10
Brookside	11
Central	11
Dammeron Valley	10
Diamond Valley	10
Enterprise	8
Grass Valley	7
Gunlock	9
Harrisburg	7
Hilldale	7
Hurricane	7
Ivins	6
Kolob Terrace	10
Laverkin	8
Leeds	8
Motoqua	10
Mountain Meadow	10
New Harmony	10
Pine Valley	11
Pinto	10

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Pintura	11
Rockville	9
Santa Clara	9
Shivwits	10
Silver Reef	9
Springdale	9
St. George	7
Toquerville	9
Veyo	10
Virgin	9
Washington	8
Winchester Hills	9
Zion Panarama	11

Map 1.12 - Communities At Risk in Washington County



Chapter 1. Introduction

1.8 COMMUNITY VALUES AT RISK

Community Values At Risk (CVAR) is a way to measure people, property, natural resources, and other resources that, if lost in a wildfire event, would be a collective loss to the community. Examples of CVARs include the following:

- Housing
- Infrastructure
- Natural resources (including wildlife and water resources)
- Cultural resources
- Tribal concerns and values
- Recreation areas and open space
- Scenic resources (including significant landscapes)

This plan focuses primarily on the risk to residential properties as these are the most prevalent in the WUI area. As this is a landscape level plan covering large areas, a more detailed assessment of resources that may be lost in a wildfire should be determined when completing community-level wildfire protection plans.

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2.1 THE LANDS AT RISK

This area was used by aboriginal Indian tribes for more than 10,000 years. It was traversed and mapped by early explorers, such as Father Escalante, in the seventeenth century. This area was populated by Mormon settlers beginning in the mid-nineteenth century. From alpine mountain area to sweeping desert expanses, this land is populated by a vast array of human cultural backgrounds along with a wide variety of wildlife.

The values at risk in the Southwest Region, also referred to as the Five County section of Utah are countless. Representing the convergence of the high plateaus of Utah, the Great Basin and Mojave Desert and bordered by Nevada and Arizona, southwest Utah is a major tourism and travel destination. Bordered on the east by the Colorado River and enjoying the attention from visitors from around the globe, the area is home to national and state parks, national monuments, national forests, and millions of acres of public and private land, with a host of historical, recreational, and cultural sites. The region includes two commercial passenger airports, an interstate freeway and federal highway, major state highways and a major Union Pacific Railroad thoroughfare. Educational opportunities are provided through Southern Utah University, Dixie State College and at applied technology centers in the region. There are also many communications, business, and manufacturing centers providing employment to this rapidly growing area. The total combined population of Beaver, Garfield, Iron, Kane and Washington counties was estimated at 195,817 persons in 2006 (source: Utah Population Estimates Committee).

The region covers more than 17,000 square miles of valleys, mountains, and high desert terrain. With a wide variety of elevations and types of vegetation, much of the southwest Utah area includes Wildland/Urban Interface Communities at Risk (CARs). Whether occurring on grass, shrub, or forest lands, all the residents of the Five County area need to be prepared for wildfire, as fire has been and will continue to be a fact of life in southwestern Utah. This plan addresses ways to minimize wildfire risks and better prepare residents by creating defensible space in Southwest Utah.

Dispelling the old notion that all wildfires are bad, over the centuries wildfires have played a significant role in the management and the enhancement of our ecosystem environments. Occurring as you would expect in nature, wildfires occur in both forested areas and on rangeland. Permitting wildfires to simply take their course after decades of suppression and encroachment would likely be catastrophic and would allow little flexibility for communities. With high summer temperatures and relatively low humidity levels, wildfire has been a continuing challenge throughout southwest Utah's history. Weather and temperature conditions create an environment conducive to wildfire. Winters are typically wet and cold; summers are characterized by long drought periods often punctuated with lightning caused wildfires. Historically, summer lightning occurs from May to September and results in wildfires. Lightning strikes are frequent across most of the region during the summer and generally ignite numerous fires. Along with a serious bark beetle infestation

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creating large areas of dead trees, the invasion of cheatgrass after multiple years of severe drought has made today's conditions much more dangerous.

Efficient fire suppression, environmental litigation with lawsuits from certain groups wanting a pristine and natural environment, and modern management practices have each contributed to a huge understory and abnormally large accumulation of hazardous fuels on both public and private lands. This large volume of fuel coupled with the rapid advance of housing developments and cabin construction within the WUI lands of southwest Utah, has created the potential for disaster. Dramatic wildfire losses to natural and cultural resources, real property, watersheds, wildlife, and endangerment to human life, may be eminent.

Over the years, the vistas of Southwest Utah were sculptured by fire. In 2005, the state of Utah identified almost 600 communities and their surrounding natural resources as “at risk” from wildland fire. In southwest Utah there are 109 wildfire-endangered communities listed on that list. The entire statewide list of CARs is presented in Appendix E. The idea for community-based woodland planning and a continued need for prioritizing risk through ongoing assessments by fire professionals is nothing new. The safety of the citizens of any community is a shared responsibility between the citizens, land owners, developers, and home owners’ associations along with the local, county, state and federal governments. The primary responsibility, however, of creating “defensible space” in and around these CARs remains at the citizen/owner and homeowner association level.



Invasive Cheatgrass shown moving into a disturbed sagebrush community. (Photo used with permission of Summer C. Olsen, SageSTEP.org).

A major concern in this region is the changing characteristics of the environment following a wildfire. In the past a cyclical repopulation of native vegetation occurred resulting in similar fire occurrences many years separated. Invasive non-native species, especially cheatgrass, now quickly becomes the dominant vegetation after a wildfire event or other ground disturbances, such as development, and is a fuel source of repetitious events almost on an annual basis. This has completely changed the fire regime in many locations resulting in annual fire occurrences, with little or no resulting vegetation diversity. A report on Cheatgrass and Green Stripping is

presented in Appendix C.

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2.2 CURRENT VEGETATION TYPES AND FIRE ECOLOGY

In determining the likelihood of and type of wildfire in the Southwest Utah RWPP project area, an essential task was to identify general types and extent of vegetation coverage using Southwest Regional GAP (ReGAP) Analysis data. Maps produced by the Five County Association of Governments GIS provide an overview of the vegetation types found in the Southwest Utah region. In keeping with a broad, landscape-level presentation in this plan, some cover types treated as separate types under ReGAP have been grouped together for facilitating presentation.

2.3 BEAVER COUNTY LAND COVER/LAND USE

Beaver County is almost exclusively covered in Forest and Shrub/Rangelands with 95% of the land area in that category (1,574,720 acres). Grass/Pasture/Haylands make up 3% of the County's land area (46,463 acres). Water/Wetlands (16,576 acres) and Urban/Developed (16,576 acres) each comprise about 1% of the County's land area. Most of the forest and rangeland in Beaver County is found on federal USFS and BLM lands. Grass/Pasture/Haylands areas in the County may include cheatgrass, fescue, sedges, yucca, wheatgrass and bluegrass. A portion of Beaver County is comprised of Farmland. Grass/Pasture/Haylands includes approximately 7,000 acres of Grass Pasture and/or grass hay in the Beaver City area. Shrub/Rangelands consist of oak savannas, juniper/pinion pine and other open areas.

Map 2.1 shows the generalized land cover of Beaver County. This map was produced by the Five County Association of Governments GIS.

2.4 GARFIELD COUNTY LAND COVER

Garfield County is almost exclusively covered in Forest and Shrub/Rangelands. Shrub/Rangelands accounts for 65.7% of the land area (2,139,677 acres). Forest area accounts for 31.8% of the County (1,036,581 acres). Grass/Pasture/Haylands make up 0.6% of the County's land area (20,300 acres). Water/Wetlands (32,150 acres) comprises 1% of the County's land area while Urban/Developed (27,000 acres) comprises only 0.8% of the County's land area. Only 4% of Garfield County land area is in private ownership. 96% of Garfield County land area is non-private land.

Map 2.2 shows the generalized land cover of Garfield County and was produced by the Five County Association of Governments GIS.

2.5 IRON COUNTY LAND COVER

Iron County is primarily covered in Forest and Shrub/Rangelands, accounting for 93% of the area. Shrub/rangelands accounts for 50% of the land area (1,064,773 acres). Forest area accounts for 43% of the County (907,610 acres). Grass/Pasture/Haylands/Croplands makes up 4% of the County's land area (75,000 acres). Urban/Developed (42,214 acres) comprises 2% of the County's land area. Water/Wetlands (21,107 acres) comprises 1% of

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Iron County's land area. Shrub/Rangelands consist of oak savannahs and pinon/juniper areas. Grass/Pasture/Haylands includes approximately 71,900 acres of Hayland/Cropland. 3,100 acres of Hayland/Cropland.

Map 2.3 shows the generalized land cover of Iron County and was produced by the Five County Association of Governments GIS.

2.6 KANE COUNTY LAND COVER

Kane County is almost exclusively covered in Forest and Shrub/Rangelands accounting for 97% of the area. Shrub/rangelands accounts for 75% of the land area (1,890,058 acres). Forest area accounts for 22% of the County (548,016 acres). Water/Wetlands (32,049 acres) and Developed (22,510 acres) each comprise about 1% of the County's land area. Grass/Pasture/Haylands/Croplands make up less than 1% of the County's land area (11,817 acres). Shrub/Rangelands consists of oak savannahs and sagebrush flats. 85% of Kane County land area is federally owned and 10% is state owned. Only 5% of Kane County land area is privately owned.

Map 2.4 shows the generalized land cover of Kane County and was produced by the Five County Association of Governments GIS.

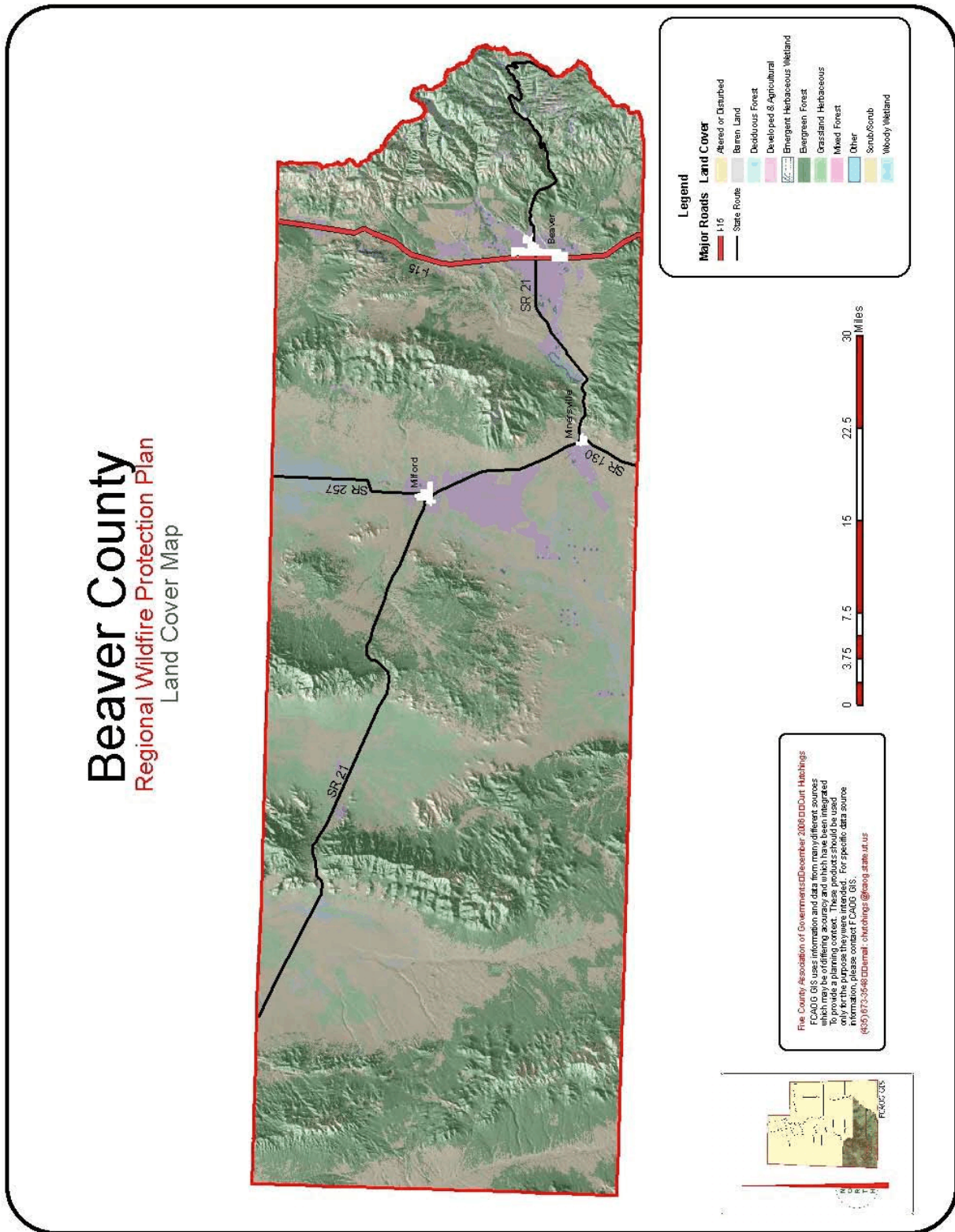
2.7 WASHINGTON COUNTY LAND COVER

Washington County is primarily covered in Forest and Shrub/Rangelands, accounting for 84% of the area. Shrub/Rangelands accounts for 74% of the land area (1,149,428 acres). Forest area accounts for 10% of the County (155,328). Zion National Park accounts for 8.2% (126,720 acres) of the County. Urban/Developed (69,120 acres) comprises 4.5% of the County's land area. Grass/Pasture/Haylands makes up 2.3% of the County's land area (35,900 acres). Water/Wetlands (15,533 acres) comprises 1% of Washington County's land area. Shrub/rangelands consist primarily of oak savannahs and pinon/juniper, mesquite and blackbrush areas. Much of the county consists of federal National Park Service, U.S. Forest Service and Bureau of Land Management owned lands.

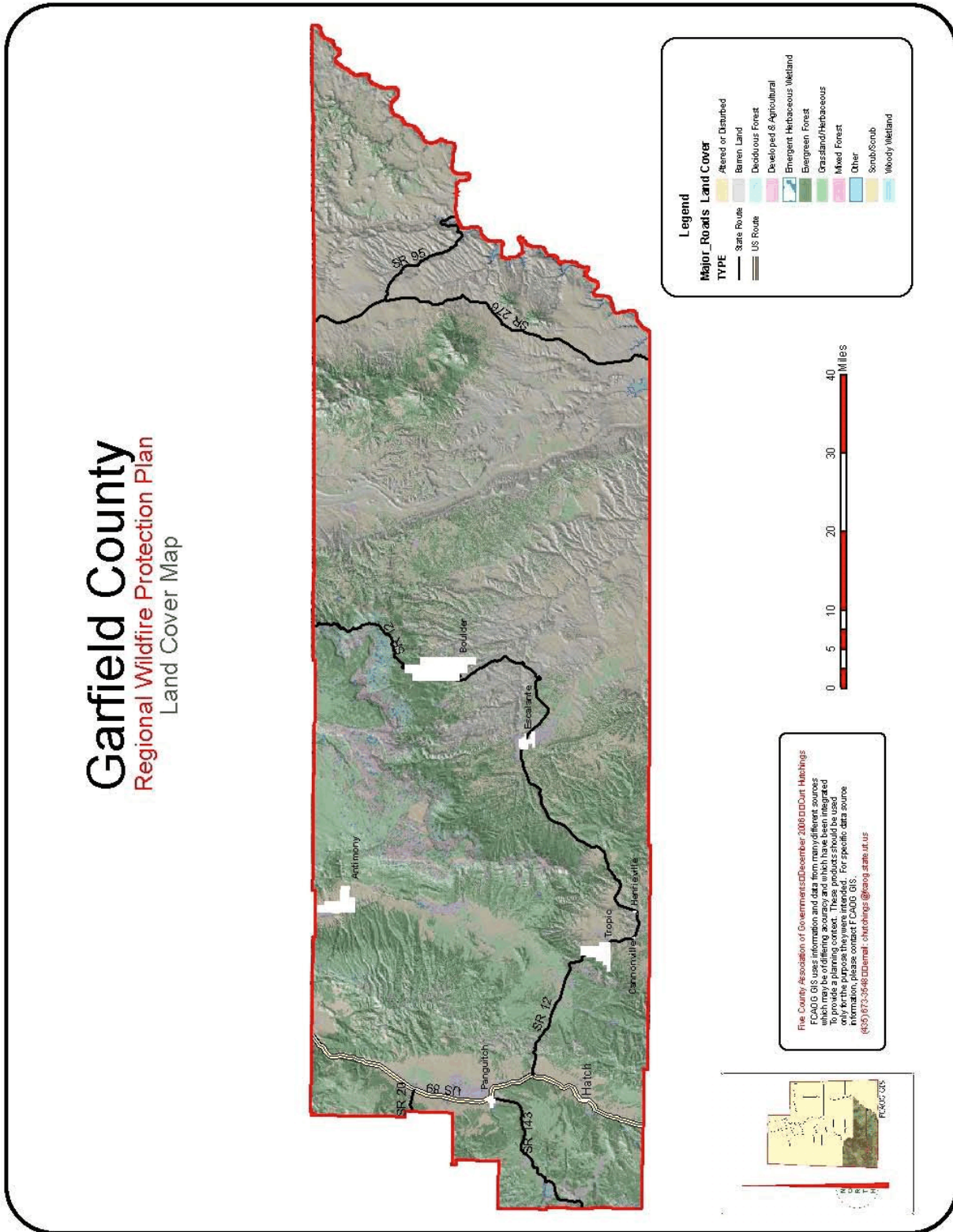
Map 2.5 shows the generalized land cover of Washington County and was produced by the Five County Association of Governments GIS.

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Map 2.1 - Beaver County Land Cover

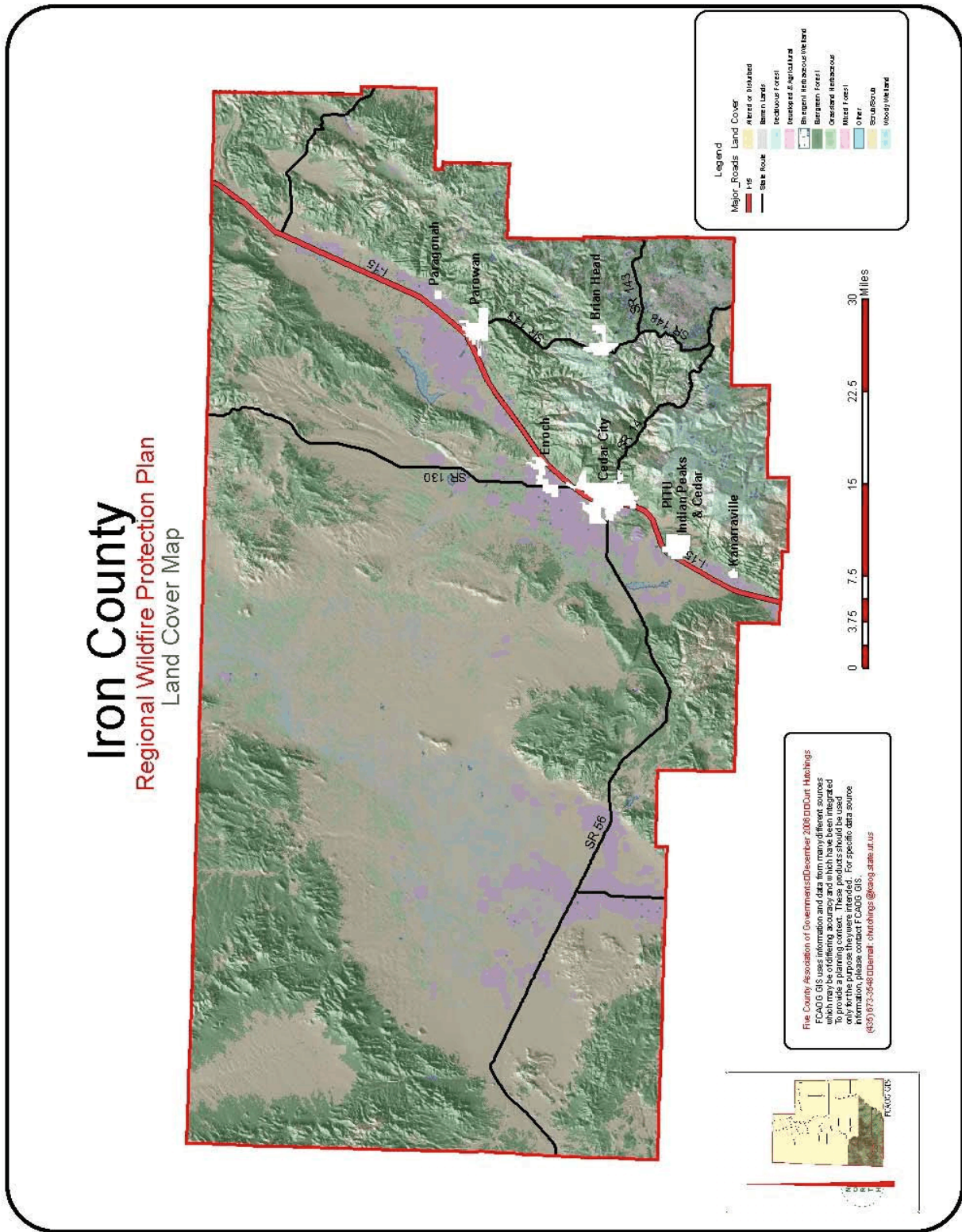


Map 2.2 - Garfield County Land Cover

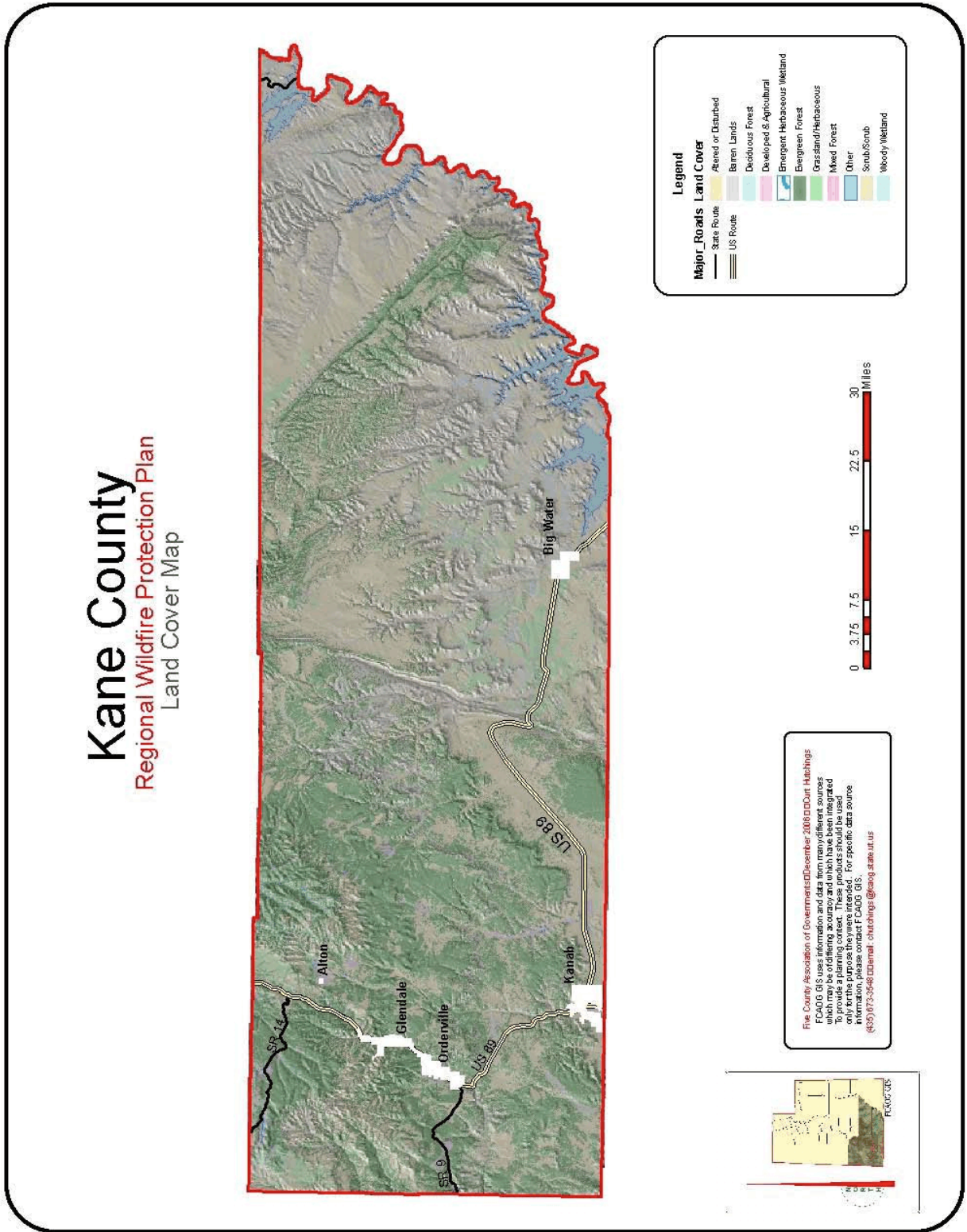


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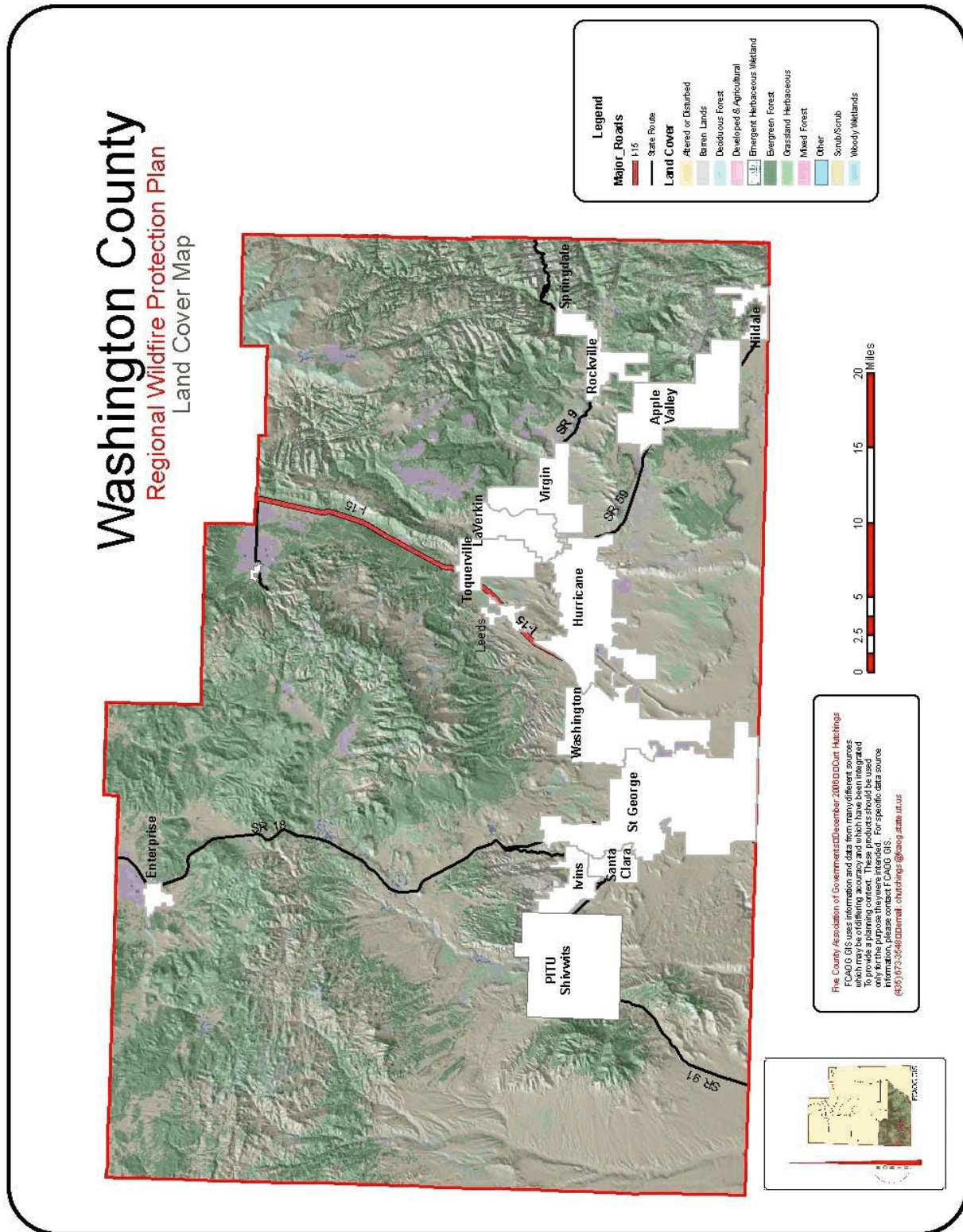
Map 2.3 - Iron County Land Cover



Map 2.4 - Kane County Land Cover



Map 2.5 - Washington County Land Cover



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2.8 CHEATGRASS INVASION



Close-up photograph of invasive Cheatgrass. (Courtesy of Summer C. Olsen, SageSTEP.org).

A major concern in this region is the changing characteristics of the environment following a wildfire. In the past a cyclical regrowth of the same type of vegetation occurred resulting in similar fire occurrences many years separated. Invasive, non-native, cheatgrass is now quickly becoming the dominant vegetation after a wildfire event and the source of repetitious wildfire events almost on an annual basis.

Greenstripping is the practice of establishing or using patterns of fire resilient vegetation and/or material to reduce wildland fire occurrence and size. Greenstripping also breaks up monocultures such as cheatgrass areas, and creates some biodiversity.

For full details on Cheatgrass invasion and greenstripping, please see the report completed by Scott Tobler presented in Appendix C.



Remnant patch of sagebrush following landscape-scale conversion to cheatgrass and other non-native annual grasses. (Photo by M. Wisdom, Courtesy of Summer C. Olsen, SageSTEP.org).

2.9 Southwestern Utah Regional Profile

This Regional Wildfire Protection Plan was developed for southwestern Utah. This 17,481 square mile area is bordered by the neighboring states of Nevada on the west and Arizona on the south and encompasses five Utah counties - Beaver, Garfield, Iron, Kane and

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Washington. This area is also often referred to as the Five County District. The Five County District contains 37 incorporated cities and towns. Figure 1.4.1. and Figure 1.4.2 in Chapter 1 are maps identifying the physical location of the five counties of southwestern Utah and the respective county seats, as well as a map showing land ownership. Demographic, Housing and Socioeconomic profiles of each county are provided in Appendix D.

Many residential areas in the WUI areas in this region consist of disperse, small enclaves of houses, more or less defined villages and subdivisions, or remote single dwellings. The five county area covered by this Regional Wildfire Protection Plan is 17,481 square miles in size. Most of the land in these counties is owned and managed by the federal or state government. The ownership in each of the counties is shown in Table 2.1.

County	Federal Area	Federal Percent	State Area	State Percent	Private & Local Government Area	Private & Local Government Percent	Tribal Area	Tribal Percent	Water Covered Area	Water Covered Percent
Beaver	2,002	77.3%	264	10.2%	321	12.4%	0	0.0%	3	0.1%
Garfield	4,631	89.5%	248	4.8%	264	5.1%	0	0.0%	31	0.6%
Iron	1,887	57.2%	221	6.7%	1,187	36.0%	3	0.1%	0	0.0%
Kane	3,317	83.1%	160	4.0%	403	10.1%	0	0.0%	112	2.8%
Washington	1,813	74.7%	141	5.8%	427	17.6%	44	1.8%	2	0.1%
Region	13,650	78.1%	1,034	5.9%	2602	14.9%	47	0.3%	148	0.8%

Source: Utah County Fact Book 2002

2.10 GEOGRAPHY AND ENVIRONMENT

The geography and environment of a region play important roles in planning. As this region develops, the towns, cities, and counties must consider the "lay of the land" and many environmental issues that come with it. It is now more important than ever that we understand the land on which we develop and its accompanying limitations and potential problems. The Five County District is no exception and has many unique issues pertaining to its distinct geography and environment. Among these issues is the risk to human development by wildfire, especially in the WUI areas.

2.11 PHYSICAL DESCRIPTION

The Five County District is located at the southwest corner of Utah near the heart of the Intermountain west. The five counties are contained in two major physiographic provinces. Most of Beaver, Iron, and Washington Counties lay within the Basin and Range physiographic province, which generally consists of north-south trending mountain ranges separated by broad arid valleys with interior drainage and vegetated with sagebrush and

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other plants of the Great Basin. Garfield and Kane counties are located in the Colorado Plateau physiographic province, which consists of uplifted sedimentary rock strata vegetated with desert sage scrub.

On a more localized scale, the area is also speckled with a variety of geologic features. Some of this area has experienced a great amount of volcanic activity which is evident in extinct volcanoes, mountains, great lava fields, and mesas. Geologic forces have uplifted huge portions of the land, and have created great rifts in others. Of particular notoriety are the erosional features of the area including the great canyons and cliffs carved by water and wind that make up the national and state parks such as Zion National Park, Bryce Canyon National Park, and Snow Canyon State Park.

The soil in this area consists mostly of aridisols, an iron-rich desert soil that can be quite productive if cultivated. Aridisols are used mainly for range, wildlife, and recreation. Because of the dry climate in which they are found, they are not used for agricultural production unless irrigation water is available. Native to the valleys throughout most the region is a variety of grasses, junipers, and pinion pines, while xerophytes and desert scrub are native to the lower elevations. Farming has produced a diversity of crops, including barley, alfalfa, hay, and cotton (which earned the southern region the name of "Dixie"). Much of the region has also been prime land for cattle and sheep ranching.

2.12 TRANSPORTATION CORRIDORS

There are two major federal highways in southwestern Utah. Interstate 15 traverses northeasterly as you enter the state from the southern border with Arizona. This highway, which begins in California and ends in Montana, generally traverses the center of Washington County and the eastern portions of Iron and Beaver counties. U.S. 89, a federal highway, is a major north-south corridor that is located in western Garfield and Kane counties. Numerous state highways and county roads are located in the five southwestern Utah counties.

2.13 CLIMATE

Because of its general location, the Five County District is mostly semiarid. As moist air moves in from the Pacific Ocean, it is forced to rise over the Sierra Nevadas mountain range, which causes it to cool and drop its precipitation, leaving very little moisture for this region. This phenomenon is known as a "rainshadow effect" where the precipitation drops out as air masses rise. While all of the Intermountain West is generally dry due to this phenomenon, the aridity in the Five County District is accentuated by its lower latitude, which makes it warmer than most regions to the north. Much of this area is also characterized by a lower elevation, which also increases the mean annual temperature.

For example, the area near St. George City has a warm climate unique to the state of Utah

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which can be attributed to the fact that it has the lowest elevation of any Utah city, with most of the city around 2,800 feet, and that it lies at the very southern end of the state. In fact, this area, also known as Utah's Dixie, has the highest mean annual temperatures in Utah, averaging, on an annual basis around 62 degrees Fahrenheit. It also boasts the highest maximum temperature ever recorded in Utah, 117 degrees Fahrenheit, measured on July 5, 1985.

Though scholars classify most of the region as "desert," only the areas with lower elevations are considered "hot" deserts, or regions where the winters average above 32 degrees Fahrenheit. This would include most of Washington County. This region usually does not have snow in the winter and has extremely warm summers. The rest of the region, which consists of higher elevations, is considered to be a "cool" desert, with snowy winters and warm summers. Some exceptions exist over the highest elevations and mountainous regions, such as Brian Head, which are classified as "undifferentiated highlands" since they experience cooler temperatures and higher humidity than the rest of the area. These regions generally have very cold, snowy winters and cool summers. Like the rest of the Intermountain West during the winter, most precipitation results from the passage of mid-latitude cyclones, while in the summer, convection from localized heating can trigger isolated thunderstorms. Without moderating effects of a nearby ocean with its associated cloud cover from water vapor in the air, this region experiences great daily and yearly fluctuations in temperature.

The nature of the climate in this region leaves it susceptible to a few hazardous weather recurrences. Although most of the country is subject to flash floods, they are particularly damaging in this region since the soil is dry, somewhat non vegetated, and easily eroded. Threats to human lives and damage to property are not only a result of rapidly rising waters, but of catastrophic mud slides as well. This area is also subject to tornadoes, although they are a rare occurrence. More common in the warmer regions are wind storms which can approach or reach hurricane strength at times and dust devils which are rarely severe enough to damage property. The higher elevations always have the potential for blizzards, dangerous low temperature conditions, and avalanches in the winter. This entire region is susceptible to wildfires resulting from either lightning caused or human actions.

2.14 RESPONSIBILITY FOR WILDLAND FIRE SUPPRESSION

Most wildland fires outside the city limits in Southwest Utah fall under the direction and coordination of the Color Country Interagency Fire organization, which consists of the state and federal agencies with the state representing the interests of the counties. The Color Country Interagency Fire Dispatch Center coordinates the firefighting resources and logistical support of the agencies. The center is located at 1750 West Kitty Hawk Drive in Cedar City. Telephone (435) 865-4600.

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Under the concept of "closest forces" and using the Incident Command System (ICS) during the initial attack phase of a wildland fire, volunteer fire departments close at hand along with appropriate government fire agencies are initially called to respond. At the conclusion of the initial attack phase of the fire and during the mop-up stages, if not available beforehand, the agency having jurisdiction would then take charge. This may result in the replacement of the "Incident Commander" (the leader in charge with the responsibility of controlling the fire.) In more complex ongoing fire situations, a Type III, Type II or Type I "Incident Management Team" may be ordered and delegated authority to manage an incident while locally based firefighting resources focus on initial attack, keeping new fires small. The management team is given instructions by the local jurisdictions on the latitude they have to manage the fire. This could be in the form of cost containment, trying to keep the daily costs at a preset level, or resource management objectives, and/or the methods used in the suppression of the fire in certain areas.

Other reasons for the Incident Command System (ICS) are for personnel accountability for safety reasons, to ensure all responding agencies know their duties and responsibilities, and for the proper chain of command can be established much faster, eliminating the freelancing of fire resources. The ICS system is used by both the structural fire agencies and wildland agencies, as well as law enforcement. In the event of needing National Guard forces at the fire, a standardized command structure is in place to work with their command system. ICS will also integrate common terminology for all responders.

2.15 FIRE RESPONSE CAPABILITIES

In the past, the responsibilities and priorities of wildfire protection for both the communities and valued natural resources, watersheds and lands located within the wildland areas, appeared to belong to the local volunteer fire departments, the state, and the federal wildland firefighters. The responsibility of the individual citizens living in the wildland interface was merely to report wildfire ignitions to the dispatch center and in modern times to dial 9-1-1, and run for safety. This tradition continues on today. However, with increasing incidents of wildfires and the modern ecological tendency of huge buildups of fuel understory, the propensity for large, catastrophic fires is far more evident. With the introduction of new scientific designations and wildland firefighting definitions and procedures, such as the WUI and the ICS across the United States, there is a new recognition and commitment that everyone must become involved in the protection of human lives, personal property, property values, wildlife, watersheds, and natural resources from wildfire. This new wildland management philosophy means there is a new role for property owners, homeowners' associations, land developers, community planners, public officials, insurance agents, firefighters, and everyone involved in the WUI area. The immense job of wildland fire protection should begin long before ignition occurs. This requires that planning and participation must be carried out by everyone who is potentially affected.

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Below is listed all forty-one fire departments located throughout the Southwest Region of Utah. The fire departments are listed by county:

Beaver County

- Beaver County Fire District #1
- Beaver County Fire District #2

Garfield County

- Antimony
- Boulder Fire Department
- Cannonville
- Escalante
- Hatch Fire Department
- Henrieville
- Mammoth Creek Fire Department
- Panguitch Fire Department
- Panguitch Lake Fire Department
- Tropic Fire Department
- Ticaboo

Iron County

- Beryl Fire Department
- Brian Head Fire Department
- Cedar City Fire Department
- Hamblin Valley Fire Department
- Kanarrville Fire Department
- Modena Fire Department
- New Castle Fire Department
- Paragonah Fire Department
- Parowan Fire Department

Kane County

- Alton Fire Department
- Big Water Fire Department
- Cedar Mountain Fire Protection District Fire Department
- Church Wells Fire Department
- East Zion-Zion Ponderosa Fire Department
- Glendale Fire Department

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- Kanab Fire Department
- Orderville Fire Department
- Quin View Fire Department

Washington County

- Central Fire Department
- Brookside Fire Department
- Dammeron Valley Fire Department
- Diamond Valley Fire Department
- Enterprise Fire Department
- Gunlock Fire Department
- Harmony Valley Fire District Fire Department
- Hildale/Colorado City Fire Department
- Hurricane Fire Department
- Ivins Fire Department
- LaVerkin Fire Department
- Leeds Fire Department
- Pine Valley Fire Department
- Santa Clara Fire Department
- Smithsonian Fire Department/Apple Valley
- St. George Fire Department
- Springdale-Rockville Fire Department
- Veyo Fire Department
- Virgin Fire Department
- Washington County Fire Department
- Winchester Hills Fire Department

A comprehensive firefighting Capabilities Assessment was completed in August 2006 for each of these fire departments. The assessment was based upon either a telephone survey or personal contact by staff of the Five County Association of Governments. The Fire Department Capabilities Assessment is presented in Appendix C.

