2012

Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update

William E. Schlosser, Joseph F. Mierzwinski

Kamiak Ridge, LLC

7/24/2012

This **Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012**
Is completed in the fulfillment of guidelines administered by
Federal Emergency Management Administration for a
Multi-Jurisdictional Hazard Mitigation Plan update, and
National Fire Plan Community Wildfire Protection Plan update

Project Leadership provided by the

Emergency Management Department
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This planning effort has been completed with the consultation by a Planning Committee comprised of representatives of administrative Departments from Benewah County, US Forest Service, US Bureau of Land Management, the Coeur d'Alene Tribe, Idaho Bureau of Homeland Security, Idaho Department of Lands, Idaho Department of Parks and Recreation, fire protection districts, and planning consultants from Kamiak Ridge, LLC.

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Chapter 1. Organization, Adoptions, Promulgations, and Acceptance

1.1. Organization of this Document

The Benewah County Multi-Jurisdictional Hazards Mitigation Plan is organized into several chapters, each addressing a specific component of the wildfire risk assessment, exposure to risk, resources available for mitigation work, and to respond to natural disasters, and potential mitigation measures.

The first chapter of this document addresses the compliance of this effort with the Idaho Bureau of Homeland Security and FEMA Region X, the National Fire Plan, FEMA's guidance for the expectations of the plan, and the development of the planning team's mission, vision, and goals. It includes the adoption by Benewah County, and the Cities of Plummer, St. Maries, and Tensed. This chapter also contains signatures from the planning committee members who were not necessarily in a position to formally adopt the completed plan, but signed to show their concurrence with the document that was developed by the planning committee and to urge adoption of the completed plan.

Chapter 2 of this plan presents a cursory background of Benewah County and the Coeur d'Alene Tribe to describe the demographics, Cities, histories, population density and development, land ownership and management, climatic conditions, and the valuation of real property in Benewah County. This chapter is designed to present both a historic and static picture of the county, its people, places, and property – all independent from natural hazards and the risks of those hazards.

Chapter 3 provides the reader with information about this Wildland-Urban Interface Wildfire Mitigation Plan's development, the organizations involved, and the intent of this update.

In chapter 4 the wildfire risk profile for Benewah County is evaluated in terms of historical occurrence and current exposure to wildfire risks. Wildfire hazards are evaluated and considered on a county-wide basis with the financial potential for losses provided for each city and populated place.

Chapter 5 closely addresses risk exposure in each populated place of the county. This chapter uses detailed mapping to show the various risk assessments for each location.

Chapter 6 extends the discussion of Chapter 5, to summarize the on-the-ground wildfire mitigation projects implemented since the adoption of the original Benewah County Wildfire Mitigation Plan (2004), accompanied by recommended wildfire mitigation projects in each populated place. This chapter also extensively uses area maps to show where these activities are recommended.

Chapter 7 includes a summary of the resources, capabilities, and needs of the first responders, and agencies within Benewah County. These summaries are carried over from the past hazard mitigation plans adopted by Benewah County and the Coeur d'Alene Tribe, with updates from the planning team assembled for this effort.

This Benewah County Wildland-Urban Interface Wildfire Mitigation Plan has been developed through the efforts of various organizations, agencies, and government representatives in an effort to better prepare Benewah County residents against wildfires affecting Benewah County.

1.1. Authorship and Conveyance

Development of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 was completed, in association with the Planning Committee members, by Kamiak Ridge, LLC. Project Management duties and Lead Authorship of this plan have been provided by William E. Schlosser, Ph.D., a Regional Planner and Environmental Scientist.

The undersigned do hereby attest and affirm that the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 was completed using information available at the time of its writing. Furthermore, analysis techniques were implemented as appropriate to provide a clear and reasonable assessment of wildfire hazard risk exposure in Benewah County. Recommendations made herein have been based on this information and on feedback from the Planning Committee members, and are proposed with the reasonable expectation that once implemented through a holistic hazard mitigation approach, the results will serve to protect people, structures, infrastructure, the regional economy, and the way of life in Benewah County.

Kamiak Ridge, LLC

August 22, 2012
Date

By: William E. Schlosser, Ph.D.
Kamiak Ridge, LLC
Environmental Scientist & Regional Planner
Lead Author and Project Mananger

August 22, 2012
Date

By: Birgit R. Schlosser, B.A.
Kamiak Ridge, LLC
Co-Owner & Planning Specialist

1.2. Benewah Board of County Commissioners Adoption

Board of
County Commissioners
245-2234

Clerk District Court
Auditor and Recorder
245-3212

Treasurer and
Tax Collector
245-2421

County of Benewah
701 W. College Avenue
St. Maries, Idaho 83861

Prosecuting Attorney
245-2564

Assessor
245-2821

Sheriff
245-2555

Coroner
245-2611

Resolution of the Commissioners of Benewah County, Idaho

Resolution № 2012-09

A resolution of the Commissioners of Benewah County declaring County support and adoption of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, dated 9/6, 2012

Whereas, The Benewah Board of County Commissioners supports the contents of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 will be utilized as a guide for planning as related to National Fire Plan and FEMA Pre-Disaster Mitigation, and other purposes as deemed appropriate by the Benewah County Commissioners, and

Therefore be it resolved, that the Benewah County Commissioners do hereby adopt, support, and will facilitate the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan's implementation.

Passed and approved this 6th Day of Sept 2012

Benewah Board of County Commissioners, Benewah County, Idaho

By: Jack Buel, Chairperson
Benewah Board of County Commissioners

By: Norman "Bud" McCall
Benewah Board of County Commissioners

By: Phil Lampert
Benewah Board of County Commissioners

Attested by:
Clerk / Auditor / Recorder

1.3. Plummer City Council Adoption

City of Plummer

P.O. BOX B
PLUMMER, ID 83851
PH. 208-686-1641
www.cityofplummer.org

Resolution of the City Council of Plummer located in Benewah County, Idaho

Resolution № 2012-03

A resolution of the City Council of Plummer declaring City support and adoption of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012.

Whereas, The City Council of Plummer supports the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The City Council of Plummer has participated in the development of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 will be utilized as a guide for planning as related to National Fire Plan and FEMA Pre-Disaster Mitigation and other purposes as deemed appropriate by the City Council of Plummer, and

Therefore be it resolved, that the City Council of Plummer does hereby adopt, support, and will facilitate the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan's implementation.

Passed and approved this 13th Day of SEPT. 2012

City Council of Plummer located in Benewah County, Idaho

By: Terry Allen
Mayor, City of Plummer

CITY OF PLUMMER BENEWAH CORPORATE SEAL COUNTY STATE OF IDAHO

Attested by: Debbie Argelan
City Clerk

1.4. St. Maries City Council Adoption

ORIGINAL

City of St. Maries

"On the Shadowy St. Joe"

602 College Avenue, St. Maries, Idaho 83861

Phone 208-245-2577

Mayor Tami Holdahl

smcityhall@smgazette.com

Fax 245-6579

Resolution of the City Council of St. Maries
located in Benewah County, Idaho

Resolution № 187

A resolution of the City Council of St. Maries declaring City support and adoption of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012.

Whereas, The City Council of St. Maries supports the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The City Council of St. Maries has participated in the development of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 will be utilized as a guide for planning as related to National Fire Plan and FEMA Pre-Disaster Mitigation and other purposes as deemed appropriate by the City Council of St. Maries, and

Therefore be it resolved, that the City Council of St. Maries does hereby adopt, support, and will facilitate the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan's implementation.

Passed and approved this 10th Day of Sept 2012

City Council of St. Maries located in Benewah County, Idaho

Tami Holdahl

By: Tami Holdahl
Mayor, City of St. Maries

S. Schiermeister

Attested by: Stacie Schiermeister
City Clerk

1.5. Tensed City Council Adoption

Placed on City Letterhead

Resolution of the City Council of Tensed located in Benewah County, Idaho

Resolution № ___________

A resolution of the City Council of Tensed declaring City support and adoption of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012.

Whereas, The City Council of Tensed supports the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The City Council of Tensed has participated in the development of the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012, and

Whereas, The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 will be utilized as a guide for planning as related to National Fire Plan and FEMA Pre-Disaster Mitigation and other purposes as deemed appropriate by the City Council of Tensed, and

Therefore be it resolved, that the City Council of Tensed does hereby adopt, support, and will facilitate the Benewah County Wildland-Urban Interface Wildfire Mitigation Plan's implementation.

Passed and approved this _____ Day of _____ 2012

City Council of Tensed located in Benewah County, Idaho

____

By: Faith Harvey
Mayor, City of Tensed

____

Attested by: Rae Anne Fritshe
City Clerk

1.6. Representatives of Benewah County Government

The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 was adopted formally through a Resolution of Adoption by the Board of Benewah County Commissioners. The people representing various Benewah County Departments sign here to show their involvement in the planning process and concurrence with the analysis and recommendations presented herein.

Norm Suenkel

Norm Suenkel, Director
Emergency Management Department
Benewah County

August 22, 2012
Date

Lance McDaniel

Lance McDaniel
Benewah County Weeds

Aug 28 2012
Date

1.1. Coeur d'Alene Tribe Representatives

The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 and all of its components were developed in close cooperation with representatives of the Coeur d'Alene Tribe. These representatives have indicated their concurrence with this plan in accompanying signature sections.

Charles Simpson
Fuels Specialist / Forester
Coeur d'Alene Tribe

8/30/2012
Date

Robert Spaulding
Emergency Manager
Coeur d'Alene Tribe

8/22/12
Date

Lance Mueller
Planning Technician
Coeur d'Alene Tribe

8/30/2012
Date

1.2. Structural Fire Protection Services Representatives

The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 and all of its components were developed in close cooperation with the participating fire districts listed herein. Fire protection districts that are a part of a city have their adoptions included in the adoptions of the municipalities by the duly elected representatives. State and Federal wildfire protection agencies have indicated their concurrence with this plan in accompanying signature sections.

Larry Naccarato Fire Chief St. Maries Fire District	8-22-12 Date
Mike Meagher Fire Chief Plummer Gateway Fire District	Date
Scott Fritshe Fire Chief Tensed Fire District	Date
Mark McQueen Fire Chief Fernwood Fire District	Date
Earl Daniels Fire Chief Emida Fire District	8/22/12 Date

1.3. Representatives of Federal and State Agencies and Companies

The Benewah County Wildland-Urban Interface Wildfire Mitigation Plan Update 2012 was developed in cooperation and collaboration with these additional listed agencies and organizations. These entities listed below are not eligible to “formally adopt” this plan, but were involved in its development and where practicable, will strive to implement its recommendations.

Jay D. Baker
North Area Field Officer
Idaho BHS

Aug 29, 2012
Date

Josh Harvey
Fire Warden
Idaho Department of Lands

9/10/2012
Date

Ron Hise
Park Manager
Heyburn State Park

8/30/12
Date

Larry Hager
Area Manager
Avista Utilities

8/30/12
Date

John Pollard
Fire Management Officer
St. Joe Ranger District
US Forest Service

8/31/12
Date

Kurt Pavlat
Field Manager
Bureau of Land Management
Coeur d'Alene Field Office

22 Aug 2012
Date

Chapter 2. Benewah County Background

Established on January 23, 1915, from sections of Kootenai County, Benewah County was named for a chief of the Coeur d'Alene Tribe. As of the 2010 census, the county had a population of 9,285. The county seat and largest city is St. Maries. Benewah County covers an area of approximately 784 square miles, with about 99% land, and 1% open water. Most of the water area is the southern reaches of Coeur d'Alene Lake, including Benewah Lake, Round Lake, and Chatcolet Lake forming at the terminus of the St. Joe River.

Benewah County is located in transition zones with the Palouse Region to the southwest, and the Rocky Mountain ridge to the east. To the west rests the Great Basin of Eastern Washington and the Columbia River before it joins with the Snake River to make its final approach to the Pacific Ocean. Benewah County is surrounded in Idaho by Kootenai County to the north, Shoshone County to the east, and Latah County to the south. Washington State is located west of Benewah County with Whitman County and Spokane County located southwest and northwest, respectively.

Within the county are a mix of land management organizations including the Coeur d'Alene Tribe and the Bureau of Indian Affairs (west side), the US Forest Service, and the Bureau of Land Management (scattered ownership on the east side of the county). The State of Idaho owns and manages lands through the Department of Lands and the Department of Parks and Recreation. Industrial forestland owners and agricultural land owners manage properties across all parts of the County. Most of the agricultural land management is completed on the high elevation plains of the west side of the county, while forestlands are mainly managed in the foothills of the central and eastern sides. A mix of private, industrial, federal and state agencies manage the forestlands of the region, and in the county.

Three cities are incorporated within the county including the County Seat St. Maries, Tensed, and Plummer. Several other 'populated places' are scattered around the county with groups of home structures ranging from a dozen homes, to hundreds of homes in these unincorporated population clusters. These population clusters include Emida, Fernwood, Renfrew, Santa, Carpenter Creek, Desmet, Benewah, Chatcolet, St. Joe, Ferrell, Highland Springs, Hells Gulch, Mowry, Cherry Creek, Alder Creek, and Elkhorn.