2.16 COMMUNITY ASSISTANCE PROGRAM

At-risk local communities are encouraged to form homeowner fire councils and write a Community Fire Plan. These plans are designed to educate the community on how they may protect life and property through community-based planning. The communities are educated on how to identify strategies to reduce the risks to homes, infrastructure and other facilities and businesses prior to a wildfire and how to implement individual and community-based fuel reduction projects to minimize the effects of a wildfire. The mitigation of risks and hazards facing highly vulnerable Communities At Risk (CAR'S) is crucial to the short-term and long-term goals of the National Fire Plan.

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Education and long-term involvement of residents in reducing wildfire risk around their homes and in their community is the goal of the Community Assistance Program. Educating citizens and providing tools and resources that enable people to prepare for wildfires can have a lasting effect building resilience to wildfires, increasing capacity for communities to work together toward common goals, and provide a means of developing their own localized versions of a community fire plan. Local plans and actions are valuable and necessary to effectively implement the goals of this RWPP.

It is realized that much of the Wildland-Urban Interface in Southwest Utah is at high wildfire risk. Citizens who live, work, or enjoy recreation in its environs, whether on grass, shrubs, or forested lands, must be prepared for wildfire.

This Community Assistance Program is intended to lend a hand to homeowners in creating defensible space and increasing their property's resistance to wildfires. The community fire plans offer ways to minimize risk and thereby reduce the undesirable effects of wildfire on lives, property, water supplies, economics, and aesthetics. In some cases, even the best planned defense will not be effective against a given wildfire. The intensity and pattern of a wildfire in a given area can, in most cases, be modeled as to what could likely happen under given set of conditions. It should be remembered that these are in fact just that, a model, and only after an major event where the "real world" lessons learned and unforeseen variables have been analyzed can they be utilized to help improve the science of wildland fire modeling in the future.

A Utah Community Fire Plan must be collaboratively developed by a local community at risk with the guidance of state government's representatives, in consultation with federal agencies and other interested parties. Community Fire Plans are written under the Community Assistance part of the National Fire Plan.

2.17 CONTENTS OF A COMMUNITY WILDFIRE PROTECTION PLAN

Each Community Wildfire Protection Plan (CWPP) should include the following:

1. Plan must address the ways and means in which the community fire council plan to educate their local residents in reference to wildland fires.
2. With the help of fire professionals, the community will complete an Infrastructure Risk Assessment within the jurisdiction of the fire plan. A risk assessment will contain the following information:
 - a. Risk: Potential and frequency for wildfire ignitions based on past history.
 - b. Hazard: Condition that may contribute to wildfires (fuel, slope, etc.).
 - c. Values: People, property, natural, and other potential wildfire losses.
 - d. Protection Capability: Ability to prepare for, mitigate, and suppress fire.

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- e. Structural Vulnerability: Vulnerability of structures during a wildfire.
3. With help from the local Emergency Services Support Officer, the CWPP will contain an Emergency Management Response Plan (EMRP) with a Fire Evacuation Strategy. This plan will provide detailed information on issues related to communications, ingress and egress, construction of roads suitable for use of emergency equipment, the design of loop road systems that allow for emergency evacuation in areas of rural development, monitoring of evacuation with some variety of a call-down system, maps of evacuation routes and safe areas, fire services, law enforcement, shelter and mass care, and a wide range of other information prepared by the emergency management committee of the local community fire council.
4. The CWPP will contain a Prioritized Fuel Reduction Strategy for creating defensible space inside the at-risk community boundaries. The plan must identify and prioritize areas for hazardous fuel reduction treatments and, where possible, recommend the types and methods of treatment that will protect the at-risk communities, including the essential infrastructure and, where necessary, the local watershed. Along with the possible recommendation of introducing fire-adaptive species into the ecosystem, the plan will include a wide variety of strategies for fuel reduction and sensible precautions against catastrophic wildfire.
5. Where necessary, the community will work with the Bureau of Land Management, the U.S. Forest Service, and the Utah Forestry, Fire and State Land fire experts to develop and implement a perimeter fuel break plan, in and around their community. This process is used to safeguard the watershed, forest health, and prevent home losses.
6. The CWPP will include a local “Fire Equipment and Infrastructure Evaluation”. The firefighting facilities, water supply, and infrastructure of the at-risk community will be evaluated, maintained, and updated where possible.
7. The CWPP addresses Regulatory Issues. Communities located in the unincorporated areas of the counties are subject to WUI building ordinances adopted by the counties. This requires any homes constructed in the community after January 2007 meet the new WUI fire building codes for fire protection, Rule 652-122. The rule applies only to unincorporated areas of the counties, municipal areas are not included at this time. The Rule also addresses minimum training and equipment standards for the fire departments that respond to the unincorporated areas. Incorporated cities are encouraged, but not required to, adopt this code.
8. Evaluate, Update, and Maintain the CWPP. After the plan has been approved the

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community fire council will continue to meet, at least on a quarterly basis, to evaluate the work accomplished and plan new projects and maintenance for the future.

2.18 ADOPTED COMMUNITY FIRE PLANS IN SOUTHWEST UTAH

Listed below, by county, are the completed community fire plans in Southwestern Utah. Each community plan was submitted prior to November 1, 2005, and all were approved by the Utah Division of Forestry, Fire and State Lands. Only a small review of each community fire plan has been listed here. Additional information on these adopted community fire plans can be obtained by contacting the Cedar City field office of Utah Forestry, Fires and State Lands. For information concerning how your community can participate in the community assistance program of the National Fire Plan, contact the UFFSL Cedar City office or visit the State of Utah website: www.utahfireinfo.gov

Beaver County

- Manderfield/Last Chance/Indian Creek
- Beaver Grove
- High-Low

Garfield County

- Panguitch Lake
- Boulder Town/Salt Gulch
- Mammoth Creek
- Ruby's Inn

Iron County

- Rainbow Meadows
- Brian Head
- Far West/Comstock
- Cedar Highlands
- Quichipa
- New Castle
- Old Irontown

Kane County

- Glendale
- Duck Creek
- Zion Ponderosa
- Zion View
- Bryce Woodlands

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Washington County

- New Harmony
- Shivwits Band of Paiutes Indian Tribe Reservation
(Note: not considered an active plan as this is a federal entity).
- Dammeron Valley
- Winchester Hills
- Leeds
- Gunlock
- Central, Brookside/Mountain Meadow
- Kolob Terrace
- Kolob M.I.A. Camp
- Pine Valley
- Diamond Valley
- Enterprise
- Veyo
- Apple Valley
- Hildale City

Chapter 3. Community Risk Assessment

3.1 COMMUNITY RISK ASSESSMENT

One of the core elements when creating the SURWPP is developing an understanding of the risk of potential losses during a wildfire. The Healthy Forests Restoration Act, the National Fire Plan, and the National Association of State Foresters all provide guidance on conducting a hazard and risk assessment for wildfire.

The Color Country Fuels Committee Risk Assessment Teams approached the Wildfire Risk Assessment with a comprehensive review of potential risk from the CARS list throughout the Southwest Utah region. These risk assessments have been reviewed and are presented in this section. Attention has been focused on the most current and up to date information and data for this report. Efforts of fire managers, fire employees, and trained subdivision member volunteers, along with the Color Country Fuels Committee, resulted in a standard methodology for wildfire risk assessment used for this report.

3.2 RISK ASSESSMENT OBJECTIVES

- Identify each of the Communities At Risk to wildfire within the Southwest Utah Wildland-Urban Interface.
- Develop and conduct a wildfire risk assessment of all Wildland-Urban Interface lands within Southwest Utah.
- Identify and prioritize hazardous fuels landscape treatment projects for all land in the Southwest Utah Region.

3.3 RISK ASSESSMENT METHODOLOGY

The SURWPP wildfire risk assessment is an analysis of the potential loss to life, property, and natural resources within Southwest Utah. The analysis takes into consideration a combination of factors defined below:

- Risk: The potential and frequency for wildfire ignitions (based on past occurrences).
- Hazard: The conditions that may contribute to wildfire (fuels, slope, aspect, vegetation, elevation and weather). The Risk Assessment Map takes these criteria into consideration.
- Values: Residential Property values and other infrastructure that may suffer losses in the advent of a wildfire. The Risk Assessment Valuation Tables are provided in Section 3.4.
- Protection Capacity: The ability to mitigate losses, prepare for, respond to and suppress wildland and structural fires. A complete Fire Department

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Capabilities profile has been conducted in Southwest Utah and is presented in Appendix B.

This risk assessment is based on an extensive literary review of many different methods developed over the years to evaluate wildfire and other natural hazards. The assessment is intended as a tool to illustrate the relative level of risk to life, property and other natural hazards within any area in the country. Emergency management and fire prevention projects are implemented through the SURWPP. The maps and priorities developed through the assessment will change, but they will always point to areas identified as having the highest relative ranking for risk and hazard.

The assessment considers several categories in determining the relative severity of fire risk. When considering how to prioritize treatment projects, other considerations include identifying where there are planned fuels reduction projects on federal, state, or county land. Categories in determining relative severity risk assessments include the following:

- Hazard - Fuels, Slope, Aspect, and Fire History
- Risk - Ignition Density
- Values - Residential (derived from 2006 county property tax assessment data provided by County Assessors in each of the five counties)
- Protection Capability - Geographic coverage of the fire department, facility information, fire equipment, manpower, training, certification(s), etc. (derived from Fire Department Capabilities Survey)

3.4 RISK ASSESSMENT LIMITATIONS

The risk assessment was based on the best available data combined with the Core Team's professional knowledge of field conditions in the project area. Also at the scale of the project, the available data does not provide resolutions necessary for detailed analysis. Some of the limitations include the following:

- Weather conditions, wind speed, and directions that were not considered in this risk assessment.
- Vegetation mapping layers had limitations. Available vegetation data depicting the distribution of various vegetation types were at scales of 1:100,000 or smaller. While this was adequate for characterizing vegetation over large areas, such as a county, the data is much less accurate when viewed for smaller focus areas. In addition, dead and downed fuels are not factored into the landscape maps.

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- While residential and infrastructure Community Values at Risk (CVAR) are included in the Risk Assessment, this assessment does not measure risk to watersheds, recreation areas, or other CVARs. These values should be taken into account when agency's are developing specific fuels reductions projects.

3.5 RISK ASSESSMENT RESIDENTIAL VALUES BY COUNTY

The risk assessment was based upon the June, 2006 County Property Tax data provided by each County Assessor's office. The values shown are based upon utilizing the *average market value* for residential structures in each WUI area. Residential structures were mapped by analyzing aerial photographs which were layered and utilized in digitizing those structures as a separate layer in the regional GIS. The GIS then quantified the number of units in each WUI area.

Table 3.1 - Beaver County Residential Structures and Values at Risk

WUI Area			Fire Risk								Residential Risk		
			Extreme		High		Medium		Low				
Name	Class	Total	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	# of units	Avg. Market Value	Estimated Total Value
Minersville	1	27,923	335	1.20%	15,282	54.73%	10,877	38.95%	1,429	5.12%	2	\$69,053	\$138,106
Adamsville/ Eagle Estates	2	27,941	399	1.43%	19,319	69.14%	6,856	24.54%	1,367	4.89%	12	\$89,567	\$1,074,804
Greenville/ North Creek	2	43,866	170	0.39%	23,422	53.39%	17,270	39.37%	3,004	6.85%	247	\$90,723	\$22,408,581
Baker Canyon/ Little Meadow	2	16,086	357	2.22%	11,789	73.29%	3,819	23.74%	121	0.75%	120	\$108,003	\$12,960,405
Elk Meadow/ Puffer Lake	2	14,358	41	0.29%	6,066	42.25%	8,003	55.74%	248	1.73%	141	\$71,318	\$9,913,202
High/Low	2	28,123	815	2.90%	14,441	51.35%	12,518	44.51%	349	1.24%	80	\$50,822	\$4,065,760
		158,297	2,117	1.30%	90,319	57.10%	59,343	37.50%	6,518	4.10%	602	\$83,988	\$50,560,858

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Table 3.2 - Garfield County Residential Structures and Values at Risk

WUI Area			Fire Risk								Residential Risk		
			Extreme		High		Medium		Low				
Name	Class	Total	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	# of units	Avg. Market Value	Estimated Total Value
Antimony	2	33,283	157	0.47%	19,808	59.51%	10,750	32.30%	2,568	7.72%	3	\$58,756	\$176,268
Blue Springs	2	12,652	479	3.79%	4,076	32.22%	6,599	52.16%	1,498	11.84%	224	\$51,161	\$11,460,064
Canonville/H enrieville/Bry ce	1	30,191	205	0.68%	17,122	56.71%	11,769	38.98%	1,095	3.63%	26	\$40,014	\$1,040,364
Panguitch	1	28,334	65	0.23%	9,667	34.12%	14,883	52.53%	3,719	13.13%	154	\$81,879	\$12,609,366
Hatch	1	21,083	601	2.85%	11,372	53.94%	8,202	38.90%	908	4.31%	12	\$86,783	\$1,041,396
Red Canyon	2	28,234	484	1.71%	15,937	56.45%	11,082	39.25%	731	2.59%	31	\$80,362	\$2,491,222
Mammoth Creek	2	16,319	742	4.55%	8,332	51.06%	6,097	37.36%	1,148	7.03%	46	\$100,175	\$4,608,050
Blue Springs	2	12,652	479	3.79%	4,076	32.22%	6,599	52.16%	1,498	11.84%	224	\$79,465	\$17,800,160
Boulder/Boul der Moutain/ Salt Gulch	2	120,530	2,020	1.68%	47,496	39.41%	60,850	50.49%	10,164	8.43%	4	\$68,973	\$275,892
		303,278	5,232	2.10%	137,886	45.50%	136,831	45.10%	23,329	7.70%	724	\$71,136	\$51,502,782

Table 3.3 - Iron County Residential Structures and Values at Risk

WUI Area			Fire Risk								Residential Risk		
			Extreme		High		Medium		Low				
Name	Class	Total	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	# of units	Avg. Market Value	Estimated Total Value
Kannaravile/ Chekshani/ Bumblebee Ridge	2	27,933	2,840	10.17%	18,299	65.51%	6,341	22.70%	453	1.62%	22	\$138,099	\$3,038,178
Quichapa	2	25,300	158	0.62%	14,125	55.83%	8,267	32.68%	2,750	10.87%	36	\$138,099	\$4,971,564
Cedar Valley Estates/ Iron Springs	2	51,550	3	0.01%	21,169	41.06%	27,146	52.66%	3,232	6.27%	148	\$138,099	\$20,438,652
Cedar City/ Cedar Highlands	1	54,934	1,585	2.89%	22,511	40.98%	19,413	35.34%	11,425	20.80%	529	\$138,099	\$73,054,371
Brian Head	2	15,499	1,014	6.54%	7,790	50.26%	6,598	42.57%	97	0.63%	36	\$83,050	\$2,989,800
Cedar V/Cedar B/ Ireland M/ Meadow L/ Rainbow M	2	28,045	64	0.23%	2,733	9.75%	22,602	80.59%	2,646	9.43%	54	\$83,050	\$4,484,700
Parowan/ Paragonah/ Summit/ Braffits Canyon/ Red Canyon	1	118,713	1,878	1.58%	61,603	51.89%	39,683	33.43%	15,549	13.10%	378	\$89,457	\$33,815,056
		321,974	7,542	2.30%	148,230	46.00%	130,050	40.40%	36,152	11.20%	1,203	\$118,696	\$142,792,321

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Table 3.4 - Kane County Residential Structures and Values at Risk

WUI Area			Fire Risk								Residential Risk		
			Extreme		High		Medium		Low				
Name	Class	Total	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	# of units	Avg. Market Value	Estimated Total Value
Johnson Canyon	2	15,343	55	0.36%	9,016	58.76%	6,162	40.16%	110	0.72%	56	\$85,051	\$4,762,856
Kanabl	1	30,131	498	1.65%	16,809	55.79%	11,544	38.31%	1,280	4.25%	25	\$85,051	\$2,126,275
Spencer B/ Spencer Cliffs/ Stout Canyon	2	33,387	3,644	10.91%	26,176	78.40%	3,513	10.52%	54	0.16%	37	\$85,051	\$3,146,887
Zion View	2	16,422	808	4.92%	9,502	57.86%	5,967	36.34%	145	0.88%	124	\$125,857	\$15,606,268
Duck Creek Area	2	16,133	295	1.83%	3,185	19.74%	10,912	67.64%	1,741	10.79%	19	\$96,987	\$1,842,753
Sylvin Canyon	2	25,994	2,165	8.33%	20,411	78.52%	3,338	12.84%	80	0.31%	10	\$96,987	\$969,870
		137,410	7,465	5.40%	85,099	61.90%	41,436	30.20%	3,410	2.50%	271	\$95,831	\$28,454,909

Table 3.5 - Washington County Residential Structures and Values at Risk

WUI Area			Fire Risk								Residential Risk		
			Extreme		High		Medium		Low				
Name	Class	Total	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	# of units	Avg. Market Value	Estimated Total Value
Blue Springs/ Kolob Terrace	2	22,052	411	1.86%	14,661	66.48%	6,125	27.78%	855	3.88%	151	\$94,892	\$14,328,692
Rockville/Zion	1	18,280	14	0.08%	8,991	49.18%	8,611	47.11%	664	3.63%	35	\$156,250	\$5,468,750
Black Ridge Ranches	2	11,098	955	8.61%	6,852	61.74%	3,208	28.91%	83	0.75%	66	\$222,756	\$14,701,896
Pintura	2	25,198	3,242	12.87%	17,038	67.62%	4,861	19.29%	57	0.23%	61	\$170,969	\$10,429,109
New Harmony	1	21,978	2,138	9.73%	12,280	55.87%	7,154	32.55%	406	1.85%	54	\$222,755	\$12,028,770
Pinto	2	36,582	80	0.22%	25,103	68.62%	11,261	30.78%	138	0.38%	34	\$94,892	\$3,226,328
Enterprise	1	32,053	213	0.66%	20,410	63.68%	8,181	25.52%	3,249	10.14%	65	\$94,892	\$6,167,980
Mountain Meadow	2	22,209	1,857	8.36%	14,516	65.36%	5,835	26.27%	1	0.00%	31	\$129,428	\$4,012,268
Brookside/ Pine Valley	2	50,436	2,762	5.48%	34,948	69.29%	11,751	23.30%	975	1.93%	365	\$204,323	\$74,577,895
Dammeron Valley/ Gunlock	2	59,606	2,015	3.38%	29,405	49.33%	27,948	46.89%	238	0.40%	363	216,951	\$78,753,502
St. George/ Winchester Hills	1	143,810	1,772	1.23%	40,672	28.28%	98,314	68.36%	3,052	2.12%	160	\$201,296	\$32,207,360
Shivwits/ Santa Clara	1	39,683	20	0.05%	8,370	21.09%	30,338	76.45%	955	2.41%	24	\$100,000	\$2,400,000
Washington/ Hurricane	1	80,031	45	0.06%	13,939	17.42%	61,931	77.38%	4,116	5.14%	34	\$94,892	\$3,226,328
		563,016	15,524	2.80%	247,185	43.90%	223,649	39.70%	14,789	2.60%	1,443	\$181,239	\$261,528,878

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3.6 RISK ASSESSMENT INFRASTRUCTURE VALUES BY COUNTY

The Five County Association of Government's Natural Hazards Mitigation Plan (NHMP) was formally approved by FEMA on February 22, 2005.

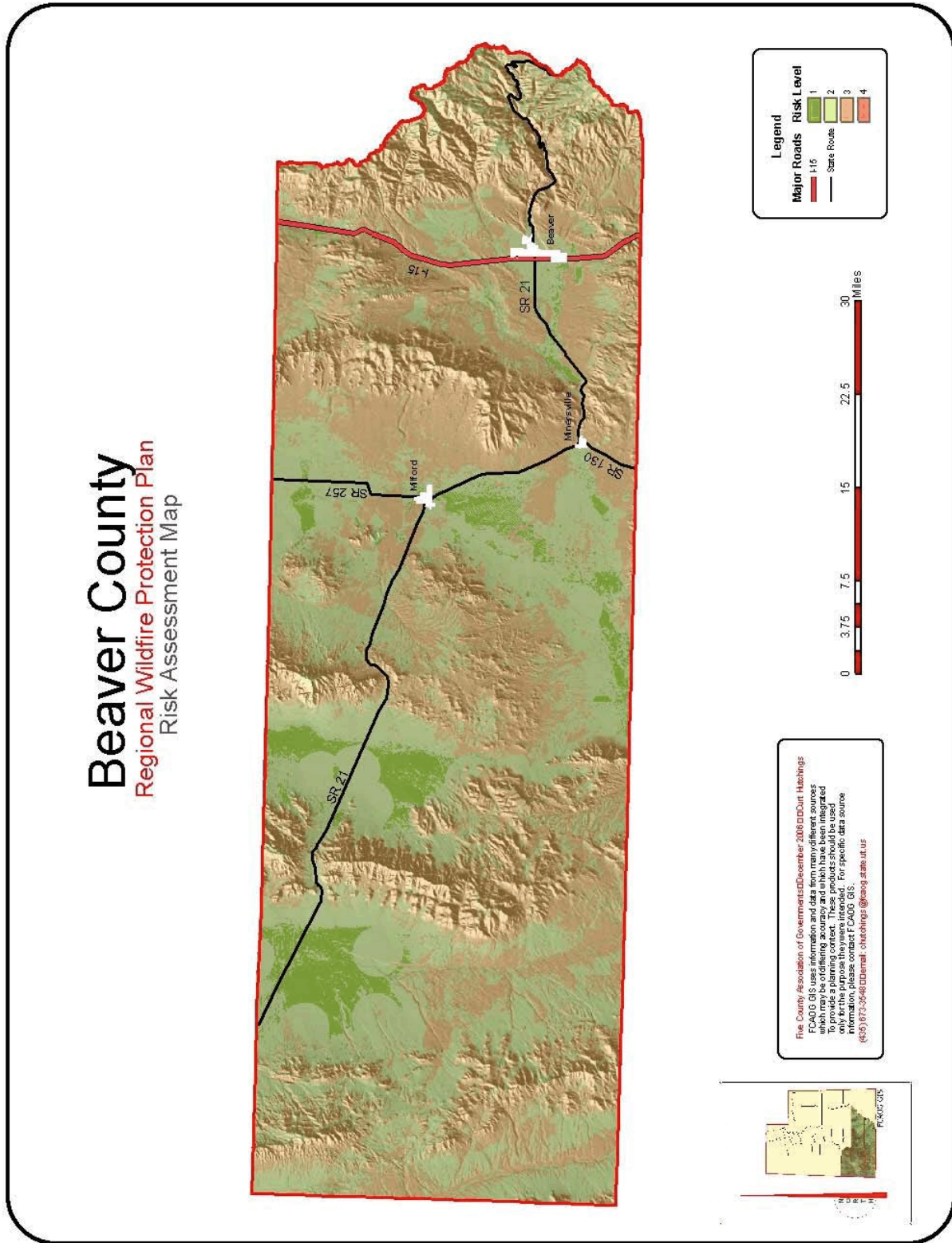
The NHMP identified over 122 miles of railroad, 423 miles of major roadways and 626 miles of utility powerlines in the five county region that are at risk from wildfire. Table 3.6 shows the miles for each of these categories, by county.

Location	Miles of Major Roadways	Miles of Railroad Track	Miles of Utility Powerlines
Beaver County	60	5	87
Garfield County	104	0	154
Iron County	110	117	180
Kane County	59	0	50
Washington County	80	0	155
Pauite Indian Lands	10	0	0
Region Totals	423	122	626

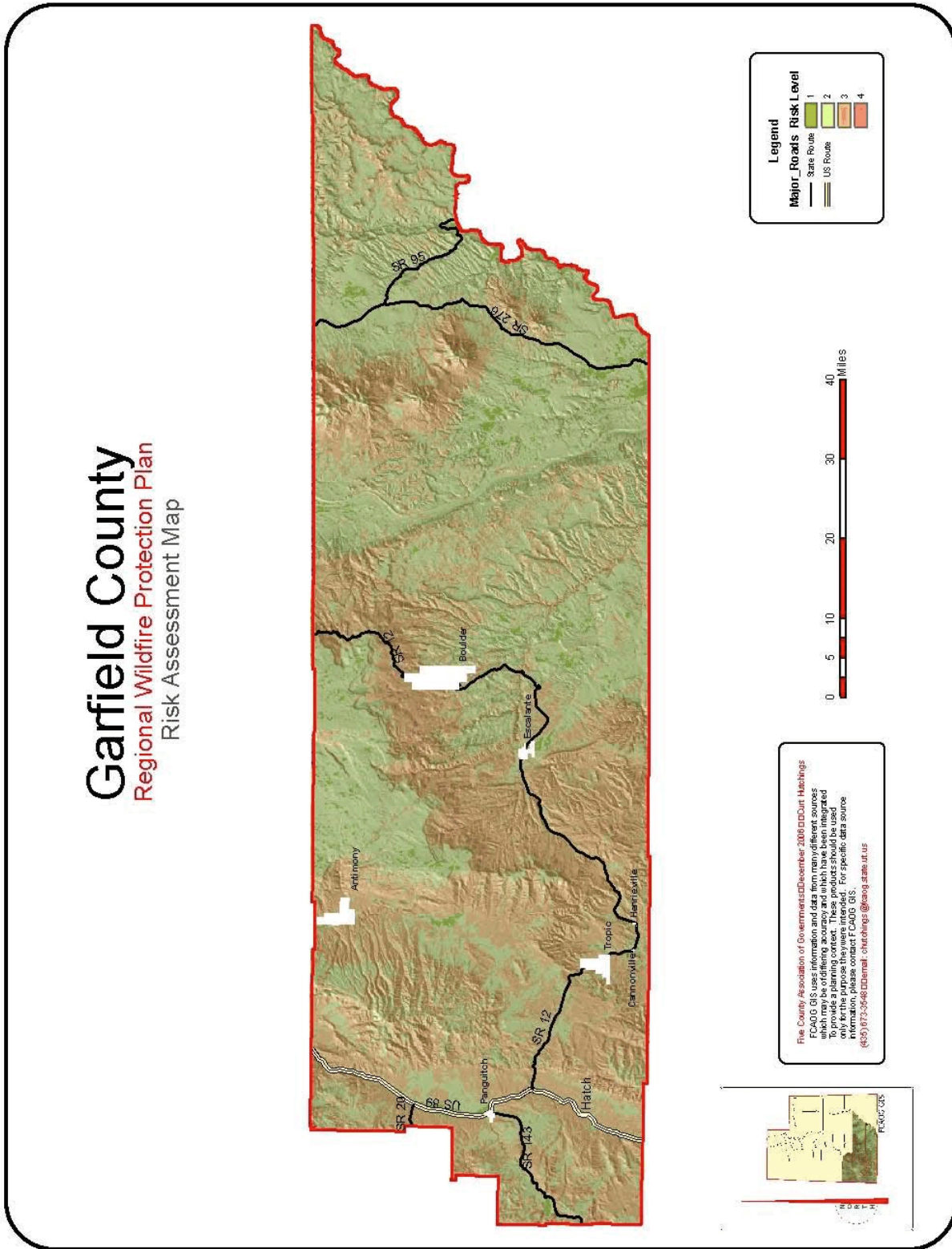
3.7 SOUTHWEST UTAH RISK ASSESSMENT MAPS

The Five County Association of Governments GIS, utilizing available data, developed a risk assessment map for each of the five southwest Utah counties which are presented on the following five pages. These maps identify the relative risk level of wildfire in each county based upon a scale of 1=Low Risk, 2=Moderate Risk, 3=High Risk and 4=Extreme Risk.

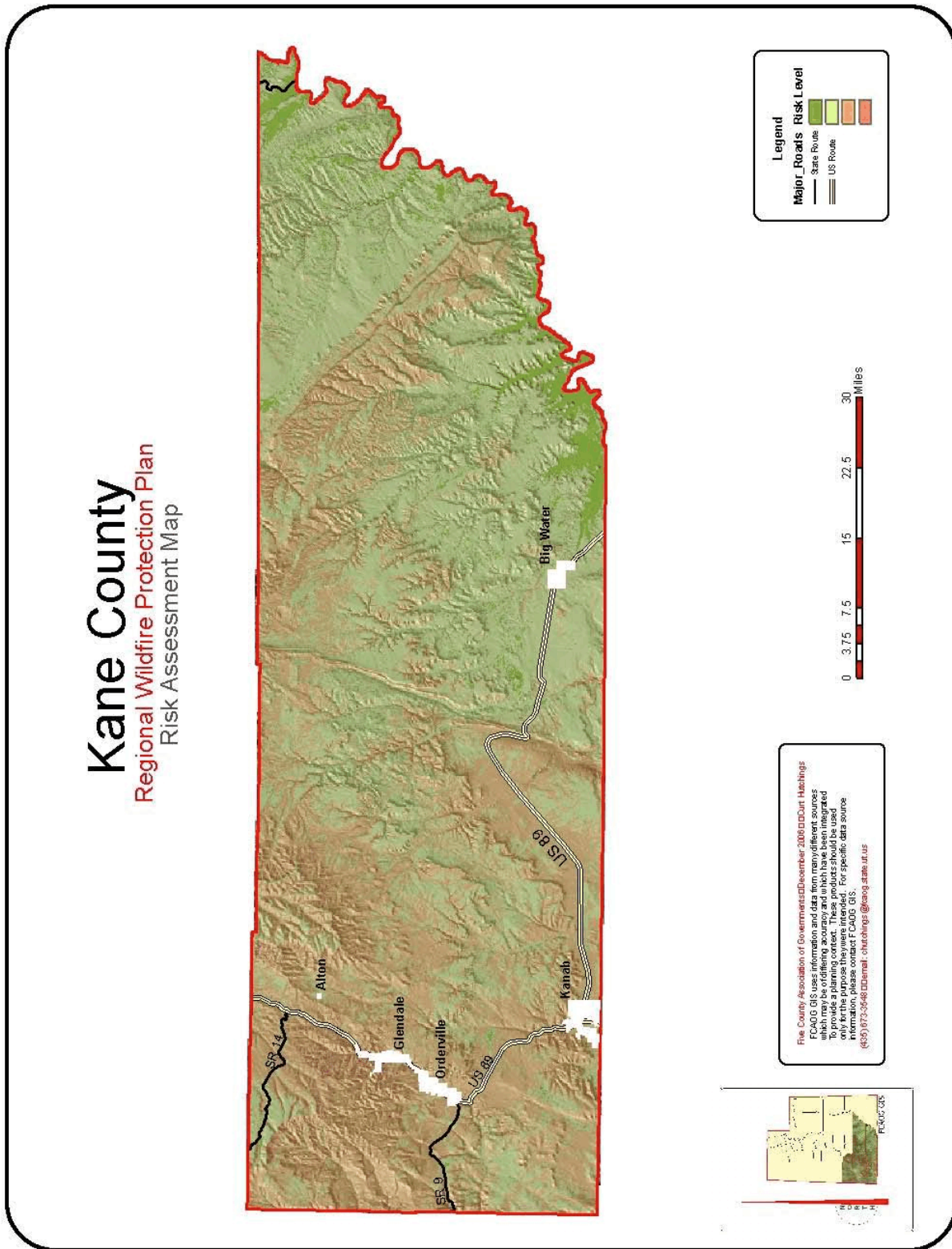
Map 3.1 - Beaver County Risk Assessment Map



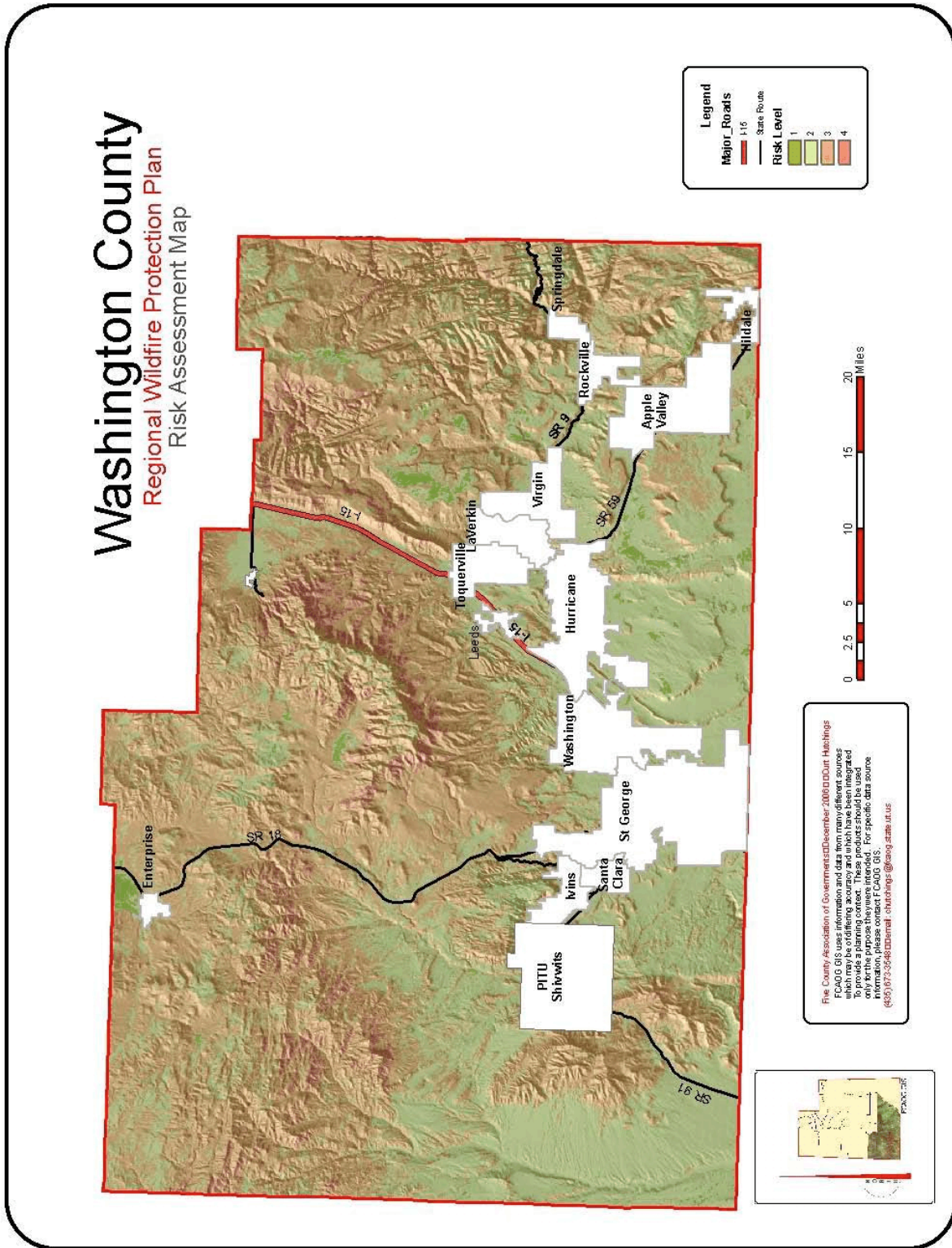
Map 3.2 - Garfield County Risk Assessment Map



Map 3.4 - Kane County Risk Assessment Map



Map 3.5 - Washington County Risk Assessment Map



Chapter 4. Regional Focus Area Recommendations

The two primary goals of this Regional Wildfire Protection Plan are to:

- 1) Provide general recommendations for the southwest Utah region;
- 2) Provide guidelines and direction for the preparation of county and local CWPPs.

Although county guidelines are included, specific recommendations for each community were not designed to be part of this process as the needs for each community will vary depending on local fuels, topography, organization, public knowledge of the issues, and the desire to address those issues.

4.1 FOCUS AREAS

The Color Country Interagency Fire Center Fuels Committee has identified the general location of ten “Focus Areas” within the southwest Utah region. These focus areas are identified in Table 4.1. The selection of these specific areas was based on the need for fuels reductions as understood by fuels specialists and fire wardens, risk levels in the Regional Wildfire Protection Plan risk assessment, values at risk in the area, firefighting concerns including access and evacuation routes, the presence of Communities At Risk (CARs), and local interest in the community documented by having a Community Wildfire protection Plan in place.

The complete list of Communities At Risk (CARs), by county, was presented in Chapter One. The list of CARs contains additional areas not focused on in this chapter. In addition, it is recommended that more detailed analysis should be accomplished on all of the CARs.

The Color Country Interagency Fire Center Fuels Committee has not prioritized these ten focus areas. The Committee determined that to do so would have the effect of minimizing the fact that every one of these areas is in need of treatment and all are of concern.

Section 4.2 contains descriptive information about the focus area boundaries and general description of each of the ten focus areas including vegetation, known values at risk, and firefighting/access concerns. Each focus area also includes a list of general goals resulting from activities and treatments for the area.

Goals common to all treatment areas include fuels reduction, public education, and increases in equipment and training available to firefighting personnel.

Goals that are generally applicable to all of the focus areas include, but are not limited to, the following:

- Protection of human life, firefighter and public safety as the highest priority.
- Public education and partnerships with citizens or community-centered approaches

Chapter 4. Regional Focus Area Recommendations

to manage fire risks and hazards in WUI areas located in the focus area, including effort aimed towards the implementation and maintenance of defensible space projects to reduce risk to homes and personal property.

- Protection of high value resources and watersheds through fuels reduction treatments as determined locally.
- Restoration and maintenance of ecosystems consistent with land uses and historic fire regimes. Restoration of vegetation to the appropriate Condition Classes and Fire Regimes.
- Maintenance and/or improvement of fire prevention and road/structure identification signage. Dissemination of fire restriction information through appropriate signage and/or visitor contacts when necessary.
- Improvement of wildland firefighting equipment, training and information for volunteer fire departments located in the focus area, including the improvement of GIS and road data.

There are five region-wide priorities that were determined by the Core Team to apply to all focus areas. These are:

1. Protect human life
2. Firefighter and public safety
3. Equipment access
4. Protection of infrastructure
5. Reduce cheatgrass occurrence after wildfire

Also presented are recommendations for potential treatments in each of the focus areas. These recommendations were developed by the Color Country Interagency Fire Center Fuels Committee.

Chapter 4. Regional Focus Area Recommendations

TABLE 4.1 - SOUTHWESTERN UTAH REGIONAL FOCUS AREAS			
Focus Area Name	Watershed Area	Community At Risk Name(s) Within Focus Area	Lead Agency
Central Dixie Deer	Upper Santa Clara River Watershed (HUC5)	Brookside/Central Mountain Meadows Pine Valley	U.S. Forest Service
New Harmony	Ash Creek Watershed (HUC5)	New Harmony/New Harmony Heights	Bureau of Land Management
Kolob Terrace	North Fork Virgin River (HUC5)	Kolob Terrace/Blue Springs	National Park Service
Duck Creek	Asay Creek Watershed (HUC5)	Duck Creek Area Ponderosa Estates Ponderosa Village	U.S. Forest Service
Ruby's/Bryce	Upper East Fork Sevier River Watershed (HUC5)	Ruby's Inn/Bryce Canyon/Pines/Foster	U.S. Forest Service
East Zion	North Virgin River Watershed (HUC5) [southeast portion]	East Zion Estates Little Ponderosa	State of Utah
Comstock/Farwest	Shurtz Creek-Quichapa Lake, Iron Springs Creek, Escalante Valley-Pinto Creek (HUC 5)	Newcastle Old Iron Town Far West/Comstock/Quichapah	Bureau of Land Management
Cedar/Parowan Front	Jack Rabbit Wash/Rush Lake Watershed, and Little Salt Lake Watershed (HUC5)	Cedar Highlands Cedar/Parowan Front Brian Head	U.S. Forest Service
Mammoth Creek	Mammoth Creek Watershed (HUC5)	Mammoth Creek Ireland Meadow Castle Valley Rainbow Meadow Meadow Lakes	U.S. Forest Service
Bryce Woodlands/ Sunset Cliffs	Pass Creek - Sevier River Watershed (HUC5)	Bryce Woodlands Long Valley/Canyon	Bureau of Land Management

4.2 FOCUS AREAS DESCRIPTIONS

The following list describes the ten Focus Areas presented in Table 4.1 in detail. The Color Country Interagency Fire Fuels Committee developed the descriptions for the ten focus areas, as well as the firefighting concerns and recommend potential treatment(s) for each focus area.

Chapter 4. Regional Focus Area Recommendations

Central/Dixie Deer:

Focus Area boundaries are generally defined as follows:

Upper Santa Clara River Watershed (HUC5) lands consist of mixed ownership, representing BLM, Forest, State and Private.

Communities at Risk in the Focus Area:

Brookside, Central, Dixie Deer, Pine Valley, Veyo

Focus Area Description and Vegetation:

This lower reaches within this watershed are composed of drought stressed and closed canopy pinyon-juniper, interior chaparral, live oak and sagebrush. Cheatgrass continues to increase and is the primary understory within the pinyon-juniper woodland and sagebrush/steppe communities. Mountain brush, ponderosa and mixed conifer are common in the upper reaches of the watershed.

Firefighting and Access Concerns:

Expanding cheatgrass increases the risk for fast moving fires, especially in dry, windy conditions. Many subdivisions have limited ingress/egress, especially the Pine Valley area, which accesses the Pine Valley Wilderness area.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$204,000.
- Watershed
- Wildlife resources
- Cultural resources
- Recreational resources

Potential Treatment Recommendations:

- Continue interagency fuel treatments that are adjacent to and within communities at risk. Such projects could include community fire plans, fuels reduction projects, and fuel breaks.
- Develop cheatgrass focus areas, to include fire tolerant vegetation and strategic fuel breaks to protect resources and communities at risk.

Chapter 4. Regional Focus Area Recommendations



Representative view of terrain and vegetation in much of the Central/Dixie Deer focus area. Note the homes in the wildland urban interface. Photo courtesy Color Country Interagency Fire Center.



View of a portion of the Dixie Deer community located in the Central/Dixie Deer focus area. Photo Courtesy Color Country Interagency Fire Center.

Chapter 4. Regional Focus Area Recommendations



Representative example of wildland urban interface concern in the Central/Dixie Deer Focus Area. Photo courtesy of Color Country Interagency Fire Center.

New Harmony:

Focus Area boundaries are generally defined as follows:

Ash Creek Watershed (HUC5), composed of State, Private, BLM and Forest Service lands.

Communities at Risk in the Focus Area:

Chekshani, Kannaraville, Black Ridge Ranches, New Harmony, New Harmony Heights, Pintura.

Focus Area Description and Vegetation:

Fuels are primarily composed of pinyon-juniper woodlands, chaparral, and grasslands interspersed with agricultural lands.

Firefighting and Access Concerns:

Strong diurnal winds along the Black Ridge, fueled by dense stands of pinyon-juniper, chaparral and oak along steeper slopes can increase rapid fire spread. Continual growth in urban interface areas increases human caused fire potential. Ingress/egress into developed subdivision is limited, with many individual properties having only a single dead-end road

Chapter 4. Regional Focus Area Recommendations

with little or no turnaround.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$222,755.
- Watershed
- Wildlife resources
- Cultural resources
- Recreational resources

Potential Treatment Recommendations:

- Continue ongoing mechanical fuels treatments and maintenance of existing fuel breaks through interagency fuels committee coordination.
- Work with new communities and volunteer fire departments to identify risks in WUI areas.
- Encourage landowner mitigation and defensible space work
- Increase fuels reduction along I-15 to decrease fire starts off the interstate. Such measures could include mowing and establishing fuel breaks/green stripping.



Representative example in the New Harmony focus area of treatment techniques to reduce fuel available for wildfires.
Photo courtesy Color Country Interagency Fire Center.

Chapter 4. Regional Focus Area Recommendations

Kolob Terrace:

Focus Area boundaries are generally defined as follows:

North Fork Virgin River (HUC5), generally consisting of Private, BLM and state lands.

Communities at Risk in the Focus Area:

Kolob Terrace

Blue Springs

Focus Area Description and Vegetation:

This area is composed of the northwestern portion of the North Fork Virgin River Watershed. Vegetation in the upper reaches of the watershed is composed primarily of mixed conifer, ponderosa pine, oak brush, chaparral, and decadent aspen. Much of the white fir within the mixed conifer vegetation type is dead or dying. Development within the focus area is increasing, with many smaller subdivisions being built within the general focus area boundary.

Firefighting and Access Concerns:

Most of the area consists of slopes greater than 20%. The steep slopes, combined with many different aspects, create extreme fire behavior and risk to firefighters. Distance to incorporated subdivisions is remote, with access from both the north and south over steep, winding roads. There are numerous narrow one-way roads into single residences. There are also several youth camps which are utilized heavily throughout the summer. Homes within this focus area are utilized almost entirely by part-year residences, many of which owners live out of state.

Community values at risk include, but are not limited to, the following:

- Zion National Park
- Residential Structures. The average market value of a residential structure in this focus area is approximately \$94,892.
- Watershed
- Wildlife resources
- Cultural resources
- Recreational resources

Chapter 4. Regional Focus Area Recommendations

Potential Treatment Recommendations:

- Reduce hazardous fuels within the mixed conifer and oak brush, especially on private lands
- Develop a community fire plan for the Kolob Terrace and Blue Springs area
- Continue ongoing mechanical fuels treatment project and maintenance in conjunction with the interagency fuels committee.
- Work with individual subdivisions/communities to identify risks in WUI areas.
- Encourage landowner mitigation and defensible space work
- Educate landowners regarding ecosystem health
- Utilize stand inventory assessments to determine total biomass on potential disposal methods for fuels on private lands.
- Coordinate with Zion National Park to use prescribed fire for ecosystem restoration projects adjacent to private lands.

Duck Creek:

Focus Area Boundary:

Asay Creek Watershed (HUC5), primarily composed of private, state and Forest Service lands.

Communities at Risk:

Duck Creek Area, Ponderosa Estates, Ponderosa Village, Swains Creek, Zion View, Strawberry Valley

Focus Area Description and Vegetation:

This area is composed primarily of mixed conifer and aspen. A recent spruce beetle outbreak has resulted in a huge mortality in the spruce vegetation component. There is a large component of heavy, downed ladder fuels. Highway 14 is a primary recreation corridor, with over 3 million annual visitors to area national parks.

Firefighting and Access Concern:

A primary concern is the potential for long-range spotting due to downed and standing dead fuels. Such fuels result in long duration fires, extensive fire crew needs, and long-term evacuation needs within communities. This may also result in long-term air quality impacts within south-central Utah airsheds, both from smoke and area emergency crews traveling

Chapter 4. Regional Focus Area Recommendations

on dirt roads. Heavy recreation traffic could also impede emergency response times.

Community and resource values at risk include, but are not limited to:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$96,987.
- Watershed
- Wildlife resources
- Cultural resources
- Recreational resources

Potential Treatment Recommendations:

- Interagency fuels projects, education and mitigation should continue throughout the focus area.
- Continued implementation of the Duck Creek Fuels Treatment Analysis will reduce fuel loads within the watershed.



Representative example of a residential structure located in the Duck Creek focus area. Note the lack of defensible space.
Photo courtesy Color Country Interagency Fire Center.

Chapter 4. Regional Focus Area Recommendations

Ruby's/Bryce:

Focus Area boundaries are generally defined as follows:

Upper East Fork Sevier River Watershed (HUC5), composed of private, state, Forest Service, BLM and National Park Service Lands. The primary concern within this focus area is located within the east-central portion of the watershed, located along Highway 12 and Highway 63 toward Bryce Canyon National Park.

Communities at Risk in the Focus Area:

Ruby's Inn, Bryce Canyon, Pines, Fosters

Focus Area Description and Vegetation:

This area is primarily composed of ponderosa pine, sagebrush and grasslands.

Firefighting and Access Concerns:

The Bryce Canyon area is classified as a Class 1 airshed. Firefighting and access concerns are related to heavy seasonal tourist traffic.

Community values at risk include, but are not limited to, the following:

- Ruby's Inn and Bryce Canyon National Park – a primary employer for Garfield County residents
- Residential Structures. The average market value of a residential structure in this focus area is approximately \$96,987.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

Potential Treatment Recommendations:

- Compliment fuels reduction work being done by the Park Service and Forest Service onto Private Lands.
- Prevent fires on private lands which may spread onto federal lands.

Chapter 4. Regional Focus Area Recommendations

East Zion:

Focus Area boundaries are generally defined as follows:

North Virgin River Watershed (HUC5). This focus area is located in the southeast portion of the North Virgin River Watershed and is composed of state, private, BLM, National Park Service, and Forest Service lands.

Communities at Risk in the Focus Area:

East Zion Estates, Little Ponderosa

Focus Area Description and Vegetation:

Vegetation is composed primarily of oakbrush, ponderosa pine and grasslands. It is bordered on the west by Zion National Park. This area is considered a Class 1 airshed. Growth continues with small subdivisions occurring throughout the area.

Firefighting and Access Concerns:

Distance to incorporated subdivisions and individual residences' is remote, with access off Highway 9 along dirt roads. There are narrow one-way roads into most residences. Brush limits visibility along roads and to individual structures. Access to this area, when wet, makes travel almost impossible.

Community values at risk include, but are not limited to, the following:

- Zion National Park
- Residential Structures. The average market value of a residential structure in this focus area is approximately \$125,857.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

Potential Treatment Recommendations:

- Increase ingress/egress into private property/subdivisions.
- Work through the interagency fuels committee to strategically place fuel breaks.
- Coordinate the work being done by private land owners with the work being done by the National Park Service and the Bureau of Land Management.

Chapter 4. Regional Focus Area Recommendations

- Complete demonstration Community Wildfire Protection Plan project on planned community within the Chamberlain Ranch Area.

Comstock/Far West:

Focus Area boundaries are generally defined as follows:

Shurtz Creek-Quichapa Lake, Iron Springs Creek, Escalante Valley-Pinto Creek (HUC 5). This focus area encompasses those areas along Highway 56, generally composed of private, Bureau of Land Management, Forest Service and state lands.

Communities at Risk in the Focus Area:

Newcastle, Old Iron Town, Far West/Comstock/ Quichapah

Focus Area Description and Vegetation:

Vegetation is comprised primarily of pinyon/juniper woodlands and sagebrush/steppe areas with little or no understory. The primarily travel corridor is along Highway 56.

Firefighting and Access Concerns:

One of the primary concerns in this focus area is the many side roads leading to individual residences that are not clearly marked. Additionally, many subdivisions and single residences have limited access with one-way, dead-end, ingress/egress. Potential for crown fire exists within the pinyon/juniper ecotype. Visibility is limited along some travel corridors due to heavy tall brush along roads.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$138,099.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

Potential Treatment Recommendations:

- Increase visibility and create a fuel break along the Pinto Road.
- Maintain existing chainings within the watershed.

Chapter 4. Regional Focus Area Recommendations

- Continue work on individual lot assessments, wildland urban interface education and defensible space within area communities at risk.
- Continue fuel breaks and fuels reduction work along Highway 56.



Representative example of residential structures located in the wildland urban interface area without defensible space. These structures are located in the Old Iron Town area which is within the Comstock/Farwest focus area. Photo courtesy of the Color Country Interagency Fire Center.

Cedar/Parowan Front:

Focus Area boundaries are generally defined as follows:

Jack Rabbit Wash/Rush Lake Watershed, and Little Salt Lake Watershed (HUC5). This area encompasses the east benches along the I-15 corridor, and is composed of state, private, Forest Service and BLM lands.

Communities at Risk in the Focus Area:

Cedar Highlands, Cedar/Parowan Front, Brian Head

Focus Area Description and Vegetation:

Vegetation in this area ranges from pinyon-juniper woodlands and sagebrush/steppe grasslands in the lower elevations, to mixed-conifer spruce-fir aspen in the upper elevations.

Chapter 4. Regional Focus Area Recommendations

Firefighting and Access Concerns:

Many of the residences within this focus area consist of permanent, year-long homeowners. Many are accessed only by narrow one-way roads. Steep slopes and dangerous topography increases the potential for extreme fire behavior. This area has high ATV use and is easily accessed from incorporated towns.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$89,457.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

Potential Treatment Recommendations:

- Continue to place strategic fuel breaks throughout the area.
- Encourage landowner mitigation and defensible space work.
- Implement Community Fire Plan for Parowan Front Area.



Representative example of a residential structure located within the Cedar/Parowan Front focus area. Need for adequate provision of defensible space around structures such as this is a concern of area fire management officials. Photo courtesy of Color Country Interagency Fire Center.

Chapter 4. Regional Focus Area Recommendations

Mammoth Creek:

Focus Area boundaries are generally defined as follows:

Mammoth Creek Watershed (HUC5), composed primarily of private and Forest Service Lands.

Communities at Risk in the Focus Area:

Mammoth Creek, Ireland Meadow, Castle Valley, Rainbow Meadow, Meadow Lakes

Focus Area Description and Vegetation:

Vegetation is composed primarily of ponderosa pine, mixed conifer and aspen. Area homeowners are mostly part-year residence.

Firefighting and Access Concerns:

This area has recently experienced a wide-spread spruce beetle outbreak. The high number of dead spruce increases fire severity, spotting and high fire intensity. Ingress/egress into residences and small subdivisions is limited by narrow one-way roads.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$100,175.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

Potential Treatment Recommendations:

- Continue to place strategic fuel breaks throughout the area.
- Encourage landowner mitigation and defensible space work.

Chapter 4. Regional Focus Area Recommendations



Representative example of a residential structure located within the Mammoth Creek focus area. The need for adequate provision of defensible space around structures such as this is a concern of area fire management officials. Photo courtesy of Color Country Interagency Fire Center.

Bryce Woodlands/Sunset Cliffs:

Focus Area boundaries are generally defined as follows:

Pass Creek - Sevier River Watershed (HUC5). Consisting of private, BLM and state lands. This area within Kane County is composed of the emerging interface area along the Long Valley, Highway 89 corridor.

Communities at Risk in the Focus Area:

Bryce Woodlands
Long Valley/Canyon

Focus Area Description and Vegetation:

This area is composed of pinyon/juniper woodlands, sagebrush grasslands, mixed conifer and Ponderosa Pine.

Firefighting and Access Concerns:

Seasonal recreational travel along the Highway 89 corridor may impede emergency response crews. Single residences have limited access, with one-way, dead-end

Chapter 4. Regional Focus Area Recommendations

ingress/egress. Potential for crown fire exists within the pinyon/juniper ecotype. There is greater response time from firefighters due to the proximity of established fire districts.

Community values at risk include, but are not limited to, the following:

- Residential Structures. The average market value of a residential structure in this focus area is approximately \$85,051.
- Watershed
- Wildlife resources
- Cultural resources
- Recreation

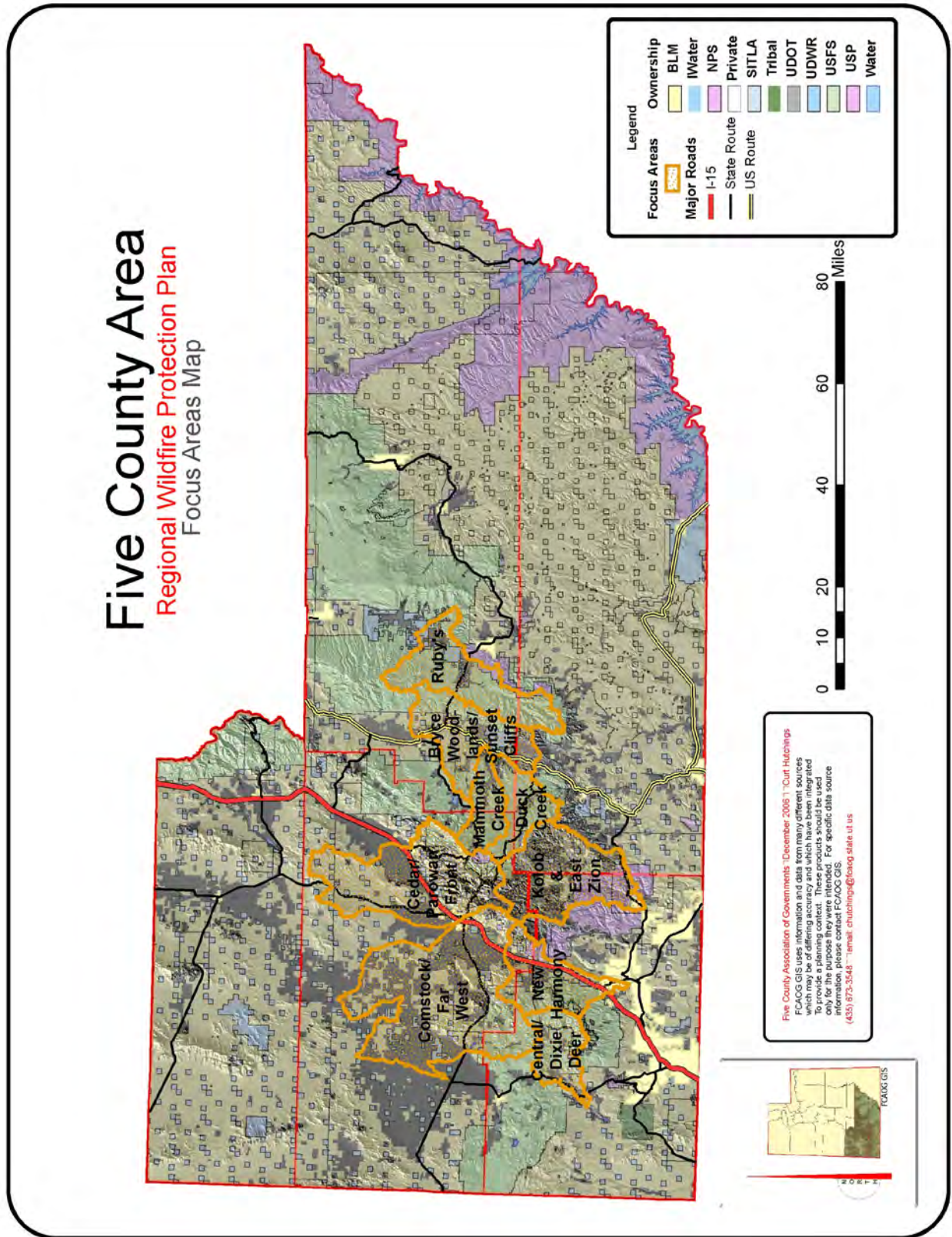
Potential Treatment Recommendations:

- Work to increase ingress/egress into establishing communities.
- Continue to work with federal agencies and the interagency fuels committee to complete landscape level pinyon/juniper treatments.
- Continue to place strategic fuel breaks throughout the area.
- Encourage landowner mitigation and defensible space work.

4.3 FOCUS AREAS LOCATIONS

Map 4.1 shows the general location of each of the ten focus areas in southwestern Utah described in Section 4.2.

Map 4.1 - Focus Areas Map



Chapter 5. Implementation & Monitoring Strategies

5.1 STEPS TO IMPLEMENT PLAN

Implementation and monitoring of this RWPP will be the responsibility of the Color Country Interagency Fuels Committee. Updates to the plan should occur annually or on an "as needed" basis as determined by the Fuels Committee.

Additionally, a specific project implementation plan will be developed for each of the ten focus areas that were described in detail in Chapter Four of this plan.

Specific NEPA-type plans should be developed for each of the ten focus areas that identify timeframes, goals, and measurable criteria.

Chapter 6. Summary of the Plan

6.1 SUMMARY OF THE PLAN

The Southwest Utah Regional Wildfire Protection Plan (SURWPP) was developed to essentially meet the general requirements of a CWPP as specified in HFRA. The Southwest Utah RWPP is one of five regional plans completed in the state of Utah and the primary goal of the plan is to assist Utah regions, counties, and communities, and government agencies in reducing the risk of catastrophic wildfire within the region.

The Southwestern Utah RWPP used a collaborative process involving federal agency and local government representatives to identify the highest risk areas in southwest Utah and to make recommendations of actions designed to reduce the risk to life and property due to catastrophic wildland fire, with focus specifically in the WUI areas containing state of Utah identified "communities at risk" (CARs).

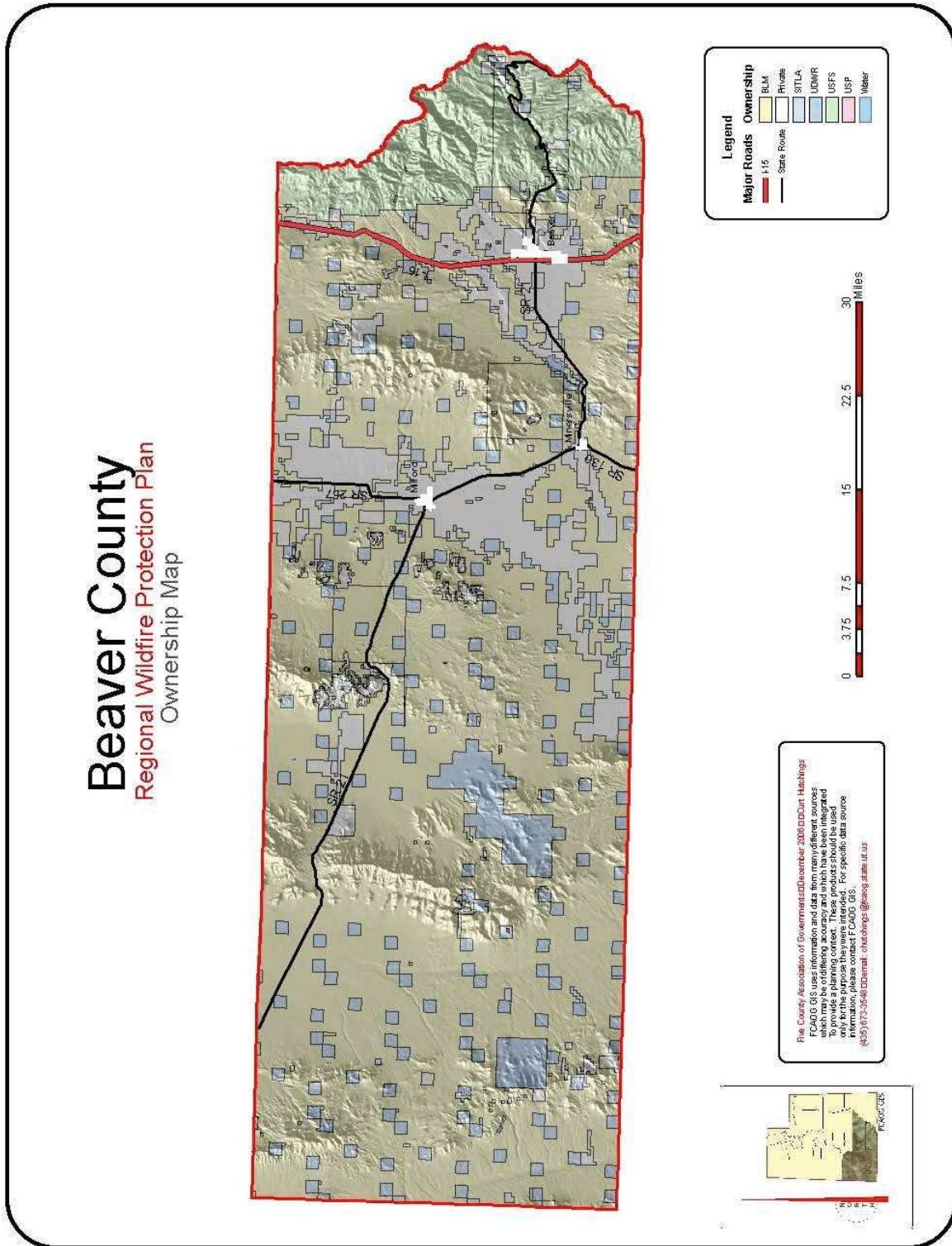
Federal agency and local government representatives established a core planning team to guide the development of the plan and process. The Core Team helped develop a regionally appropriate definition of the WUI area and established parameters of the base map. The team also provided data necessary to develop a community risk assessment that considered fuel hazards, risk of wildfire occurrence and location of communities at risk (as identified by the state of Utah).

A cooperative planning process was utilized during the development of this plan and should be encouraged to be continued as the identified priority projects are implemented. RWPP implementation and monitoring will be the responsibility of the Color Country Interagency Fuels Committee. The plan should be updated annually or as deemed necessary by the Fuels Committee.

Individual project implementation plans will be developed by the appropriate agencies for each of the ten focus areas described in Chapter Four, and will include specific timeframes, goals, and measurable criteria.

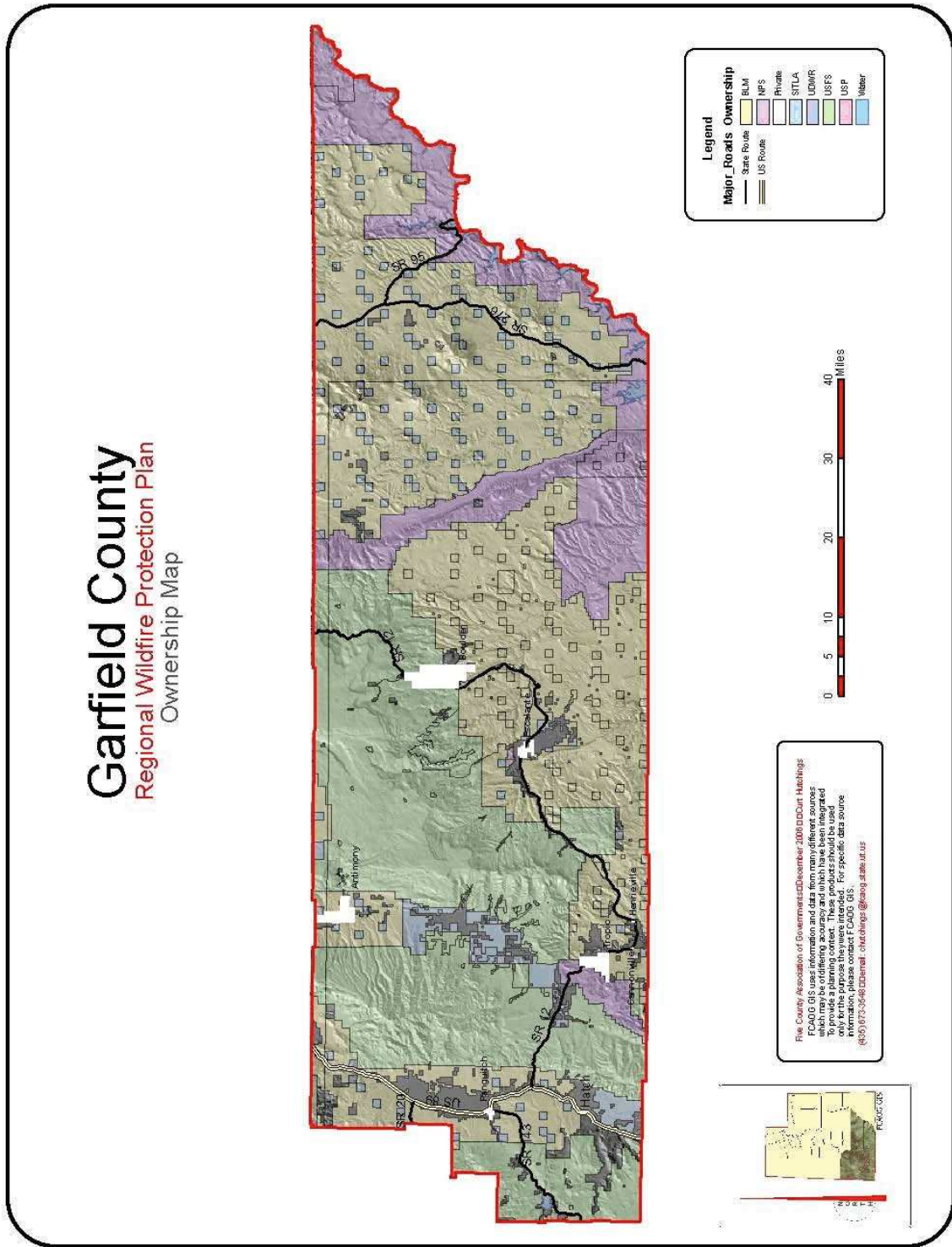
APPENDIX A - County Ownership Maps

Map A.1 - Beaver County Ownership Map

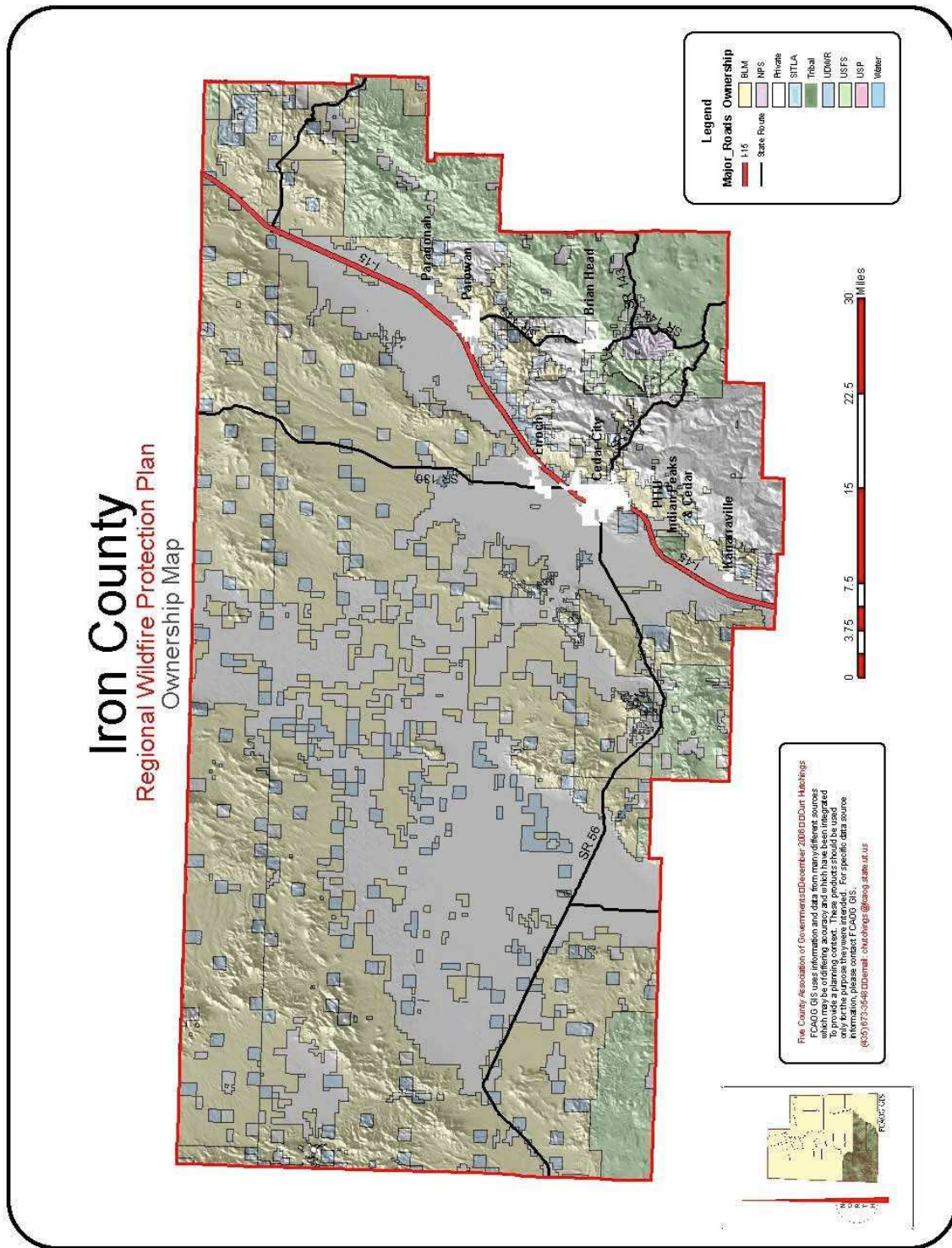


APPENDIX A - County Ownership Maps

Map A.2 - Garfield County Ownership Map

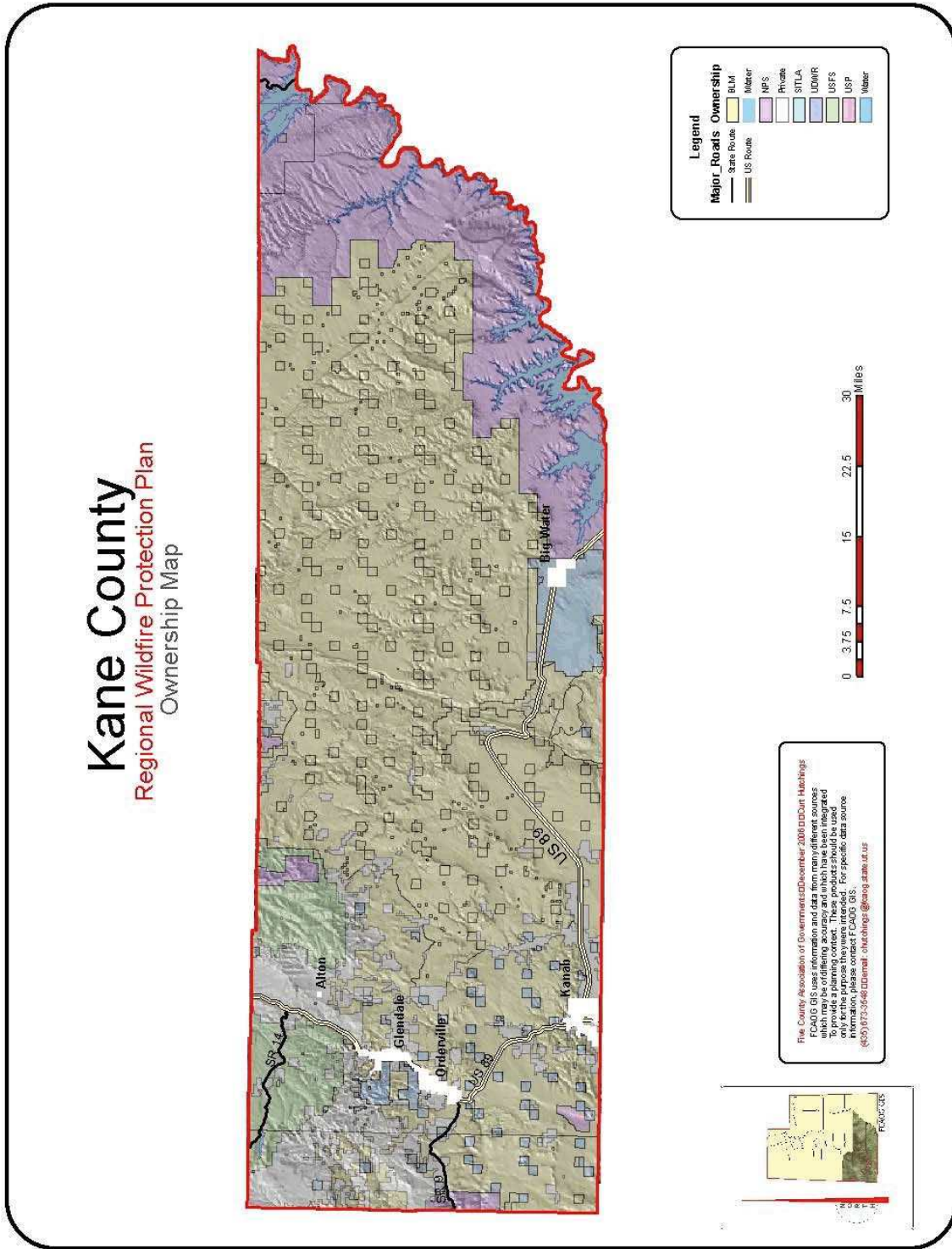


Map A.3 - Iron County Ownership Map

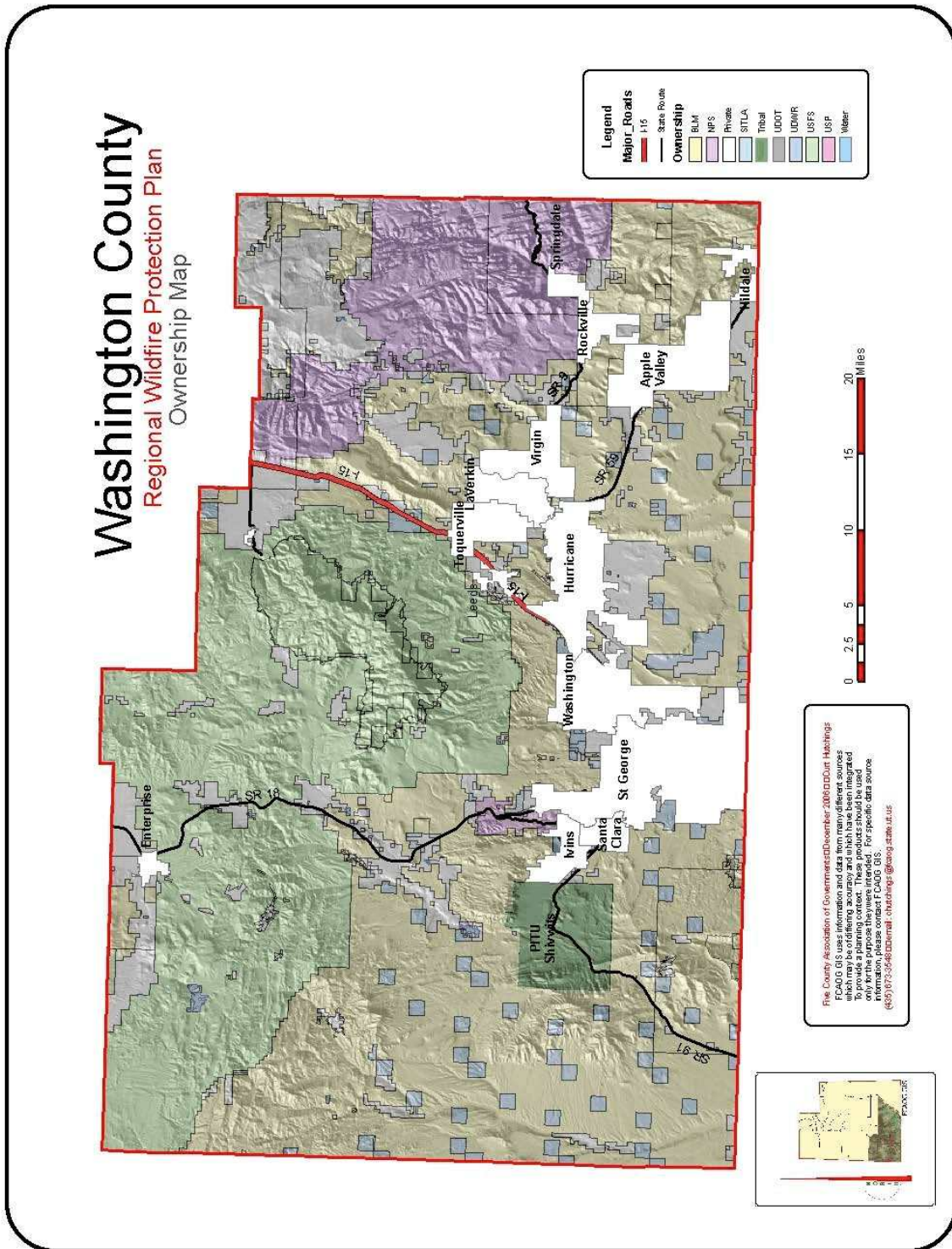


APPENDIX A - County Ownership Maps

Map A.4 - Kane County Ownership Map



Map A.5 - Washington County Ownership Map



APPENDIX B - Fire Department Capabilities

The fire department capabilities data that follows was collected from various sources, including in-person and telephone interviews conducted by a plan development consultant during in 2006. This information should only be considered as a relative snapshot in time reflecting the general preparedness of local fire fighting entities. Thus, what is listed, may or may not reflect the current situation as of the Plan adoption date. Because of the difficulty in obtaining and updating data, no warranty of completeness is made. You are advised to contact the specific entity you are concerned about to confirm the current details and state of readiness of that fire department.