2.1. Coeur d'Alene Tribe

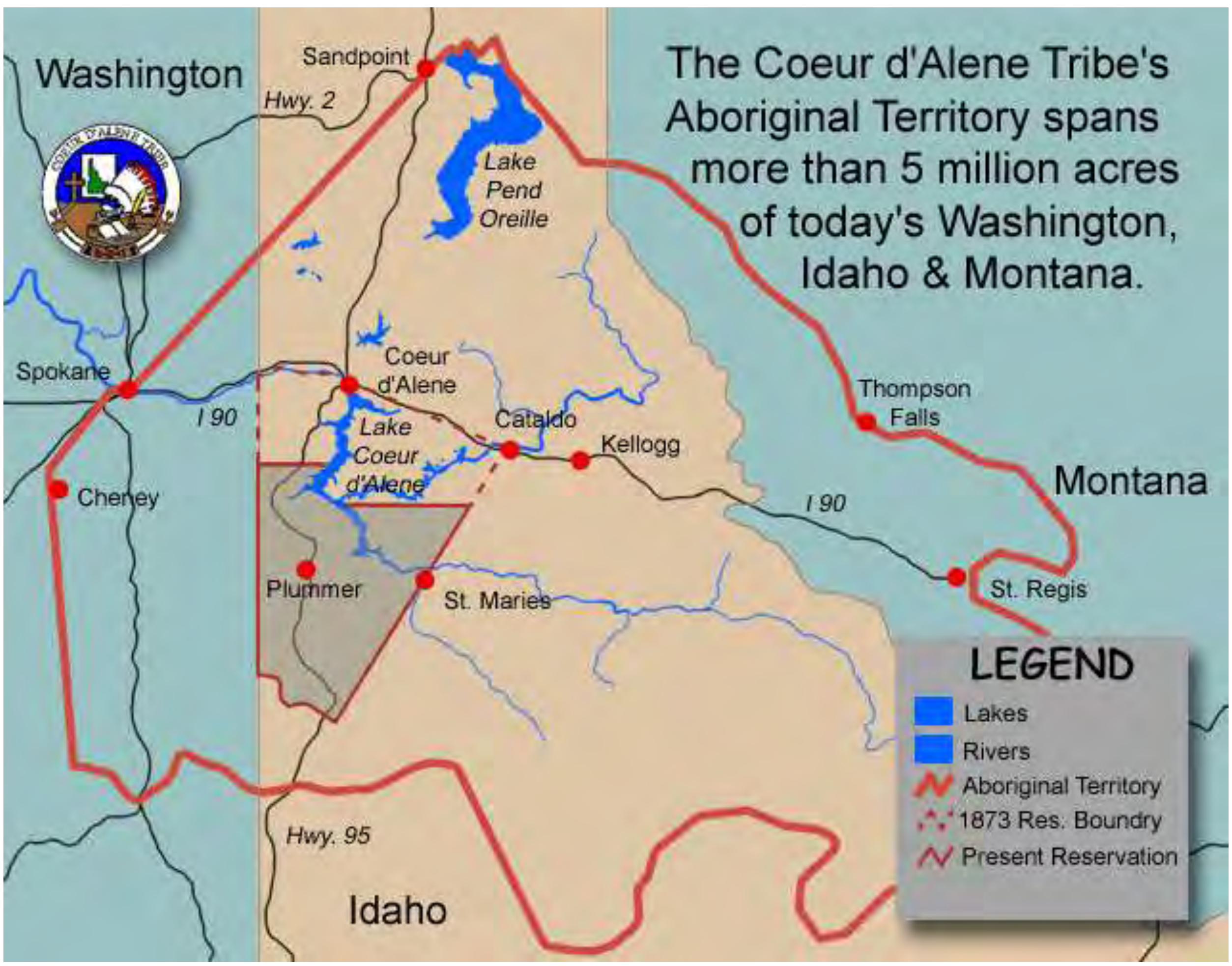
Coeur d'Alene Indians were known as the Schitsu'umsh by other tribes, which means, in the native Salish language, "the ones that were found here." The Coeur d'Alene Indians lived in large permanent villages along the Spokane and St. Joe Rivers, near Coeur d'Alene Lake and Hayden Lake and on parts of the large prairie known today as the Palouse country, an area of about 5 million acres. They enjoyed a close relationship with the inland Tribes of Canada and the Northwest, sharing a common language and fishing grounds, intermarrying, and attending big trade gatherings and celebrations.

The Schitsu'umsh people were placed by the creator in what would become the Panhandle region of Idaho and adjoining parts of what would be named Washington to the west and Montana to the east. It was a landscape of some 5 million acres of Douglas-fir, grand fir, ponderosa pine, western white pine, and western redcedar forested mountains, freshwater rivers, lakes and marshlands, perennial bunchgrass and fescue wheatgrass-covered rolling hills and prairie (Figure 1). At the heart of this region was Coeur d'Alene Lake. It was a homeland inundated with "gifts" from the Animal Peoples that would provide for some 5,000 Schitsu'umsh (Frey 1995).

The influence of the Euro-Americans on the Schitsu'umsh Indians occurred long before the actual first-contact. By the second half of the 18th century the horse had become integrated into Schitsu'umsh lifestyles.

According to Walter Prescott Webb in "The Great Plains", anthropologists hold that the spread and use of the horse among the Plains Indians began after 1540, when the horse was reintroduced into Indian country by the Spanish through intertribal trade, and as wild herds began spreading out over the land. The Plateau Indians including the Flatheads and Schitsu'umsh being neighbors to Blackfeet and the western Plains Indians surely got their horses about this time. Obtaining horses changed the lifestyle and economy of the Schitsu'umsh Indians. Traveling to distant places such as locations east of the Bitterroot Mountains to hunt buffalo or to Kettle Falls to the northwest to trade for salmon became a feasible option. No longer were the Schitsu'umsh dependent only on fish, roots, berries and the hunt on foot (Kevis 1999).

Figure 1. Coeur d'Alene Reservation Locator Map within upper Columbia region (CDAT 2008).



Silver was discovered in the Idaho panhandle in the 1870s, setting off a frenzy of mining activity. The Coeur d'Alene Reservation, established in 1873, originally included all of Coeur d'Alene Lake. By a series of treaty agreements, the reservation was reduced to its present size. Approximately half of Benewah County is encompassed by the Coeur d'Alene Reservation.

The first European people to encounter the Coeur d'Alenes were French trappers and traders. It was one of these Frenchmen who found the tribe to be vastly experienced and skilled at trading. That Frenchman described the tribe as "the greatest traders in the world."

2.2. European Settlement of Benewah County

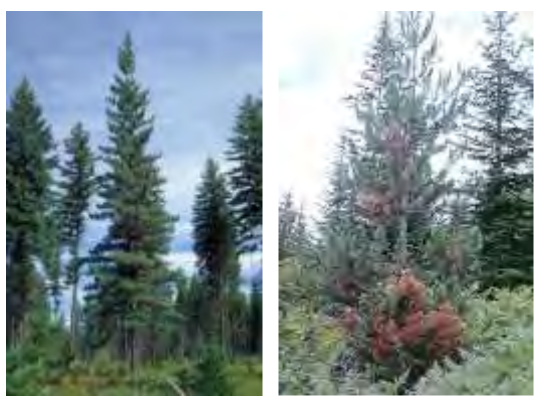
Catholic missionaries settled in the St. Joe River Valley in 1846, and in the western part of the county, in Desmet[1], in 1877. The missionaries worked mainly with the Coeur d'Alene Indians on the Reservation. At this time in history the rich prairie lands were settled. Meanwhile major settlement activities took place in the forested area in the eastern part of the county.

Although there were some early settlers in the meadows along streams, the main influx of European people did not begin until about 1900. It was then possible to acquire land as timber claims. Lumbering became an important industry in Benewah County and across the region, and settlement in relation to this industry increased.

The forestry industry in this area grew as logs were brought down the St. Joe and St. Maries Rivers to St. Maries at the southern end of Coeur d'Alene Lake and then as the railroad was established in the early 1900s to move logs from source forestlands to log mills. While mining expanded to the east and north of Benewah County, many workers settled in Benewah County to mine, ranch, farm, and log timber.

The region is lush with forests of dry-lands dominated by ponderosa pine and Douglas-fir, and mesic lands with western redcedar and western hemlock. Several tree species are found across the county including western larch, grand fir, and Idaho state tree western white pine (Figure 2).

Figure 2. Western white pine – the Idaho State Tree. On the left is a healthy tree, the right shows a blister rust infected tree.



2.3. Population Density Indices

Current population density trends in Benewah County have been determined based on the location of structures within the county and extending 3 miles in each direction surrounding it. This analysis approach has been defined by Schlosser (2012) in the development of Wildland-

[1] Pierre-Jean De Smet (30 January 1801 – 23 May 1873) was a Belgian Roman Catholic priest and member of the Society of Jesus (Jesuits), active in missionary work among the Native Americans in the mid-19th century. Today the spelling of the community sometimes uses "Desmet" and other times uses "DeSmet". Both refer to the same place.

Urban Interface (WUI) population density indices and is used here (Figure 3). These assessments indicate how the relative density of structures is distributed. Structures are used as a surrogate for population density, although the number of people living in each structure is not consistent between neighborhoods, and not within one community. As a planning tool, these population density indices indicate where high density is currently located in juxtaposition to other high and low density areas.

2.3.1. WUI Conditions

In Figure 3, the limited white colored areas, located inside the eastern and southern boundary of the County indicate areas of wildlands; where no structures currently exist. There are approximately 61,536 acres of WUI wildland category lands in Benewah County.

More expansive yellow-brown colored areas can be referred to as rural lands where there are a low density of structures located. The rural areas identified within the County encompass approximately 410,765 acres and include 3,292 structures giving a density of about 125 acres per structure (Table 1). These areas are divided into the “Rural 95%” and “Rural 100%”. The former classification shows the area of the county that contains the lowest 95% density of structures in the county. The latter “Rural 100%” shows an area containing lowest structure density of the entire countyA look into the values in Carpenter Creek populated. Relatively, the “Rural 95%” shows a higher density of structures than the “Rural 100%”, as would be expected. Within the Rural 95% area there are approximately 3,229 structures on 189,656 acres yielding an average density of 58.7 acres per structure. Within the Rural 100% zone, there are approximately 63 structures scattered within 221,109 acres, or about 1 structure per 125 acres (Table 1).

The areas colored in shades of brown represent the suburban population densities (the higher the concentration of structures, the darker the brown shading). The highest structure density is found in the Interface Areas, named for the juxtaposition of structures and wildland fuels. It can be said that often a group of structures is immediately surrounded by non-risk fuels with paved roads, green lawns, and other homes, but at the ‘edge of the community’ there is found the ‘wildland interface’ in a rapid transition to wildland fuels. In Benewah County, this interface is described in Plummer and St. Maries, the highest population density areas in the county. These areas combined are represented by approximately 1,543 structures on 1,266 acres yielding a density of about 1.22 structures per acre (0.8 acres per structure) (Table 1).

Surrounding these Interface areas are the Intermix Areas, aptly named for the commonly observed homes that are ‘intermixed’ with wildland fuels. Frequently, wildland fuels can build up substantial loads that can directly threaten homes from all sides. Within Benewah County this WUI status is present around more structures than any other status. There are approximately 3,803 structures located on 29,410 acres (7.7 acres per structure) (Table 1).

Table 1. Structure Density in Benewah County.

Population Density Classification	Acres (approximate)	Number of Structures	Density (Structures per Acre)	Density (Acres per Structure)
Interface	1,266	1,543	1.22	0.8
Intermix	29,410	3,803	0.13	7.7
Rural 95%	189,656	3,229	0.02	58.7
Rural 100%	221,109	63	0.00	3,509.7
Rural Combined	410,765	3,292	0.01	124.8
Wildlands	61,536	-		
Total, Average	**502,977**	**8,638**	**0.017**	**58.2**

2.3.2. WUI Values

A look into the different levels of structure density within Benewah County (Table 1) reveals insights to how structure values are distributed across the landscape (Table 2, Figure 3, Figure 4). Several named places are identified in association with clusters of homes and other structures. The WUI condition of these locations is identified with the value of structures (Table 2). These structure values have been assembled from Benewah County Assessor's Office data showing "Assessed Values" in 2012, and cooperator values for insured structures in 2010 and 2011. These insured values are not identical to the Assessed value assigned by the County Assessor, but both provide useful data that are used here.

A cursory review of these data reveals several insights applicable to their application of wildfire mitigation efforts. First, the reader can compare the total "Improvement" values (from the County Assessor data), and the "Public Insured" values (additive) in relation to the number of properties with improvements on them. This comparison reveals the 'average value' of structures in the populated place.

The 'number of properties with improvements on them' (Table 2) is in relation to parcels with multiple structures. Based on the process used to identify structures from the NAIP aerial imagery, it is not possible to consistently identify the difference between a house, business, garage, or any other structure. Therefore, this analysis technique combines all structures on a parcel under the County Assessor's assessed value of 'Improvements'. The same process is used with public entities (non-assessed, not property taxed parcels). One parcel with improvements, may represent one structure, or several structures.

A look into the values in Carpenter Creek populated area, shows an area of approximately 383 acres, with 32 properties with improvements totaling $1.2 million in value. This yields an average parcel value from improvements of about $38,000. That can be contrasted with the parcel improvements values in St. Maries Interface areas (downtown St. Maries) where $59.4 million of private structures and $57.2 million of public structures are placed on 651 improved parcels on over 1,144 acres. The average improved parcel in this WUI area is approximately $179,000. The average improvement value of parcels (overall) is approximately $126,300 in Benewah County.

This comparative process reveals some insightful results, but the reader is cautioned to use discretion in how those results are applied. Seeking a preference to 'treat' the highest valued structure areas first, and the 'lowest' valued structure areas last, ignores the differential impacts to families of varying income levels and economic conditions. Further, it can be realized that implementing wildfire mitigation projects with fewer parcels to treat (like Bear Springs; 7 improved parcels) may be less expensive while still positively influencing the potential for negative wildfire impacts.

Use of these data can be converted into expressing a 'benefit' potentially realized from a wildfire mitigation project's costs, to derive a Benefit/Cost Ratio. It is reasonable to derive a potential benefit as the percent reduction in risk and associate values, resulting from the implementation of a wildfire mitigation project (the costs). These values are only a portion of the benefits potentially realized from the implementation of wildfire mitigation projects.

Beyond the tangible benefits to protecting structures, is the benefit from saving lives or reducing injuries to people in the path of a wildfire event. Additional costs potentially derived from implementing wildfire mitigation projects is the reduction in emergency service costs observed when structure fire and wildland fire crews respond to emergency situations to fight the advances of a wildfire. These are costs foregone due to preparedness efforts, and these costs are rarely determined directly, they are generally derived from analogous estimations.

Further extrapolation of the benefits from wildfire mitigation comes in the form of ecosystem preservation, restoration, protection of unique ecosystems, and wildlife habitat, or the prevention of damages to aquatic systems from increased sediment loads contributed from burned lands. Those benefits are sometimes considered to be intangible financial benefits to society, but they are not to be ignored in their significance.

2.3.3. Differential WUI Changes Over Time

A time-series study of this analysis procedure in this region, and other areas, has revealed that populations will tend to grow into two different areas unless regulated through planning and zoning efforts to direct or limit the expansion of growth.

The first area of growth pressures is the occupation of those areas that are in the low density suburban category and located between two disjunctive areas of higher population density. This is the case as seen (Figure 3) between Desmet/Tensed and Sanders along US95. When compared with the estimates of population density using 2004 data (Schlosser 2004), both of these communities were considered in the lowest density intermix category with rural lands separating the two. Today, these communities are joined together in low density intermix structure density. A similar increase of structure density can be observed between Plummer and St. Maries. The analysis completed by Schlosser (2004) using structure locations in 2004 revealed a narrow corridor along State Highway 5 with a density profile consistent with rural lands and some wildlands (no structures). As of 2012, the structure density has expanded considerably into moderate density intermix to the complete exclusion of wild lands along this corridor. In addition, the expansion within and adjacent to recognized communities (such as Plummer and St. Maries) has increased.

The second area of development pressures are generally in those areas that are in the situation of rural lands (yellow zones on Figure 3). Development trends also attempt to populate those areas of “remoteness” and seclusion. This case is apparent within the Benewah Valley (central Benewah County). The analyses completed in Benewah County by Schlosser (2004, 2005, 2010) and for the Coeur d’Alene Reservation (Schlosser 2011) using structure locations in the years indicated, reveals that all of the Benewah Valley was in the category of very low density rural lands intermixed with wildlands just 5 years previous (2004). As of 2009, the structure density along the northern extent of this valley (leading to Coeur d’Alene Lake) increased structure density areas to the category of low density rural (Figure 3). As of 2012, Benewah Valley has continued the density expansion to be extended southward in the low density Rural category with an adjacent area of Alder Creek increasing in a small pocket of population density to intermix WUI condition.