BEAVER COUNTY

Beaver County Fire District #1

Extent of Service Area: Running North to South, from the top of the Mineral Mountains running West to the Nevada State line.

Fire Station Address: Firehouse (1) 1110 No. Main Street, Beaver, Utah, 84713
Firehouse (2) 50 No. 100 East, Beaver, Utah, 84713

Name of Chief / Phone: George Humphries (590-4713 or 438-5870)

Square footage of Station: (1) 3750 sq. ft. (2) 3200 sq. ft.

Number of Truck Bays: (1) 6 bays – 14 trucks (2) 3 bays – 6 trucks

Training Facilities: Station Number 1

I.S.O. Rating: 6 - 9

Number paid Firefighters: 0

Number "Red Carded" Firefighters: 10

Truck #1: (4) Type 1 - Engines

Truck #2: (2) Type 6 - Engines

Truck #3: (2) Type 3 - Engines

Truck #4: (3) Watertenders (1- 2700 gal, 1 – 5000 gal, 1 – 1200 gal)

Truck #5: (1) Rescue Truck

Truck #6: (1) HAZMAT Operations Trailer W/2 Chase Rigs

Truck #7: (1) Mobile Incident Command Bus

Miscellaneous notes/comments: None

Beaver County Fire District #2

Extent of Service Area: From middle of Minersville Reservoir/ West of lake.
(West of the Pinto Mountain range.)

Fire Station address: (1) Milford, 241 S. Main, Milford, Ut. 84751
(2) Minersville, 60 W. Main, Minersville, Ut 84752
(3) Circle 4 Station, 1350 W. Thermal Rd. Milford, Utah, 84751

Name of Chief / Phone: Les Whitney (387-2107 ext. 104)

Square footage of Station: Undetermined

Number of Truck Bays: (1) 6 bays (2) 4 bays (3) 2 bays

Training Facilities: In Milford Station

I.S.O. Rating: 5

Number paid Firefighters: 0 / 18 Volunteers

Number "Red Carded" Firefighters: 0

Truck #1: (4) Engines

Truck #2: (4) Wildland Trucks

Truck #3: (2) Brush Trucks

Truck #4: (2) 6X6 Tenders

Miscellaneous notes / comments: Future plans include an addition to the Minersville (#2) Fire Dept.

APPENDIX B - Fire Department Capabilities

GARFIELD COUNTY

Boulder Fire Department

Extent of Service Area: Boulder Town, The Draw, Salt Creek
Fire Station address: 140 East Main, Boulder, Utah 48716 (next to the Post Office)
Name of Chief, phone: Katie Austin (335-7379)
Square footage of Station: 3960 sq. ft.
Number of Truck Bays: 4
Training Facilities: Inside Firehouse
I.S.O. Rating: 6 - if within five miles of Firehouse, 9 - outside
Number paid Firefighters: 14
Number "Red Carded" Firefighters: Some taking training
Truck #1: (1) Type 1 - Structure Truck
Truck #2: (1) Type 2 - Wildland
Truck #3: (1) Type 3 - Wildland (deuce and a half)
Truck #4: (1) Ambulance
Miscellaneous notes/comments: None

Hatch Fire Department

Extent of Service Area: Highway 12 to county line
Fire Station address: 100 North 150 East, Hatch, Utah, 84735
Name of Chief, phone: Kelly Dix phone: 735-4364
Square footage of Station: 90 X 90 8100 sq. ft.
Number of Truck Bays: 2 double bays
Training Facilities: large area in fire house with classroom
I.S.O. Rating: 9
Number paid Firefighters: 0 / 8 Volunteers
Number "Red Carded" Firefighters: 2
Truck #1: (1) Type 1 - Engine
Truck #2: (1) Type 6 - Brush Truck
Truck #3: (1) Type 3 - Brush Truck
Miscellaneous notes/comments: None

Mammoth Creek Fire Department

Extent of Service Area: Mammoth I,II,III, Big Pine, and all surrounding subdivisions
Fire Station address: Big Pines Subdivision
Name of Chief/Phone: John Miller (682-2717), Station (682-2700)
Square footage of Station: 60 X 80 - 4800 sq.ft.
Number of Truck Bays: 3
Training Facilities: Inside Firehouse and at Duck Creek
I.S.O. Rating: 10
Number paid Firefighters: 0 / 12 Volunteers
Number "Red Carded" Firefighters: 5

APPENDIX B - Fire Department Capabilities

Truck #1: (2) - Type 1 Engine
Truck #2: (2) - Type 6 Brush Trucks
Miscellaneous notes/comments: None

Panguitch Fire Department

Extent of Service Area: Ten miles in every direction of Panguitch
Fire Station address: 50 East 100 North, Panguitch, Utah 84759
Name of Chief/Phone: David Dobbs (676-3419)
Square footage of Station: 90 X 100 - 9000 sq. ft.
Number of Truck Bays: 2 Doubles
Training Facilities: Inside fire house
I.S.O. Rating: 6
Number paid Firefighters: 0 / 15 Volunteers
Number "Red Carded" Firefighters: 3
Truck #1: (2) Type 1 Engines
Truck #2: (1) Type 3 Engines
Truck #3: (2) Type 2 Tender
Truck #4: (1) Watetender 1200 gallon
Miscellaneous notes/comments: None

Panguitch Lake Fire Department

Extent of Service Area: Panguitch Lake community area only
Fire Station address: Rustic Lodge, 186 West Shore Road, Panguitch, Utah 84759
Name of Chief, phone: Brandon Smith (676-2627)
Square footage of Station: no station
Number of Truck Bays: no bays
Training Facilities: none
I.S.O. Rating: 8
Number paid Firefighters: 0 / 5 Volunteers
Number "Red Carded" Firefighters: 0
Truck #1: (1) TFEPP Brush Truck
Miscellaneous notes/comments: The Panguitch Lake home owners have approached the US Forest Service to donate forest ground for a Firehouse.

Tropic Fire Department

Extent of Service Area: All the Pines, Rubies Inn, Henryville, Cannonville
Fire Station address: 210 West 100 North, Tropic, Utah 84776
Name of Chief, phone: Ron Harris phone: 679-8834 Station: 679-8696
Square footage of Station: 100 X 100 - 10,000 sq. ft.
Number of Truck Bays: 3
Training Facilities: Large space inside fire Firehouse
Number paid Firefighters: 0 / 16 Volunteers
Number "Red Carded" Firefighters: 5
Truck #1: (2) Type1 Engines

APPENDIX B - Fire Department Capabilities

Truck #2: (1) Type 6 Brush Truck
Truck #3: (1) water tender 1200 gallon
Miscellaneous notes/comments: None

IRON COUNTY

Beryl Fire Department

Extent of Service Area: Beaver County Line, Nevada State Line, Washington
County Line, Town of New Castle
Fire Station address: 1466 West 2450 North, Beryl, Utah, 84714
Name of Chief, phone: Nyal Bosshardt
Square footage of Station: 2100 Sq. ft.
Number of Truck Bays: 5
Training Facilities: At Firehouse
I.S.O. Rating: 9 - within five miles of station
Number paid Firefighters: 0 / 12 regular Volunteers
Number "Red Carded" Firefighters: 6
Truck #1: (2) Structure Trucks
Truck #2: (2) Wildland Trucks -1500 gallon
Truck #3: (2) Brush Trucks (One-ton) 300 gallon & 400 gallon
Truck #4: (3) Water tenders w/ 3500 gallon tanks
Miscellaneous notes/comments: Beryl Fire Department oversees three Fire Trucks at the
Vince Rice residence in Modena.

Beryl Fire Department - Modena

Extent of Service Area: From Beryl and Beryl Junction West to State Line
Fire Station address: Vince Rice residence, Modena, Utah, 84753
Phone 439-5212
Name of Chief/Phone: Nyal Bosshardt
Square footage of Station: no station, vehicles parked outside
Number of Truck Bays: none
Training Facilities: none
I.S.O. Rating: 9
Number paid : 0 / 2 Volunteers
Number "Red Carded" firefighters: 0
Truck #1: (1) 5000 gallon structure truck
Truck #2: (1) 6 X 6 duce and one half FEPP 1000 gallon truck
Truck #3: (1) older Ford F350 with 500 gallon tank and pump
Miscellaneous notes/comments: These truck are under the control of the Beryl Fire
Department but are parked in Modena at the Vince Rice
residence.

APPENDIX B - Fire Department Capabilities

Brian Head Fire Department

Extent of Service Area: Brian Head Town and Resort, Navajo Ridge,
Steamboat Springs, Crystal Mountain
Fire Station address: 535 South Brian Head Blvd, Brian Head, Utah 84719
Name of Chief, phone: Chief Gary Bullock (cell 990-1001)
Brian Head Town Hall phone: 677-2029
Square footage of Station: 5000 sq. ft.
Number of Truck Bays: 3 Double Bays
Training Facilities: Inside firehouse and adjoining rooms in city offices
I.S.O. Rating: 9
Number paid Firefighters: 5 – Full- time Fire & Public Safety Captains.
11 Volunteers = 16 total Firemen.
Number “Red Carded” Firefighters: 14
Truck #1: (2) Structure trucks with w-wheel drive wildland capability
Truck #2: one 1250 gpm – 500 gallons, one 800 gpm 400 gallons
Truck #3: (2) Type 6 - Brush Trucks
Truck #4: (1) Ambulance
Miscellaneous notes/comments: None

Cedar City Fire Department

Extent of Service Area: 1500 sq. miles. Milepost 68 to 42 north to south.
East and west to county lines.
Fire Station address: (1) 129 North 800 West, Cedar City,Utah 84720
(2) 2599 Commerce, Cedar City, Utah 84720
Name of Chief/ Phone: Paul Irons I.S.O.
Rating: 4
Number paid firefighters: 4 paid, 35 active Volunteers
Number “Red Carded” firefighters: 18
Truck #1: (4) Engines
Truck #2: (1) Ladder Truck
Truck #3: (5) Type 6 Trucks
Truck #4: (2) Watertenders (1 – 2500 gallon, 1 - 4000 gallon)
Truck #5: (1) Heavy Rescue Truck
Truck #6: (1) Light Rescue Truck
Miscellaneous notes/comments: Planned 6500 sq. ft. addition to # 1. Planned West Station
firehouse #3, 6500 sq. ft. on 1600 N. Lund Hyw

Hamblin Valley Fire Department

Extent of Service Area:Hamblin Valley extending along Hamblin Valley Rd.
Fire Station address: Hack Horner Home, Hamblin Valley, Utah
Name of Chief, phone: Wayne Peterson 439-5374, 439 - 5300
Square footage of Station: Inside caretaker Jack Horner’s personal garage
Number of Truck Bays: 0
Training Facilities: Training with Newcastle Department at NC Firehouse

APPENDIX B - Fire Department Capabilities

I.S.O. Rating: 10

Number paid Firefighters: 0 / 3 volunteers

Number "Red Carded" Firefighters: 0

Truck #1: (1) Type 6 - Brush Truck

Miscellaneous notes/comments: Hamblin Valley FD is under the direction of Chief Wayne Peterson and Iron County Fire Warden Ryan Riddle. The engine is located at the private home of Hamblin Valley resident Jack Horner who has training and acts as the fire equipment caretaker.

Kanarrville Fire Department

Extent of Service Area: Kanarrville town and surroundings

Fire Station address: 100 South 108 East, Kanarrville, Utah 84743

Name of Chief, phone: Hesse Hirschi phone 865-1866

Square footage of Station: 40 X 58 2320 sq. ft.

Number of Truck Bays: 3

Training Facilities: Inside firehouse

I.S.O. Rating: 6

Number paid firefighters: 0 / 11 volunteers Number "Red Carded" firefighters: 0

Truck #1: 2 - engines

Truck #2: 1 - wildland truck

Truck #3: 1 - ¾ ton Dodge brush truck

Miscellaneous notes/comments: The Kanarrville Fire Department owns several trucks that may be put back in service if needed in the future.

Newcastle Fire Department

Extent of Service Area: Pinto on south, Bench road to county line on south, MP 28 to Antelope

Springs Road on north, MP 4 to 42 east and west on Highway 56

Fire Station address: 75 West Highway 56, Newcastle, Utah 84756

Name of Chief, phone: Wayne Peterson phone 439-5374, 439-5300

Square footage of Station: 35 X 100 3500 sq. ft.

Number of Truck Bays: 4 plus office and classroom

Training Facilities: Firehouse

I.S.O. Rating: Newcastle Town = 6, five miles from firehouse = 9

Number paid firefighters: 0 / 12 volunteers on roster

Number "Red Carded" firefighters: 10

Truck #1: (1) Type 1 Engine 1750gpm - 750 gallon tank

Truck #2: (1) Type 3 Engine 400 gpm - 400 gallon tank

Truck #3: (1) Type 6 Engine 250 gallon brush truck

Truck #4: (1) Type 6 Rescue 250 gallon tank

Truck #5: (1) Deuce and ½ 150 gpm - 1200 gallon tank

Truck #6: All trucks have water extending (foam) capabilities

Miscellaneous notes/comments: Newcastle Fire Dept. is searching for a Water tender

APPENDIX B - Fire Department Capabilities

Paragonah Fire Department

Extent of Service Area: I-15 MP 80 – 100, Parowan to county line
Fire Station address: 88 West Center, Paragonah, Utah 84760
Name of Chief, phone: Royce Barton home(477-3420), cell (559-3430)
Square footage of Station: 20 X 50 1000 sq. ft. plus new addition
Number of Truck Bays: 3
Training Facilities: Inside Firehouse
I.S.O. Rating: 7
Number paid: 0 / 15 Volunteers
Number "Red Carded" Firefighters: 10
Truck #1: (1) New 2006 Central States 1250 gpm 1000 gallon number
Truck #2: (1) Structure Pumper
Truck #3: (1) FMC 2000 gpm 1000 engine
Truck #4: (2) Type 6 Brush Truck w/ utility rescue bed
Truck #5: (1) Wildland Brush Truck
Truck #6: (1) 2500 gallon Watertender
Miscellaneous notes/comments: Breaking ground for new addition to fire house. A 30' X 60' building being added to the Paragonah Fire Department.

Parowan Fire Department

Extent of Service Area: Kane Springs Rd. to county line on west, I-15 MM 69 to 80 north and south, SR30 to Summit Canyon on east
Fire Station address: 280 West 200 South, Parowan, Utah 84761
Name of Chief, phone: Albert Orton (477-3641)
Square footage of Station: 100 X 50 5000 sq. ft.
Number of Truck Bays: 5
Training Facilities: In Firehouse
I.S.O. Rating: 6 ½
Number paid Firefighters: 0 / 25 Volunteers
Number "Red Carded" Firefighters: 13
Truck #1: (3) Engines
Truck #2: (4) Type 5 and 6 Brush Trucks
Miscellaneous notes/comments: None

KANE COUNTY

Alton Fire Department

Extent of Service Area: Town of Alton
Fire Station address: 60 South Main, Alton, Utah 84710
Name of Chief / Phone: Stacey (684-2635) Ken Johnson (691-0747)
Square footage of Station: 840 sq. ft.
Number of Truck Bays: 2
Training Facilities: Inside firehouse

APPENDIX B - Fire Department Capabilities

I.S.O. Rating: unrated

Number paid Firefighters: 0 / 2 Volunteers

Number "Red Carded" Firefighters: 0

Truck #1: (1) Type 2 - Engines

Truck #2: (2) Type 6 - Engines

Truck #3: (1) Watertender (under construction)

Miscellaneous notes/comments: Alton Firehouse due for remodel summer of 2007

Big Water Fire Department

Extent of Service Area: Big Water

Fire Station address: 15 Aaron Burr, Big Water, Utah 84741

Name of Chief, phone: John Althedir (675-9160)

Square footage of Station: 2400 sq. ft.

Number of Truck Bays: 2 (new station under construction)

Training Facilities: Inside firehouse

I.S.O. Rating: 9

Number paid Firefighters: 0 / 10 volunteers

Number "Red Carded" Firefighters: 2

Truck #1: (1) Type 1 - Engine

Truck #2: (1) Type 6 - Engine

Truck #3: (1) Watertender 800 gallons

Miscellaneous notes/comments: A new firehouse is under construction in Big Water which will be an addition to the current one.

Church Wells Fire Department

Extent of Service Area: Church Wells area

Fire Station address: Church Wells, Utah 84742

Name of Chief, phone: Currently no Chief

Square footage of Station: 30 X 40 - 1200 Sq. ft.

Number of Truck Bays: 2

Training Facilities: in Firehouse

I.S.O. Rating: Unrated

Number paid Firefighters: 0 / 4 Volunteers

Number "Red Carded" Firefighters: 2

Truck #1: (1) Type 2 - Structure Truck

Truck #2: (1) Type 6 - Brush Truck

Miscellaneous notes/comments: None

Glendale Town Fire Department

Extent of Service Area: Mount Carmel on South to Alton on North

Fire Station address: 50 South 100 East, Glendale, Utah 84730

Name of Chief / Phone: Sherman Cox (private 648-2019)

Square footage of Station: 3600 sq. ft.

Number of Truck Bays: 2 Doubles

APPENDIX B - Fire Department Capabilities

Training Facilities: Inside Firehouse
Number paid Firefighters: 0 / 5 Volunteers
Number "Red Carded" Firefighters: 0 - 3 Volunteers ready for pack test
Truck #1: (1) Structure engine
Truck #2: (1) Deuce and one half FEPP Brush Truck
Miscellaneous notes/comments: None

Cedar Mountain Fire Protection District Fire Dept.

Extent of Service Area: Cedar Mountain Fire Protection District
Fire Station address: 10 Mammoth Creek Road, Duck Creek Village 84762
Name of Chief, phone: Ken Johnson - cell (691-0747), Station(682-3225)
Square footage of Station: 40 X 80 3200 sq. ft.
Number of Truck Bays: 3 w/ foyer, office, large meeting room
Training Facilities: Inside Firehouse
I.S.O. Rating: Swains Creek - 5 Duck Creek Village - 9
Number paid firefighters: 1 full time, 2 part-time/ 20 volunteers
Number "Red Carded" firefighters: 9
Truck #1: (2) Structure Engines one 1000 gallon, one 500 gallon
Truck #2: (1) Type 4 Windland, 750 gallon 1 - type 5 wildland 375 gallon
Truck #3: (1) Type 3 Windland 600 gallon 1 - 40k portable generator
Truck #4: (3) Type 3 Pumpertenders 1000 gallon each
Truck #5: (1) Rescue Truck 180 gallons, (1) Chase Truck
Truck #6: (2) First Response & Medic Trucks (1) Engine Rescue Truck
Miscellaneous notes/comments: 2 double bay addition next year to firehouse

Cedar Mountain Fire Protection District Sub-Station - Zion View

Extent of Service Area: Zion View
Fire Station address: Zion View
Name of Chief, phone: Ken Johnson, cell (691-0747)
Square footage of Station: 29 X 49 1160 sq. ft.
Number of Truck Bays: 3
Training Facilities: Inside forestation or a Duck Creek (Mammoth)
I.S.O. Rating: 10
Number paid Firefighters: 0 / 2 Volunteers
Number "Red Carded" Firefighters: 0
Truck #1: (1) Type 3 Wildland 600 gallon
Truck #2: (1) Type 2 Windland 6 X 6 - 750 gallon (deuce and one half)
Truck #3: RMTEXT
Miscellaneous notes/comments: None

Kanab Fire Department

Extent of Service Area: MP 79 to State Line and wherever needed
Fire Station address: 601 South 100 East, Kanab, Utah 84741

APPENDIX B - Fire Department Capabilities

Name of Chief / Phone: Alan Aldridge (644-2718)
Square footage of Station: 600 sq. ft.
Number of Truck Bays: 4 Double Bays / 8 doors
Training Facilities: Inside Firehouse
I.S.O. Rating: 6
Number paid Firefighters: 1 half-time/ 15 (Volunteer Firemen Association)
Number "Red Carded" Firefighters: 2 (both Federal Firefighters)
Truck #1: (2) Type 1 - Engines
Truck #2: (1) Type 2 - Engines
Truck #3: (2) Type 6 - Engines
Truck #4: (1) Type 5 - Engines
Truck #5: (1) Type 7 - Rescue Truck
Miscellaneous notes/comments: None

Orderville Fire Department

Extent of Service Area: Mt. Carmel to Kanab MP 82 - 88
Fire Station address: 415 East State Street, Orderville, Utah 84758
Name of Chief, phone: Earl Levanger (689-0425)
Square footage of Station: 28 X 40 1130 sq. ft.
Number of Truck Bays: 4
Training Facilities: Inside firehouse
I.S.O. Rating: 9
Number of paid Firefighters: 0 / 5 volunteers
Number "Red Carded" Firefighters: 2
Truck #1: (1) Type 4 Engine
Truck #2: (2) Type 2 Engine
Truck #3: (1) Support Truck
Truck #4: (1) Ambulance
Miscellaneous notes/comments: None

WASHINGTON COUNTY

Brookside Fire Department

Extent of Service Area: Northwest Special Services District
Fire Station address: Brookside, Utah, 84782
Name of Chief, phone: Captain Dan Tanasy (574-35360)
Square footage of Station: 40 X 20 800 sq. ft.
Number of Truck Bays: 3
Training Facilities: Inside station or at Central Fire Department
I.S.O. Rating: 9
Number paid firefighters: 0 / 6 Volunteers
Number "Red Carded" Firefighters: 0
Truck #1: (1) Engine

APPENDIX B - Fire Department Capabilities

Truck #2: (1) Brush Truck
Truck #3: (1) Tender
Miscellaneous notes/comments: None

Central Fire Department

Extent of Service Area: Northwest Special Services District
Fire Station address: P.O. Box 121, 411 North Main, Central, Utah 84722
Name of Chief, phone: Bill Becker / Captain (574-3183 or 632-4743)
Square footage of Station: 3200 Sq. ft.
Number of Truck Bays: 4 plus meeting room
Training Facilities: Inside firehouse
I.S.O. Rating: 7 - 9
Number paid Firefighters: 0 / 10 – 12 Volunteers
Number “Red Carded” Firefighters: 3
Truck #1: (2) Engines
Truck #2: (1) Brush Truck
Truck #3: (1) Water tender
Miscellaneous notes/comments: None

Enterprise Fire Department

Extent of Service Area: Under Mutual Aid Agreement all of Washington
County and norther sections of Iron County
Fire Station address: 246 East 200 South, Enterprise, Utah 84725
Name of Chief, phone: Wayne Hunt, work 878-2221, home 878-2770
Cell 231-9016
Square footage of Station: 30 X 80 2400 sq. ft.
Number of Truck Bays: 4 single, additional ambulance added to 1 bay
Training Facilities: Classroom and office inside firehouse
I.S.O. Rating: 6
Number paid firefighters: 1 / 15 structure volunteers, 5 red card wildland
only – 5 of structure volunteers are recorded
Number “Red Carded” firefighters: 10
Truck #1: 2 - type 1 structure engines w/ 500 gallon tanks
Truck #2: 2 - type 4 tactical tender engines 1000 tanks
Truck #3: 2 - type 6 engines w/ 250 gallon tanks
Truck #4: 1 - ambulance
Miscellaneous notes/comments: Under cooperative agreement with Utah Forestry, Fire &
State Lands, EFD purchasing new type 6 engine next year

Gunlock Fire Department

Extent of Service Area: Northwest Special Services District
Fire Station address: P.O. Box 121, 411 North Main, Gunlock, Utah 84733

APPENDIX B - Fire Department Capabilities

Name of Chief, phone: Mike Joyner (574-4894)
Square footage of Station: 20 X 20 400 sq. ft.
Number of Truck Bays: 1
Training Facilities: Gunlock Fire House and in Central
I.S.O. Rating: 10
Number paid firefighters: 0 / 4 volunteers
Number "Red Carded" Fire Fighters: 1
Truck #1: (1) Pumper Engine
Truck #2: (1) BrushTruck
Miscellaneous notes/comments:

Harmony Valley Fire Department

Extent of Service Area: I-15 MM 36 – 42. Mutual Aid First Responders
MM 44 to Chekshoni development
Fire Station address: 1 - 133 East Center, New Harmony, Utah 84757
2 -POBox 650, 1388 S. Old Hyw 91, New Harmony
Name of Chief/ Phone: Dick Holland (865-1672)
Square footage of Station: 1 - 2000 sq. ft.
2 - 64 X 100 6400 sq. ft.
Number of Truck Bays: (1) 2 bays with kitchen, office, and classroom
(2) 3 double stack bays w/classroom, lobby, male and female bath
and showers
Training Facilities: classrooms in both fire stations
I.S.O. Rating: 7 if structure is within 200 feet of a fire hydrant
Number paid Firefighters: 0 / 22 Volunteers on roster
Number "Red Carded" firefighters: 7
Truck #1: 4 - class I engines
Truck #2: 1 - new 2006 brush truck
Truck #3: 2 - rescue squads w/ brush truck capability
Truck #4: 1 - quad 4-wheeler fully decked for fire
Truck #5: 1 - fire trailer
Truck #6: 1 - 2200 gallon tender with pump and hoses
Miscellaneous notes/comments: 5 new 3 story homes ladder truck next

Hildale City

Extent of Service Area: Hildale city limits, will respond further of necessary
Fire Station address: 350 E. Newel Avenue, Hildale, Utah, 84780
Name of Chief, phone: Joseph I. Barlow, Jr. 874-2753
Square footage of Station: 1540
Number of Truck Bays: 3
Training Facilities: Upstairs training facility
I.S.O. Rating: 3
Number paid Firefighters: 0
Number "Red Carded" Firefighters: 41
Truck #1: (1) HME – 1750 gpm pump, 2500 gallon tank

APPENDIX B - Fire Department Capabilities

Truck #2: (1) 5000 gallon water tender w/1000 gpm pump

Truck #3: (2) Type 1 Engines

Truck #4: (3) Type 6 Engines

Miscellaneous notes/comments: Depending upon manpower available at the station at any given time, the Hildale/Colorado City Fire Department will respond to fires past Apple Valley.

Hurricane City Fire Department

Extent of Service Area: Apple Valley & Zions on East, Washington on West

Fire Station address: 3 Main Street, Hurricane, Utah 84737 (next to Police Station)

Name of Chief / Phone: Ed Campbell (Fire Station 635-9562, City Office 635-2811)

Square footage of Station: (1) 8 Bays - 8 Doors

(2) 4 Double Bays

(3) 3 Double Bays

Number of Truck Bays: See above

Training Facilities: Firehouse (1)

I.S.O. Rating: 5

Number paid Firefighters: 0 / 34 Volunteers

Number "Red Carded" Firefighters: 11

Truck #1: (4) Type 1 - Structure Engines

Truck #2: (3) Type 3 - Wildland Engines

Truck #3: (3) Type 6 - Wildland Engines

Truck #4: (1) Rescue Truck

Truck #5: (2) Ambulance

Miscellaneous notes/comments:

Leeds Fire Department

Extent of Service Area: Leeds Area Special Service District (LASSD.)

Will extend further under Mutual Aid agreement.

Fire Station address: 730 North Main, Leeds, Utah 84746

Name of Chief, phone: Steve Lewis 879-2220, cell 467-2911. Fire station (Full-time chief) office 879-2881. Leeds City Offices 879-2447

Square footage of Station: 68 X 50 3400 sq ft

Number of Truck Bays: 3 double bays plus classroom

Training Facilities: Classroom inside firehouse

I.S.O. Rating: 5

Number paid Firefighters: 1 full time / 18 volunteers

Number "Red Carded" Firefighters: 10 red carded, 13 certified EMT's

Truck #1: (2) Type 2 Structure Engines

Truck #2: (2) Type 6 Brush Engines

Truck #3: (2) Ambulance

Miscellaneous notes/comments: 3 Volunteer Firemen are certified HAZMAT Operations, remainder are Firefighter 1 trained and certified.

APPENDIX B - Fire Department Capabilities

Pine Valley Fire Department

Extent of Service Area: All Pinto geographical area and all Pine Valley geographical area. EMS 1st responders also to Central, Brookside, & Mountain Meadows

Fire Station address: 680 East Main St. Pine Valley, Utah 84781

Name of Chief, phone: Steve Robinson home (574-3755), cell (668-3050) Station (574-2126)

Square footage of Station: 120 X 80 9600 sq. ft.

Number of Truck Bays: 3 singles plus classroom, office, and showers

Training Facilities: Inside firehouse

I.S.O. Rating: 6

Number paid Firefighters: 1 part-time / 18 volunteers

Number "Red Carded" Firefighters: 0 / 9 classroom trained no pack tests

Truck #1: (1) Type 1 Engine - 2006 International w/ compressed full foam, 500 gallon tank.

Truck #2: (1) Type 1 Engine - American LeFrance with 500 gallon tank

Truck #3: (2) Type 6 Brush Trucks w/ 250 gallon tanks

Miscellaneous notes/comments: None

Santa Clara Fire Department

Extent of Service Area: Shivwits on West, St. George on North.

Fire Station address: (1) 2827 Rachel Drive, Santa Clara, Utah 84765
(2) 2365 No, Circle Drive, Santa Clara, Utah 84765

Name of Chief/Phone: Robert Hansen (673-6712)

Square footage of Station: (1) 6000 sq. ft., Classroom, 2 Offices
(2) 2000 sq. ft.

Number of Truck Bays: (1) 6 Bays and 6 Doors
(2) 2 Bays

Training Facilities: Firehouse (1)

I.S.O. Rating: 6

Number paid Firefighters: 2 / 32 Volunteers

Number "Red Carded" Firefighters: 5

Truck #1: (2) Type 1 Structure Engines

Truck #2: (2) Type 4 Wildland Engines

Truck #3: (1) Type 6 Brush Truck

Truck #4: (1) Rescue Truck

Miscellaneous notes/comments: None

Smithsonian Fire Department of Apple Valley

Extent of Service Area: Little Creek to Hurricane

Fire Station address: 6802 Meadowland Drive, Apple Valley, Utah 84737

Name of Chief, phone: Louis Ford (467-1044)

Square footage of Station: 60 X 88 4899 sq. ft.

Number of Truck Bays: 3 double bays

APPENDIX B - Fire Department Capabilities

Training Facilities: Inside the firehouse
I.S.O. Rating: 6
Number paid Firefighters: 0 / 14 Volunteers
Number "Red Carded" Firefighters: 6
Truck #1: (1) Engine
Truck #2: (3) Brush Trucks
Truck #3: (1) Rescue Vehicle
Truck #4: (1) Watertender
Miscellaneous notes/comments: None

Springdale - Rockville Fire Department

Extent of Service Area: Special Service District that covers both Springdale and Rockville
Fire Station address: 118 Lion Blvd, Springdale, Utah 84767
Name of Chief / phone: Jim Hansen (722-3434)
Square footage of Station: 2400 sq. ft.
Number of Truck Bays: (4) Drive through with 4 doors
Training Facilities: Inside Firehouse
I.S.O. Rating: 7
Number paid Firefighters: 1 / 12 Volunteers (6 active)
Number "Red Carded" Firefighters: 0
Truck #1: (2) Type 1 - Structure Engines
Truck #2: (1) Type 4 - Wildland Engine
Truck #3: (1) Ambulance
Miscellaneous notes/comments: None

St. George Fire Department

Extent of Service Area: From Leeds on the North to Ivins on the South
Fire Station address: (1) 51 South 100 East, St. George, Utah 84770
(7) 1912 West 1800 North, St. George 84770
Name of Chief, phone: Robert Stoker (cell 435-703-0921)
Square footage of Station: There are 7 Fire Stations in St. George. (1) & (7) are manned by Full-time Firemen, # 2, 3, 4, 5, 6, are Satellite Volunteer.
Number of Truck Bays: Minimum two or more bays in each station.
Station (2)(6) have no Type 6 engines.
Training Facilities: (1) Firehouse
I.S.O. Rating: St. George City = 4
Number paid Firefighters: 19 Full-time Firemen / 76 Active Volunteers
Number "Red Carded" Firefighters: 6 - 10
Truck #1: (7) Type 1 - Structure Engines
Truck #2: (2) Reserve Type 1 - Structure Engines
Truck #3: (5) Type 6- Brush Trucks
Truck #4: (1) Ladder Truck
Miscellaneous notes/comments: St. George Fire Department has the only trained and certified HAZMAT Team in the 5-County area.

APPENDIX B - Fire Department Capabilities

Veyo Fire Department

Extent of Service Area: Northwest Special Services District

Fire Station address: 59 East Center, Veyo, Utah 84782

Name of Chief, phone: District Chief Mike Johnson (home) 574-2441, (work) 673-1764 ext.574
Captain Chris Larsen 574-2341

Square footage of Station: 4000 sq. ft.

Number of Truck Bays: (1) Double Bay (2) 20ft. Bay

Training Facilities: Inside Firehouse

I.S.O. Rating: 7 - 8

Number paid Firefighters: 0 / 15 Volunteers

Number "Red Carded" Firefighters: 6

Truck #1: (1) Type I - Engine

Truck #2: (1) Type 6 - Brush Truck

Truck #3: (1) Type 1 - Water tender

Miscellaneous notes/comments: None

Virgin Valley Fire Department

Extent of Service Area: 16 sq. miles of Virgin Valley and upon request; all
over Washington County

Fire Station address: Wilcox Lane & Kolob Terrace Road, Virgin Valley, 84779

Name of Chief, phone: Chief Gary (635-7524)

Square footage of Station: Converted old pump station 25 X 30 = 750 sq.ft.

Number of Truck Bays: 2 inside w/ electric heater, 2 outside

Training Facilities:

NI.S.O. Rating: 9

Number paid Firefighters: 0 / 12 volunteers

Number "Red Carded" Firefighters: 5

Truck #1: (2) Type 6 Structure Engine 1 – 750 gallon, 1 - 500 gallon

Truck #2: (1) Type 6 Brush Truck - 125 gallon

Truck #3: (1) 1000 gallon Watertender:

Miscellaneous notes/comments: None

Washington City Fire Department

Extent of Service Area: Washington City

Main Firehouse address (1): 250 W. Buena Vista Rd. Washington City, 84738

Fire Station address (2): 875 E. Washington Blvd. Washington City, 84720

Name of Chief / Phone: Chuck Pandy (673-4788)

Square footage of Station: (1) 10,000 sq. ft,
(2) 5,000 sq. ft.

Number of Truck Bays: (1) 3 Double Bays w/ drive through, office,
classroom, and sleeping rooms
(2) 3 Bay's, 1 Drive-through

Training Facilities: Inside Firehouse (1)

APPENDIX B - Fire Department Capabilities

I.S.O. Rating: 6 - 9

Number paid Firefighters: 3 / 39 Volunteers on roaster

Number "Red Carded" Firefighters: 20

Truck #1: (3) Type 1 - Structure Trucks

Truck #2: (3) Type 6 - Brush Trucks

Truck #3: (2) Rescue Vehicles

Miscellaneous notes/comments: Two new Full-time Firemen will be hired in April 2007.

Winchester Hills Fire Department

Extent of Service Area: Winchester Hills community to Diamond Valley

Fire Station address: 1090 West 5830 North, Winchester Hills, Utah 84770

Name of Chief, phone: Don Ruesch (673-5946)

Square footage of Station: 40 X 60 2400 sq ft

Number of Truck Bays: 2

Training Facilities: Inside firehouse

I.S.O. Rating: 6

Number paid Firefighters: 0 / 9 volunteers

Number "Red Carded" Firefighters: 2

Truck #1: (1) Type 1 Structure Engine

Truck #2: (1) Type 6 Brush Engine

Miscellaneous notes/comments: None

APPENDIX C - Cheatgrass Invasion & Greenstripping

Cheatgrass: A Weedy Annual on Great Basin Rangelands

by Scott Tobler

Introduction

Cheatgrass is pre-evolved to fill niches created by humans through concentrations of their domesticated livestock (Young and Allen, 1997). This adaptability of cheatgrass allows it to out compete native vegetation in the semi-arid areas of the U.S. where it has been introduced. In the Great Basin, cheatgrass readily invaded overgrazed and deteriorated rangelands reaching its present distribution by the 1930's. Once established, cheatgrass changes the fire frequency by creating an easily ignited, continuous fine fuel between native shrub and bunchgrass species. The forage quality of cheatgrass is low, and as it forms a monoculture there can be irreversible damage to the native plant and animal communities. Rehabilitation of cheatgrass ranges requires intensive methods that are very expensive. A recent, more cost effective approach to rehabilitating cheatgrass infested rangelands is greenstripping. Established greenstrips will reduce the cheatgrass fire frequency and give native vegetation a chance to recover.

Cheatgrass Physiology

Cheatgrass (*Bromus tectorum*) is an exotic Mediterranean winter annual. The life history of this grass was preadapted to the wet, cold winters and dry, hot summers of the Great Basin (Mack, 1981). Cheatgrass typically germinates in the fall and forms numerous roots that occupy the soil surface. These roots continue to elongate during the winter while small dormant leaves are maintained. When spring moisture becomes available it "cheats"

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other vegetation out of the moisture because it has already established a root system and can begin growing at lower temperatures than most other plants. Cheatgrass grows rapidly, ripens and dries out in, or even before June. If conditions in the fall do not allow cheatgrass to germinate, it will germinate in the spring and complete its lifecycle by early summer. When moisture is deficient, total height growth may be only 5 to 8 cm. In a wet year it can reach 60 cm or more. Cheatgrass is a prolific seed producer, and even in a dry year produces enough of a seed crop to provide for the next year's plants. In fact, one plant/m² can produce as many seeds as 10,000 plants/m² (Stewart and Hull, 1949, Yensen, 1981, Young and Allen, 1997). Seeds are short-lived (less than 3 years) in most situations, and most control strategies for this weed are driven by the principle of depleting the soil seed bank (Ogg, 1994).

Pre-Cheatgrass Invasion Grazing History

The cheatgrass problems now being experienced on Great Basin rangelands are a result of practices that began back in the mid-1800's. The Mormons first filled the Utah ranges with stock they drove across the plains, beginning in 1847. By about 1880, the ranges in northern and central Utah were occupied by about 160,000 head of cattle (Stewart, 1936). Strong cattle markets in the late seventies and early eighties, as a result of gold and silver discovered in the Rocky Mountains, carried grazing onto most of the accessible ranges as cattle were raised and driven annually to the mines (Mack, 1981). Spurred by strong markets, the accumulated forage of many years was mined by too early and too continuous grazing. Then harsh winters and severe droughts in the mid-to-late 80's wiped out many stockmen making the necessity of providing a dependable forage supply evident. But just when security in the ownership of cattle was becoming established there was a tremendous

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and rapid increase in sheep. In Utah, sheep numbers increased from a few hundred thousand in the early eighties to nearly 2.9 million by 1901 (Stewart, 1936). These vast numbers of sheep arriving on fully used cattle ranges, further exhausted the range forage. The mindset of the time was that the only way to prevent another outfit from obtaining a given range on public lands was to strip it clean. Homesteading also rapidly increased in the early 1880's (Mack, 1981), and crop growing had the effect of decreasing the range area and added the settlers' farm stock to the shrinking ranges. Alien weeds also started appearing with the advent of agriculture (Mack, 1981). War demands created high prices, and by 1918-19, the number of animal units in the nation was the highest ever attained (Stewart, 1936). These record numbers of livestock further speeded up range depletion. In Utah, there were reported to be 344,000 cattle and 2,926,000 sheep in 1931 (Pickford, 1932), going into the drought of 1930-35, further setting back any range recovery. As perennial range grasses were depleted throughout this history of grazing and land use, they were replaced by annuals that had originally only been able to gain a hold in disturbed areas along roadways, railways, and deserted agricultural fields.

Cheatgrass Invasion and Spread

Cheatgrass glumes are covered with short strong barbs that cause the spikelets to work into wool, hair, and clothing and aids in the dispersal of seed (Stewart and Hull, 1949). Cheatgrass is thought to have arrived in Idaho from awns carried in the coats of sheep trailed from California through Nevada to Southern Idaho (Yensen, 1981, Young and Allen, 1997). Another way cheatgrass was dispersed throughout the west was probably in contaminated seed grain (Mack, 1981). Cheatgrass is also often a contaminant of alfalfa seed (Young and Allen, 1997). Billings (1994) traced the introduction of cheatgrass to eastern North America

APPENDIX C - Cheatgrass Invasion & Greenstripping

from ships bringing settlers of the 17th and 18th centuries and from there it moved west as a seed grain contaminant. Cheatgrass was being collected repeatedly on ballast dumps at Portland, Oregon in 1902, and was also spread in discarded straw packed with dry goods (Mack, 1981). Cheatgrass is now widely distributed in the United States, occurring in all areas except for the coastal southeast.