Although not a predictive analysis, it can be said that if this situation continues, that Alder Creek and the Benewah Valley will continue to expand together in response to increased population densities, while pockets of increased density will be seen within the Rural WUI Condition lands of this area. Certain barriers of population density growth can be seen on lands held by federal and state agencies that do not allow structure developments, although adjacent properties are often sought by land buyers seeking ‘quite neighbors’ (like the federal agency) where their dwellings can be built.

Other factors of population density growth are expected along major transportation corridors such as state and federal highways and within areas with services such as fire protection. Planning and zoning efforts often attempt to favor desirable growth management areas.

Table 2. Community populated places, WUI status, and values from County Assessor appraised values (2012) and insured values for public structures (2010).

Populated Place	WUI Status	Zone Acres	Private Structures Total Value	Private Structures Improvements	Private Structures Land Value	Public Property Insured Value	Number of Properties	Number of Improved Properties
Alder Creek Intermix	Intermix	517	$2,166,397	$1,127,520	$1,038,877	$-	29	23
Alder Creek Rural	Rural 95%	7,802	$5,173,245	$2,797,000	$2,376,245	$-	72	49
Bear Springs	Intermix	86	$622,908	$417,650	$205,258	$-	7	7
Blackwell Divide	Rural 95%	6,790	$7,633,613	$5,120,810	$2,512,803	$-	78	62
Carpenter Creek	Intermix	667	$2,244,895	$1,228,110	$1,016,785	$-	43	32
Chatcolet	Intermix	383	$-	$-	$-	$2,750,000	6	4
Cherry Hill	Intermix	128	$959,534	$753,390	$206,144	$-	7	5
Chief MOC-TEL-ME	Rural 95%	790	$183,421	$81,450	$101,971	$-	2	1
County Wide Low Density Rural Expanse	Rural 100%	221,109	$3,427,318	$562,970	$2,864,348	$50,000	41	16
Emida	Intermix	867	$3,029,704	$1,830,991	$1,198,713	$358,336	60	48
Fernwood	Intermix	3,352	$14,136,957	$8,449,957	$5,687,000	$3,850,000	245	198
Forever Green	Intermix	818	$5,678,618	$4,393,530	$1,285,088	$-	41	33
Garnet	Intermix	42	$1,178,688	$1,065,050	$113,638	$-	4	4
Lovell Valley	Rural 95%	89	$-	$-	$-	$-	1	-
North Central Rural Expansion	Rural 95%	88,838	$75,125,300	$47,515,448	$27,609,852	$-	631	488
Palouse Divide	Rural 95%	399	$745,841	$627,446	$118,395	$-	2	1
Parkline	Intermix	565	$4,649,247	$3,055,000	$1,594,247	$-	36	30
Plummer Interface	Interface	121	$5,582,031	$4,463,150	$1,118,881	$26,945,342	149	113
Plummer Intermix	Intermix	3,777	$33,745,267	$26,682,889	$7,062,378	$5,382,195	284	216
Rock Creek Valley	Rural 95%	549	$179,506	$151,560	$27,946	$-	2	1
Rocky Point	Intermix	426	$-	$-	$-	$4,500,000	7	5
Sanders	Intermix	266	$1,562,319	$1,279,475	$282,844	$-	8	6
Santa	Intermix	1,899	$7,771,171	$4,735,906	$3,035,265	$1,095,076	119	96
Santa Creek	Intermix	728	$3,164,871	$1,762,760	$1,402,111	$-	51	41
Santa Rural	Rural 95%	3,549	$1,940,088	$919,040	$1,021,048	$-	29	18

Table 2. Community populated places, WUI status, and values from County Assessor appraised values (2012) and insured values for public structures (2010).

Populated Place	WUI Status	Zone Acres	Private Structures Total Value	Private Structures Improvements	Private Structures Land Value	Public Property Insured Value	Number of Properties	Number of Improved Properties
Skyline Divide	Rural 95%	177	$47,910	$35,410	$12,500	$-	1	1
Southeastern Rural Zone	Rural 95%	30,298	$20,155,746	$12,037,834	$8,117,912	$-	251	186
Southwestern Rural Zone	Rural 95%	45,944	$25,184,531	$13,855,825	$11,328,706	$-	220	165
St. Joe	Intermix	917	$4,098,305	$1,327,020	$2,771,285	$56,605	48	36
St. Joe Riverside	Intermix	190	$1,131,459	$174,140	$957,319	$-	19	15
St. Maries Interface	Interface	1,144	$78,046,045	$59,395,548	$18,650,497	$57,234,673	766	651
St. Maries Intermix	Intermix	11,928	$128,500,796	$87,367,698	$41,133,098	$4,610,916	791	663
Tensed & Desmet	Intermix	1,835	$2,977,960	$2,124,220	$853,740	$12,261,391	102	68
Western Liberty Butte	Rural 95%	131	$202,148	$47,450	$154,698	$-	1	1
Willard	Intermix	20	$695,809	$510,350	$185,459	$-	4	2
Windfall / Lolo Pass	Rural 95%	4,299	$2,349,351	$1,657,040	$692,311	$-	25	15
Summary		**441,441**	**$444,290,999**	**$297,553,637**	**$146,737,362**	**$119,094,534**	**4,182**	**3,300**

Figure 3. Population Density Indices (Wildland-Urban Interface) for Benewah County based on 2011 Structure Locations (2012).

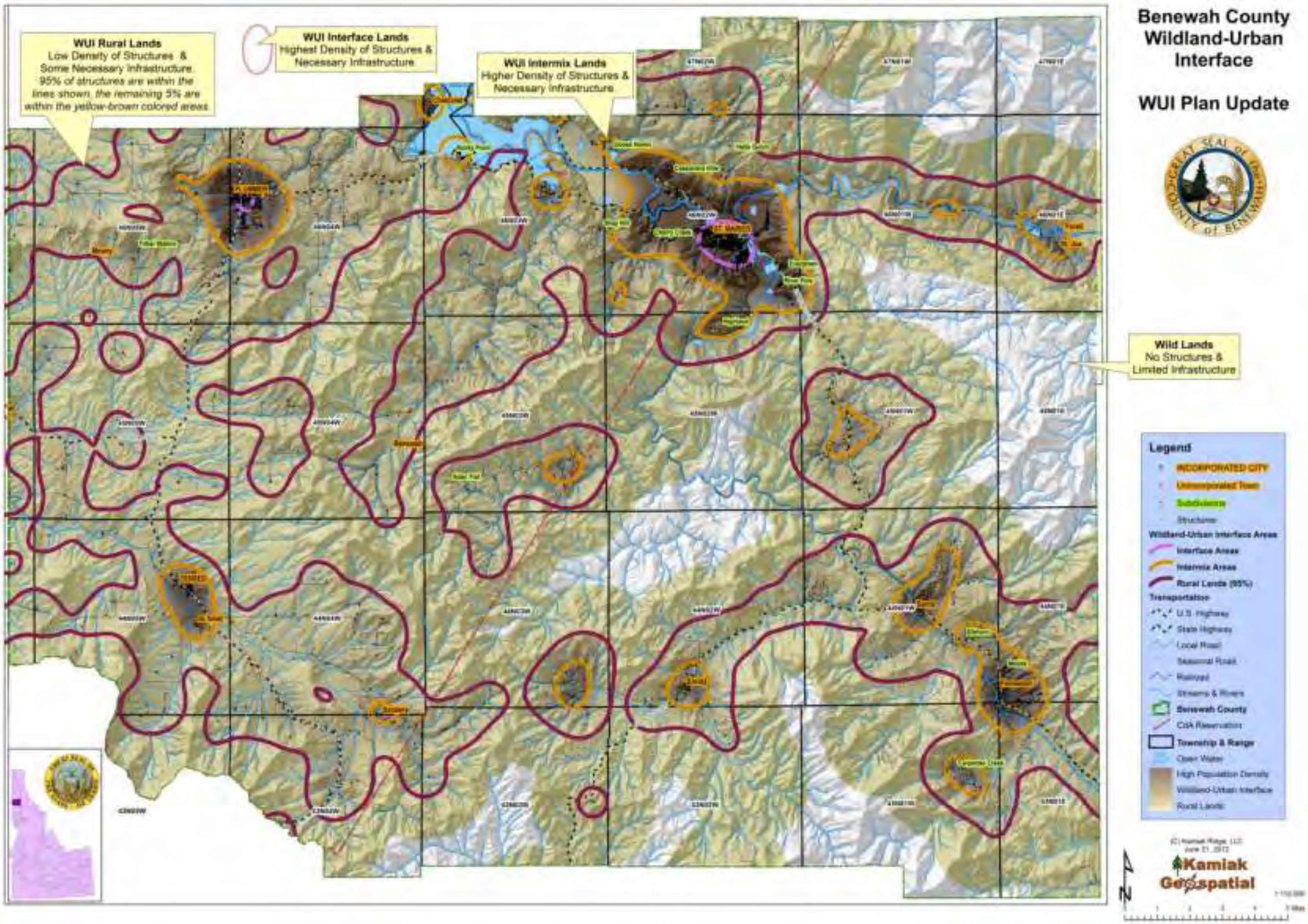
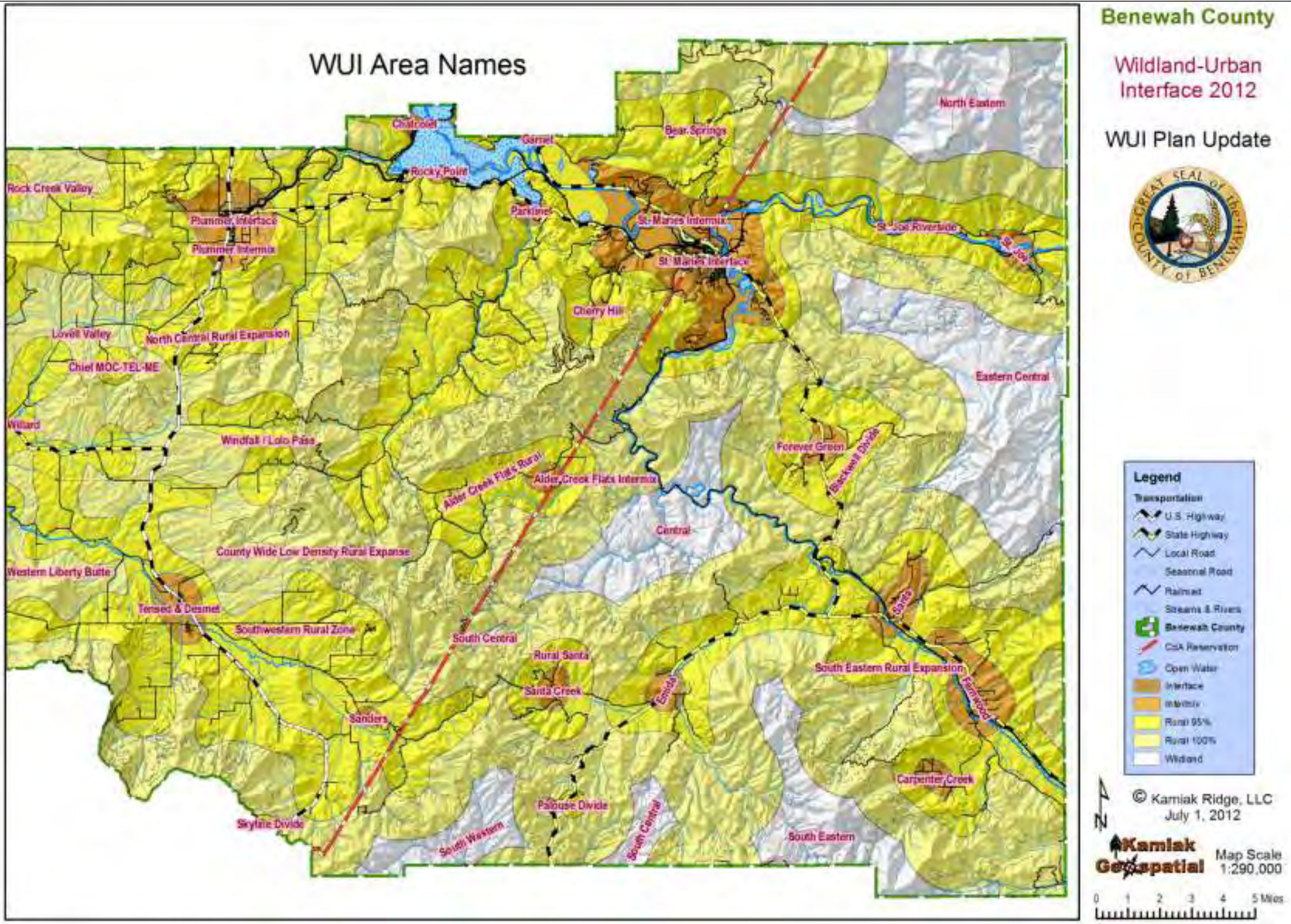


Figure 4. Wildland-Urban Interface Area Names of Benewah County.



2.4. Transportation Systems

Benewah County is traversed by several vehicle travel routes constructed over the past 2 centuries, evolving from foot paths to horse trails, from wagon routes to dirt roads, then some graveled roads transitioned to paved roads. Today, several routes are seasonal roads, local roads, State Highways, or U.S. Highways. U.S. Highway 95 is a major connection route from Canada to Mexico that crosses through the west side of Benewah County (through Plummer and Tensed/Desmet), and is the major north to south transportation route within Idaho.

In total, there are approximately 2,157 miles of roads within the county. These roads are used by commercial traffic (logging, mining, and interstate commerce) as well as residents, local businesses, the county and tribal employees and visitors. The status of these roads is highly variable, from readily available and suitable egress routes (U.S. Highways and State Highways) to county roads, and local business access routes (forestry roads) that are sometimes described not as a 'road' but as a 'direction' (Figure 5).

Figure 5. Benewah Valley Roads explained by a local resident; "the best road here is when it is 'paved by snow' otherwise it is mostly impassable!"

Many roads cross streams and rivers, or railroads and the crossing qualities are not consistently described to the traveler. These descriptive signs often display the road width and weight restrictions associated with the crossing (Figure 6). This consistency is not only a convenience for the local traveler, but are a necessity for the wildland fire crews that come into the region for firefighting efforts, but may not personally know the area. A lack of crossing limitations may delay response times, or even cause the closure of a crossing from overloading of water carrying trucks used in firefighting efforts.

Figure 6. Differing road/stream crossing indicators give drivers, including emergency services drivers, an indication of restrictions.