Cheatgrass was first collected in Pennsylvania in 1864, Washington in 1893, Utah in 1894, Colorado in 1895, and Wyoming in 1900 (Stewart and Hull, 1949, Mack, 1981). In the first few years of the 1900's, cheatgrass gained a foothold on disturbed areas like railroad right-of-ways, road shoulders, orchards, and fallow fields. The most spectacular occupations were on abandoned farms (Stewart and Hull, 1949). By 1915 to 1920, cheatgrass started to colonize overgrazed rangelands (Stewart and Hull, 1949, Young and Allen, 1997). Cheatgrass increased very rapidly, especially when fire was combined with overgrazing, which was often the case. Figure 1 characterizes the spread of cheatgrass.

Aldo Leopold (1941) portrayed the expansion of cheatgrass well when he said, "One simply woke up one fine spring to find the range dominated by a new weed . . . cheatgrass (*Bromus tectorum*)."

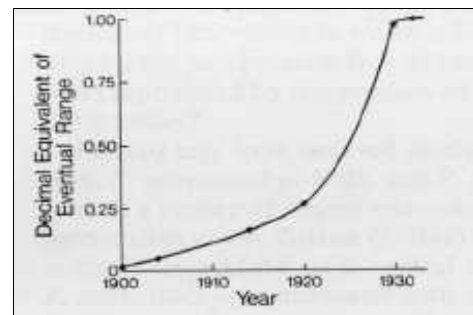


Fig. 1. Plot of area occupied by cheatgrass verses time (Mack, 1981).

Some stockmen, in search of new forage for depleted rangelands, aided the spread of cheatgrass by enthusiastically and deliberately introducing it to new areas (Young and Allen, 1997, Yensen, 1981). As it invaded rangelands, cheatgrass started to fill the interspaces between shrubs, where perennial grasses had been before being lost through overgrazing. Pickford (1932) did a study to determine the changes that had taken place on

APPENDIX C - Cheatgrass Invasion & Greenstripping

the Utah spring-fall range type as a result of grazing, fire, or other human induced factors and paints a pretty clear picture of the trend toward the annualization of rangelands as it was beginning in the early 1930's. The density of perennial grasses on grazed plots was only 38 percent as great as on protected plots, and sagebrush density was about 2.25 times higher on the grazed plots. Sagebrush had been practically eliminated on the burned plots and cheatgrass constituted 22 percent of the vegetation with the density of perennial grasses being 32 percent lower on the burned plots than on protected plots. On plots both burned and grazed, cheatgrass was the dominant species, and the density of perennial grasses was only 16 percent as great as that of protected plots.

Cheatgrass and Fire

Cheatgrass is extremely flammable. Cheatgrass range is 500 times more likely to burn than any other rangeland type (Yensen, 1981). Because of the lifecycle of cheatgrass, it can burn 4 to 6 weeks earlier in the summer than perennials do and remains susceptible to fall fires for 1 to 2 months later. The Forest Service estimates that five times more men and equipment are needed for standby crews on cheatgrass ranges than if these same ranges were in perennial grasses (Stewart and Hull, 1949). These characteristics of cheatgrass change the fire regime of the ranges they have invaded by creating a continuous fuel that carries wildfires to more widely spaced shrubs.

Much of the Great Basin can be characterized by three general range types: low-elevation with playas, greasewood (*Sarcobatus verticillatus*), or saltgrass (*Distichlis stricta*) habitat, mid-elevation shrub dominated upper valleys and foothills with big sagebrush (*Artemisia tridentata*) and bunchgrass species, and high-elevations dominated by juniper (*Juniperus osteosperma*) habitat (Sparks et al., 1990, Rogers, 1982). Fire was not a driving

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variable in the low-elevation salt-desert shrub ecosystems (West, 1994). The natural fire frequency of mid-elevation sagebrush-grass vegetation is 32 to 70 years, and in the driest sagebrush communities the fire frequency could have been as low as 100 years (Wright and Baily, 1982). Until about the 1950's, cheatgrass had not invaded juniper woodlands to any serious extent. Since then, fires have become much more common in this woodland ecosystem fueled by dry cheatgrass and once started by the resins of the trees themselves. This woodland is being replaced after fire by great expanses of annual grassland dominated by even more cheatgrass (Billings, 1994). Cheatgrass is fire tolerant and is perpetuated by fire, causing large areas of the salt-desert shrub, sagebrush-bunchgrass, and juniper ecosystems to burn as often as every 3 to 5 years (Whisenant, 1994). Pickford (1932) noted that on burned-over areas of the Great Salt Lake District, cheatgrass had replaced sagebrush as a dominant and often occupies these sites in dense stands. Today, millions of hectares of rangelands in the Great Basin are characterized by cheatgrass in a conversion from native vegetation that has occurred at an accelerated rate during the 20th century (Young and Allen, 1997).

Cheatgrass as Forage

Cheatgrass produces a relatively large amount of herbage and on many ranges it is the most important forage plant, especially for spring use. However, the period during which the herbage is fresh and green is several weeks shorter than for wheatgrasses. Forage quality decreases as plants mature and the protein content drops to about 3 percent (Nesse and Ball, 1994). The palatability of cheatgrass is often lower than that of associated perennial grasses and long slender awns on the seed head can limit feed intake by irritating and puncturing the soft tissues inside the mouth of grazing animals. Herbage production of

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cheatgrass also fluctuates greatly year-to-year due to weather variations as compared to perennial grasses. Perennial grasses produce twice as much herbage as cheatgrass in a moist year and 12 times as much herbage in a drought year (Roberts, 1991, Stewart and Hull, 1949).

Cheatgrass and the Environment

The long-term implications of the cheatgrass invasion and its effects in relation to fires and their cumulative repetitive impacts will be a loss of biological and genetic diversity. The native plant and animal species in ecosystems that are now prone to widespread wildfires are at considerable risk of going extinct at the population level locally or even regionally. Worse, this conversion of native ecosystems to simplistic annual grasslands could alter the energy flow, water cycling, and nutrient balance, causing ecosystemic destruction that could be irreversible (Billings, 1994).

Revegetating Cheatgrass Infested Rangelands

The presence of cheatgrass makes it very difficult to reestablish perennial grasses. The efficient root system of cheatgrass simply overwhelms and starves out new seedlings by absorbing all of the moisture from the soil. As few as four cheatgrass plants per square foot can out-compete crested wheatgrass seedlings and the seedlings of native bunchgrasses are even less competitive (Young et al, 1987). However, once established, species like crested wheatgrass will out-compete cheatgrass in the following years. Weed control revegetation techniques involving furrowing during seeding have been developed that permit the establishment of desirable species in areas dominated by cheatgrass. James DeFlon (1986) describes a revegetation procedure that has been successful on the Promontory Ranch, about

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40 miles west of Ogden, Utah, for replacing cheatgrass. In August or September when conditions are dry, the old stand of cheatgrass is burned. This is followed by running a brush beater over the ground to remove all remnants of brush and other vegetation. When the cheatgrass starts to sprout, usually around the first of October, the area is tilled with a chisel plow equipped with sweeps to suppress any sprouting cheatgrass and remove any surface roots left from the brush. A deep furrow drill equipped with shoes spaced 14 inches on the center followed by packer wheels is used to plant the seed of perennial grass species about one-half inch deep.

A chemical fallow technique was used by Eckert et al. (1967) to establish perennial grasses on cheatgrass infested rangelands in eastern California and in central Nevada. Six by six meter plots were treated with Atrazine in the fall and then seeded with perennial grasses the next fall. There was a significant decrease in cheatgrass density during the fallow year. Treated plots produced significantly more herbage than did the check, and seeding in furrows resulted in about twice as many, and also more vigorous seedlings than did surface seeding. The success of the Atrazine fallow technique on the study plots led Eckert et al. (1974) to apply the technique to sites in central and eastern Nevada of 20 to 65 hectares. Very high spring precipitation in the seedling year masked some of the treatment effects, but seedling height, vigor, and survival were better in the Atrazine fallow and furrowed areas. Deep furrowing tended to remove more of the Atrazine residue from the vicinity of the seeded plants as well as create a more moist and weed free microenvironment for the seeded species.

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Greenstripping

The costs of rehabilitating cheatgrass infested rangelands, using an aggressive approach, can exceed the appraised value of the land. The cost of rehabilitation has influenced how much land can be treated and prohibits it on marginally productive sites. An alternative to seeding entire areas that are dominated by cheatgrass being implemented mostly in southern Idaho is greenstripping. Greenstripping is the practice of establishing or using patterns of fire resilient vegetation and/or material to reduce wildfire occurrence and size (USDI, 1987). The Idaho BLM has put strips of fire resilient vegetation up to 91 meters wide, mainly along roads and railways to reduce human-caused fire starts and create a wider fire barrier. It is hoped that these greenstrips will protect fire-susceptible vegetation types (sagebrush/grass and salt-desert shrubs) by reducing the cheatgrass induced fire frequency and give native plants a chance to reestablish (Pellant, 1990). For greenstrips a relatively small area of land is treated compared to the amount of land that will be protected, therefore, the cost of an aggressive approach for seedling establishment may be justified. Plant materials suitable for greenstrips need to be adapted to persist on semiarid sites, capable of establishing and persisting in competition with annual weeds, fire resistant throughout much of the wildfire season, fire tolerant (to survive occasional burns), and palatable to herbivores (to reduce fuel buildup) (Pellant, 1990; Pellant, 1994; Monsen, 1994). Two widely adapted and uniformly establishing possibilities that the Idaho BLM has had success with are crested wheatgrass (*Agropyron desertorum*) and forage kochia (*Kochia prostrata*). Few other species demonstrate the broad adaptability, establishment, or competitive attributes of these two species (Monsen, 1994).

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Conclusion

Cheatgrass is also a problem in agricultural crops, especially winter wheat where 10 cheatgrass plants per square foot will give a 27 % reduction in wheat yield (Young et al., 1987). However, crop rotations, tillage practices, and many herbicides have been developed to combat cheatgrass in agricultural settings, but there are not the financial incentives to pursue such practices on public rangelands. Many herbicides do exist, however, that can be used on rangelands. Ogg (1994) lists the herbicides registered for cheatgrass control (Table 1) and Whitson et al. (1988) tested some of them on cheatgrass infested rangelands with the results shown in table 2. Much research is still needed to develop more efficient means of rehabilitating the cheatgrass infested rangelands of the Great Basin. Aldo Leopold (1941) summed it up well when he said, “The cheat problem reminds me, again, how difficult a task has been laid upon the coming generation of technical men.”

Amitrole	Hexazinone	Pronamide
Atrazine	Metribuzin	Propham
Bromacil	Napropamide	Sethoxydim
Diuron	Norflurazon	Simazine
Ethofumesate	Oryzallin	Sulfometuron-methyl
Fluazifop-butyl	Paraquat	Terbacil
Glyphosate	Prometon	Trifluralin

APPENDIX C - Cheatgrass Invasion & Greenstripping

Table 2. Herbicides applied April 1987 (Whitson et al., 1988).

Herbicide	lbs ai/a	% downy brome control	% perennial grass damage
atrazine	0.25	0	0
atrazine	0.5	3	0
atrazine	1.0	17	0
atrazine	2.0	83	38
metribuzin	0.25	6	0
metribuzin	0.5	27	0
Sethoxydim + crop oil conc.	0.25 + 1%	0	3
Sethoxydim + crop oil conc.	0.5 + 1%	10	7
Fluazifop-P + crop oil conc.	0.25 + 1%	100	Suppressed seed heads
Fluazifop-P + crop oil conc.	0.5 + 1%	100	Suppressed seed heads
ethyl metribuzin	0.5	3	0
ethyl metribuzin	1.0	7	0
quizalofop	0.25	100	Suppressed seed heads
quizalofop	0.5	100	Suppressed seed heads
terbacil	0.5	17	33
terbacil	1.0	90	83
terbacil	2.0	98	95
check	-----	0	0

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APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County



Beaver County

Demographic Profile

Beaver County, Utah had a total estimated population of 6,204 for the year 2005. The total population has increased, since the population in 2000 of 6,018. This growth shows an increase of 3.1 percent. Beaver ranks 19 of 29 counties when calculating total change in population for Utah and the county ranks 1,673 of 3,141 counties by growth in county population in the United States.

Beaver County, Utah has a population that is made of 89.1 percent White, 0.3 percent African American, 0.9 percent Asian, and 8.4 percent Hispanic. This area can be considered to have a modest amount of racial and ethnic diversity, with 9.6 percent of the population being minorities. This is less than the State of Utah percent of 13.5. Since 2000, Beaver has increased the percent of minority population when 6.5 percent of the population was made up of minorities.

When measuring the total land area, Beaver spans a total area of 2590 square miles. The county has a very low population density of 2 persons per square mile.

In 2005, the Population Division of U.S. Census Bureau estimates the median age in Beaver County, Utah to be 30.3 years of age. The median in Beaver is greater than the median in Utah of 28.5. Since the year 2000, the area has witnessed a decline in this median, when at that time it was 30.7 years old. With a total of 31.8 percent of the population in 2005 being comprised of children and youth younger than 18, Beaver can be described as being made up of a relatively high proportion of youths. The working age population group (18-64) has a relatively low representation within the population, making up 55.4 percent of the population within the age group. People 65 and older make up 12.7 percent of the total population in the area. Compared to other counties in the US, this represents a medium-low proportion of the population.

Since 2000, a medium-high amount of people have migrated to Beaver internationally. The migration from outside the US into Beaver makes up 0.1 percent of all immigration into Utah. This level of international migration can be considered medium-high when analyzed against the base population in the year 2005 and compared to other counties across the US.

Datasource: Population Estimates Program, U.S. Bureau of the Census.

Housing Profile

In 2000, Beaver County had an owner-occupied dwelling median value of \$89,200, according to the Decennial Census. This median is less than the overall State of Utah 2000 home value of \$146,100 and less than median home value of \$119,600 for the rest of the nation in that year.

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

When compared to other counties in Utah, Beaver County is positioned 26 of 29 in terms of growth of new housing structures between 2001 and 2005. The county stands 1,334 of 3,141, when comparing the change in housing structures in counties throughout the nation.

In Beaver County, the U.S. Census Bureau, Population Division accounted for a total of 2,791 housing structures in 2005. The area has seen growth in housing units, adding all together 85 residential units since 2001, or 3.1 percent.

Data Source: U.S. Census Bureau

Employment - Industry Summary 2005

Transportation and Warehousing from 2001-2005 had the highest increase in employment in Beaver County, changing a total of 111.4 percent. This is greater than the change in industry employment in the United States of -1 percent. The State of Utah faced a industry job change of 1.4 percent, in the period of time since 2001.

Beaver County is ranked at 24 of 30 total Counties throughout Utah by total number of jobs in 2005. This position has moved up during the time of 2001 and 2005. The County, in the year 2001, was ranked 23 of 30 Counties.

In Beaver County, Agriculture, forestry, fishing and hunting, Mining and Utilities industries have the highest United States location quotient (LQ). The Agriculture, forestry, fishing and hunting sector has a United State LQ of 28.49. The level of employment in the Agriculture, forestry, fishing and hunting sector is 28.49 times the percent of the national average, This signifies that Beaver County may specialize, or be an exporter of Agriculture, forestry, fishing and hunting.

In Beaver County, Agriculture, forestry, fishing and hunting, Retail Trade, and the Construction industries are the largest employment industries. The Agriculture, forestry, fishing and hunting is the largest employment industry and makes up 30 percent of all the jobs in the county. This makes up 482 individuals. The Retail Trade and Construction industries total 18 and 5.4 percent of the total jobs, respectively.

Agriculture, forestry, fishing and hunting has the largest employers in Beaver County, averaging 48 workers per each place of employment, being greater than the industry's average in the United States of 12 and greater than the State of Utah establishments size average of 12 for the Agriculture, forestry, fishing and hunting industry.

Datasource: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

People Quick Facts

	<u>Beaver County</u>	<u>Utah</u>
Population, 2005 estimate	6,204	2,469,585
Population, percent change, April 1, 2000 to July 1, 2005	3.3%	10.6%
Population, 2000	6,005	2,233,169
Population, percent change, 1990 to 2000	26.0%	29.6%
Persons under 5 years old, percent, 2004	9.2%	9.7%
Persons under 18 years old, percent, 2004	32.0%	31.0%
Persons 65 years old and over, percent, 2004	13.5%	8.7%
Female persons, percent, 2004	48.5%	49.8%

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

White persons, percent, 2004 (a)	96.8%	93.8%
Black persons, percent, 2004 (a)	0.3%	0.9%
American Indian and Alaska Native persons, percent, 2004 (a)	1.2%	1.3%
Asian persons, percent, 2004 (a)	1.1%	1.9%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.0%	0.7%
Persons reporting two or more races, percent, 2004	0.6%	1.3%
Persons of Hispanic or Latino origin, percent, 2004 (b)	7.5%	10.6%
White persons, not Hispanic, percent, 2004	89.8%	83.8%
Living in same house in 1995 and 2000, pct age 5+, 2000	58.4%	49.3%
Foreign born persons, percent, 2000 4.4% 7.1%		
Language other than English spoken at home, pct age 5+, 2000 8.3%		12.5%
High school graduates, percent of persons age 25+, 2000	83.2%	87.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	12.1%	26.1%
Persons with a disability, age 5+, 2000	966	298,686
Mean travel time to work (minutes), workers age 16+, 2000	17.1	21.3
Housing units, 2004	2,776	848,737
Homeownership rate, 2000	79.0%	71.5%
Housing units in multi-unit structures, percent, 2000	11.2%	22.0%
Median value of owner-occupied housing units, 2000	\$89,200	\$146,100
Households, 2000	1,982	701,281
Persons per household, 2000	2.93	3.13
Per capita money income, 1999	\$14,957	\$18,185
Median household income, 2003	\$37,969	\$46,709
Persons below poverty, percent, 2003	10.1%	10.0%

Business QuickFacts

	<u>Beaver County</u>	<u>Utah</u>
Private nonfarm establishments, 2003	144	60,3241
Private nonfarm employment, 2003	1,232	900,6051
Private nonfarm employment, percent change 2000-2003	-4.0%	-1.8%(1)
Nonemployer establishments, 2003	329	154,097
Manufacturers shipments, 2002 (\$1000)	NA	25,104,045
Retail sales, 2002 (\$1000)	63,100	23,675,432
Retail sales per capita, 2002	\$10,344	\$10,206
Minority-owned firms, percent of total, 1997	F	5.1%
Women-owned firms, percent of total, 1997	F	24.8%
Housing units authorized by building permits, 2004	20	24,267
Federal spending, 2004 (\$1000)	38,070	13,683,623

Geography QuickFacts

	<u>Beaver County</u>	<u>Utah</u>
Land area, 2000 (square miles)	2,590	82,144
Persons per square mile, 2000	2.3	27.2
FIPS Code	001	49
Metropolitan or Micropolitan Statistical Area	None	

(1) Includes data not distributed by county.

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

FN: Footnote on this item for this area in place of data

NA: Not available

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

D: Suppressed to avoid disclosure of confidential information
X: Not applicable
S: Suppressed; does not meet publication standards
Z: Value greater than zero but less than half unit of measure shown
F: Fewer than 100 firms

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments
Last Revised: Thursday, 08-Jun-2006



Garfield County

Demographic Profile

Garfield County, Utah had a population of 4,470 in the year 2005. The population has decreased sharply, since the population in 2000 of 4,750. The decline denotes a decrease of -5.9 percent. Garfield ranks 28 of 29 counties when analyzing total population change in Utah and the county ranks 2,475 of 3,141 counties when analyzing total county population change across the nation.

From 2000, a very low amount of people migrated to Garfield internationally. The migration from outside the US into Garfield accounts for 0 percent of all immigration into Utah. This percent of international migration is very low when comparing levels of immigration per population in 2005.

The population division of the Census Bureau estimates in 2005 a median age in Garfield County, Utah to be 36.7 years old. The median in Garfield is greater than the median age for the State of Utah of 28.5. Since 2000, the area has experienced an increase in the median, when the median age was 33.8 years old. With 28.4 percent of the population in the year 2005 being made up of individuals less than 18 years old, Garfield can be understood as being made up of a relatively high proportion of youths. The 18 to 64 years old population group has a relatively low representation within the estimated 2005 area population, making up 55.4 percent of the population within the age group. People 65 and older make up 16.2 percent of the total population in the area. Compared to other counties in the US, this represents a medium-high proportion of the area population base.

By measuring total land area, Garfield covers a total land area of 5174 total square miles. The area has a very low average area density of 1 persons per square mile.

Garfield County, Utah has a population that is made up of 94.7 percent White, 0.2 percent African American, 0.3 percent Asian, and 3.1 percent Hispanic. The area population base can be described as having a very modest level of diversity in terms of race and ethnicity, with 3.6 percent minorities. This is less than the State of Utah percent of 13.5. Since 2000, Garfield has increased the percent of minority population when 3.5 percent of the total population were minorities.

Datasource: Population Estimates Program, U.S. Bureau of the Census.

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

Housing Profile

In Garfield County, the U.S. Census Bureau, Population Division accounted for a total of 3,146 housing structures in 2005. The area has seen growth in housing units, adding a sum of 289 residential units since 2001, or 10.1 percent.

Garfield County recorded median owner-occupied home value in the year 2000 of \$90,500, accounted by the Decennial Census. This is less than the overall Utah 2000 home value of \$146,100 and less than median home value of \$119,600 for the rest of the nation in that year.

In the State of Utah, Garfield County is positioned 12 of 29 in terms of percentage growth in new housing structures. The county ranks 296 of 3,141, compared to change in residential structure growth in counties throughout the Unities States.

Data Source: U.S. Census Bureau

Employment - Industry Summary 2005

In Garfield County, Retail Trade, Manufacturing, and the Construction industries have the largest percent of jobs of all industries. The Retail Trade produces the largest number of jobs in the area accounting for 10.6 percent of all the jobs in the county. This makes up 174 jobs. The Manufacturing and Construction sectors provide 5.2 and 4.4 percent of industry employment.

In Garfield County, Utilities, Retail Trade and Construction industries have the highest United States location quotient (LQ). The Utilities industry has an LQ of 3.42. The level of employment in the Utilities sector is 3.42 times greater than the US average, showing signs that Garfield may be an exporter of products or services of Utilities.

Manufacturing (sawmills) are the largest employers in Garfield County, with the industry averaging 17 workers per each place of employment, being less than the industry's national average of 39 and less than the Utah average establishment size of 31 for the Manufacturing industry.

The Accommodation and food services sector has decreased the most in local industry presence in Garfield County since the year 2001.

Retail Trade has had the highest level of job growth from 2001-2005 in Garfield County, moving a total of 5.5 percent. This is greater than the industry job change at the national level of 0.5 percent. The State of Utah went through a industry job change of 3.8 percent, since the year 2001.

Datasource: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

People QuickFacts

	<u>Garfield County</u>	<u>Utah</u>
Population, 2005 estimate	4,470	2,469,585
Population, percent change, April 1, 2000 to July 1, 2005	-5.6%	10.6%
Population, 2000	4,735	2,233,169
Population, percent change, 1990 to 2000	19.0%	29.6%
Persons under 5 years old, percent, 2004	7.1%	9.7%
Persons under 18 years old, percent, 2004	29.1%	31.0%
Persons 65 years old and over, percent, 2004	15.0%	8.7%
Female persons, percent, 2004	48.5%	49.8%

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

White persons, percent, 2004 (a)	97.4%	93.8%
Black persons, percent, 2004 (a)	0.2%	0.9%
American Indian and Alaska Native persons, percent, 2004 (a)	1.8%	1.3%
Asian persons, percent, 2004 (a)	0.4%	1.9%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.0%	0.7%
Persons reporting two or more races, percent, 2004	0.2%	1.3%
Persons of Hispanic or Latino origin, percent, 2004 (b)	3.3% 1	0.6%
White persons, not Hispanic, percent, 2004	94.5%	83.8%
Living in same house in 1995 and 2000, pct age 5+, 2000	61.7%	49.3%
Foreign born persons, percent, 2000 0.8% 7.1%		
Language other than English spoken at home, pct age 5+, 2000 3.5%		12.5%
High school graduates, percent of persons age 25+, 2000	85.8%	87.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	20.3%	26.1%
Persons with a disability, age 5+, 2000	630	298,686
Mean travel time to work (minutes), workers age 16+, 2000	13.9 2	1.3
Housing units, 2004	3,057	848,737
Homeownership rate, 2000	79.1%	71.5%
Housing units in multi-unit structures, percent, 2000	1.4%	22.0%
Median value of owner-occupied housing units, 2000	\$90,500	\$146,100
Households, 2000	1,576	701,281
Persons per household, 2000	2.92	3.13
Per capita money income, 1999	\$13,439	\$18,185
Median household income, 2003	\$34,847	\$46,709
Persons below poverty, percent, 2003	10.0%	10.0%
<u>Business QuickFacts</u>	<u>Garfield County</u>	<u>Utah</u>
Private nonfarm establishments, 2003	153	60,3241
Private nonfarm employment, 2003	928	900,6051
Private nonfarm employment, percent change 2000-2003	-13.3%	-1.8% (1)
Nonemployer establishments, 2003	313	154,097
Manufacturers shipments, 2002 (\$1000)	NA	25,104,045
Retail sales, 2002 (\$1000)	16,145	23,675,432
Retail sales per capita, 2002	\$3,502	\$10,206
Minority-owned firms, percent of total, 1997	F	5.1%
Women-owned firms, percent of total, 1997	F	24.8%
Housing units authorized by building permits, 2004	95	24,267
Federal spending, 2004 (\$1000)	41,463	13,683,6231
<u>Geography QuickFacts</u>	<u>Garfield County</u>	<u>Utah</u>
Land area, 2000 (square miles)	5,174	82,144
Persons per square mile, 2000	0.9	27.2
FIPS Code	017	49
Metropolitan or Micropolitan Statistical Area	None	
(1) Includes data not distributed by county.		
(a) Includes persons reporting only one race.		
(b) Hispanics may be of any race, so also are included in applicable race categories.		
FN: Footnote on this item for this area in place of data		
NA: Not available		

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

D: Suppressed to avoid disclosure of confidential information
X: Not applicable
S: Suppressed; does not meet publication standards
Z: Value greater than zero but less than half unit of measure shown
F: Fewer than 100 firms

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments
Last Revised: Thursday, 08-Jun-2006



Iron County

Demographic Profile

Iron County, Utah has a population that is made up of 89.9 percent White, 0.3 percent African American, 1.2 percent Asian, and 5.1 percent Hispanic. The population mix can be considered to have a modest level of diversity in terms of race and ethnicity, with 6.6 percent minorities. This is less than the State of Utah percent of 13.5. Since 2000, Iron has increased the level of diversity when 5.3 percent of the population was made up of minorities.

In 2005, the Census Bureau estimated the median age in Iron County, Utah to be 26.0 years of age. The median age in Iron is less than the median age in Utah of 28.5. Since 2000, the area has experienced an increase in the median age, at that time the median was 24.3 years of age. With a total of 29.1 percent of the 2005 population being made up of children and youth younger than 18, Iron can be described as having a relatively high proportion of youths. The 18 to 64 years old population group has a medium-low representation within the population, making up 61.5 percent of the population falling in this age category. The retirement (65 and over) group makes up 9.4 percent of the total population in the area. Compared to other counties in the US, this represents a relatively low percent of the population.

In terms of total land area, Iron encompasses a total area of 3298 square miles. The land areas has a very low population density of 12 persons per square mile, in 2005.

Iron County, Utah had a population of 38,311 for the year 2005. The total population has increased sharply, since the 2000 total population of 33,966. This growth denotes an increase of 12.8 percent. Iron ranks 9 of 29 counties when calculating total change in population for Utah and the county ranks 543 of 3,141 counties in terms of population growth in the United States.

Since the year 2000, a medium-high amount of people migrated to Iron from another country. The international migration into Iron totals 0.7 percent of the total international migration into the State of Utah. This level of international migration can be considered medium-high when analyzed against the base population in the year 2005 and compared to other counties across the US.

Datasource: Population Estimates Program, U.S. Bureau of the Census.

Housing Profile

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

In Iron County, the U.S. Census Bureau, Population Division accounted for a total of 16,137 homes in 2005. The county has experienced a growth in housing units, adding in all 1,953 residential structures since 2001, a change of 13.8 percent.

Iron County recorded median owner-occupied home value in the year 2000 of \$112,000, reported by the Decennial Census. This median is less than the overall Utah 2000 home value of \$146,100 and less than median owner-occupied dwelling value of \$119,600 across the nation during that year.

When compared to other counties in Utah, Iron County is positioned 6 of 29 in terms of percentage growth in new housing structures. The county ranks 144 of 3,141, in terms of residential real estate percentage change change in the United States.

Iron County may be described as having a small, but present proportion of high-valued homes. In 2000, the Decennial Census counted that 0.3 percent of the homes were valued over \$500,000.
Data Source: U.S. Census Bureau

Employment - Industry Summary 2005

The Administrative and waste services has seen the largest decrease in industry presence in Iron County, from the year 2001 to 2005, accounting for 13.8 percent of total employment in 2001 to 7.7 percent of total employment in the year 2005.

Administrative and waste services between the years 2001 and 2005, saw the greatest loss in employment in Iron County. The sector dealt with a loss of 500 jobs, or 35.5 percent of industry's employment. The industry declines made up 62.3 percent of the total jobs loss in the County.

In Iron County, Construction, Arts, entertainment, and recreation and Accommodation and food services industries, in terms of United States location quotient, are the most dominant in the region. The Construction industry has a US LQ in the county of 1.84. This means the percent of total employment in the Construction industry is 1.84 times greater than the national average, signifying that Iron may be an exporter of products or services of Construction.

Arts, entertainment, and recreation saw the biggest increase in jobs since the year 2001 in Iron County, with an industry growth of 411.3 percent. This is greater than the rate of employment change across the nation of 4.7 percent. The State of Utah had an industry job change of 1.6 percent, in the recent period of 2001-2005.

In Iron County, Retail Trade, Manufacturing, and the Accommodation and food services industries are the largest employment industries. The Retail Trade is the largest employment industry and makes up 17.9 percent of the total county employment. This totals 2,115 employees. The Manufacturing and Accommodation and food services sectors provide 14.4 and 13 percent of all employment.

Manufacturing has a largest number of employee per establishment in Iron County. The industry averages 23 jobs per place of business. This is less than the industry's average in the United States of 39 and less than the State of Utah typical size of 31 for the Manufacturing industry.

Datasource: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

<u>People QuickFacts</u>	<u>Iron County</u>	<u>Utah</u>
Population, 2005 estimate	38,311	2,469,585
Population, percent change, April 1, 2000 to July 1, 2005	13.4%	10.6%
Population, 2000	33,779	2,233,169
Population, percent change, 1990 to 2000	62.5%	29.6%
Persons under 5 years old, percent, 2004	10.0%	9.7%
Persons under 18 years old, percent, 2004	30.0%	31.0%
Persons 65 years old and over, percent, 2004	9.4%	8.7%
Female persons, percent, 2004	50.4%	49.8%
White persons, percent, 2004 (a)	94.9%	93.8%
Black persons, percent, 2004 (a)	0.4%	0.9%
American Indian and Alaska Native persons, percent, 2004 (a)	2.2%	1.3%
Asian persons, percent, 2004 (a)	1.1%	1.9%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.4%	0.7%
Persons reporting two or more races, percent, 2004	1.0%	1.3%
Persons of Hispanic or Latino origin, percent, 2004 (b)	4.8%	10.6%
White persons, not Hispanic, percent, 2004	90.6%	83.8%
Living in same house in 1995 and 2000, pct age 5+, 2000	42.1%	49.3%
Foreign born persons, percent, 2000	2.9%	7.1%
Language other than English spoken at home, pct age 5+, 2000	7.5%	12.5%
High school graduates, percent of persons age 25+, 2000	88.6%	87.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	23.8%	26.1%
Persons with a disability, age 5+, 2000	4,123	298,686
Mean travel time to work (minutes), workers age 16+, 2000	15.0	21.3
Housing units, 2004	15,257	848,737
Homeownership rate, 2000	66.2%	71.5%
Housing units in multi-unit structures, percent, 2000	24.2%	22.0%
Median value of owner-occupied housing units, 2000	\$112,000	\$146,100
Households, 2000	10,627	701,281
Persons per household, 2000	3.11	3.13
Per capita money income, 1999	\$13,568	\$18,185
Median household income, 2003	\$35,793	\$46,709
Persons below poverty, percent, 2003	14.5%	10.0%
<u>Business QuickFacts</u>	<u>Iron County</u>	<u>Utah</u>
Private nonfarm establishments, 2003	970	60,3241
Private nonfarm employment, 2003	9,891	900,6051
Private nonfarm employment, percent change 2000-2003	-0.9%	-1.8%(1)
Nonemployer establishments, 2003	2,335	154,097
Manufacturers shipments, 2002 (\$1000)	358,909	25,104,045
Retail sales, 2002 (\$1000)	361,548	23,675,432
Retail sales per capita, 2002	\$10,228	\$10,206
Minority-owned firms, percent of total, 1997	8.1%	5.1%
Women-owned firms, percent of total, 1997	26.8%	24.8%
Housing units authorized by building permits, 2004	631	24,267
Federal spending, 2004 (\$1000)	183,200	13,683,6231
<u>Geography QuickFacts</u>	<u>Iron County</u>	<u>Utah</u>
Land area, 2000 (square miles)	3,298	82,144
Persons per square mile, 2000	10.2	27.2

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

FIPS Code
Metropolitan or Micropolitan Statistical Area

021
Cedar City Micro Area

49

- (1) Includes data not distributed by county.
- (a) Includes persons reporting only one race.
- (b) Hispanics may be of any race, so also are included in applicable race categories.
- FN: Footnote on this item for this area in place of data
- NA: Not available
- D: Suppressed to avoid disclosure of confidential information
- X: Not applicable
- S: Suppressed; does not meet publication standards
- Z: Value greater than zero but less than half unit of measure shown
- F: Fewer than 100 firms

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments.

Last Revised: Thursday, 08-Jun-2006



Kane County

Demographic Profile

In 2005, the Census Bureau estimated the median age in Kane County, Utah to be 40.6 years of age. The median in Kane is greater than the median age for the State of Utah of 28.5. Since the year 2000, the area has witnessed an increase in the median, when the median age was 39.2 years old. With a total of 24.6 percent of the 2005 population being comprised of individuals under the age of 18, Kane can be understood as having a medium-high percent of people under 18. The 18 to 64 years old population group has a medium-low presence of the population, with 58.2 percent of the population makes up this age category. The retirement (65 and over) age group comprises 17.3 percent of the population in the area. When compared to other counties throughout the United States, this represents a medium-high proportion of the area population base.

In terms of total land area, Kane encompasses a total area of 3992 total square miles. The area has a very low average population density of 2 persons per square mile.

Since the year 2000, a low number of individual migrated to Kane County from outside the country. The immigration into Kane accounts for a negligible percent of immigration into the State of Utah. This percent of international migration is low when analyzed against immigration per population in 2005.

Kane County, Utah has a population base that is comprised of 95.6 percent White, 0.1 percent African American, 0.3 percent Asian, and 2.6 percent Hispanic. This area can be considered to have a very modest amount of racial and ethnic diversity, with 3.0 percent of the population being minorities. This is less than the State of Utah percent of 13.5. Since 2000, Kane has increased the percent of minority makeup when 2.9 percent of the total population were minorities.

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

Kane County, Utah had a population that was estimated at 6,202 in 2005. The total population has increased, since the 2000 total population of 6,080. This growth denotes an increase of 2 percent. Kane ranks 20 of 29 counties when calculating total change in population for Utah and the county ranks 1,765 of 3,141 counties when calculating the total change in county population across the US. Datasource: Population Estimates Program, U.S. Bureau of the Census.

Housing Profile

In Kane County, the U.S. Census Bureau, Population Division accounted for a total of 4,374 housing units in the year 2005. This represents a growth in housing units, adding in all 492 housing units since the year 2001, or 12.7 percent.

Kane County had a median home value in the year 2000 of \$103,900, according to the Decennial Census. This is less than the Utah 2000 home value of \$146,100 and less than median owner-occupied dwelling value of \$119,600 across the nation during that year.

Throughout the State of Utah, Kane County ranks 10 of 29 in terms of percentage growth in new housing structures. The county ranks 181 of 3,141, when comparing the change in housing structures in counties throughout the nation.

Data Source: U.S. Census Bureau

Employment - Industry Summary 2005

Kane County is ranked at 22 of 30 Counties throughout the State of Utah in terms of total 2005 employment. The County's employment ranking has moved up during the time of 2001 and 2005. The County, in the year 2001, was ranked 20 of 30 Counties.

In Kane County, Arts, entertainment, and recreation, Other services, except public administration and Accommodation and food services are the three industries with the highest location quotients. The Arts, entertainment, and recreation sector has a United State LQ of 7.08. The percent of employment in the Arts, entertainment, and recreation industry is 7.08 times the percent of the national average. This signifies that Kane specializes in Arts, entertainment, and recreation.

Finance and insurance is the industry that has grown the most in terms of employment from 2001-2005 in Kane County, growing in new jobs by 129.7 percent. This is greater than the rate of industry employment change in the United States of 4.8 percent. The State of Utah experienced a sector employment shift of 6.4 percent, during the time since 2001.

In Kane County, Accommodation and food services, Retail Trade, and the Other services, except public administration industries have the largest percent of jobs of all industries. The Accommodation and food services is the largest employment industry and makes up 26.2 percent of total employment in the county, making up 556 jobs. The Retail Trade and Other services, except public administration industries total 16.6 and 16.6 percent of all employment.

Arts, entertainment, and recreation has a largest number of employee per establishment in Kane County, with the industry averaging 21 workers per each place of employment, being greater than the industry's national average of 16 and greater than the State of Utah average of 18 for the Arts, entertainment, and recreation industry.

Datasource: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

<u>People QuickFacts</u>	<u>Kane County</u>	<u>Utah</u>
Population, 2005 estimate	6,202	2,469,585
Population, percent change, April 1, 2000 to July 1, 2005	2.6%	10.6%
Population, 2000	6,046	2,233,169
Population, percent change, 1990 to 2000	17.0%	29.6%
Persons under 5 years old, percent, 2004	6.8%	9.7%
Persons under 18 years old, percent, 2004	26.2%	31.0%
Persons 65 years old and over, percent, 2004	17.7%	8.7%
Female persons, percent, 2004	50.2%	49.8%
White persons, percent, 2004 (a)	97.8%	93.8%
Black persons, percent, 2004 (a)	0.0%	0.9%
American Indian and Alaska Native persons, percent, 2004 (a)	1.5%	1.3%
Asian persons, percent, 2004 (a)	0.3%	1.9%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.0%	0.7%
Persons reporting two or more races, percent, 2004	0.3%	1.3%
Persons of Hispanic or Latino origin, percent, 2004 (b)	2.3%	10.6%
White persons, not Hispanic, percent, 2004	95.7%	83.8%
Living in same house in 1995 and 2000, pct age 5+, 2000	57.4%	49.3%
Foreign born persons, percent, 2000	2.9%	7.1%
Language other than English spoken at home, pct age 5+, 2000	6.1%	12.5%
High school graduates, percent of persons age 25+, 2000	86.4%	87.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	21.1%	26.1%
Persons with a disability, age 5+, 2000	954	298,686
Mean travel time to work (minutes), workers age 16+, 2000	18.9	21.3
Housing units, 2004	4,228	848,737
Homeownership rate, 2000	77.9%	71.5%
Housing units in multi-unit structures, percent, 2000	3.2%	22.0%
Median value of owner-occupied housing units, 2000	\$103,900	\$146,100
Households, 2000	2,237	701,281
Persons per household, 2000 2.67 3.13		
Per capita money income, 1999	\$15,455	\$18,185
Median household income, 2003	\$36,050	\$46,709
Persons below poverty, percent, 2003	9.0%	10.0%
 <u>Business QuickFacts</u>	 <u>Kane County</u>	 <u>Utah</u>
Private nonfarm establishments, 2003	225	60,3241
Private nonfarm employment, 2003 1,565 900,6051		
Private nonfarm employment, percent change 2000-2003	9.6%	-1.8%(1)
Nonemployer establishments, 2003	515	154,097
Manufacturers shipments, 2002 (\$1000)	NA	25,104,045
Retail sales, 2002 (\$1000)	35,812	23,675,432
Retail sales per capita, 2002	\$5,931	\$10,206
Minority-owned firms, percent of total, 1997	F	5.1%
Women-owned firms, percent of total, 1997	F	24.8%
Housing units authorized by building permits, 2004	153	24,267
Federal spending, 2004 (\$1000)	38,162	13,683,6231

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

Geography QuickFacts

	<u>Kane County</u>	<u>Utah</u>
Land area, 2000 (square miles)	3,992	82,144
Persons per square mile, 2000	1.5	27.2
FIPS Code	025	49
Metropolitan or Micropolitan Statistical Area	None	

(1) Includes data not distributed by county.