There are approximately 76 miles of railroads within Benewah County. Historically, the railroads were established for timber commerce to move logs from the high country of Clarkia (to the southeast in Shoshone County) to St. Maries, and from points up the St. Joe River to St. Maries and then to Plummer and other destinations outside the county (mainly to the north) (Figure 7). The use of the railroad has decreased in the recent decade to the point that rail traffic is being curtailed by most commercial enterprises in favor of trucking.

Figure 7. The legacy of Benewah County's railroads.

2.5. Forest Health

Forest health issues within Benewah County and surrounding areas, can significantly impact wildfire risks. These forest health issues can include root rots, defoliators, and beetle attacks to the native forest tree species. Over the past many decades a series of defoliators have impacted this region leading to a wide spread increase in wildfire risks while the trees are standing-dead, with red needles, and a continuous concentrations of elevated fine-fuels that when ignited pose a high level of resistance to control.

One such defoliator spreading through the region while this plan is being updated is the Douglas-fir Tussock Moth (DFTM) (*Orgyia pseudotsugata* (McDunnough)). Caterpillars of the DFTM chew the needles of spruces, Douglas-fir and true firs (Figure 8). During outbreaks they may cause extensive defoliation, with injury typically first concentrated at the top of the tree. Older caterpillars may rapidly defoliate a tree and tops may be killed, sometimes after only a single season of severe injury. Following repeated attacks over several seasons whole trees may die or be weakened to the point of inviting fatal attacks by bark beetles (CSUE 2009).

Figure 8. Douglas-fir Tussock Moth defoliation near Plummer, Idaho, in Benewah County 2012.

2.5.1. Description

Young DFTM caterpillars are blackish with long body hairs, producing brightly colored tufts of hair as they grow larger. A mature larva is 1.2-1.4 inches long, with a gray to brown body and shiny black head. Two long tufts of black hairs project forward from the head, and a similar tuft projects backward from the rear of the body. Dense, light brown patches of hairs and red spots occur on the first four and the last abdominal segment and there is an orange stripe on each side (IDL 1981, CSUE 2009).

The cocoon surrounding the pupal stage is brownish gray and covered with hairs from the body of the larva. Cocoons usually are attached to foliage but may be found on tree trunks, rock, or other objects in the vicinity of a previously infested tree.

The adult males are moths with rusty-colored forewings and gray-brown hind wings, with a wing-span of about one inch. Females are thick-bodied and wingless, found in close association with the spot where they earlier pupated (IDL 1981, CSUE 2009).

The egg mass, laid on the pupal cocoon of the female, contains about 300 white spherical eggs laid in several layers. The entire mass is covered with a frothy substance that is intermixed with body hairs of the mother. Movement of DFTM into new locations around the region sometimes result from humans incidentally moving construction materials or other items that have attached egg masses (IDL 1981, CSUE 2009).

2.5.2. Life History and Habits

The DFTM spends the winter as an egg within the egg mass. Eggs hatch in the spring, often in late May, typically following bud break. The small, hairy caterpillars migrate, moving to the new growth but also often dispersing upwards in the trees. This latter habit allows some of the caterpillars to disperse by winds, which will carry the small, hairy caterpillars. Since the adult female moths do not fly, wind-blown movement of young larvae is an important means of initiating new infestations.

The caterpillars first feed solely on the newer foliage, and partially eaten needles may wilt and turn brown. Later, the older caterpillars will move to older needles as the more tender needles are eaten. During feeding, particularly when disturbed, larvae may drop from branch to branch on long silken strands. By mid-July or August, the larvae become full grown and many may migrate away from the infested tree. They pupate in brownish spindle-shaped cocoons in the vicinity of the infested trees (CSUE 2009).

The adults emerge from late July through mid-August. The males are winged and are strong fliers, but the females have only minute, non-functional wings. Mating occurs in the immediate vicinity of the female pupal case and they then lay their characteristic mass of eggs covered with grayish hairs. There is one generation produced per year (IDL 1981, CSUE 2009).

2.5.3. Response

In 2011, the Idaho Department of Lands (IDL), Washington State Department of Natural Resources (WaDNR), and the U.S. Forest Service detected new areas with defoliation in Idaho and Washington. Kootenai, Benewah, and Latah counties in Idaho were determined to be most impacted by the moth (Figure 9 & Figure 10). The IDL held public meetings in Plummer in February 2012 to provide affected forest landowners information and management assistance options related to the DFTM outbreak (IDL 2012).

The IDL initiated spraying of lands in North Idaho to control the DFTM infestation (IDL 2012). Generally, the population will spread rapidly and then when controlled through natural or chemical control efforts the population will drop to low levels again.

During the 2012 outbreak, over 68,000 acres were defoliated in the northern Idaho Panhandle. Trees that are repeatedly defoliated can be killed outright or suffer top kill. Dry sites such as ridge tops and southerly aspects are particularly susceptible to defoliation, especially when grand fir or Douglas-fir makes up a significant proportion of the stand. Historically, damage in North Idaho forests has occurred in the Moscow Mountain area (south and east of Potlatch), in the McCroskey State Park area) southwestern Benewah County), and on the Coeur d'Alene Indian Reservation. The current outbreak shows the most defoliation occurring in Benewah and Kootenai Counties. During the 2000-2002 outbreak, defoliation was not observed north of Benewah County, with most of the damage to the south of Plummer (IDL 2012).

Figure 9. IDL Generated map of defoliation from Douglas-fir Tussock Moth in north Idaho, 2010 & 2011.

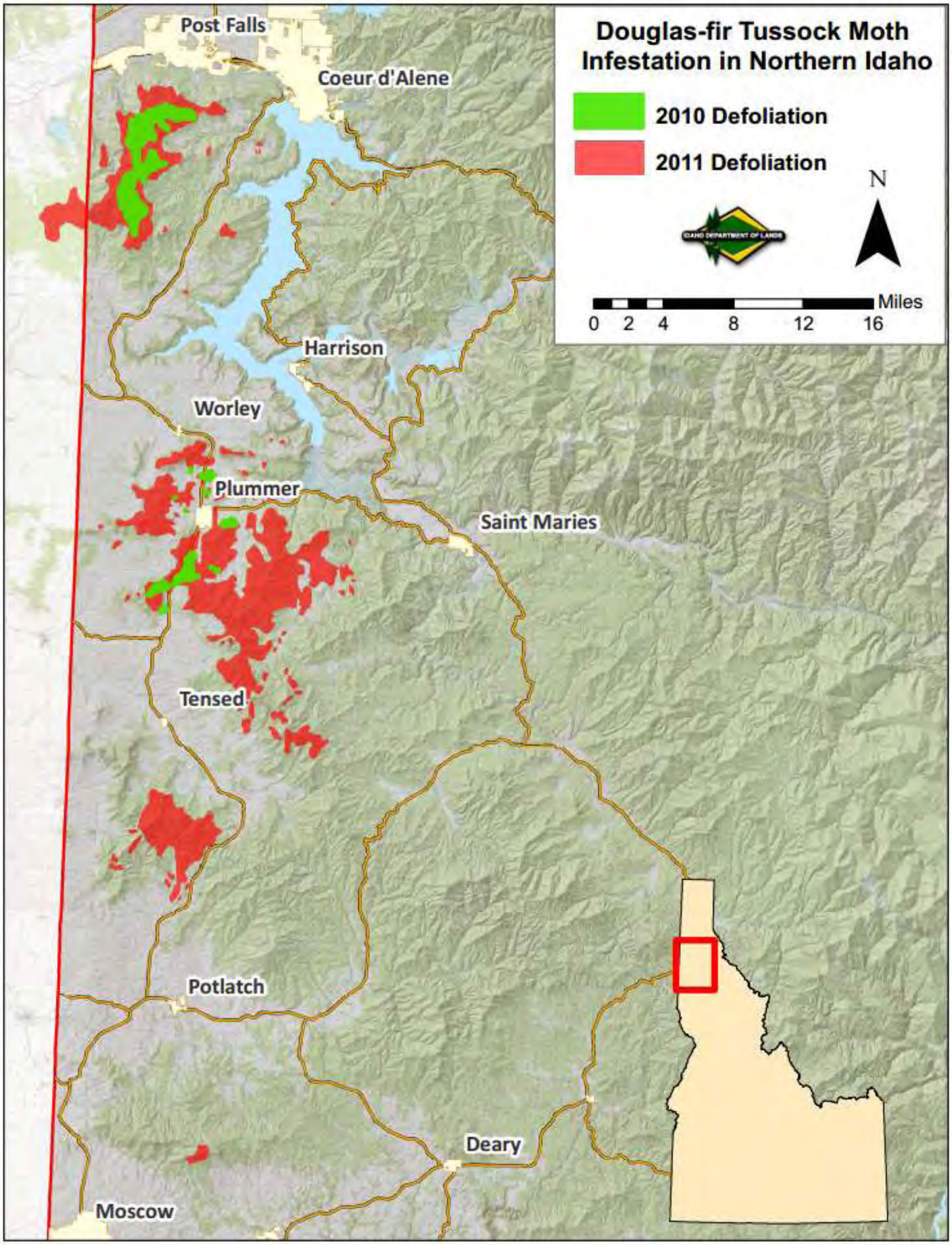
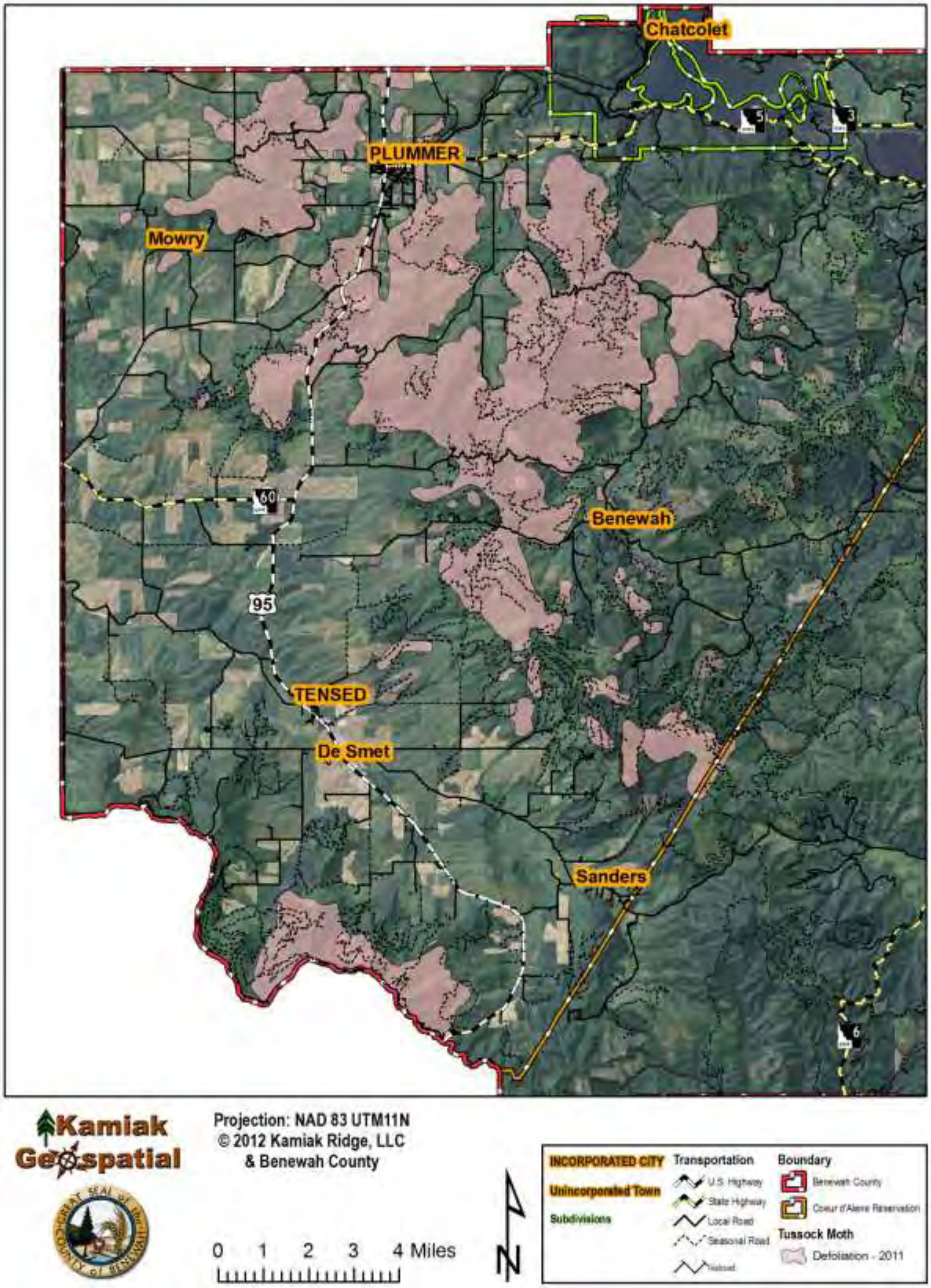


Figure 10. Douglas-fir Tussock Moth Infestations in Benewah County, 2011.



2.5.4. Impacts on Wildfire Control

DFTM infested trees are not necessarily killed outright by the infestation during the first year of attack. Infected trees are defoliated of current-year growth as the caterpillars feed on the new needles of the tree. Identification of the infestation during the initial year is critical to controlling the population before large areas are defoliated. Through a series of DFTM infestations, the region has witnessed a two to four year cycle of infestations followed by a year of dropping DFTM population numbers from natural forces (such as disease and parasites) combined with chemical spraying (IDL 2012).

The DFTM weakens trees making them susceptible to other factors such as bark beetles and pathogens. The weakened trees may succumb to the secondary attacks, or from repeated initial attacks by the DFTM. The result can be large expanses of standing-dead trees. Not all infected trees expire after DFTM infestations. Some infected trees survive, but may take a few years to regain the pre-attack vigor and growth.

The standing-dead trees generally die with branches intact, cambium layers dried, and some of its reddened needles retained on the branches. Detritus is often accumulated near the base of the tree as the trees expire (Figure 11). When these trees are surrounded by fire risk fuels, the wildland fire risk increases because of the dry elevated fuels, surface fuels, and potential continuity of wildfire fuels.

A proactive response to DFTM infestations is to aggressively control the insect when it is first identified in the region, as the IDL has initiated in north Idaho. If large acreages are defoliated and trees expire, then either harvesting the trees as soon as feasible, combined with slash burning, or felling the non-merchantable and dead trees with pile burning of their infected organic matter can result in a reduced wildfire risk. These general recommendations must be evaluated on a case by case basis. In a forest where Douglas-fir and grand fir are a minor component of the timber stand, the rapid response may not be as critical as in a timber stand where the potential hosts represent the major tree species of the watershed.

Generally, the heavily DFTM infected Douglas-fir and grand fir forest can show increased wildfire risk for a period of 2 to 3 years during and after the infestation when fine fuels are held in the crowns of the trees and on the forest floor. By removing these ignitable flash-fuels wildfire risks can be reduced. If fuel loads are not treated, the deterioration of the organic matter will naturally progress over a period of 3 to 5 years, depending on aspect, overstory cover, snow loads, and other factors.

When these DFTM infected areas are located within the Rural, Interface, and Intermix WUI areas, it is advisable to reduce the exposure to wildfire risk by treating the red- and standing-dead trees.

This response cannot wait for another update to a Wildfire Mitigation Plan for it to happen. When forest health emergencies happen, the response must be focused and automatic, to respond to the risk by reducing the exposure of lives and homes in the region.

Figure 11. Defoliation south of Plummer at State Highway 95 and Lovell Valley Road, August 2011 (IDL 2012).

Chapter 3.
Planning Process

This planning process was initiated by the Benewah County Board of Commissioners, in cooperation with local municipalities, the Coeur d'Alene Tribe, state and federal agencies, local fire protection districts, and local businesses to update the Wildland-Urban Interface Wildfire Mitigation Plan first written and adopted in 2004 (Schlosser 2004). Since that time, Benewah County prepared a FEMA compatible Hazard Mitigation Plan (Schlosser 2005) then updated it in with a Multi-jurisdictional Hazard Mitigation Plan (Schlosser 2010). In 2010-2011, the Coeur d'Alene Tribe prepared and adopted a similar FEMA compliant Mitigation Plan; Tribal Hazards Mitigation Plan (Schlosser 2011). All of these documents have included wildfire control as one of the major hazards in the area, attaining the highest significance of potential risk of occurrence, and the highest potential to impact people and structures (Table 12).

This plan update includes the significant findings originally identified in the earlier documents with the inclusion of lessons learned through the years of mitigation measure implementation in the County. Agencies, Departments, Municipalities, and commercial enterprises have come together to make this update possible.

3.1. Development and Approval Process

The Benewah County Wildland-Urban Interface Wildfire Mitigation Planning team came together to formally develop this update in May 2012, to work to a completion of August 31, 2012 (Table 3). A planning team meeting accompanied by correspondence and communications between planning team members and the team organizers was initiated in early May. Benewah County entered into a contract with Kamiak Ridge, LLC, led by Dr. William Schlosser, to complete this update with the coordination of the planning team members. Dr. Schlosser led all of the previous efforts with the county and the planning team and brought that continuity of planning services to the team members who also represented a significant continuity of cooperation, both as organizations and as individuals.

Table 3. Planning Team Names, Contact Information, and Attendance.

Name Title	Address	e-mail	Phone	May 31	July 18	Aug 22
Chuck Simpson CdA Tribe Forester/Fuels Specialist	PO Box 408 Plummer, Idaho 83851	csimpson@cdatribe-nsn.gov	(208) 686-5030	X		
Cory Flesher Assistant Fire Warden	1806 Main Ave. St. Maries, Idaho 83861	CFlesher@idl.idaho.gov	208-245-4551	X	X	
Earl Daniels Emida Fire Chief		svlezarder@yahoo.com	(208) 245-1832	X		
Mark McQueen Fernwood Fire District	PO Box 301 Fernwood, Idaho 83830		(208) 245-4542			
Jay Baker North Area Field Officer	600 W Prairie Ave Coeur d' Alene, Idaho 83815-8764	jbaker@bhs.idaho.gov	(208) 666-6738	X		
Jim Minser Emida Fire	29105 Hyw 6 St. Maries, Idaho 83861	minser28@yahoo.com	(208) 245-1971	X	X	
Joe Mierzwinski Kamiak Ridge, LLC	737 N 2nd Street Coeur d'Alene, ID 83814	Mierzwinski@Resource-Analysis.com	208-277-5837	X	X	
John Pollard USFS	222 S 7th Street Suite 1 St. Maries, Idaho 83861	jopollard@fs.fed.us	(208) 245-6204	X	X	
Josh Harvey IDL Fire Warden	1806 Main Ave. St. Maries, Idaho 83861	jharvey@idl.idaho.gov	208-245-4551	X		
Kurt Naccarato Idaho Dept. of Lands	3284 W Industrial Loop Coeur d'Alene, ID 83815	knaccarato@idl.state.id.us	(208) 666-8653	X		

Table 3. Planning Team Names, Contact Information, and Attendance.

Name Title	Address	e-mail	Phone	May 31	July 18	Aug 22
Kurt Pavlat Bureau of Land Management	3815 Schreiber Way Coeur d'Alene, ID 83815	kpavlat@blm.gov	(208) 769-5038		X	
Lance McDaniel Benewah County Weeds	701 W College Ave # 7 St. Maries, ID 83861	lancemcd@gmail.com			X	
Lance Mueller Coeur d'Alene Tribe	PO Box 408 Plummer, Idaho 83851	Lmueller@cdatribe-nsn.gov	(208) 686-7219		X	
Larry Hager Avista Utilities	528 College Ave. St. Maries, Idaho 83861	larry.hager@Avista.com	(208) 5122876		X	
Larry Naccarato St. Maries Fire Chief	308 W Jefferson St. Maries, Idaho 83861	firechief@smfpd.com	(208) 245-5253	X	X	
Lisa Spinelli USFS	222 S 7th Street Suite 1 St. Maries, ID 83861	lspinelli@fs.fed.us		X		
Mike Meagher Plummer gateway Fire Chief	PO Box 328 Plummer, Idaho 83851	mike-plummerfire@rezmail.com	(208) 686-1313			
Norm Suenkel Benewah County Emergency Management	701 W College Ave # 7 St. Maries, ID 83861	nsuenkel@benewahcounty.org	(208) 245-4122	X	X	
Richard Morrison Commissioner, Tensed Fire	Tensed, Idaho 83870	snocat@smgazette.com	(208) 274-5644			
Robert Spaulding CdA Tribe Emergency Manager	PO Box 408 Plummer, Idaho 83851	raspaulding@cdatribe-nsn.gov	(208) 686-7219		X	
Ron Hise Heyburn State Park	1291 Chatcolet Road Plummer, Idaho 83851	rhise@idpr.idaho.gov	(208) 686-1308	X	X	
Scott Fritshe Tensed Fire Chief	Tensed, Idaho 83870	fritshescott@yahoo.com	(208) 582-1572			
Sherri Wastweet Panhandle Area Council	11100 N. Airport Drive Hayden, ID 83835-9798	swastweet@pacni.org	(208) 772-0584 Ext 3023		X	
Steve Bloedel Inland Forest Management	P.O. Box 1966 Sandpoint, ID 83864	steveb@inlandforest.com	208-255-9394	X	X	
William Schlosser Kamiak Ridge, LLC	1515 NW Kenny Pullman, WA 99163	Schlosser@Resource-Analysis.com	509-592-7650	X	X	

The planning team conducted public outreach efforts such as WUI Mitigation Posters, flyers, handouts, press releases, and an interactive website for the public and the planning team members to use while spreading information about the effort while collecting valuable knowledge about ideas for innovative mitigation measures.

This planning team adopted several previously articulated mission, goals, and objectives for natural hazard mitigation efforts and augmented them for current efforts. All of the previously adopted projects for natural hazards mitigation are incorporated into this document, even when not specifically listed here. This update includes specific findings that represent updates to the efforts previously identified in the referenced documents.

3.1.1. Mission Statement

To make Benewah County residents, communities, and businesses less vulnerable to the negative effects of wildfire hazards through the effective administration of wildfire mitigation grant programs, risk assessments, wise and efficient mitigation measures, and a coordinated approach to mitigation policy through county, Tribal, state, federal, regional, and local planning efforts. Our combined prioritization is the protection of people, structures, infrastructure, economy, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.

This Mission Statement remains consistent with the stated Mission from the 2004 WUI Wildfire Mitigation Plan, the 2005 Benewah County All Hazards Mitigation Plan, the 2010 Benewah

County Multi-Jurisdictional Hazard Mitigation Plan, and the 2011 Coeur d'Alene Reservation Tribal Hazard Mitigation Plan.

3.1.2. Vision Statement

Institutionalize and promote a county-wide hazard mitigation ethic through leadership, professionalism, and excellence, leading the way to a safe, sustainable Benewah County, Coeur d'Alene Tribe, and local municipalities.

This Vision Statement remains consistent with the previously stated Mission statements adopted by these jurisdictions.

3.1.3. Goals

The Benewah County Wildland-Urban Interface Wildfire Mitigation Planning team adopted a series of primary goals intended to benefit each populated place, municipality, and the county's residents and visitors.

- Reduce the area of land damaged and losses experienced because of wildland fire where these risks threaten communities in the county.
- Prioritize the protection of people, structures, infrastructure, and unique ecosystems that contribute to our way of life and the sustainability of the local and regional economy.
- Educate communities about the unique challenges of pre-disaster hazard mitigation and post-disaster response.
- Establish wildland fire mitigation priorities and develop mitigation strategies.
- Strategically locate, plan, and implement wildland fire hazard reduction projects.
- Provide recommendations for alternative treatment methods that can impact the exposure to multiple hazards at one time.
- Promote and implement disaster-resistant development policies.
- Build and support local capacity to enable the local government and the community to prepare for, respond to, and recover from wildland fire disasters.
- Reduce the threats to public health and safety posed by wildland fire hazards.
- Establish mitigation priorities and develop mitigation strategies.
- Reduce the long-term costs of wildland fire disaster recovery and wildland fire disaster mitigation through intelligent and strategic mitigation policies and practices.
- Identify and facilitate the management for sustainable land use in light of natural hazards and our management of the land resources.

3.1.3.1. Objectives to Meet Goals

This Wildland-Urban Interface Wildfire Mitigation Plan update will implement the following philosophical practices in order to achieve the goals outlined in this plan:

- Improve wildland fire hazard area identification and emergency warnings to citizens and visitors.
- Increase public awareness of wildland fire hazards and improve appropriate preparation for and response to such hazards.

- Prevent new development in areas that are extremely vulnerable to wildland fire hazards or ensure that development occurs in such a way as to mitigate wildland fire risks to the new development without putting others at increased risk.
- Ensure the implementation plan developed to protect existing developments is the most cost effective alternative, given considerations for:
    - Personal and business investments
    - Natural resources
    - Existing land use plans
    - Economy of Benewah County
- Utilize the cost / benefit analysis criteria when evaluating implementation plans for mitigation measures (during implementation) to ensure the benefits of the plan outweigh the costs of implementation – both short-term and long-term.
- Maintain, improve, and where appropriate, formalize policy coordination and consistency between the Benewah County government and neighboring jurisdictions and governmental activities, as appropriate, including:
    - Coeur d'Alene Tribe
    - State of Idaho
        - Kootenai County
        - Shoshone County
        - Latah County
        - Clearwater County
    - State of Washington
        - Whitman County
        - Spokane County
    - Idaho State Agencies
        - Idaho Department of Lands
        - Idaho Department of Parks and Recreation
        - Idaho Transportation Department
        - Idaho Bureau of Homeland Security
    - Federal Governmental Organizations:
        - USDA: Forest Service (USFS)
        - USDI: Bureau of Land Management (BLM)
        - USDI: Bureau of Indian Affairs (BIA)
        - Homeland Security: Federal Emergency Management Agency

3.2. FEMA Disaster Mitigation Planning

FEMA conducts reviews of all local hazard mitigation plans submitted through the appropriate State Hazard Mitigation Officer (SHMO). FEMA will review the final version of a plan prior to local adoption to determine if the plan meets the criteria, but FEMA is unable to approve any plan prior to adoption by the local municipalities and county.

The Benewah County Multi-Jurisdictional Hazards Mitigation Plan (2010) was developed in compliance with these listed FEMA program requirements, and in adherence to Idaho State Code concerning open public meeting laws.

The Benewah County Multi-Jurisdictional Hazards Mitigation Plan (2011) was developed and internally evaluated to adhere to a variety of FEMA developed criteria, including:

- Adoption by the Local Governing Body
- Multi-Jurisdictional Plan Adoption
- Multi-Jurisdictional Planning Participation
- Documentation of Planning Process
- Identifying Hazards
- Profiling Hazard Events
- Assessing Vulnerability: Identifying Assets
- Assessing Vulnerability: Estimating Potential Losses
- Assessing Vulnerability: Analyzing Development Trends
- Multi-Jurisdictional Risk Assessment
- Local Hazard Mitigation Goals
- Identification and Analysis of Mitigation Measures
- Implementation of Mitigation Measures
- Multi-Jurisdictional Mitigation Strategy
- Monitoring, Evaluating, and Updating the Plan
- Implementation Through Existing Programs
- Continued Public Involvement

This Wildland-Urban Interface Wildfire Mitigation Plan Update has been developed to be consistent with these requirements, but is being treated as an interim update of the Wildfire Mitigation portion of the FEMA plan currently adopted by the County and Cities. That FEMA plan is not due for formal update until the current plan expires in 2015.

3.3. State Hazard Mitigation Plan

The Idaho State Hazard Mitigation Plan was prepared by the Idaho Bureau of Homeland Security (IBHS) to reduce disaster assistance costs and preserve disaster assistance eligibility for the State and the local governments within its borders. It was approved by FEMA and adopted by the state in 2010 (BHS 2010). The Plan was a comprehensive, statewide mitigation planning effort conducted in Idaho. It identified hazards and associated vulnerabilities within the State and provided a comprehensive statewide strategy to reduce future disaster losses through sound mitigation projects. Specifically, the Plan:

- Identified and profiled hazards in the State of Idaho
- Assessed statewide risks from hazards present in the State.
- Established a Framework for statewide Mitigation Planning and Implementation.

- Developed Opportunities for State, Regional, Tribal, and Local Mitigation Planning and Implementation.
- Facilitated Integration of Mitigation into community development before disasters occur, and during disaster recovery.

The 2010 Idaho State Hazard Mitigation Plan was a major, FEMA-required update and revision of the 2007 plan.

3.4. Guidance and Integration with Wildfire Planning Activities

The goals of this planning process in Benewah County include the integration of the National Fire Plan, the Idaho Statewide Implementation Strategy of the National Fire Plan, the Healthy Forests Restoration Act, the Idaho State Hazard Mitigation Plan, the Benewah County Emergency Operations Plan (BCEMD 2009), and the requirements of FEMA for a countywide Multi-Jurisdictional Hazards Mitigation Plan update. This effort utilizes the best and most appropriate science from all partners, and the integration of local and regional knowledge about wildfire hazards, while meeting the needs of local citizens, the regional economy, and the significance of this region to the rest of Idaho and the Inland Northwest.

A complete summary of legal and regulatory resources developed and adopted for Benewah County is summarized in Table 4.

Table 4. Benewah County Legal and Regulatory Resources Available for Wildfire Mitigation Efforts.