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

FN: Footnote on this item for this area in place of data

NA: Not available

D: Suppressed to avoid disclosure of confidential information

X: Not applicable

S: Suppressed; does not meet publication standards

Z: Value greater than zero but less than half unit of measure shown

F: Fewer than 100 firms

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments
Last Revised: Thursday, 08-Jun-2006



Washington County

Demographic Profile

Washington County, Utah had a total estimated population of 118,885 in 2005. The estimated population has increased very sharply, from the population in the year 2000 of 91,234. This growth represents an increase of 30.3 percent. Washington ranks 4 of 29 counties when analyzing total population change in Utah and the county ranks 119 of 3,141 counties by growth in county population in the United States.

When measuring the total land area, Washington extends a total area of 2427 square miles. The county has a low population density of 49 persons per square mile.

Washington County, Utah has a population that is made up of 89.7 percent White, 0.3 percent African American, 0.6 percent Asian, and 6.6 percent Hispanic. The area can be described as having a modest amount of racial and ethnic diversity, with 7.5 percent of the population made up of minorities. This is less than the State of Utah percent of 13.5. Since 2000, Washington has increased the percent of minority population when 5.9 percent of the people were minorities.

The U.S. Census Bureau, in the year 2005, estimated a median age in Washington County, Utah to be 30.1 years old. The median in Washington is greater than the median age in Utah of 28.5. Since 2000, the area has experienced a decline in this median, when at that time it was 31.0 years of age. With 28.1 percent of the population in the year 2005 being made up of individuals less than 18 years old, Washington can be understood as being made up of a relatively high proportion of youths. The

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

18 to 64 years old population group has a relatively low presence of the 2005 population base, with 54.9 percent of the population within the age group. People 65 and older make up 17 percent of the total population base. Compared to other counties throughout the nation, this represents a medium-high proportion of the population.

From 2000, a medium-high amount of people migrated to Washington from outside the country. The immigration into Washington accounts for 1.9 percent of all immigration into Utah. This percent of international migration is medium-high when analyzed against immigration per population in 2005.

Datasource: Population Estimates Program, U.S. Bureau of the Census.

Housing Profile

In Washington County, there were a total of 48,777 housing units in the year 2005. This represents a growth in housing units, adding in all 10,335 housing units since the year 2001, or 26.9 percent.

The residential real estate values in Washington County, Utah have seen large increases since the Census values accounted for in the year 2000. The values have increased by \$63,600, or 45.5 percent, since 2000 when they were valued at \$139,800.

In the State of Utah, Washington County stands 1 of 29 in terms of percentage growth in new housing structures. The county ranks 15 of 3,141, in terms of residential real estate percentage change change in the United States.

Washington County recorded median owner-occupied home value in the year 2005 of \$203,400, according to the American Community Survey. This home value is greater than the Utah 2005 home value of \$167,200 and greater than median owner-occupied dwelling value of \$167,500 across the nation during that year.

Washington County is made up of a relatively high percentage of homes that are high in price. In 2005, the American Community Survey reports that 7.2 percent owner-occupied dwelling are valued over a half a million dollars.

Data Source: U.S. Census Bureau

Employment - Industry Summary 2005

Transportation and Warehousing is the industry with the largest establishments in Washington County, averaging 22 workers per each place of employment, being greater than the industry's average at the national level of 19 and greater than the Utah average of 19 for the Transportation and Warehousing industry.

In Washington County, Construction, Transportation and Warehousing and Accommodation and food services industries have the highest United States location quotient (LQ). The Construction sector in the county has a location quotient of 2.65. The percent of employment in the Construction industry is 2.65 times the percent of the national average, This signifies that Washington County may specialize, or be an exporter of Construction.

In Washington County, Retail Trade, Construction, and the Health care and social assistance industries are the largest employment industries. The Retail Trade produces the largest number of jobs in the area accounting for 17.5 percent of the total county employment. This totals 7,211

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

individuals. The Construction and Health care and social assistance industries make up 17.4 and 14.6 percent of the total jobs, respectively.

Construction from 2001-2005 had the highest increase in employment in Washington County, increasing by 72.5 percent. This is greater than the change in industry employment in the United States of 7.3 percent. The State of Utah felt a shift in employment in the industry of 14 percent, in the duration of 2001 to 2005.

Management of companies and enterprises saw the largest loss of employment between the years 2001-2005 in Washington County. The sector dealt with a loss of 105 employees during the period, or 59.7 percent of industry's employment. The industry declines made up 94.6 percent of all employment losses in the county.

Datasource: U.S. Department of Labor. Bureau of Labor Statistics. Quarterly Census of Employment and Wages (QCEW).

People QuickFacts	Washington County	Utah
Population, 2005 estimate	118,885	2,469,585
Population, percent change, April 1, 2000 to July 1, 2005	31.6%	10.6%
Population, 2000	90,354	2,233,169
Population, percent change, 1990 to 2000	86.1%	29.6%
Persons under 5 years old, percent, 2004	8.7%	9.7%
Persons under 18 years old, percent, 2004	28.9%	31.0%
Persons 65 years old and over, percent, 2004	17.0%	8.7%
Female persons, percent, 2004	50.7%	49.8%
White persons, percent, 2004 (a)	96.0%	93.8%
Black persons, percent, 2004 (a)	0.4%	0.9%
American Indian and Alaska Native persons, percent, 2004 (a)	1.5%	1.3%
Asian persons, percent, 2004 (a)	0.5%	1.9%
Native Hawaiian and Other Pacific Islander, percent, 2004 (a)	0.5%	0.7%
Persons reporting two or more races, percent, 2004	1.2%	1.3%
Persons of Hispanic or Latino origin, percent, 2004 (b)	6.2%	10.6%
White persons, not Hispanic, percent, 2004	90.2%	83.8%
Living in same house in 1995 and 2000, pct age 5+, 2000	42.5%	49.3%
Foreign born persons, percent, 2000	4.1%	7.1%
Language other than English spoken at home, pct age 5+, 2000	7.6%	12.5%
High school graduates, percent of persons age 25+, 2000	87.6%	87.7%
Bachelor's degree or higher, pct of persons age 25+, 2000	21.0%	26.1%
Persons with a disability, age 5+, 2000	13,688	298,686
Mean travel time to work (minutes), workers age 16+, 2000	17.2	21.3
Housing units, 2004	44,909	848,737
Homeownership rate, 2000	73.9%	71.5%
Housing units in multi-unit structures, percent, 2000	13.2%	22.0%
Median value of owner-occupied housing units, 2000	\$139,800	\$146,100
Households, 2000	29,939	701,281
Persons per household, 2000	2.97	3.13
Per capita money income, 1999	\$15,873	\$18,185
Median household income, 2003	\$39,738	\$46,709

APPENDIX D - Demographic, Housing and Socioeconomic Profiles By County

Persons below poverty, percent, 2003	11.4%	10.0%
<u>Business QuickFacts</u>	<u>Washington County</u>	<u>Utah</u>
Private nonfarm establishments, 2003	2,992	60,3241
Private nonfarm employment, 2003	31,468	900,6051
Private nonfarm employment, percent change 2000-2003	18.1%	-1.8% (1)
Nonemployer establishments, 2003	8,540	154,097
Manufacturers shipments, 2002 (\$1000)	281,772	25,104,045
Retail sales, 2002 (\$1000)	1,156,928	23,675,432
Retail sales per capita, 2002	\$11,615	\$10,206
Minority-owned firms, percent of total, 1997	3.2%	5.1%
Women-owned firms, percent of total, 1997	21.4%	24.8%
Housing units authorized by building permits, 2004	3,792	24,267
Federal spending, 2004 (\$1000)	476,665	13,683,6231
<u>Geography QuickFacts</u>	<u>Washington County</u>	<u>Utah</u>
Land area, 2000 (square miles)	2,427	82,144
Persons per square mile, 2000	37.2	27.2
FIPS Code	053	49
Metropolitan or Micropolitan Statistical Area	St. George, Metro Area	

(1) Includes data not distributed by county.

(a) Includes persons reporting only one race.

(b) Hispanics may be of any race, so also are included in applicable race categories.

FN: Footnote on this item for this area in place of data

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Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, 1997 Census of Governments

Last Revised: Thursday, 08-Jun-2006

APPENDIX E - Comments on draft document received from the public and members of Local Emergency Preparedness Committees

A public draft was presented by the staff of the Five County Association of Governments in June 2007 at “Open House” presentations publically announced and advertised locally in each of the five counties of southwestern Utah. These were held in the following locations:

- June 11, 2007 for Beaver County held in Beaver, Utah.
- June 13, 2007 for Kane County held in Kanab, Utah.
- June 15, 2007 for Iron County held in Cedar City, Utah.
- June 19, 2007 for Washington County held in St. George, Utah.
- June 28, 2007 for Garfield County held in both Panguitch, Utah at the Panguitch City Office and at Ruby’s Inn near Bryce Canyon National Park, Utah.

Comments, both written and verbal were solicited during each of the Public Open Houses.

The following comments were received:

Beaver County Open House

Comment: “There are additional areas, including east of Beaver, such as the Puffer Lake area, that should have consideration for inclusion as focus areas.”

Response: The Color Country Interagency Fuels Committee determines the regional focus areas. Those areas are a dynamic list which will and should change from time to time as fuels projects are undertaken or other circumstances warrant changes in the list of areas. When this plan document is updated local involvement in the process should address this concern.

Kane County Open House

No comments received.

Iron County Open House

No comments received.

Washington County Open House

Comment: “There were obvious solutions to the fire hazard problems that were not addressed in the plan: 1) Allow cattle to graze on hazardous areas. Ranchers keep roads and trails open. Cattle eat the tinder grasses. 2) Allow wood gathering, lumber harvesting of dead wood. 3) Harvest beetle infested trees to prevent dead wood. 4) Fight the fires! 5) Use the resources instead of leaving them to burn. ”

Response: These concerns expressed are outside the scope and realm of this landscaped-level regional plan and are issues that would be better addressed in another forum.

Garfield County Open House

Comment: “Why are additional areas not shown as focus areas. A good portion of the county has fire risk concerns of one sort or another?”

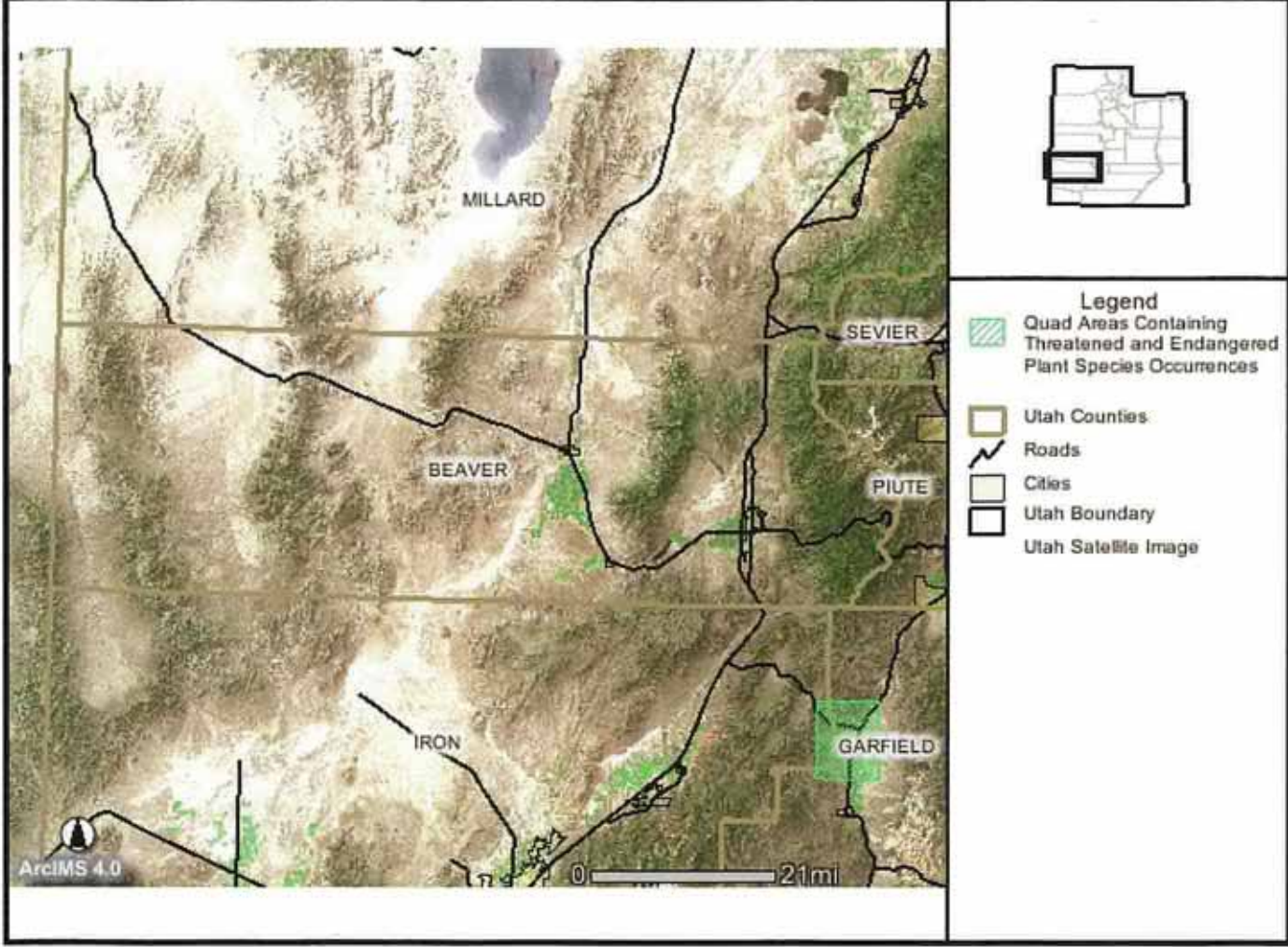
Response: Again, as above, it is the Color Country Interagency Fuels Committee that determines the regional focus areas that are identified in this document.

APPENDIX F - Southwest Utah Plants and Animals Habitat Maps

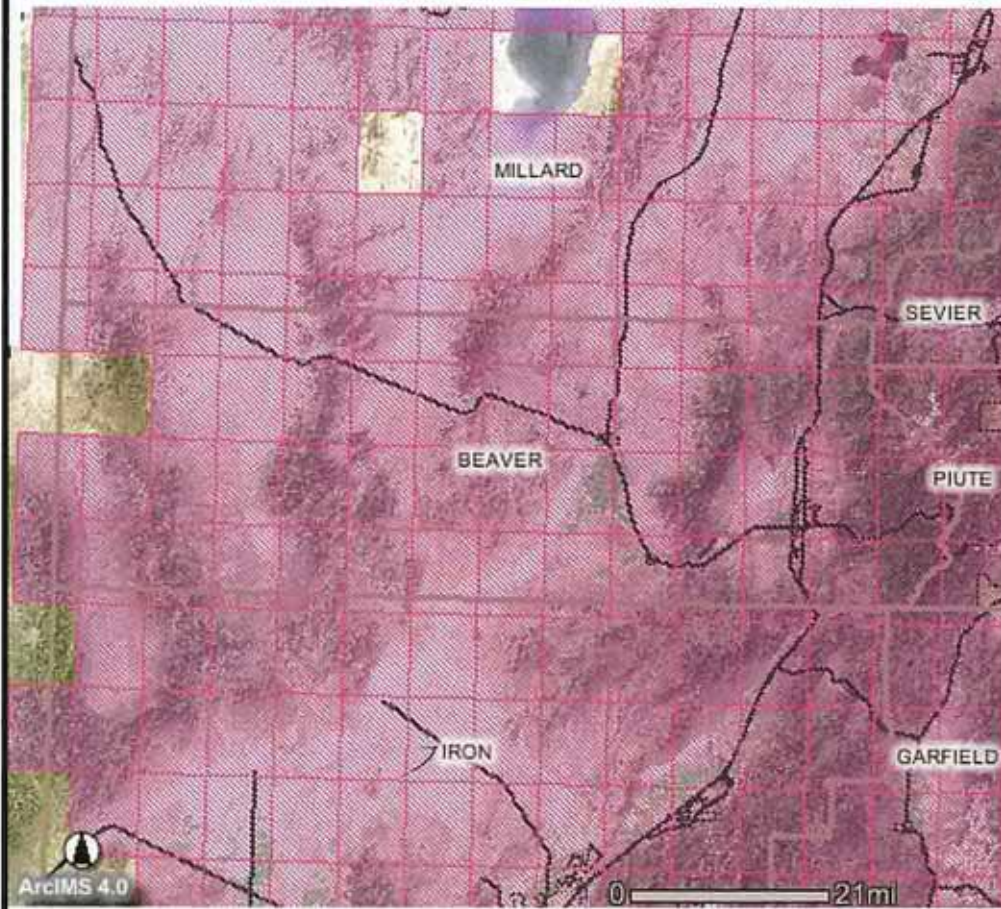
The following pages contain habitat maps for selected plant and animal species in the five counties of southwestern Utah. They were obtained from the Utah Division of Wildlife Resources, Conservation Data Center.

**BEAVER COUNTY
PLANTS AND ANIMALS
HABITAT MAPS**

Utah Div. of Wildlife Resources -- Conservation Data Center

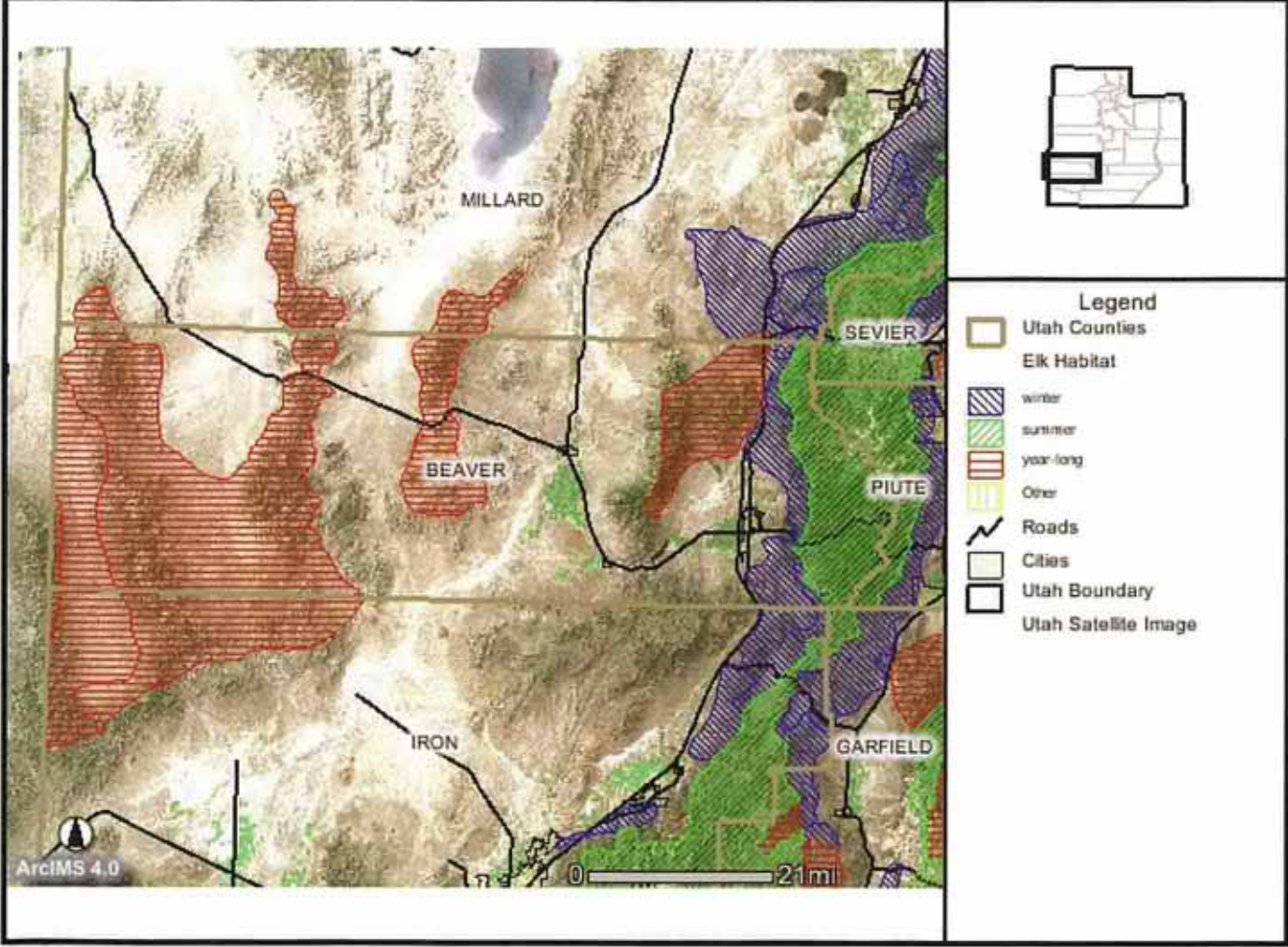


Utah Div. of Wildlife Resources -- Conservation Data Center

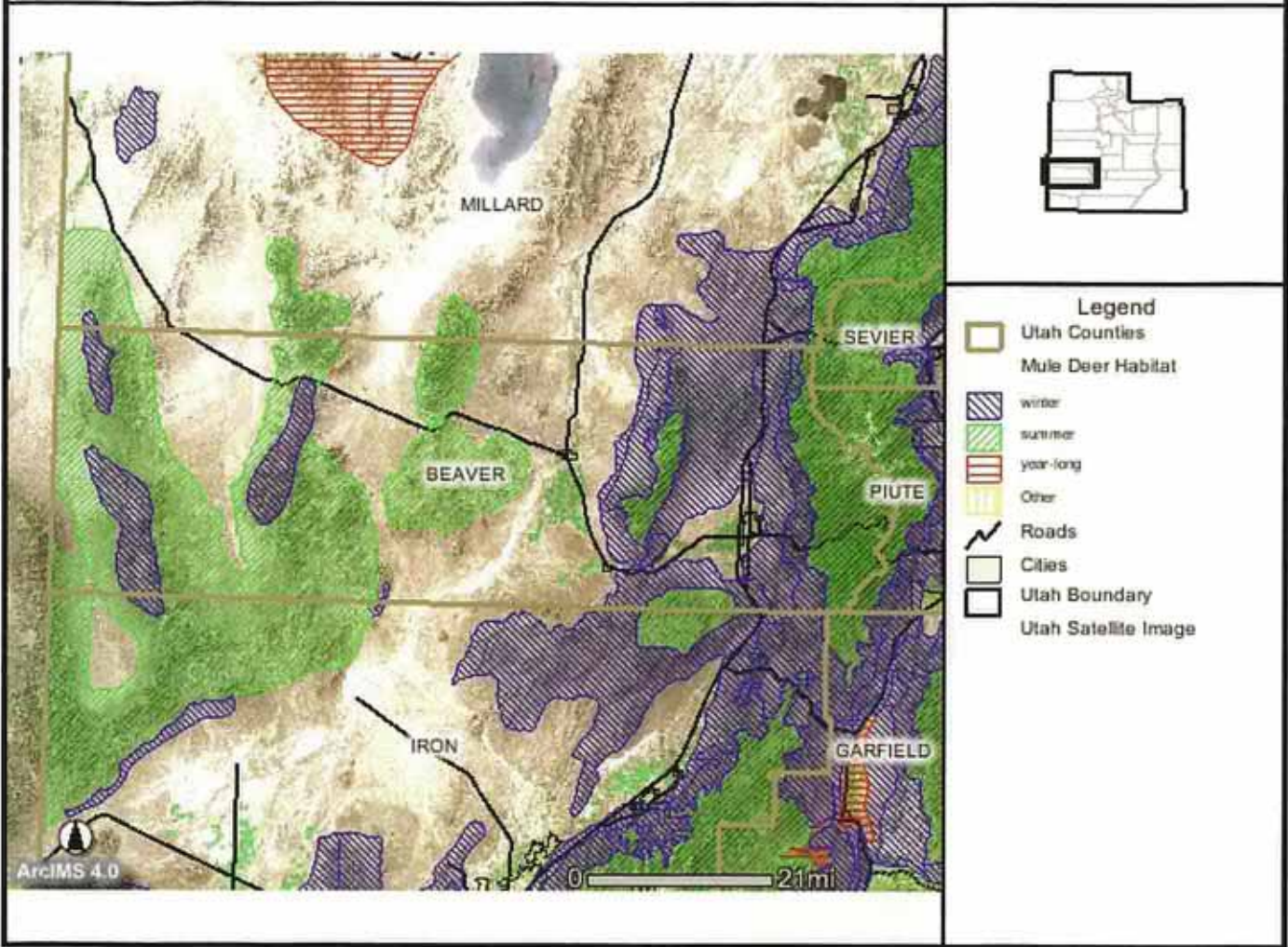


- Legend**
-  Quad Areas Containing Threatened, Endangered, and Sensitive Animal Species Occurrences
 -  Utah Counties
 -  Roads
 -  Cities
 -  Utah Boundary
 -  Utah Satellite Image

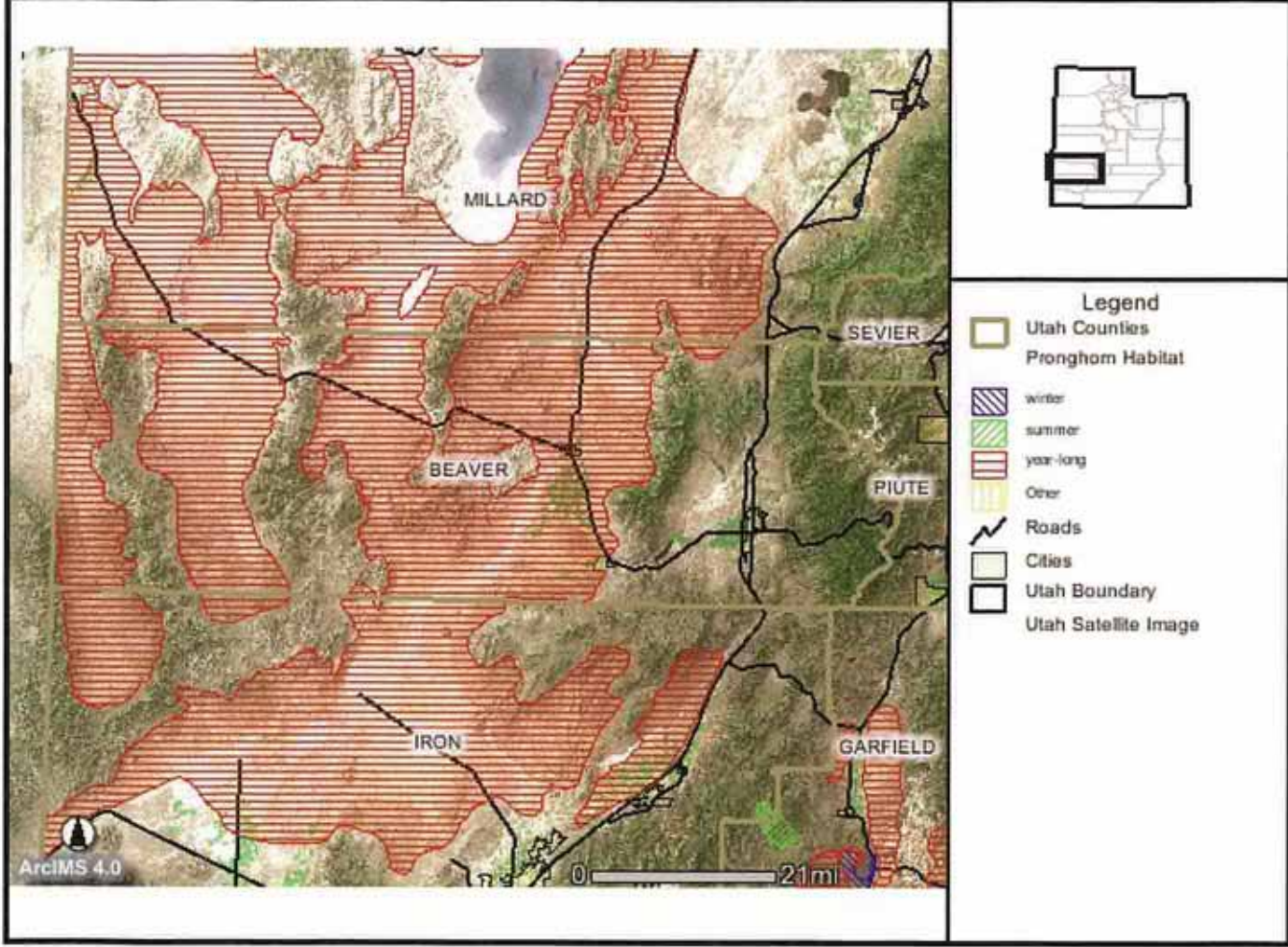
Utah Div. of Wildlife Resources -- Conservation Data Center



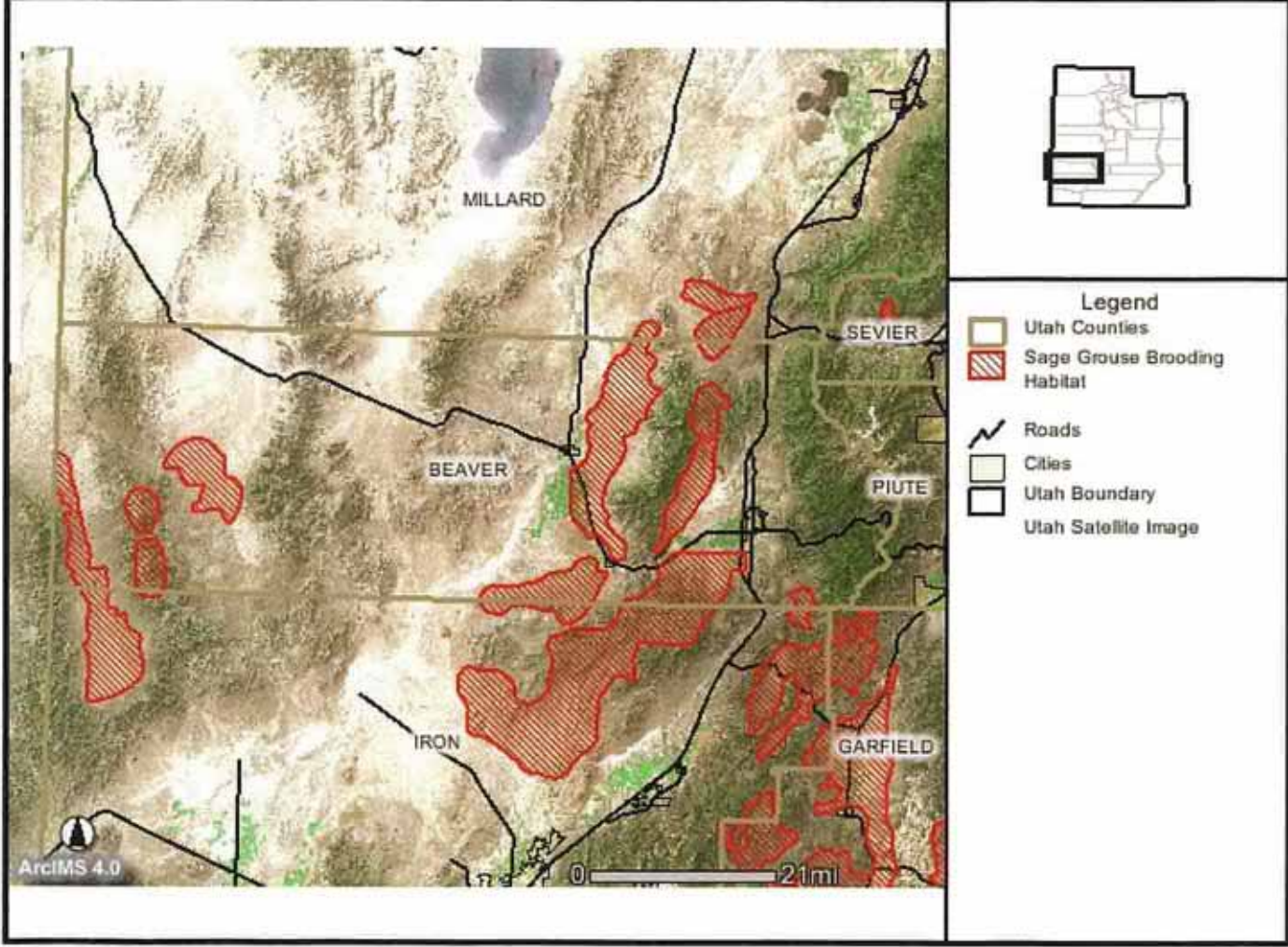
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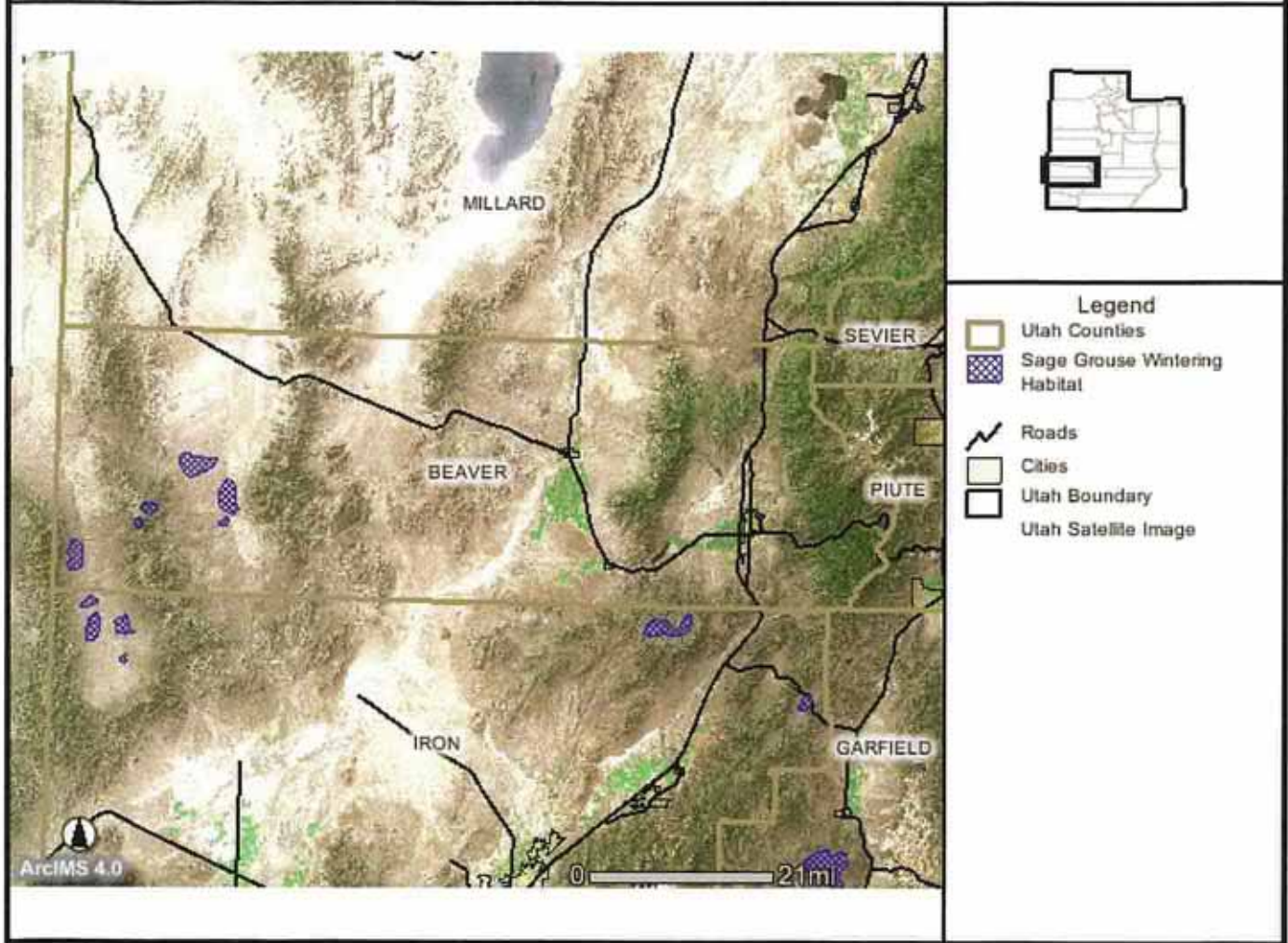
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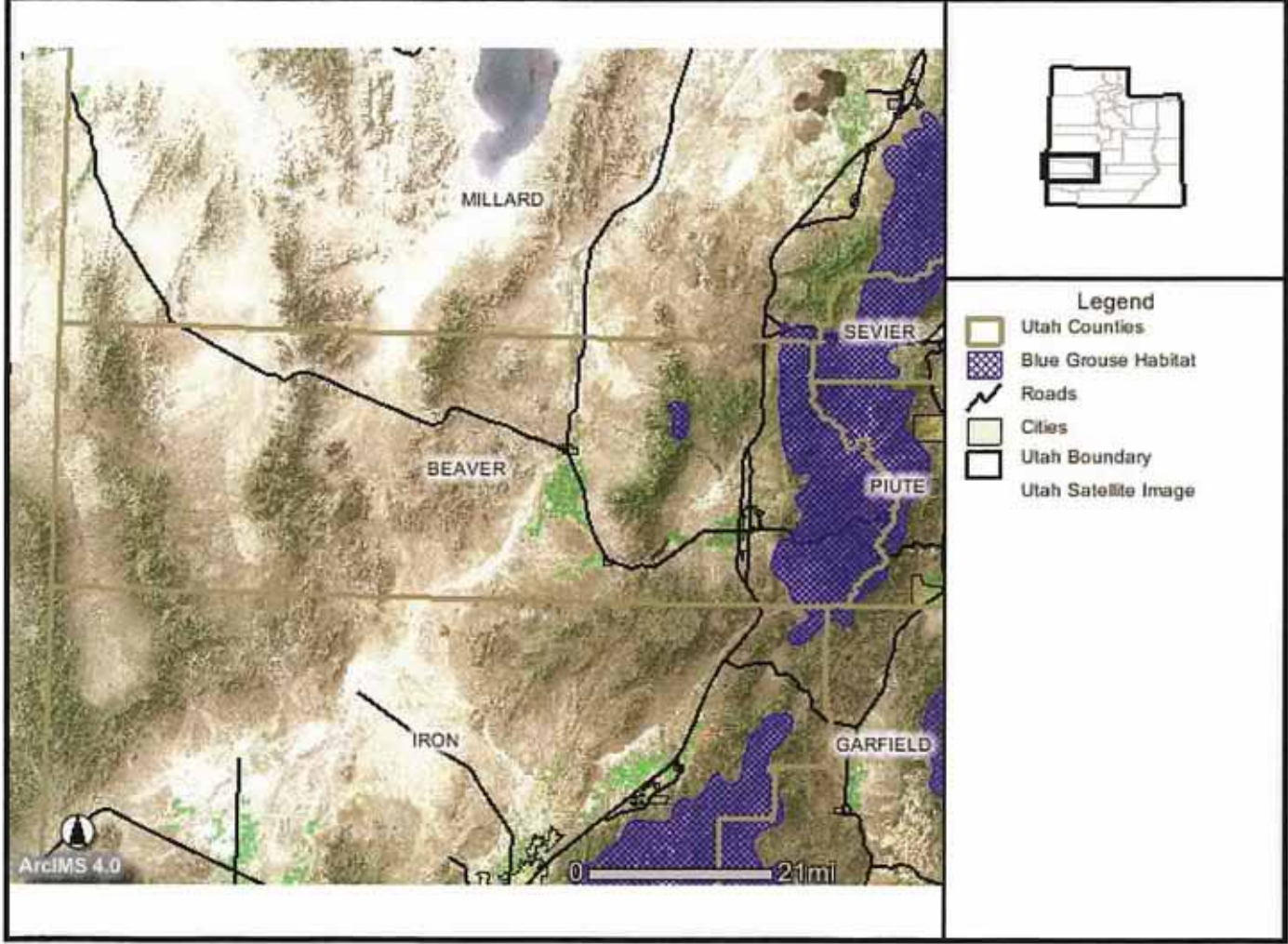
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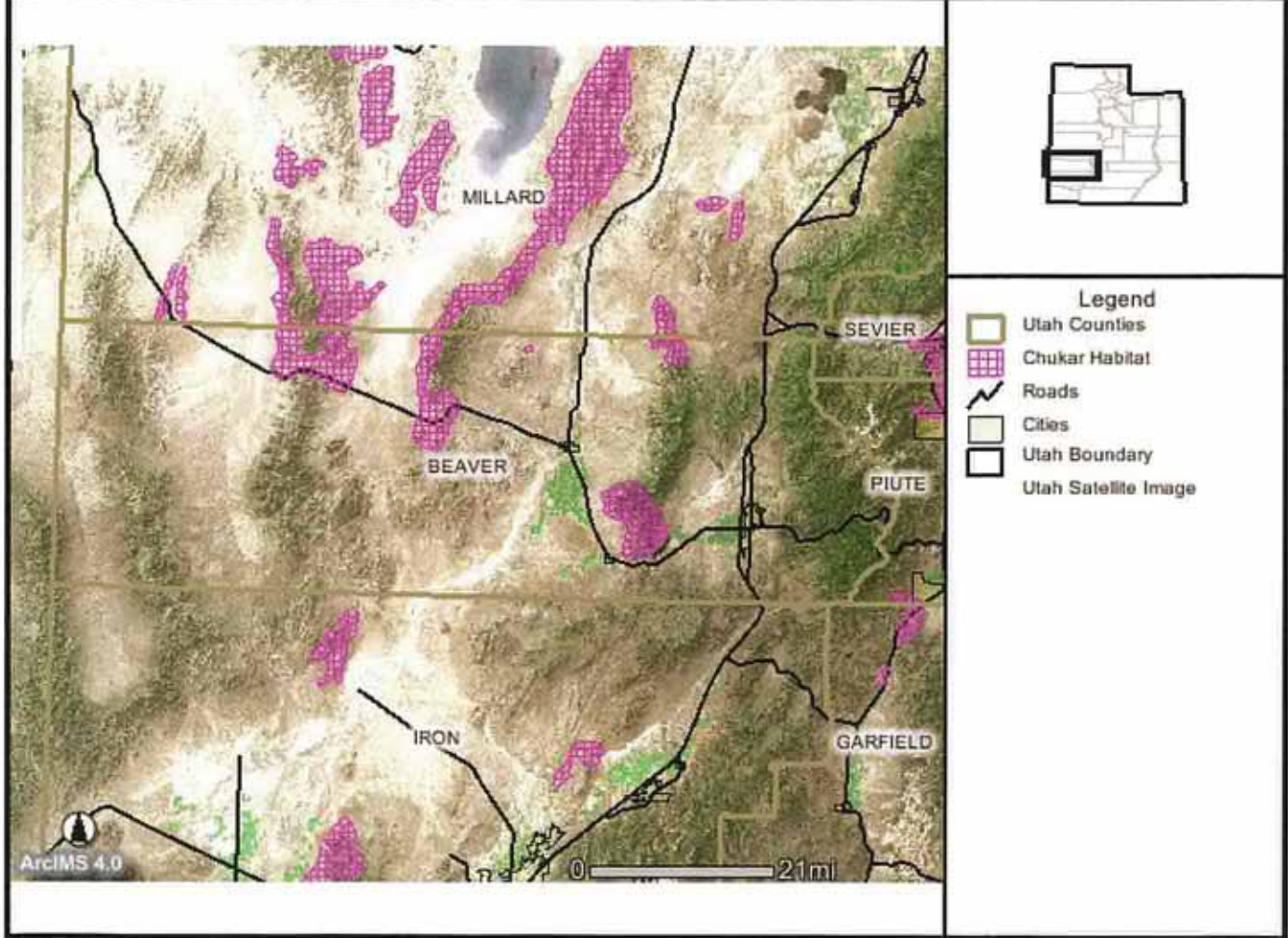
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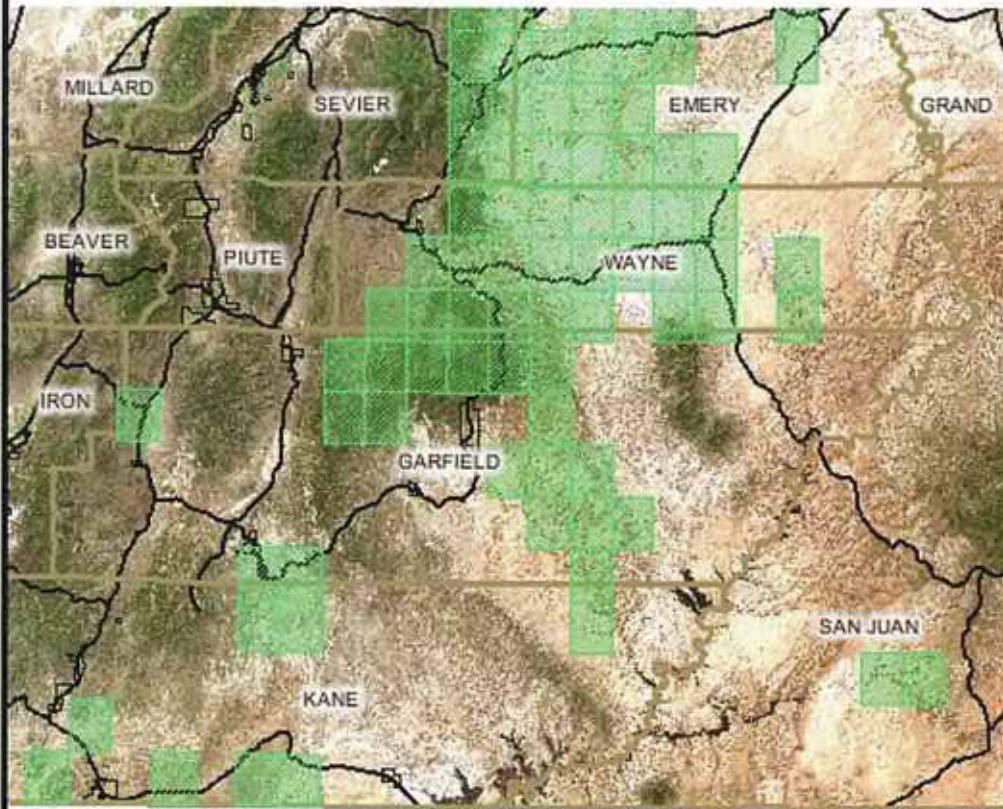


Utah Div. of Wildlife Resources -- Conservation Data Center



**GARFIELD COUNTY
PLANTS AND ANIMALS
HABITAT MAPS**

Utah Div. of Wildlife Resources -- Conservation Data Center



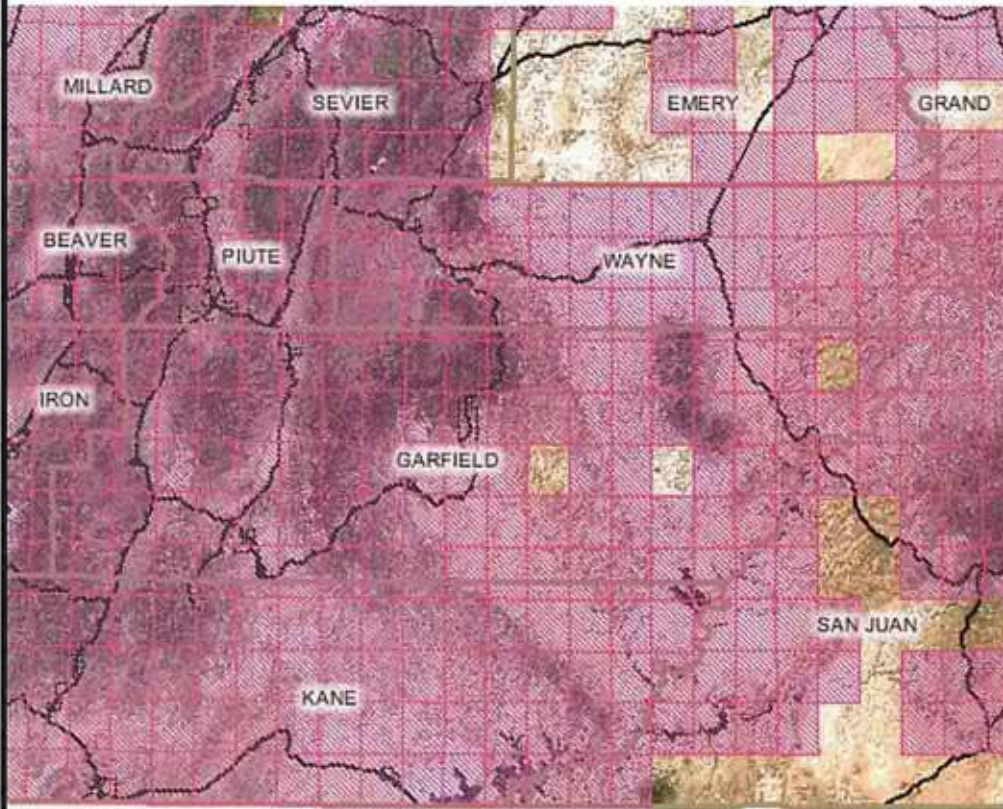
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-  Quad Areas Containing Threatened and Endangered Plant Species Occurrences
-  Utah Counties
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image

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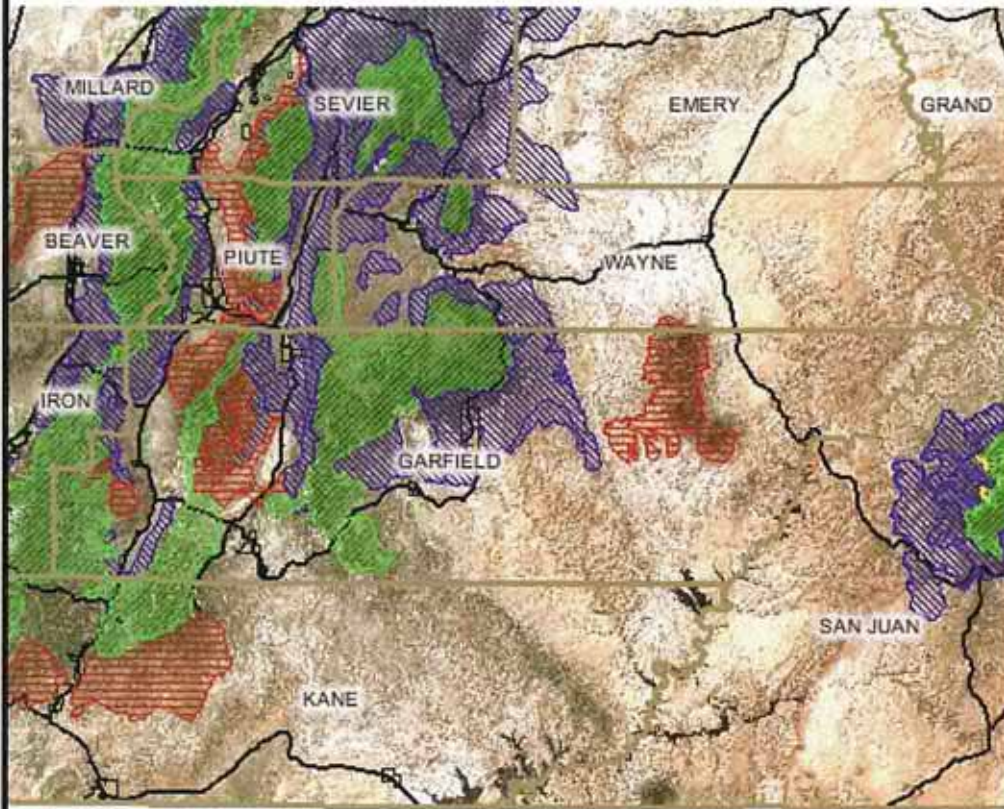


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-  Quad Areas Containing Threatened, Endangered, and Sensitive Animal Species Occurrences
-  Utah Counties
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



Utah Div. of Wildlife Resources -- Conservation Data Center



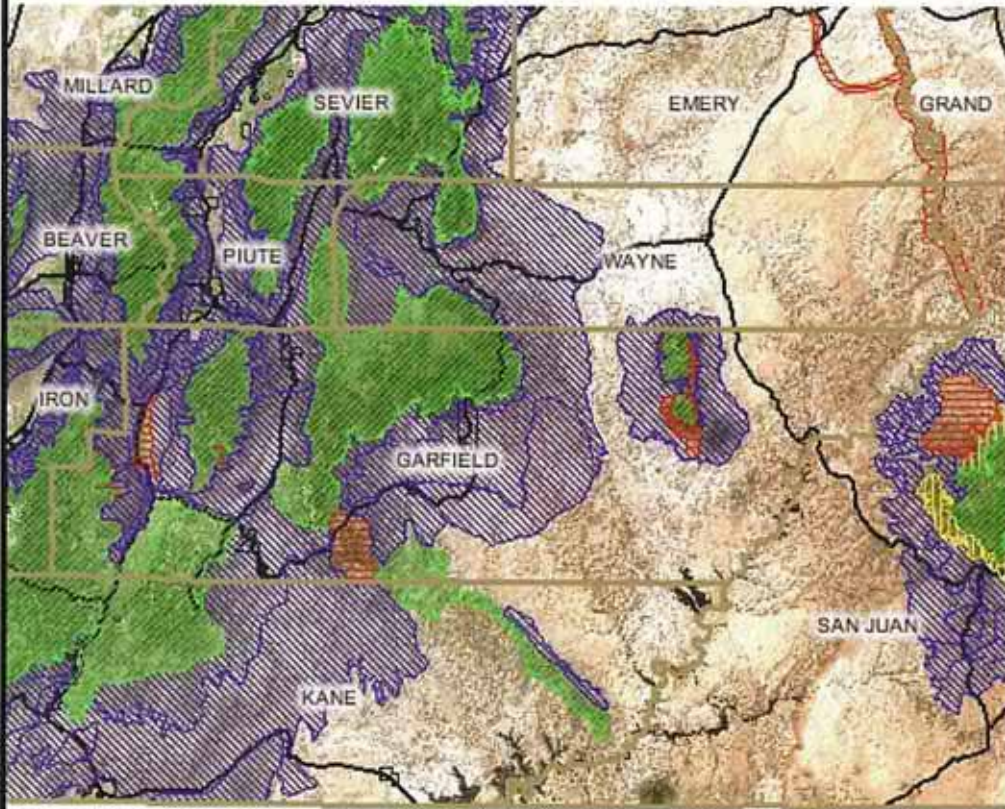
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- Utah Counties
- Elk Habitat
 - winter
 - summer
 - year-long
 - Other
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

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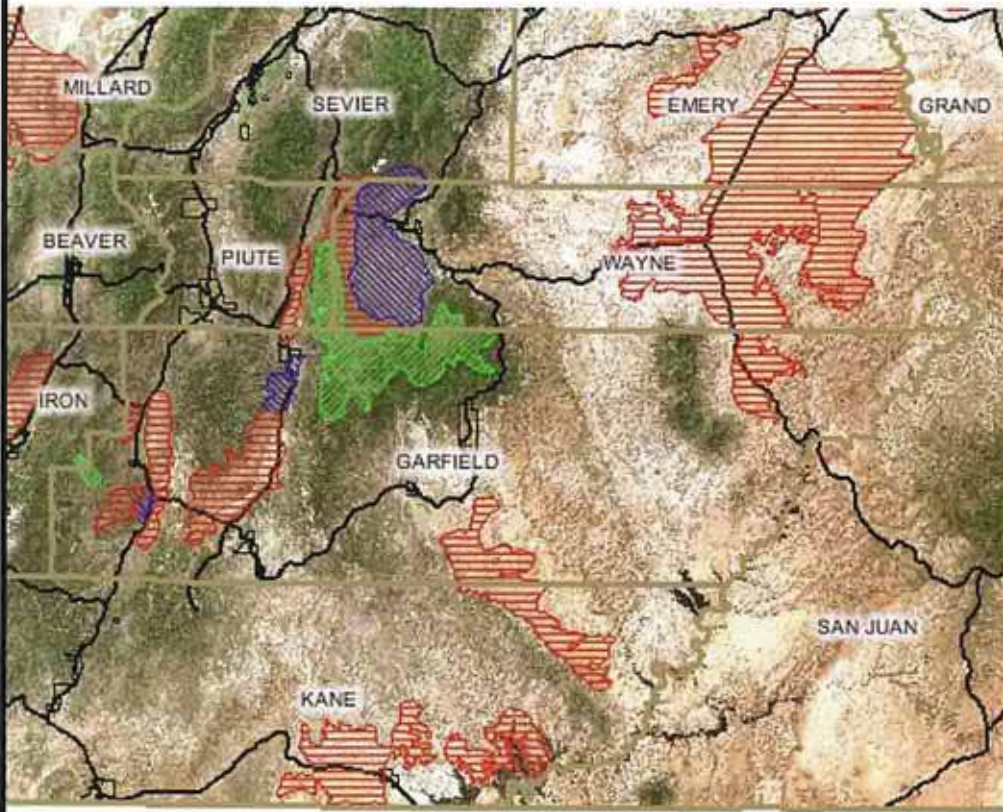
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- Utah Counties
- Mule Deer Habitat
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- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

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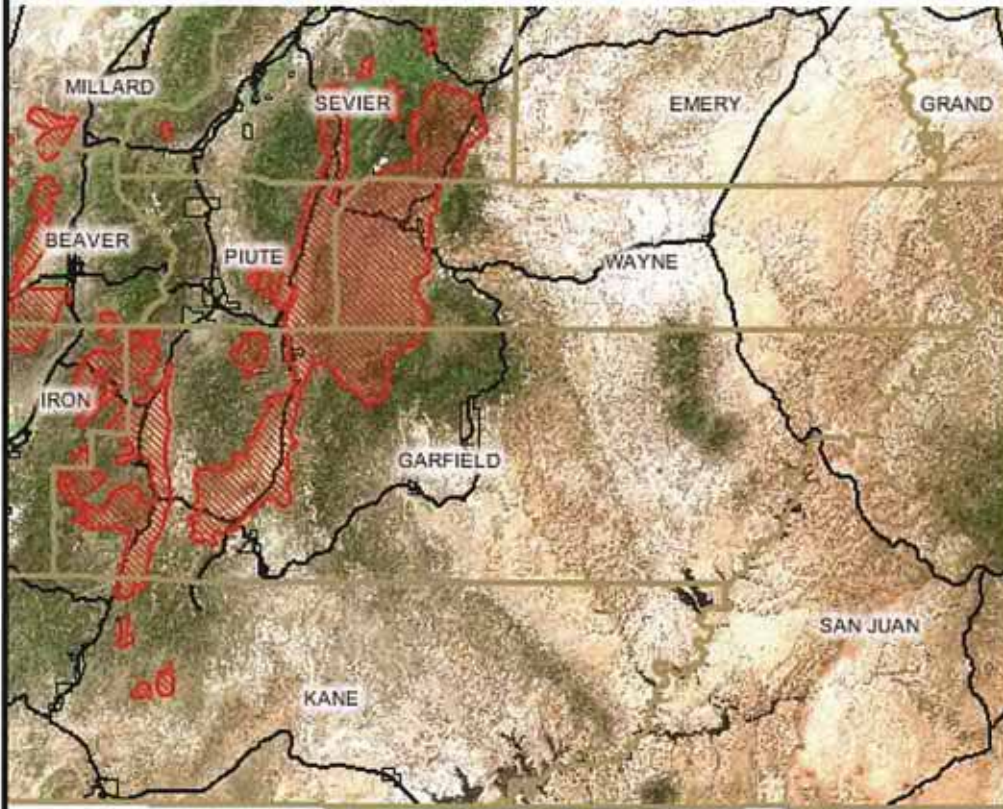
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- Utah Counties
- Pronghorn Habitat
 - winter
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 - Other
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

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Utah Div. of Wildlife Resources -- Conservation Data Center



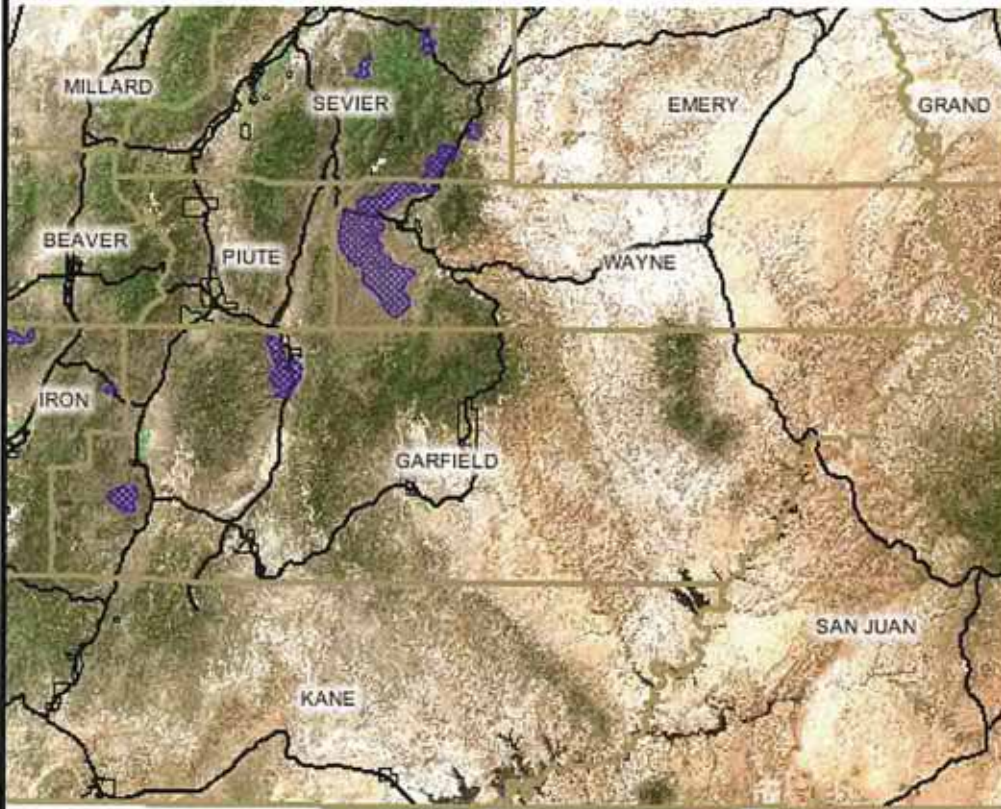
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-  Utah Counties
-  Sage Grouse Brooding Habitat
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-  Cities
-  Utah Boundary
-  Utah Satellite Image

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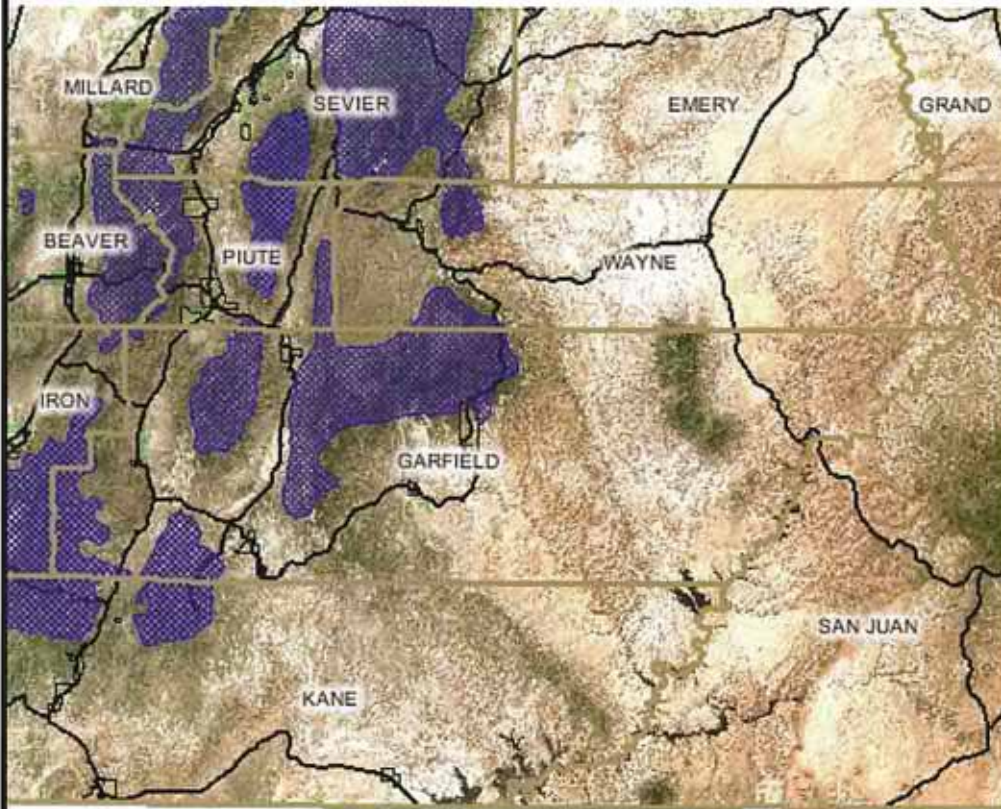
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- Utah Counties
- Sage Grouse Wintering Habitat
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

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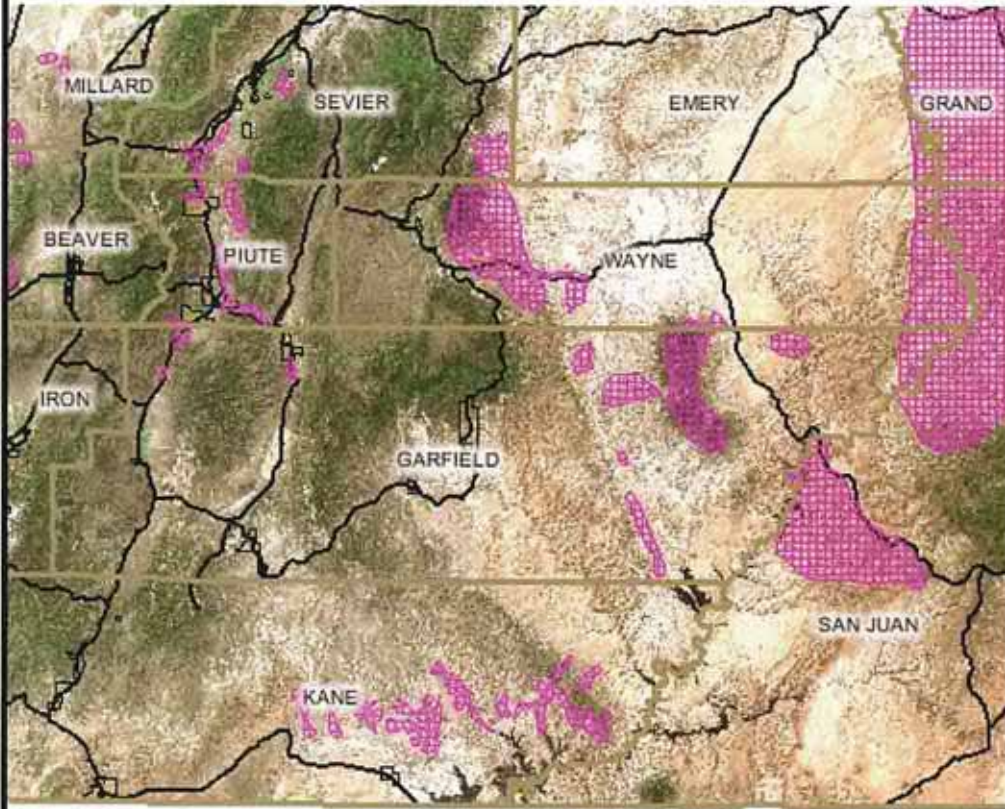
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- Utah Counties
- Blue Grouse Habitat
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

Utah Div. of Wildlife Resources -- Conservation Data Center



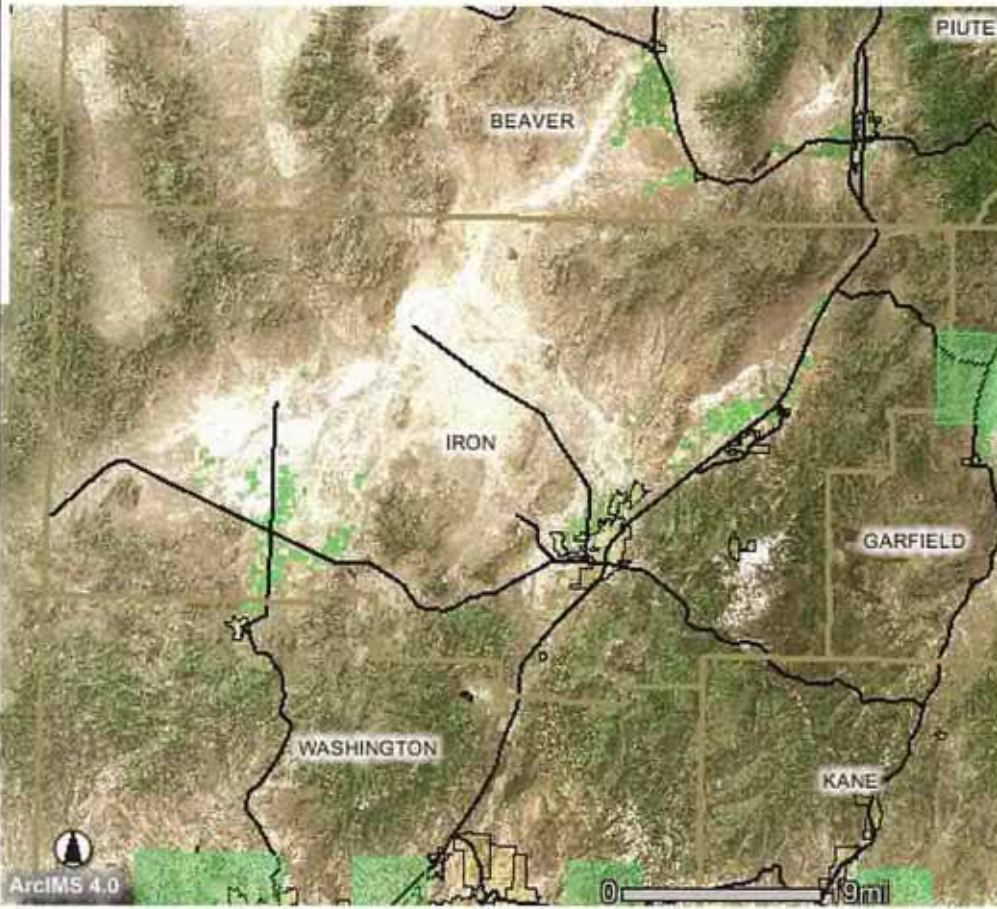
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-  Utah Counties
-  Chukar Habitat
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



**IRON COUNTY
PLANTS AND ANIMALS
HABITAT MAPS**

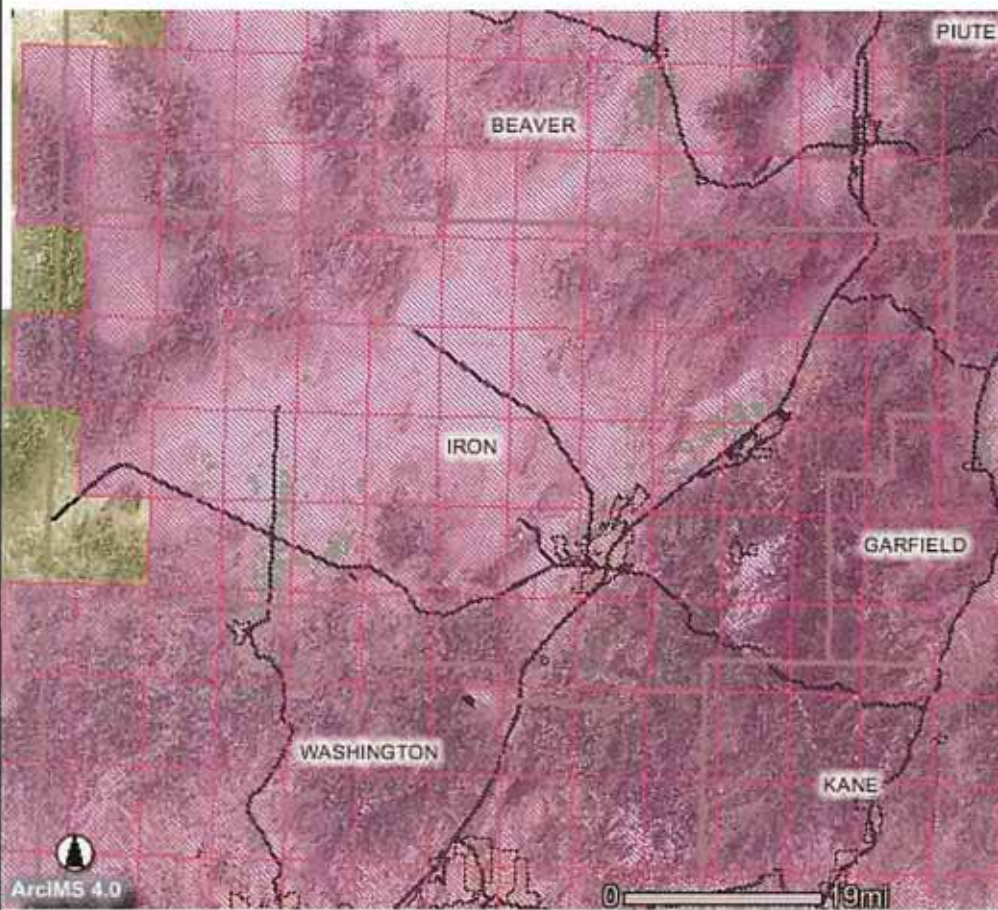
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Legend

-  Quad Areas Containing Threatened and Endangered Plant Species Occurrences
-  Utah Counties
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image

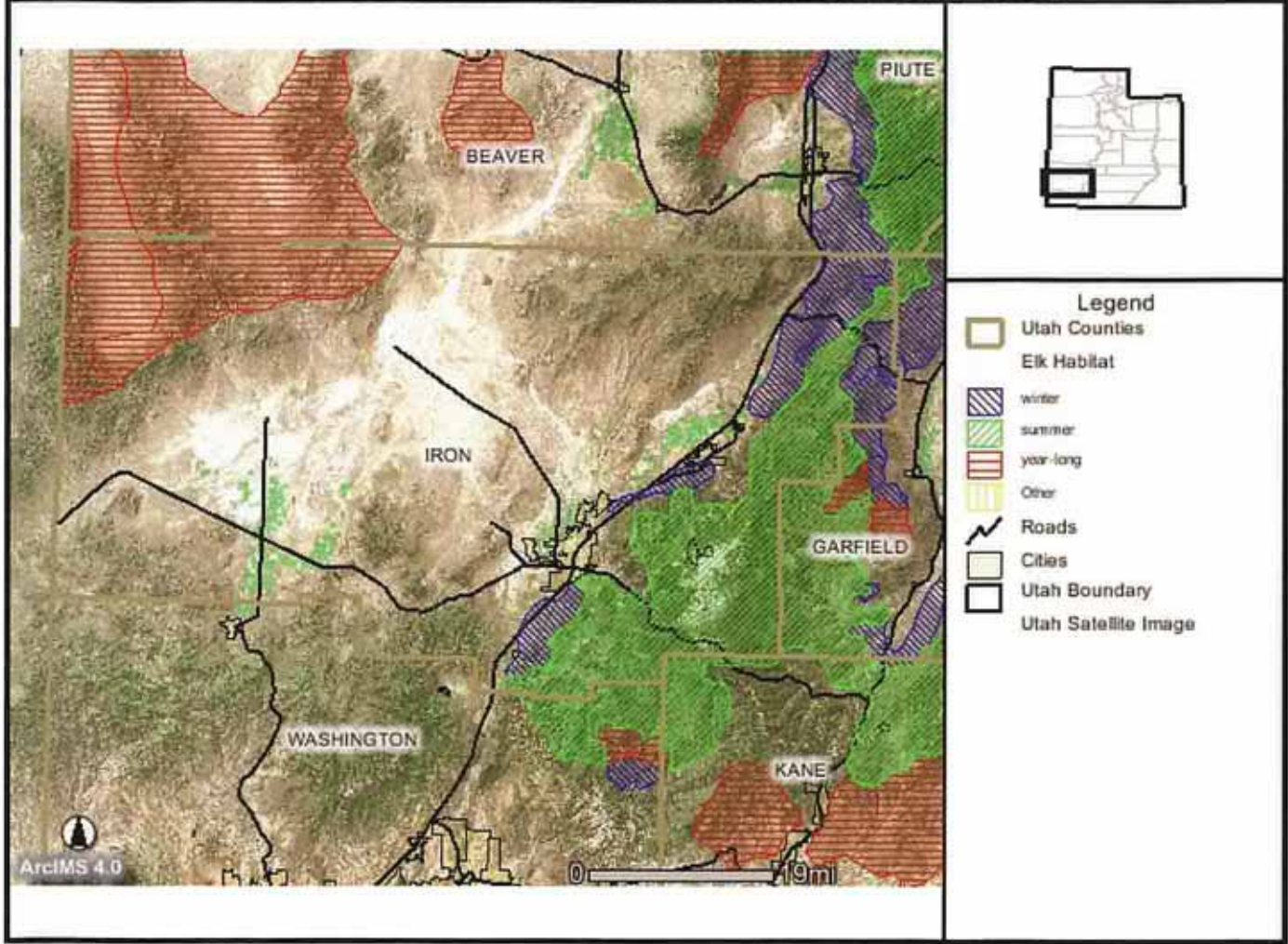
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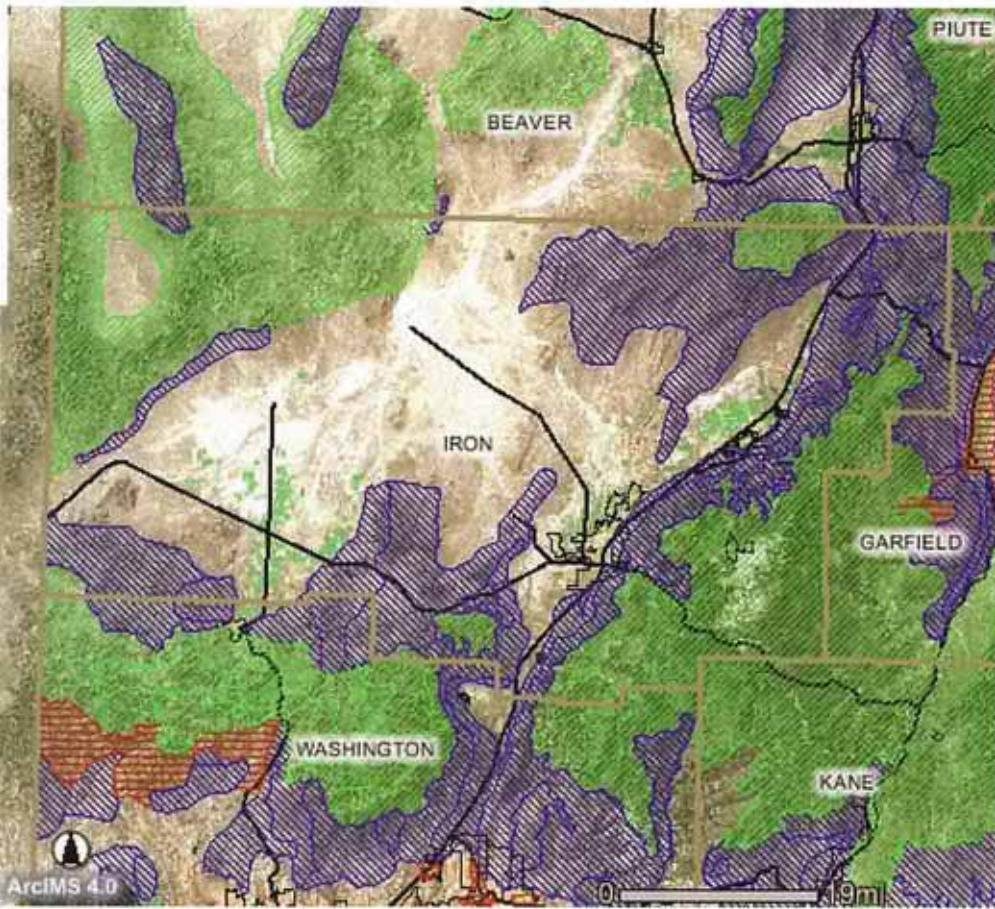
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-  Quad Areas Containing Threatened, Endangered, and Sensitive Animal Species Occurrences
-  Utah Counties
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image