Regulatory Tool	Name	Description (Effect on Hazard Mitigation)	Hazards Addressed	Mitigation, Preparedness, Response, or Recovery	Affects Development in Hazard Areas?
Plans	Benewah County Emergency Operations Plan	Defines responsibilities	All	Preparedness and Response	No
	Flood Response Plan	Identifies actions related to flood activities and safety of responders and the public	Flood	Preparedness and Response	No
	County Comprehensive Plan	Defines level of importance	All	All	Yes
	County Wildfire Mitigation Plan	Identifies threats and hazard mitigation activities for wildfire	Wildfire	All	No
Policies	Zoning Ordinance	Identifies land use locations	All	Mitigation, Preparedness	Yes
	Subdivision Ordinance	Specifies densities	All	Mitigation, Preparedness	Yes
	Floodplain Ordinance	Identifies restricted or controlled areas	Flood	Mitigation, Preparedness, Recovery	Yes
	Site Disturbance Ordinance	Controls construction disturbance	All	All	Yes
Programs	County Fire Mitigation Program	Reduces threat	Wildfire	Mitigation, Preparedness	No

3.5. Agency Planning Guidance

Several state and federal agencies provide services in Benewah County and many of these were invited to participate in the Benewah County Wildland-Urban Interface Wildfire Mitigation Planning committee. The tribal, state and federal agencies participating in this effort include:

- Idaho Transportation Department (ITD)
- Idaho Bureau of Homeland Security (IBHS)
- Idaho Department of Lands (IDL)
- USDA Forest Service (USFS)
- USDI Bureau of Land Management (BLM)
- Coeur d'Alene Tribe Wildfire Control

The USFS and BLM provided detailed information concerning their existing planning efforts affecting hazard mitigation. These ongoing efforts are summarized in Table 5.

Table 5. USFS & BLM Legal and Regulatory Resources Available for Hazard Mitigation Efforts.

Regulatory Tool	Name	Description (Effect on Hazard Mitigation)	Hazards Addressed	Mitigation, Preparedness, Response, or Recovery	Affects Development in Hazard Areas?
Plan: USFS	Forest Plan Idaho Panhandle National Forests 1987	Defines management direction on all National Forest Land	All	Mitigation	N/A
Plan: USFS, BLM, IDL	Interagency Standards for Fire and Fire Aviation Operations	Provide program management direction and guiding principles	Wildfire	Mitigation, Preparedness, and Response or Recovery	Yes
Plan: USFS, BLM, IDL	North Idaho Interagency Fire Danger Rating Operating Plan	Provides tools for fire managers to correlate fire danger ratings with appropriate fire business decisions	Wildfire	Mitigation, Preparedness, and Response	No
Plan: USFS, BLM, IDL	Coeur d'Alene Interagency Dispatch Center Standard Operating Procedures	Provide management oversight of the operation of Coeur d'Alene Interagency Dispatch Center	All	Mitigation, Preparedness, and Response or Recovery	No
Plan: IDL	West St. Joe Fire Plan	Contact directory of cooperators, contractors, utility companies and others involved in first response for wildfire.	Wildfire	Mitigation, Preparedness, and Response or Recovery	No
Plan: IDL	IDL Fire Management Handbook	List of policies and procedures for the IDL Fire Management Program.	Wildfire	Mitigation, Preparedness, and Response or Recovery	No
Plan: IDL	IDL Fire Mobilization Guide	Provides guidance and policy for wildland fire	Wildfire	Mitigation, Preparedness, and Response or Recovery	No

Table 5. USFS & BLM Legal and Regulatory Resources Available for Hazard Mitigation Efforts.

Regulatory Tool	Name	Description (Effect on Hazard Mitigation)	Hazards Addressed	Mitigation, Preparedness, Response, or Recovery	Affects Development in Hazard Areas?
Plan: IDL	IDL Fire Protection District Memorandum of Understanding and Operating Plans (St. Maries FPD, Fernwood FPD, Gateway FPD, Tensed FPD, and Emida FPD).	Provides guidance on responsibilities, incident organization and communications plan.	Wildfire	Mitigation, Preparedness, and Response or Recovery	No
Plans – BLM	Coeur d'Alene Resource Management Plan 2007	Defines management direction on all BLM managed Public Lands	All	Mitigation	N/A
Plans – BLM	Coeur d'Alene District Fire Management Plan 2010	Defines program to manage wildland and prescribed fire	Wildfire	Mitigation, Preparedness, Response, and Recovery	Yes
Programs – BLM	Forest Health Program	Implementation of forest restoration practices to improve ecological health of forest stands located on BLM managed public lands.	Wildfire	Mitigation & Preparedness	No
Programs – BLM	Fuels Management Program	Implementation of mechanical and prescribed fire techniques to reduce hazardous activity and natural fuels located on BLM managed public lands.	Wildfire	Mitigation & Preparedness	No

3.6. Public Involvement

Public awareness of the wildfire risk in Benewah County, and the entire region, has been maintained at a high level for many decades. This awareness is heightened as annual media covers the spread of catastrophic wildfires in local areas and adjacent states. In June and July 2012 the reports of wildfire from Colorado and Montana struck a local thread because of the similarity of those regions to Benewah County in many ways. Some local wildfire fighters were even dispatched to those areas for wildfire response. Then in August, wildfires in Washington State's Ellingsburg and Cle Elum took the attention of homeowners in the region. Those were paired with wildfires in Orofino, Idaho, just 75 miles south of Benewah County. The fire season of 2012 received the attention of homeowners around the region in the WUI, especially in Benewah County.

Locally, the awareness of wildfire preparation is evidenced by a local billboard along State Highway 95, in Tensed (Figure 12). Public awareness is evidenced by the interest in what can be done to reduce the risk from wildfire loss.

Figure 12. Wildfire Preparedness Billboard along State Highway 95 in Tensed.

Public involvement in this planning process was important to the success of this effort. Public involvement included press releases (Section 3.6.2), flyers (Figure 13 & Figure 14), wildfire mitigation planning poster (Figure 15), and information handouts. Public outreach efforts included distributing the poster at 12 locations across the county, including:

1. Benewah County Courthouse (St. Maries)
2. St. Maries City Hall
3. Plummer City Hall
4. Coeur d'Alene Tribe (Plummer)
5. St. Maries Library
6. St. Maries Fire Protection Department
7. Gateway Fire Protection Department (Plummer)
8. Tensed Fire Department
9. Fernwood Fire Department
10. Emida Fire Department
11. Idaho Department of Lands (St. Maries)
12. Heyburn State Park
13. US Forest Service (St. Maries)

3.6.1. WUI Planning Public Outreach Website

A project website was developed for planning team and public outreach communications where people could learn more about the planning effort and take part in learning more, or suggesting ideas. The opening of the webpage included specifics on the mission, vision, and goals of the planning effort (Figure 17), one static map of the WUI and an interactive map allowing people, through the internet, to scroll through the county's areas, see the location of past projects and proposed mitigation projects being considered by the planning team (Figure 16). In the week following the first press release (Section 3.6.2), the number of visitors to the interactive web page showing past and proposed mitigation measures totaled 467 visitors, the busiest week of the interactive website's record.

The project website included a mechanism for people to call the organizers of the planning effort, or to send e-mail correspondence directly them.

Figure 13. Public outreach flyer developed for the plan update (front cover).

Wildland-Urban Interface

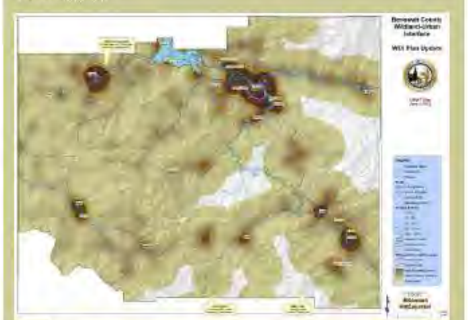
The **Wildland-Urban Interface** (called the WUI) is described as the areas where people, structures, and infrastructure combine to form unique zones of human habitation leading to wildlands without human habitation. In some places the 'structure density' is high, such as in cities like St. Maries and Plummer. In these areas we can see a situation of a WUI ***Urban Condition***—where homes are densely packed together. Around the edges of these cities, leading into the forest, we can often observe structures that are located 'on the interface with wildland fuels' called a WUI ***Interface Condition***.

As the homes are located further apart, smaller communities, like in Emida, Fernwood, and Mowry, show conditions of the WUI consistent with an ***Intermix Condition***. In these areas the structures are often 'intermixed with wildland fuels' - there are often risks on all sides of the structures.

As structures are located further and further apart, the WUI condition changes to a '***Rural Condition***' where small clusters of structures are positioned within wildland fuels, and separated by miles between the home site clusters.

The '***Wildland Condition***' includes the areas where there are no home structures found.

Each zone benefits from different approaches to protection for residents and visitors to the area. These Wildland-Urban interface mitigation plans are updated periodically to track the changes within these WUI regions, mostly due to new structures appearing from year to year.



Cooperators

St. Maries Fire Protection Department
Gateway Fire Protection Department
Tensed Fire Department
Fernwood Fire Department
Emida Fire Department

Benewah County, Idaho

Norm Suenkel
Emergency Manager
701 W College Ave Suite 3
St. Maries, ID 83861
Phone: 208-245-4122
E-mail: nsuenkel@BenewahCounty.org

Benewah County, Idaho

Wildland-Urban Interface Wildfire Mitigation Plan Update 2012

Protecting People, Structures, Infrastructure, the Economy and Way of Life

Tel: 208-245-4122

Figure 14. Public outreach flyer developed for the plan update (back page).

2012 Wildfire Mitigation Plan Update

Benewah County, Idaho, was one of the first counties in Idaho, and in the nation, to develop and adopt a **Wildland-Urban Interface Wildfire Mitigation Plan** in 2005. Since that time, Benewah County has cooperated with the Coeur d'Alene Tribe, local Fire Departments, the Idaho Department of Lands, the US Forest Service, and the US Bureau of Land Management to create an integrated program of project implementation to abate the risks to Benewah County homes through mitigation projects: to increase defensible space around homes, to improve evacuation when needed along access routes, and emergency services access as required. Policy adoption by the County and Cities improves preparedness for potential wildfire events in the County.

At this time, Benewah County is updating the Wildfire Mitigation Plan and we ask for your input.

Project Website

In order to share information, Benewah County, the incorporated Cities, the Coeur d'Alene Tribe, local Fire Departments, with State and Federal Agencies, have posted an interactive internet web site to share these data on the location of past and potential mitigation measures on a map of the county accompanied by community assessments, recommendations of risk reduction activities, and resources homeowners and renters can use to reduce the risk of loss from wildfires.

http://www.Resource-Analysis.com/WUI3B/

Seeking Your Input!

As a planning team, we are seeking ways to integrate assessments of risk with potential wildland fire mitigation measures to reduce risk to life, damages to structures or infrastructure, and to the economy of the County. We have updated County risk assessments using well-established, and new sources of insightful data showing where wildland fires have occurred, how they happened, and how large the wildfire became before control efforts could take effect.

With these historic wildfire characteristics, we have estimated the impacts to people and structures in light of current home locations and characteristics with road data and vegetation qualities to combine them into profiles of *'resistance to control'* during a possible wildfire event to contribute to identifying the best practices for pre-disaster mitigation measures.

We ask you, residents of the County, to review our findings and offer your ideas for potential mitigation measures. Write to us or call! **We want to hear from you!**

This Update

The original Benewah County Wildland-Urban Interface Wildfire Mitigation Plan was developed in 2004 and formally adopted by the Benewah County Board of Commissioners, the Mayors of St. Maries, Plummer, and Tensed, and integrated into operations by the Coeur d'Alene Tribe, the Idaho Department of Lands, the US Forest Service, and US Bureau of Land Management.

In 2005, Benewah County initiated its first FEMA Hazards Mitigation Plan with the cities and many cooperators including the Idaho Bureau of Homeland Security and the Federal Emergency Management Agency. This Hazards Mitigation Plan integrated the Wildland-Urban Interface Wildfire Mitigation Plan's findings and recommendations into the multiple-hazards profile of the Hazards Mitigation Plan.

When the County updated the FEMA Multi-Jurisdictional Hazards Mitigation Plan in 2010, the Wildland-Urban Interface Wildfire Mitigation Plan was again updated and integrated into the broad profile of multiple-risk assessments.

Now in 2012, the Wildland-Urban Interface Wildfire Mitigation Plan update will make current the assessments of wildfire risks and develop a fresh set of potential mitigation measures to be implemented around structures and roads, while seeking needed capability enhancements such as increasing fire protection abilities, and ways to save lives from wildfires.

Benewah County, Idaho

Phone: 208-245-4122
E-mail: rsuenkel@BenewahCounty.org

Figure 15. WUI Mitigation Poster (36”x44”) used for public display.

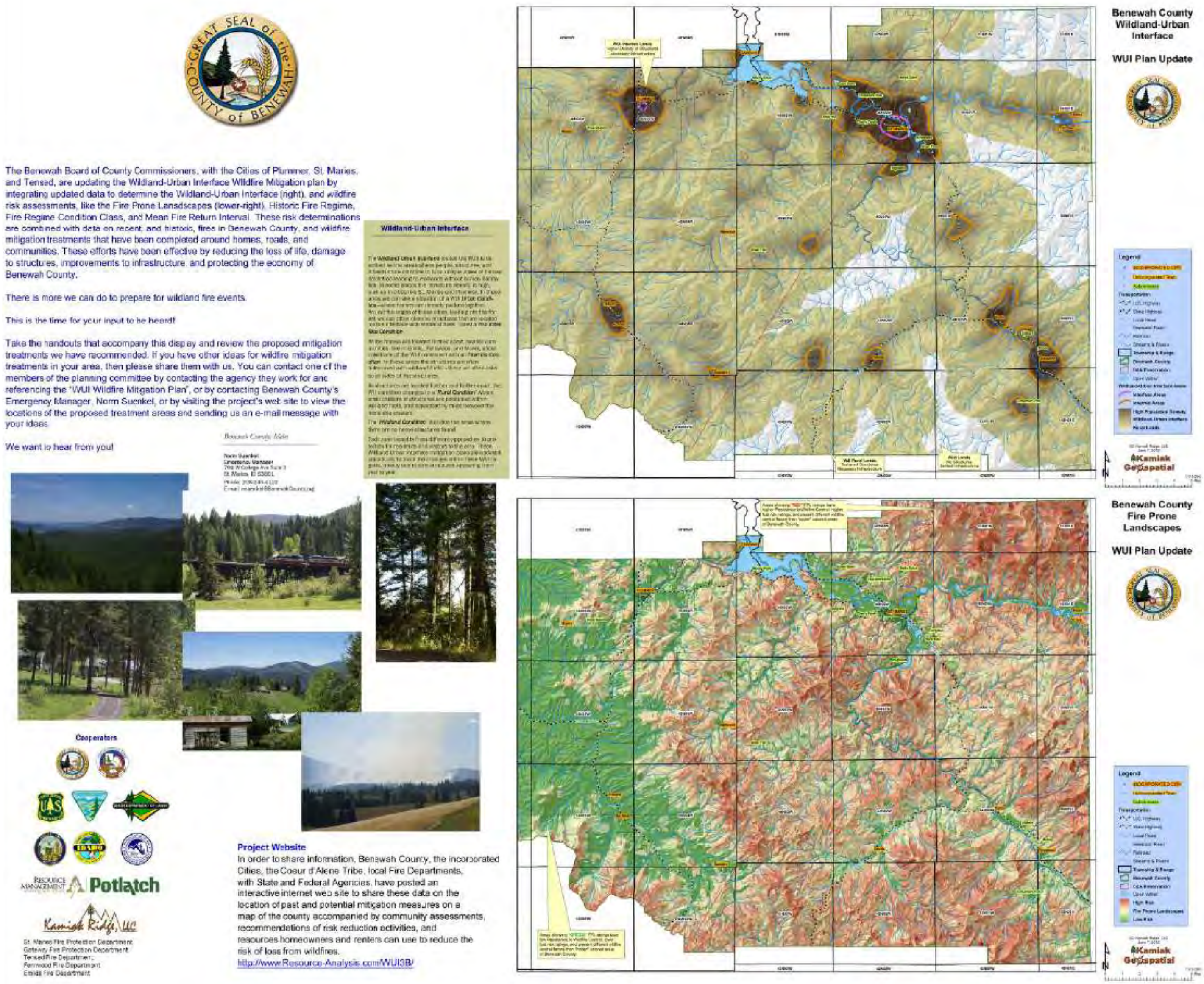


Figure 16. Interactive mapping application, on the project website, showing past and proposed wildfire mitigation planning efforts.