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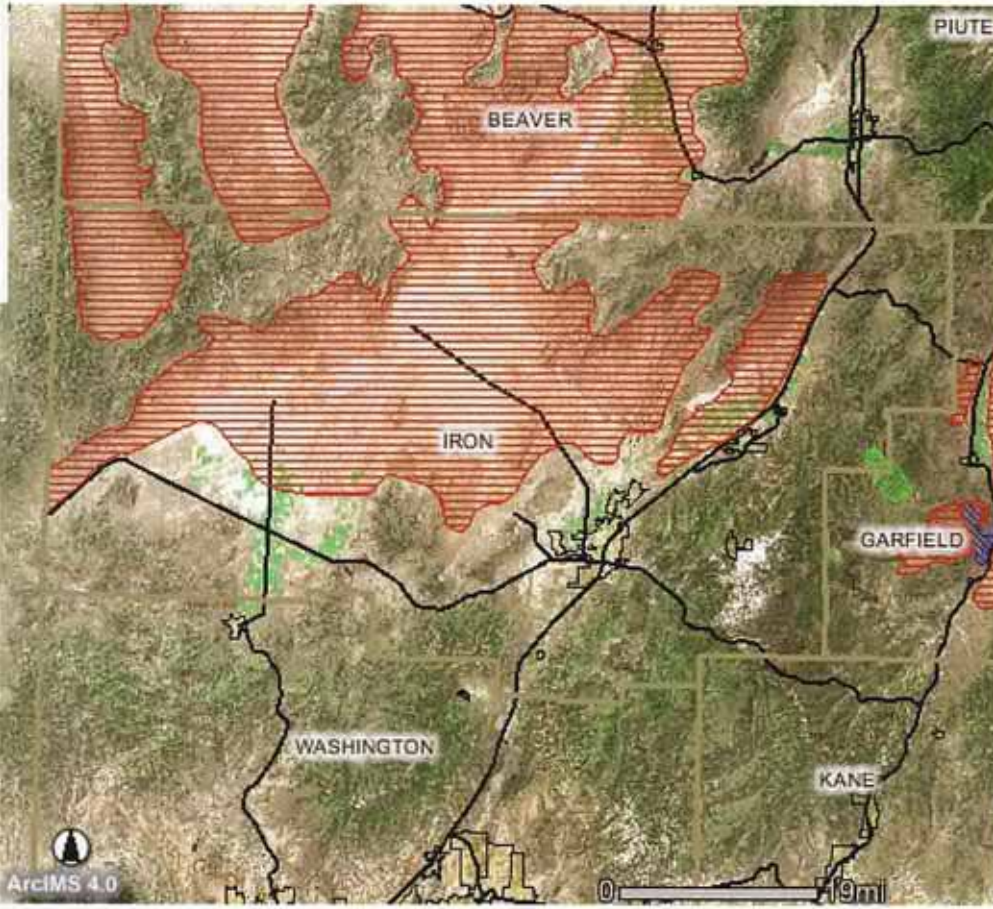
Utah Div. of Wildlife Resources -- Conservation Data Center



Legend

-  Utah Counties
- Mule Deer Habitat**
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-  Other
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image

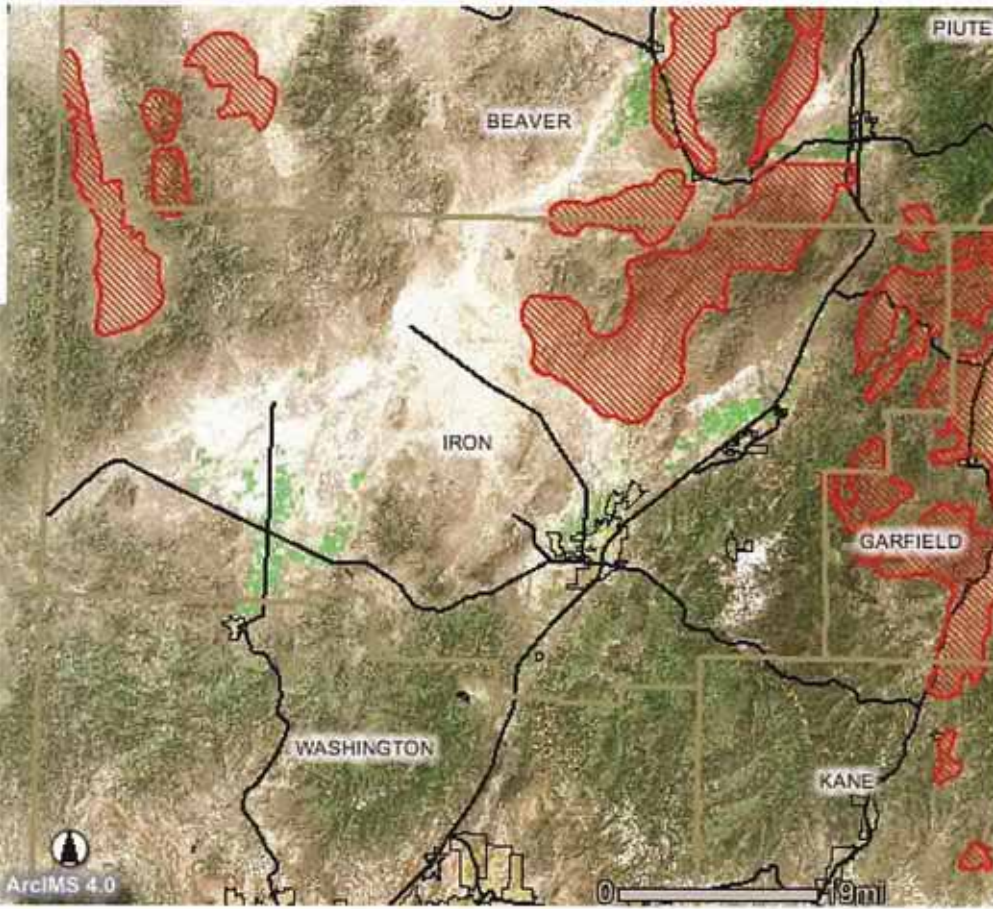
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Legend

-  Utah Counties
-  Pronghorn Habitat
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-  Cities
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-  Utah Satellite Image

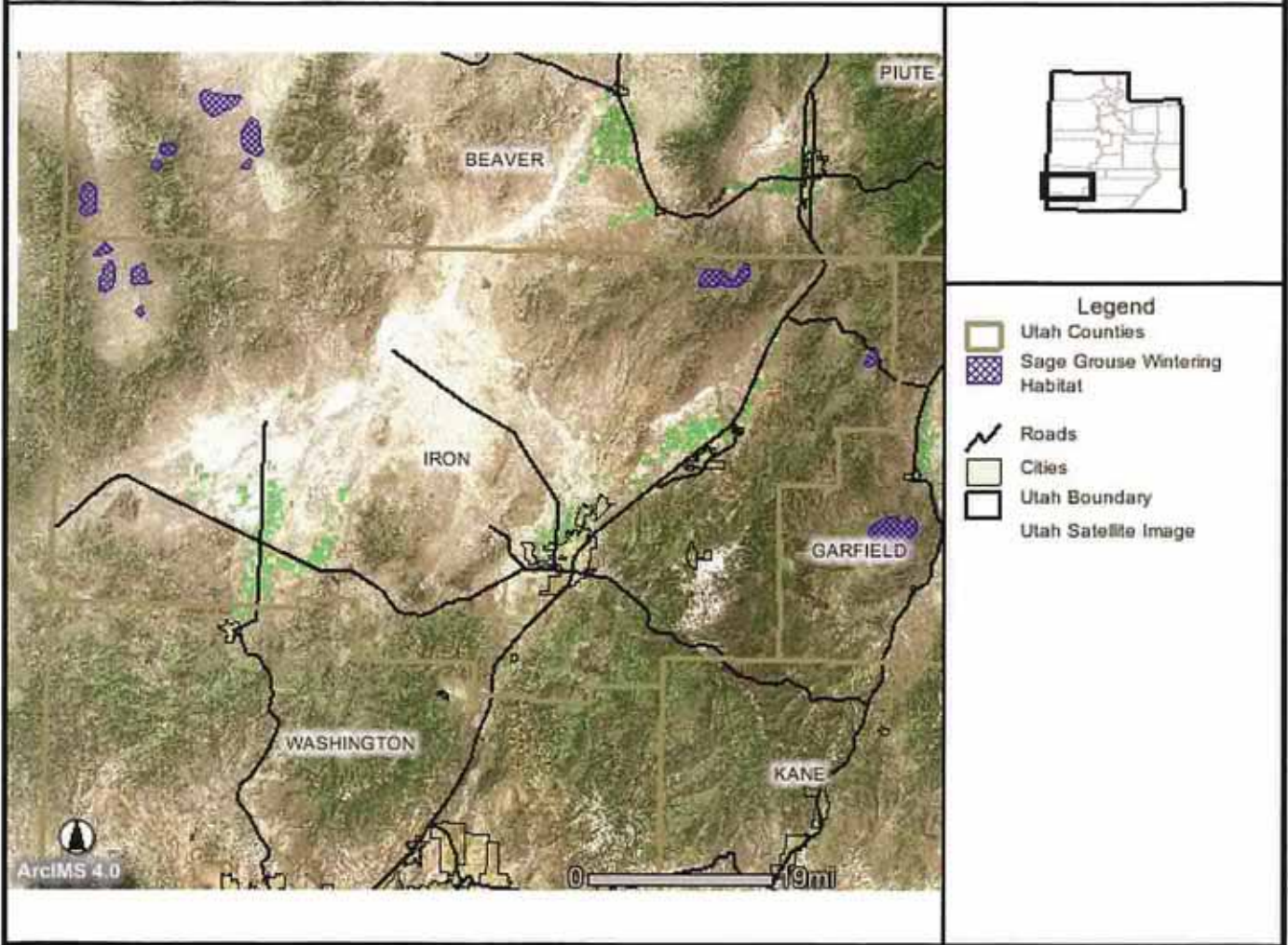
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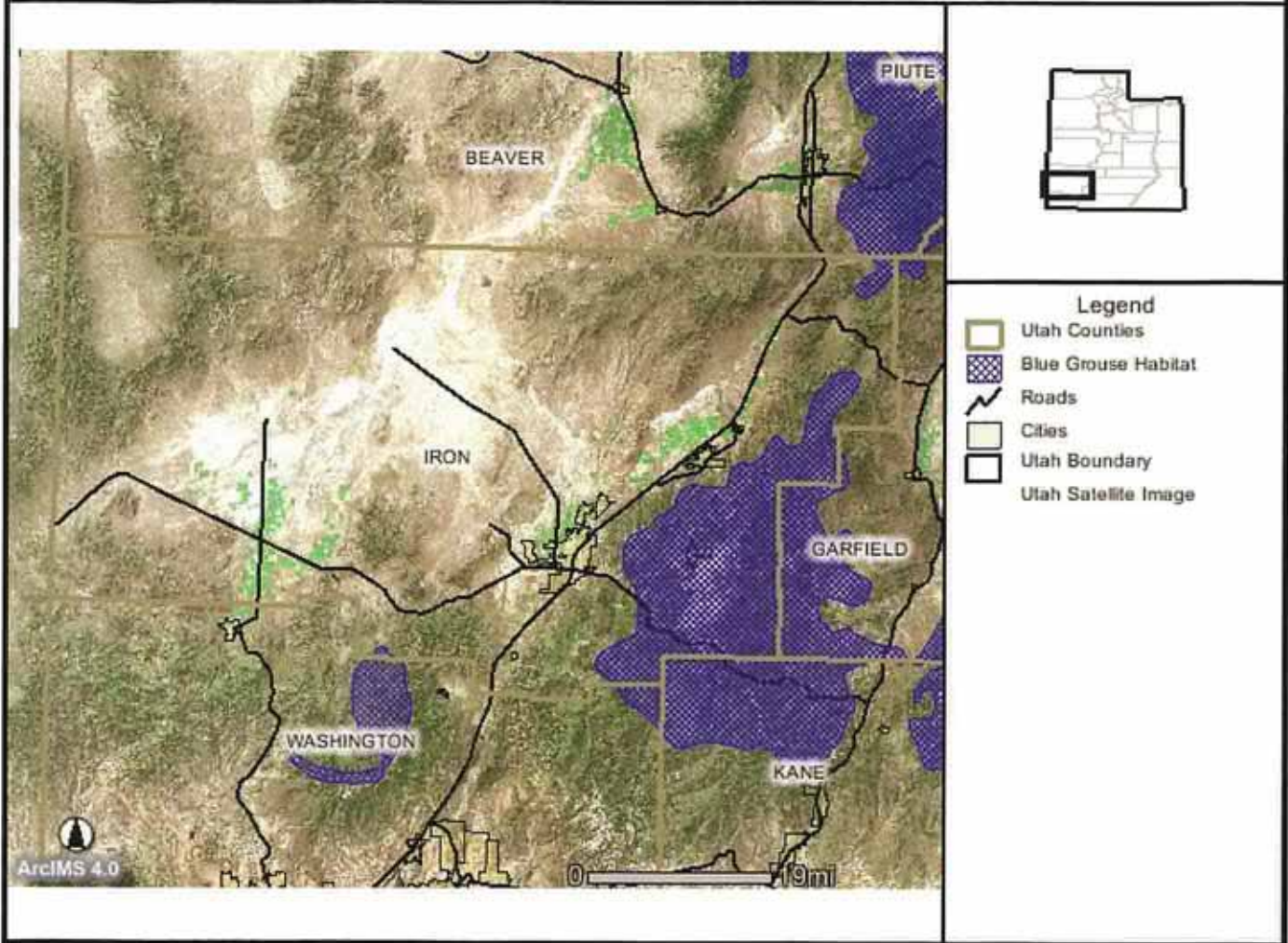
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- Utah Counties
- Sage Grouse Brooding Habitat
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

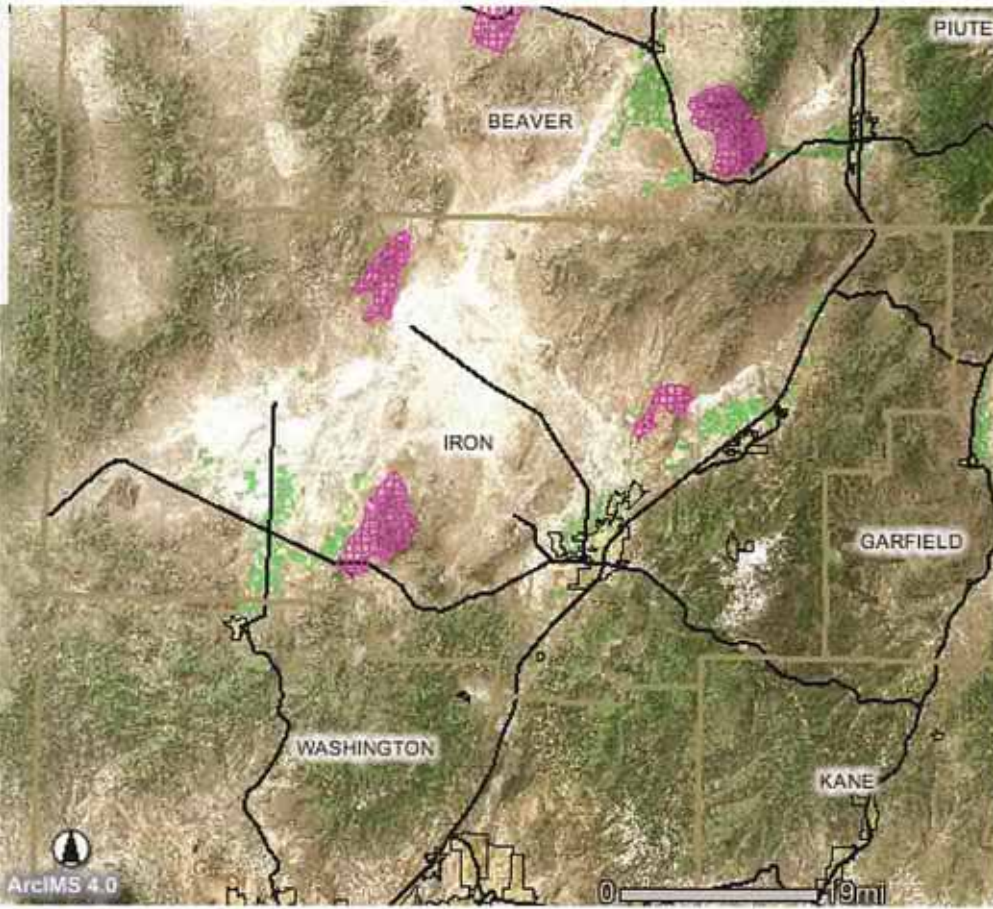
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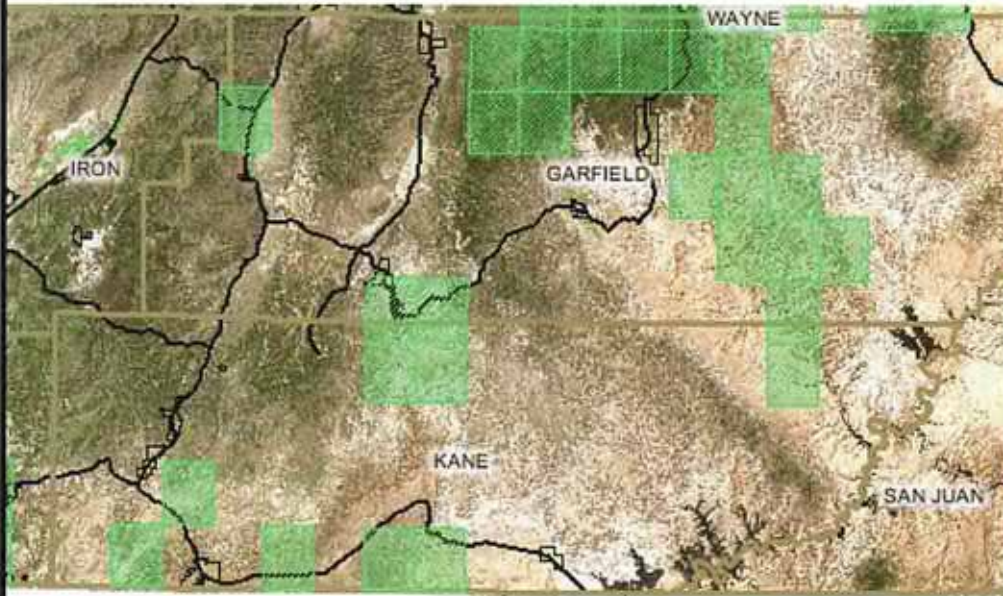
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- Legend
- Utah Counties
 - Chukar Habitat
 - Roads
 - Cities
 - Utah Boundary
 - Utah Satellite Image

**KANE COUNTY
PLANTS AND ANIMALS
HABITAT MAPS**

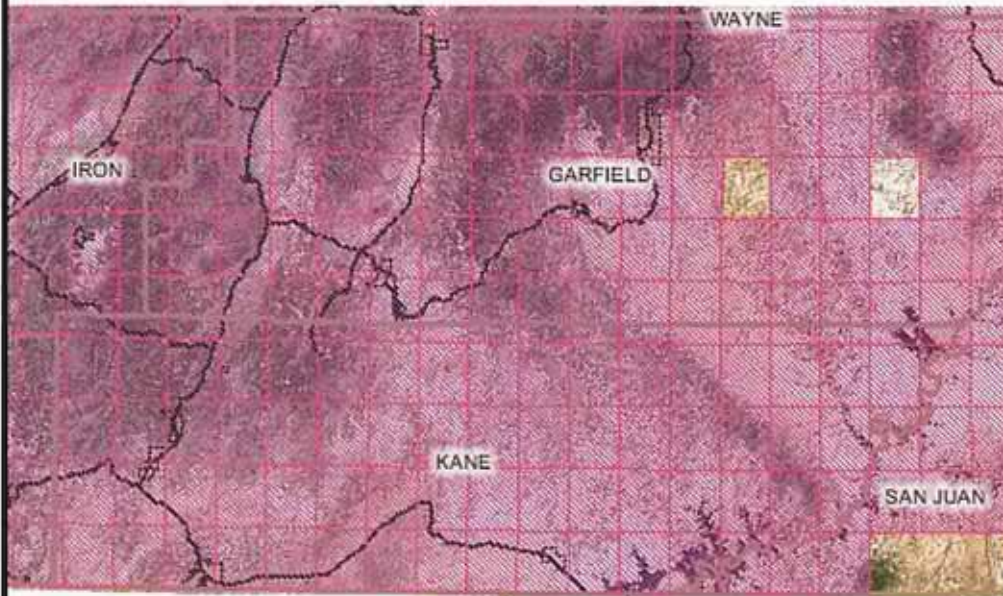
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- Legend**
-  Quad Areas Containing Threatened and Endangered Plant Species Occurrences
 -  Utah Counties
 -  Roads
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Utah Div. of Wildlife Resources -- Conservation Data Center

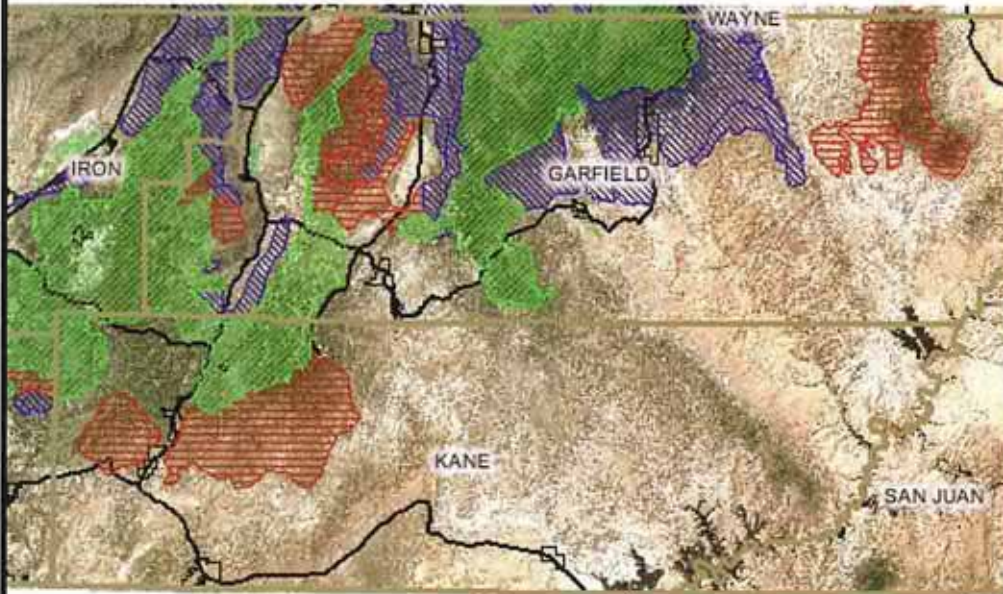


Legend

-  Quad Areas Containing Threatened, Endangered, and Sensitive Animal Species Occurrences
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-  Cities
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-  Utah Satellite Image



Utah Div. of Wildlife Resources -- Conservation Data Center

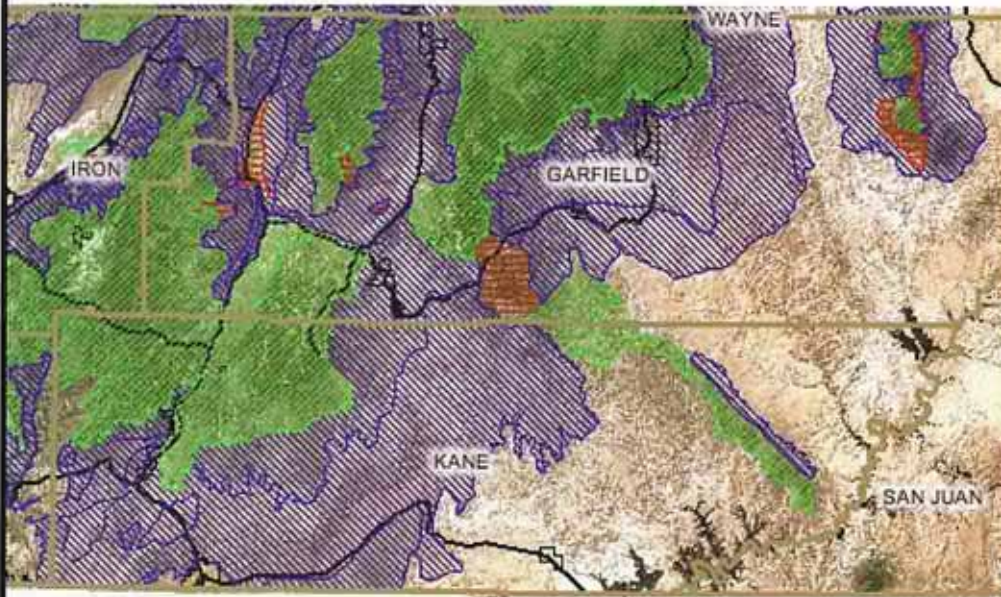


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-  Utah Counties
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Utah Div. of Wildlife Resources -- Conservation Data Center

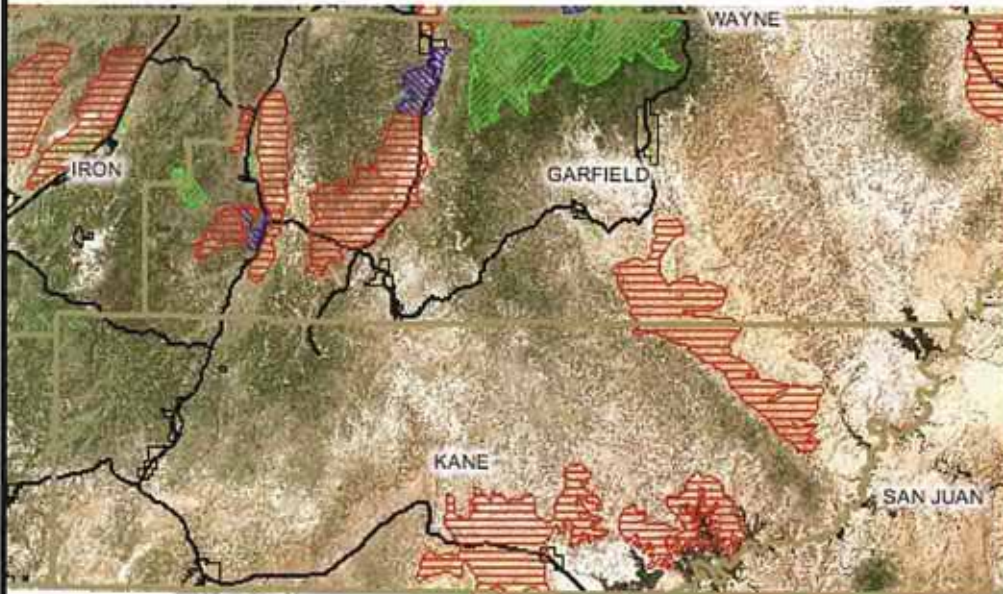


- Legend**
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 - Mule Deer Habitat**
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Utah Div. of Wildlife Resources -- Conservation Data Center

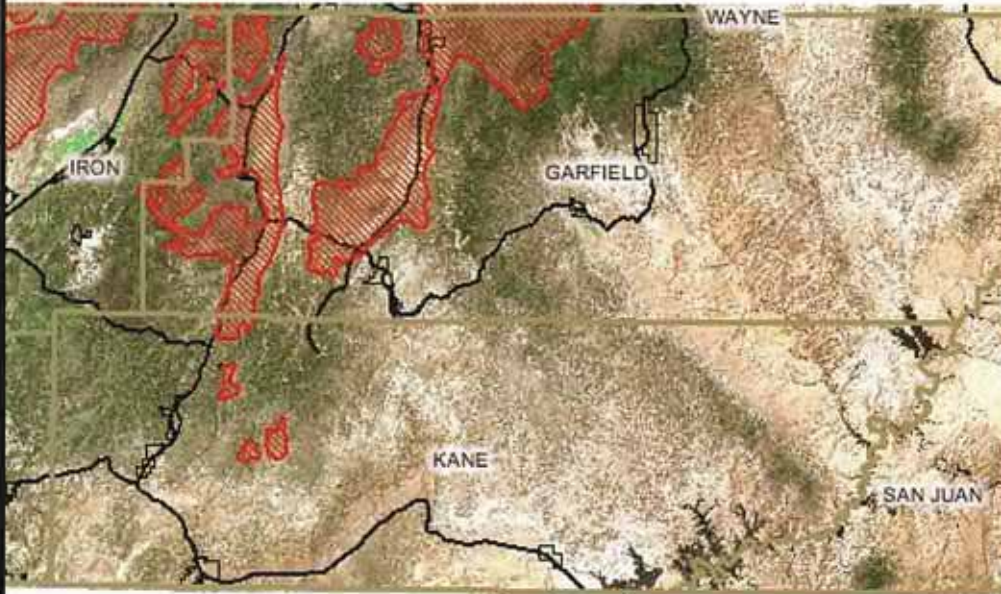


Legend

-  Utah Counties
-  Pronghorn Habitat
-  winter
-  summer
-  year-long
-  Other
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



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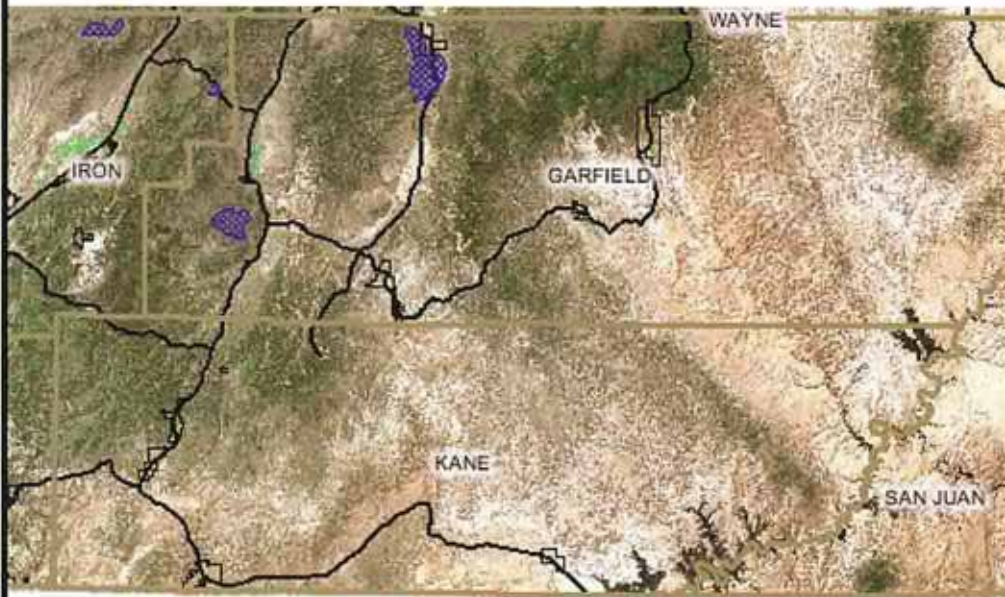


Legend

-  Utah Counties
-  Sage Grouse Brooding Habitat
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



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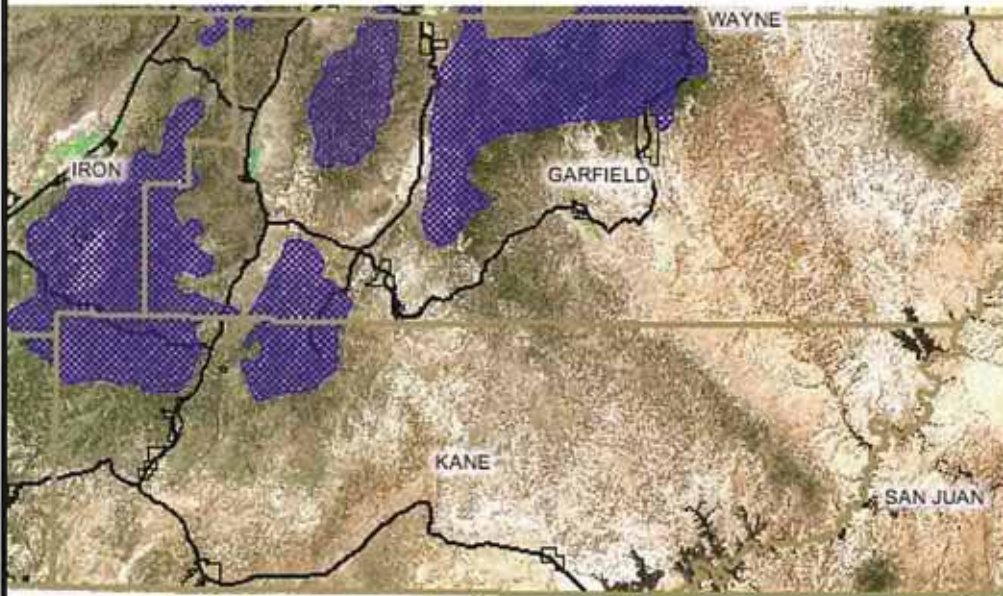


Legend

-  Utah Counties
-  Sage Grouse Wintering Habitat
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



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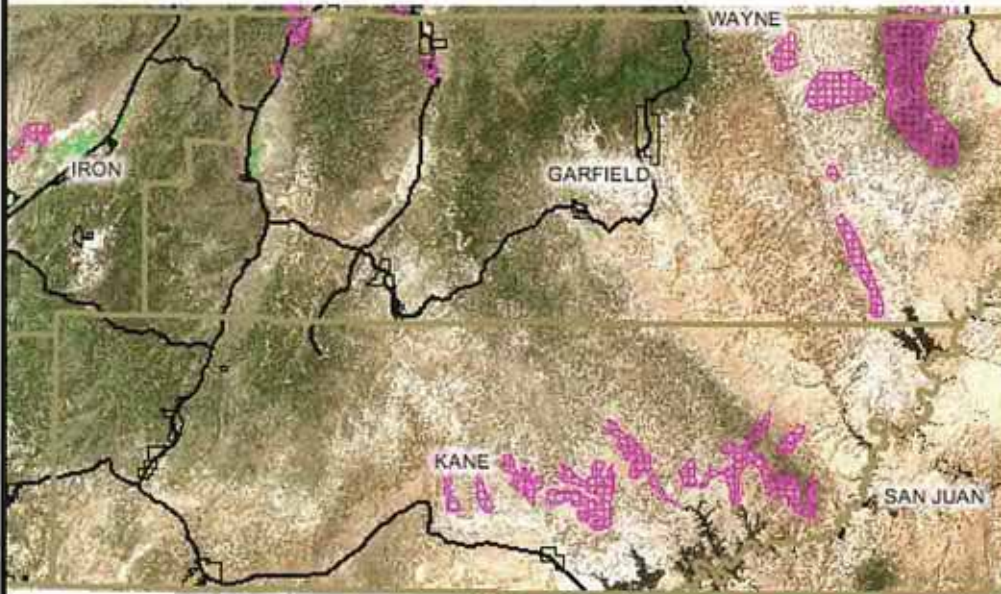


Legend

-  Utah Counties
-  Blue Grouse Habitat
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



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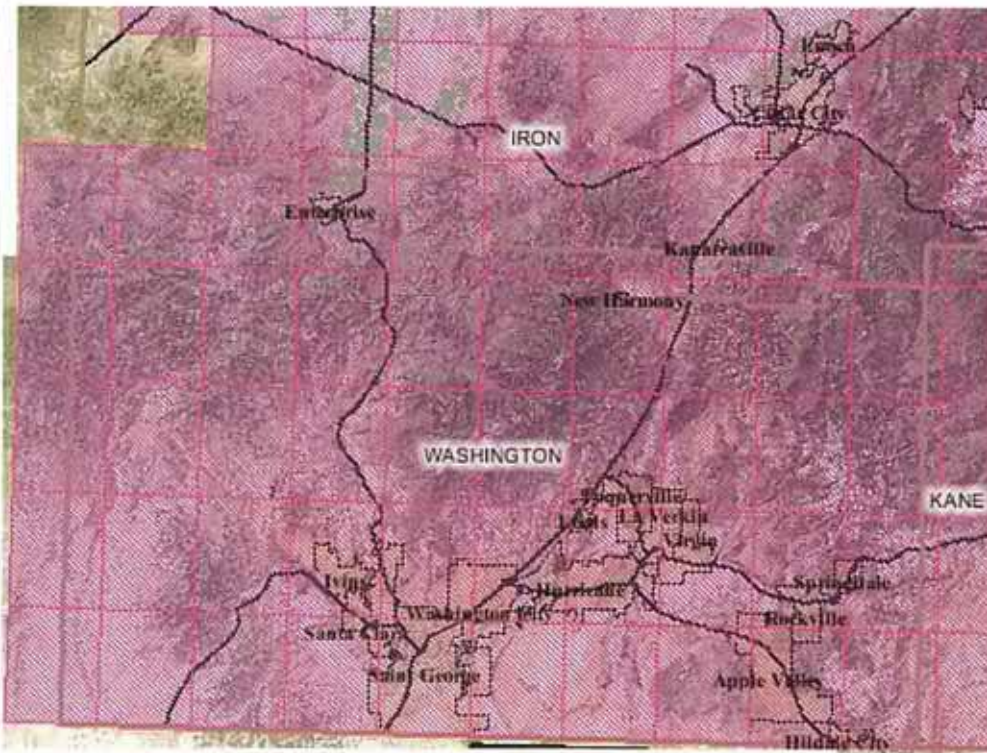
Legend

-  Utah Counties
-  Chukar Habitat
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



**WASHINGTON COUNTY
PLANTS AND ANIMALS
HABITAT MAPS**

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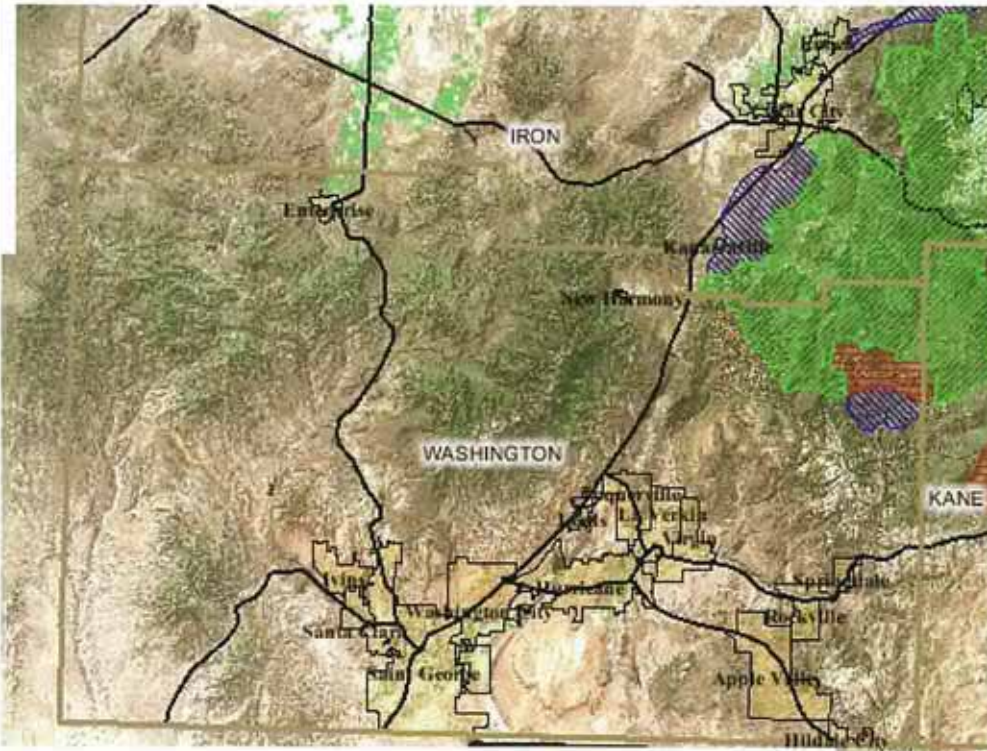


Legend

-  Quad Areas Containing Threatened, Endangered, and Sensitive Animal Species Occurrences
-  Utah Counties
-  City Labels
-  Roads
-  Cities
-  Utah Boundary
-  Utah Satellite Image



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Legend

- Utah Counties
- Elk Habitat**
- winter
- summer
- year-long
- Other
- City Labels
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

ArcIMS 4.0

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Legend

- Utah Counties
- Sage Grouse Brooding Habitat
- City Labels
- Roads
- Cities
- Utah Boundary
- Utah Satellite Image

ArcIMS 4.0

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