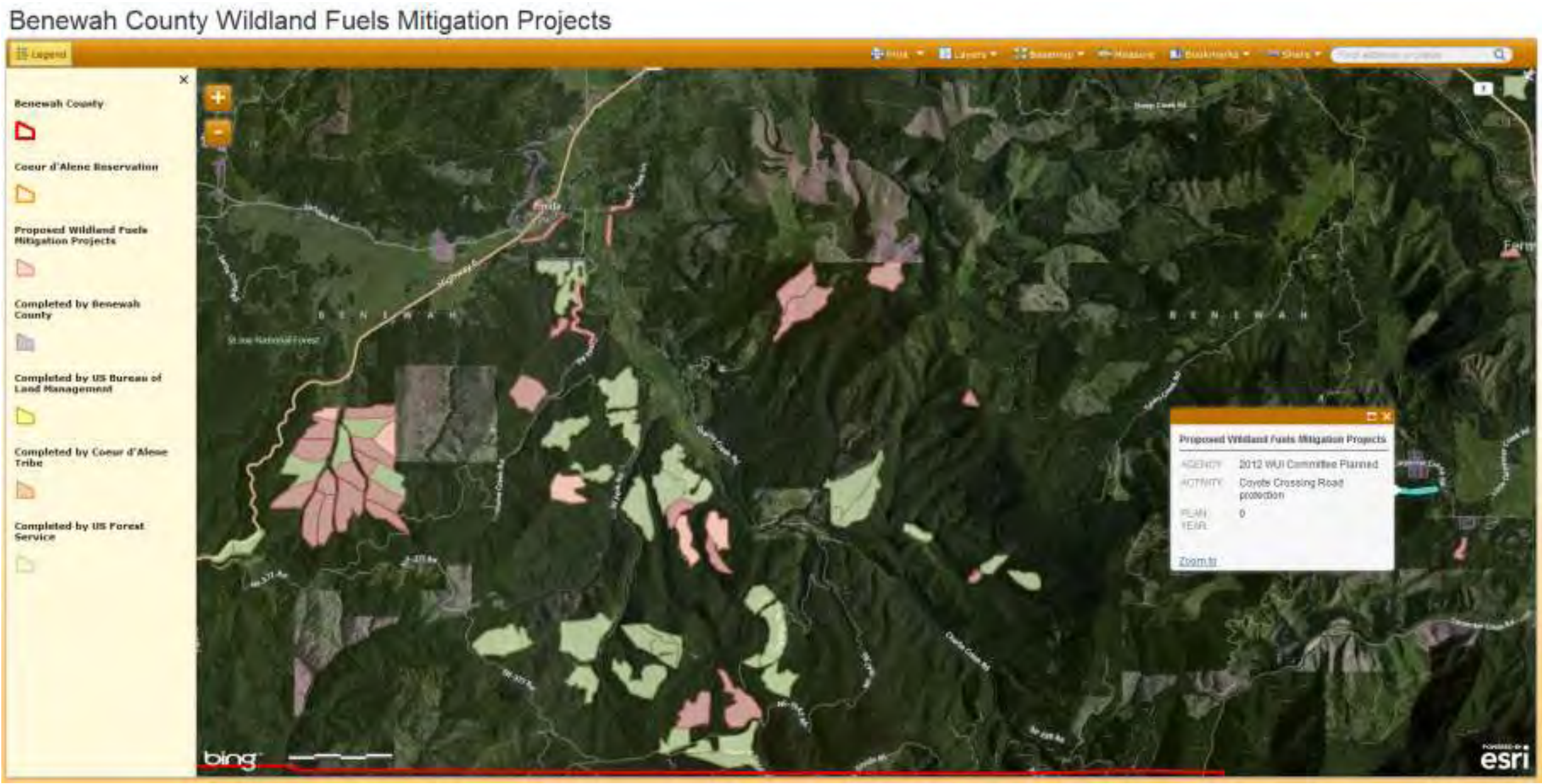


Figure 17.	Benewah County's WUI Mitigation Planning website.

http://www.Resource-Analysis.com/WUI3B/

3.6.2. Press Release

The St. Maries Gazette published a press release announcing the county's update of the WUI plan update on June 27, 2012 (Figure 18). It announced the wildfire mitigation displays showing at local fire stations, city and county offices, and the agencies of the region. It also announced the public outreach for this planning update at the Benewah County Forestry Field Day held on July 14, in St. Maries, and sponsored by the Idaho Forest Owners Association.

Figure 18. St. Maries Gazette article promotes the WUI Plan update.

Comment sought on plan

By Mary Orr

A $32,200 federal grant will pay for Benewah County to update its wildfire urban interface plan.

The team assigned the task would like public input.

The plan was originally drafted in 2004 as a way to protect people and property in the event of forest fires.

Benewah County has witnessed some significant disasters throughout history. One notable event was the August 1910 wildfire, which charred more than 3 million acres within the region, and approximately 87,500 acres in Benewah County.

The county hired Dr. Bill Schlosser, of Kamiak Ridge which is a natural resources consulting firm, who helped with previous plans, to complete the update. The company has created a web page for the public to visit to gather information on the project and to submit comments. The site includes a map that shows the projects recently completed and displays the next five year's worth of proposed projects.

Interested readers can view the web page at: www.Resource-Analysis.com/WUI3B/. The bottom of the opening page gives an e-mail link to Kamiak Ridge so that new project areas can be proposed, or questions can be asked.

The company will have a display at Benewah County Woods Day July 14. Interested visitors can view maps of the project areas and talk with planners during this event to learn more about proposed project areas and suggest their own ideas of how the county can make a positive difference for wildfire control.

A second press release was published in the St. Maries Gazette (Figure 19) announcing the public review period, August 1 – 22, 2012, with printed documents in 4 County libraries, and at the County Courthouse. Visitors to the project website could download the DRAFT plan and provide comments. This press release was accompanied by an e-mail blog to the newspaper's readers announcing the public review process.

Figure 19. Public Review Press Release.

The Gazette Record August 15, 2012 7

Briefly

Comment now on fire plan

The Benewah County Wildland-Urban Interface (WUI) Wildfire Mitigation Plan has been updated.

Several agencies work together according to this plan to reduce the potential loss to landowners from wildfires.

The updated plan is designed to keep the county's responses specific to the risks facing local residents. The update is available for public review through Aug. 22. Printed copies are available at the Tensed, Plummer, St. Maries and Tri-Community libraries and at the county courthouse. Electronic copies may be downloaded from the internet by accessing http://www.Resource-Analysis.com/WUI3B/.

Several other details are provided on the website including information on the planning process, tools for emergency response, and mapping in the county.

People are encouraged to review the plan and provide comments or request more information. The county commissioners and city councils from Tensed, Plummer and St. Maries will formally adopt this plan's update when the public review is completed.

For additional information call Norm Suenkel, Benewah County Emergency Manager, St. Maries, at 208-245-4122.

3.6.1. Benewah County Forestry Field Day

The Idaho Forest Owners Association sponsors events across the forested areas of Idaho State and on July 14, 2012, they held a Forest Owners Field Day in St. Maries in cooperation with the Washington Forest Owners Association. The WUI planning team was represented by Kamiak Ridge and Inland Forest Management staff who displayed the WUI Mitigation poster, handed out flyers, and displayed a potential mitigation map of the county (Figure 20).

Landowners from Benewah County who visited the display asked questions, received information, and in some cases offered new potential mitigation measures by drawing their ideas on a large-scale map of the County. Those proposed mitigation measures were added to this plan. There were about 100 visitors to this event.

Figure 20. Forestry Field Day Display of the WUI Plan's Update.

Figure 21. Idaho & Washington Forest Owners Field Day Announcement.

3.6.2. Residential Survey

When the first Wildland-Urban Interface Wildfire Mitigation Plan (Schlosser 2004) was prepared and adopted by the Benewah County Board of Commissioners and the Mayors of the county's cities in 2004, the planning team prepared and launched a public mail survey. This mail survey was developed to randomly select residents from the county and mail a short survey to gather relevant information about wildfire risks and preparedness (Dillman 1978). The response rate for that survey indicated it was well received, with a 44% response rate. When the county prepared the first FEMA compatible Benewah County Hazards Mitigation Plan in 2005 (Schlosser 2005), the same style of a public mail survey was developed and launched. That survey received a 38% response rate.

During the preparation of the Benewah County Multi-Jurisdictional Hazard Mitigation Plan in 2010 (Schlosser 2010), the Dillman Total Design Method (Dillman 1978) was again used to develop and deploy a public mail survey. The format of the public mail survey was modified and it was accompanied by a targeted media program, and received a 64% response rate.

When the Coeur d'Alene Tribe developed and then adopted their first FEMA Tribal Hazard Mitigation Plan (Schlosser 2011), the Dillman Total Design Method was again used to sample households to garner information about hazard risks and preparedness. The overall response rate from this survey was 51%.

All of these hazard mitigation plans identified wildfire as one of the highest risks for the jurisdictions and sampled specifically for that risk vector. During the preparations for this Wildland-Urban Interface Wildfire Mitigation Plan update, the coordinators decided to recognize the currency of the most recent public mail surveys, within the last two years, and combine the repeated themes identified in all of them over the eight year period.

3.6.2.1. Structure Fire Protection

In repeated surveys about 90% of the respondents correctly indicated that their home is located in a structural fire protection coverage area. Since the completion of the 2004 Wildfire Mitigation Plan a new fire district was voted on and made a reality to provide fire protection services in the southeastern populated places of Benewah County.

Many respondents correctly indicated that their home is not protected by a structure fire department, when it was not located in a fire district. Most of these respondents were from the Flat Creek, and Benewah Valley areas of the county where structure fire protection services are not currently available. However, a few respondents in each survey incorrectly indicated their fire protection status as not protected, when in actuality they are protected by a fire department (including respondents from Emida where fire protection was recently created). A couple respondents living in the St. Maries area, where fire protection services are provided, incorrectly reported their location as not protected by a fire department.

These findings, from multiple survey results, indicate a need for homeowner education about the existence and current protection boundaries of a structural fire protection. These findings indicate that potentially a large share of respondents who believe they are not within a structural fire protection service area may be incorrect in their assessment, as the areas they report as their "closest community" are in fact within the structural fire protection service area. Conversely, there are several respondents to the residential surveys that believe they are within a structural fire protection boundary, when it would appear they are not currently protected by one of the service organizations in the region.

3.6.2.2. Roofing Materials

The respondents to each survey indicated the type of roofing materials covering their home. Consistently, approximately 50% indicated a metal roof, while about 44% indicated a composite roofing material. For the remaining respondents, 3% specified a wood shingle roofing and 1% a ceramic roofing material.

From a wildfire mitigation standpoint, this is a rather good set of factors as the indicated roofing material shows only 3% of the total number of homes are covered by materials ignitable by wildfire brands or embers.

3.6.2.3. Driveways

The average driveway lengths listed by survey respondents ranged from about 520 feet to about 650 feet long, with the longest driveway listed at 3 miles. Approximately 60% of the driveways over ½ mile long were reported to possess a turn-out which can allow two vehicles to pass each other. Respondents indicated the driveway surfaces were predominately gravel (53%-70%) and paved (15%-26%), with the remaining 21% bearing a dirt surface. The average driveway surface indicated was 25 feet wide. The most limiting (narrowest) driveway width indicated by respondents was 5 to 10 feet wide by 18%, 10 to 15 feet wide by 37%, 15 to 20 feet wide by 22%, and greater than 20 feet wide by 22% of the survey's respondents.

Survey respondents provided information about the steepness, or grade, of their driveways. Between 12% and 25% indicated a flat grade, 28% to 30% showed a slight grade, 38% to 44% signaled a moderate grade, and the remaining 8% to 14% of respondents indicated a steep grade to access their homes. At the same time, around half of the respondents to the surveys indicated that they do not have alternative access to and from their home in the event the primary access route was cut off due to a natural hazard such as wildfire.

Survey recipients were asked to identify if their address numbers are clearly visible from the nearest public road. About three-quarters of respondents to each survey set signified a positive response to this question, confirming what has been a substantial effort by many of the fire departments and citizens of Benewah County and the Coeur d'Alene Tribe to make structure addressing visible for emergency responders.

3.6.2.4. Communications

Communications in populated places, and even in the remote areas of Benewah County, have changed substantially in the past decade. Approximately 79% of respondents indicated they have an alternative communication device available when their primary telephone service is inoperable. Of those respondents with alternative communications, about 68% use a cell phone, 1% use a CB or Ham Radio, while others use a combination of satellite phones, closed channel radios, or even internet telephone services. Approximately 71% of the respondents indicated they have internet connections, and a computer to use it, at their home.

3.6.2.5. Emergency Services Training

Emergency services training within the household is an indicator of a family's exposure to safety issues and awareness in emergency situations. This training can include one or more family members participating in volunteer activities (such as volunteer fire fighting), or from employment based training, or from other venues. Respondents indicated training in the following areas within the last 10 years: 10%-19% wildland fire, 9%-10% city or rural fire fighting, 11%-16% paramedic or Emergency Medical Technician (EMT), 46% basic first aid, and 8%-13% in search and rescue.

Overall, about half of respondents in each survey reported at least one of these training activities for at least one member of the household. About a quarter of those respondents with training in the household indicated a combination of two or more training categories. A respectable 10% of respondents with training in the household indicated training in three or more categories listed within the last 10 year period. Two households even indicated training in all five categories of emergency response.

3.6.2.6. Wildfire Risk Exposure

Wildfire in Benewah County is one of the most widespread natural hazards. Wildfire risks are often very pronounced because of the vastness of the areas potentially impacted each summer.

Homes and businesses are scattered around populated places and into rural and often very remote places. Respondents to the survey were asked to evaluate four categories of wildfire risk in the areas immediately surrounding their homes (Table 6) (Carree, Schnepf and Colt 1998). The right column reports the average response rates by category, as summarized further in Table 7.

Table 6. Wildfire Fuel Hazard Rating Worksheet.

		Rating	Results
Fuel Hazard	Small, light fuels (grasses, forbs, weeds, shrubs)	**1**	**49%**
	Medium size fuels (brush, large shrubs, small trees)	**2**	**26%**
	Heavy, large fuels (woodlands, timber, heavy brush)	**3**	**25%**
Slope Hazard	Mild slopes (0-5%)	**1**	**52%**
	Moderate slope (6-20%)	**2**	**35%**
	Steep Slopes (21-40%)	**3**	**10%**
	Extreme slopes (41% and greater)	**4**	**3%**
Structure Hazard	Noncombustible roof and noncombustible siding materials	**1**	**33%**
	Noncombustible roof and combustible siding material	**3**	**47%**
	Combustible roof and noncombustible siding material	**7**	**5%**
	Combustible roof and combustible siding materials	**10**	**15%**
Additional Factors	Rough topography that contains several steep canyons or ridges	**+2**	**Average: -4.1 pts**
	Areas having history of higher than average fire occurrence	**+3**	
	Areas exposed to severe fire weather and strong winds	**+4**	
	Areas with existing fuel modifications or usable fire breaks	**-3**	
	Areas with local facilities (water systems, rural fire districts, dozers)	**-3**	

Fuel hazard 1.76 x Slope Hazard 1.64	=	2.89
Structural hazard	+	3.59
Additional factors	(+ or -)	-4.10
Average Hazard Points	**=**	**2.38**

The relative risk scores of respondents who live within city limits were compared to those living in rural areas in each survey conducted over the six year period. These comparisons revealed no statistically significant difference between these two populations. The overall self-evaluation performed by the homeowners places approximately 64% of the homes at low risk, 31% at a moderate risk, and the remaining 5% at high risk, with none reporting factors leading to an assessment of to extreme risk factors to loss from wildfire (Table 7).

Table 7. Percent of respondents in each wildfire risk category as determined by the survey responses.

00% – Extreme Risk = 26 + points
05% – High Risk = 16–25 points
31% – Moderate Risk = 7–15 points
64% – Low Risk = 6 or less points

Survey recipients were asked to rate their home exposure to natural disasters. Responses indicated that 71% of respondents believe that their homes are exposed to wildfire risks.

3.6.2.7. Financial Losses

Financial losses collected by the surveys are residential out-of-pocket losses and not the insured losses or the financial burden caused by the natural disaster event. When damages are witnessed there may be losses borne by the homeowner in the form of loss of work, personal labor to clean-up or repair their home and personal access routes, and even personal injury. At the same time, natural disasters may be responded to by emergency responders, emergency services organizations, the County or Tribal services.

Respondents to the most recent two surveys, for Benewah County (2010) and the Coeur d'Alene Tribe (2011), were requested in the light of multiple hazards, not just wildfire. The losses reported included only the residential out-of-pocket losses associated with the natural disaster events.

The two surveys used a slightly different format and both are reproduced here to observe the comparative financial loss profiles of wildfire in comparison to the other natural disasters in the county.

3.6.2.7.1. Benewah County

Survey recipients were asked about their personal experiences in Benewah County concerning natural hazards within the 10 year period preceding the survey (1999-2008). Responses indicated that winter storms were experienced by approximately 56% of respondents, more than any other natural hazard. Some of these winter storms caused home, business, and property damages and affected real estate owned by 13% of respondents. Losses averaged $1,358 per occurrence of damage (Table 8).

Wind storms (including tornados) were experienced by approximately 17% of survey respondents. Approximately 7% of respondents experienced financial loss damages to their real estate averaging over $2,764 per occurrence (Table 8).

Flood events were experienced by about 11% of homeowners during the 10-year period in Benewah County. While only 4% of respondents reported monetary losses from flooding to their home, business, or real estate, the losses were on a similar footing with winter storms, averaging $1,275 per event (Table 8).

Wildfire events occurred in close proximity to approximately 11% of survey respondents, with only 2% of the survey responses indicating a monetary loss of $2,000 per occurrence due to these wildfire events (Table 8).

Table 8. Disasters affecting private real estate in Benewah County (1999-2008).

↓Hazard↓	Percent of respondents reporting hazard occurrence during the period 1999-2008, near their home.	If YES, Complete these questions…	Percent of respondents experiencing monetary damage to their home, property, or business.	Approximate average monetary loss caused by each hazard (during the period 1999-2008)	Average losses estimated for private real estate in Benewah County during the period 1999-2008
Wildfire	**11%**	→	**2%**	**$2,000**	**$94,246**
Flood	11%	→	4%	$1,275	$151,533
Earthquake	1%	→	0%	$--	$--
Landslide	0%	→	0%	$--	$--
Wind Storm / Tornado	17%	→	7%	$2,764	$525,655
Winter Storm	56%	→	13%	$1,358	$488,636
	↑	**Data provided through the survey**		↑	**↑ Data derived ↑ through analysis**

Based on the data collected, private homeowner losses can be extrapolated to the level of all private homeowners in Benewah County by combining the total homeowner loss values from the survey for each risk (Table 8), and expanding these numbers to the level of the entire county. Using this methodology it can be observed (Table 8 – right side column) that wind storms and tornados have caused the largest estimated losses to private homeowners during this period, with just over $525,650 of property damages in the last decade (an average of $52,565 per year across the entire county).

Winter storms have resulted in private homeowner real estate damages of approximately $488,600 in the last 10-year period, or approximately $48,860 per year (Table 2.10). Winter storms were the most reported natural hazard experienced by survey respondents, at 56% reporting these incidences (Table 8).

Although wildfire is intuitively a very widespread risk in Benewah County (affecting a significant land area), low actual losses reported by a low percentage of homeowners expands to a loss of only $94,250 per decade within the county (Table 8).

3.6.2.7.2. Coeur d'Alene Tribe

During the Coeur d'Alene Tribal Hazard Mitigation Plan survey, recipients were asked to rate their home's exposure to natural disasters. Responses indicated that 75% of respondents believe that their homes are exposed to high wind storm damage. At the same time, approximately 73% of respondents indicated their homes have risk exposure to snowstorm damages, and 71% gave the same assessment to wildfire risks for their home. Although still significant, other natural hazards were rated lower by survey respondents in the chance of the disaster to threaten homes with earthquake risks reported by 38% of respondents, landslides reported by 18% of respondents, and flooding with storm water damage potential reported by 15% of survey respondents.

Respondents to the survey reported the exposure of their home and access to their home by natural disasters by completing a tabular summary of these factors and the natural disasters (Table 9). The resulting summary by respondents illuminates the overall high frequency of exposure of homes and access by high and damaging winds (75% and 54% respectively), wildfire (71% and 44% respectively), and earthquakes (55% and 36% respectively) (Table 9).

In unison with these data, respondents reported disaster events that did affect their homes and access to their homes and the out-of-pocket losses caused by these natural disaster events. Approximately 12% of respondents reported that high winds have caused damages to their home with 8% reporting compromise to the access to their home. When the respondent did experience a financial loss, the out-of-pocket loss averaged $3,480 (Table 9). Although flood loss exposure was considered a risk to homes by 17% of survey respondents, approximately 5% of respondents reported experiencing a damage to their homes and 10% of respondents reported a loss of access from flooding. When a loss was experienced by the survey respondent, the average out-of-pocket loss was approximately $2,160. Severe winter weather in the form of snowstorm losses were reported by survey respondents at 3% of the homes and 7% of the access routes to those homes. The average loss, when a loss was encountered by the respondent, was approximately $800 (Table 9).

Table 9. Respondent self-assessment of home site risk exposure.

Hazard	Exposure to HOME by risks	Exposure to ACCESS by risks	History of Loss to HOME by disaster	History of Loss of ACCESS by disaster	Average Loss to HOME by disaster
Flood	17%	26%	5%	10%	$2,160
Storm Water Accumulation	19%	32%	4%	7%	$150
Wildfire	**71%**	**44%**	**1%**	**1%**	**--**
Landslides	16%	15%	1%	2%	--
Earthquakes	55%	36%	1%	0%	--
High & Damaging Winds	75%	54%	12%	8%	$3,480
Severe Snow Storms	17%	12%	3%	7%	$800

3.6.2.8. Mitigation Funding

In each of the four residential surveys conducted, respondents were asked how hazard mitigation projects should be funded in the areas surrounding homes, communities, and infrastructure such as power lines and major roads. Responses between the survey years was fairly consistent.

As shown in Table 10, approximately 39% of respondents indicated a preference for cost-share funding of home defensibility projects to reduce the exposure of individual homes to natural hazards. Conversely, about 50% of respondents indicated a public funding preference for community defensibility projects, while 38% opted for a cost-share approach. Public funding options were preferred by 69% of respondents for infrastructure hazard mitigation projects (Table 10).

Table 10. Public opinions of hazard mitigation funding preferences.

	Public Funding	Cost-Share (Public & Private)	Privately Funded (Owner or Company)
Home Defensibility Projects →	22%	39%	39%
Community Defensibility Projects →	50%	38%	12%
Infrastructure Projects Roads, Bridges, Power Lines, Etc. →	69%	25%	6%

Appreciation is extended to the Coeur d'Alene Tribe's Public Works Department by Benewah County's Emergency Services Department for the cooperation extended on this project to authorize the sharing of residential survey data to combine with the County collected data for this effort. Data used in determining risks, preparedness, and prevention has been shared across the administrative authorities and will continue to be shared with the data collected during this effort shared with all cooperators involved in this plan's update.

Chapter 4. Wildland Fire Hazards Assessment

Benewah County has witnessed some significant disasters throughout history. One notable event was the August 1910 Wildfire, which charred over 3.0 million acres within the region, and approximately 87,500 acres in Benewah County alone. This inferno resulted in over $1.0 million in damages at the time. The total death toll has been estimated at over 300 lives. This event has been well known as "The 1910 Fire" and "The Big Blowup".

Other large wildfire events impacting Benewah County have included wildfires in 1900 (21,240 acres), 1889 (11,500 acres), 1927-28 (6,700 acres), 1931 (5,000 acres), 1919 (4,700 acres), 1929 (3,400 acres), 1969 (1,400 acres), 1932-33 (1,100 acres), 1922-23 (170 acres), and 1927 (90 acres). Each of these events indiscriminately crossed county and state boundaries to char lands in the path of the inferno (Figure 22). Although some of these blazes appear to be small, the size shown here only reflects the impact on Benewah County; for instance, the 1927 wildfire event torched a total of 28,300 acres in Benewah County and adjoining areas.

The databases of natural hazard events in Benewah County reveal few records of wildfires, except some of the more significant. Table 11 summarizes wildfire related events in those databases that have impacted Benewah County.

Table 11. Hazard Profile for significant wildfire disaster events in Benewah County.

Year	Time Period	Event	Extent
2007	August	Wildfire	**Echo Springs** wildfire southwest of St. Maries ignited within the WUI of Benewah County and destroyed one non-residential structure. The suppression costs for the 505 acre incident was over $1.2 million. The fire team was able to stage in a field near a home on the point of a ridge close to the fire in the Shay Hill area because the area had received WUI defensible work. This reduced suppression costs and provided faster and more effective response to the fire.
1998	August	Wildfire	Lightning sparked 25 small fires near **St. Joe**, each ranging 1-5 acres in size (NOAA 2009).
1998	July	Wildfire	A 2 acre wildfire threatened the **St. Maries High School** (NOAA 2009, BCEMD 2009).
1967	August	Wildfire	Property damage was estimated at $2,255,454 from a wildfire that burned Benewah and neighboring counties.
1910*	August 21-22	Wildfire	In a brief 48-hour span, fires carried by hurricane-force winds burned more than 3 million acres, killed over 300 persons and destroyed between 7 and 8 billion board-feet of timber. The winds, which gave **The Big Blowup** its horror, came up from the southwest in the Nez Perce National Forest near Elk City. The government paid $5.4 million in claims of fire-related injuries alone. This $25.4 million in 1910 losses would equate to approximately $464.4 million in 2012 dollars.

* Only the 1910 Wildfire and a couple of minor wildfires were included in this summary in terms of wildfire history.

Local emergency and public works personnel, volunteers, humanitarian organizations, and other private interest groups provide emergency assistance required to protect the public's health and safety and to meet immediate human needs. If necessary, a governor can declare a state of emergency and invoke the state's emergency plan to augment individual and public resources as required (FEMA 2012).

A governor may determine, after consulting with local government officials, that the recovery appears to be beyond the combined resources of both the state and local governments and that federal assistance may be needed. In requesting supplemental federal assistance under the Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. §§ 5121-5206 (Stafford Act), the Governor must: certify that the severity and magnitude of the disaster exceed state and local capabilities; certify that federal assistance is necessary to supplement the efforts and available resources of the state and local governments and disaster relief organizations, as well as compensation by insurance for disaster related losses; confirm execution of the state's emergency plan; and certify adherence to cost sharing requirements (FEMA 2012).

Under the declaration process and to assist a governor to determine if a request for assistance should be made, a preliminary damage assessment is conducted. These assessments are conducted in counties affected by the disaster event. FEMA works with the State's emergency management agency to accomplish these assessments (FEMA 2012).

4.1. Characterizing Normal Weather

There is a high degree of weather variability within the landforms of Benewah County represented by the western, high elevation plateaus, to the east side river valleys. Topographic variations that begin at the low point of Coeur d'Alene Lake are influenced by the rising hillsides that climb to the ridgelines. Stream networks are fed by a combination of foothill and mountain ridgeline sources – within and outside the county. Precipitation is highly variable and show tendencies of increasing precipitation amounts with increasing elevation. Annual precipitation ranges from a low of only 20" per year near Desmet and Mowry to a high of 65" at Rochat Peak and the St. Joe Divide (northeastern corner of the County) (PRISM Climate Group 2012).

Numerical data for this report concerning monthly weather trends within Benewah County were created using the PRISM (Parameter-elevation Regressions on Independent Slopes Model) climate mapping system, developed by Dr. Christopher Daly, PRISM Climate Group director at Oregon State University. PRISM is a unique knowledge-based system that uses point measurements of precipitation, temperature, and other climatic factors to produce continuous, digital-grid estimates of monthly, yearly, and event-based climatic parameters. Continuously updated, this unique analytical tool incorporates point data, digital elevation models, and expert knowledge of complex climatic extremes, including rain shadows, coastal effects, and temperature inversions. PRISM data sets are recognized world-wide as high-quality spatial climate data sets. PRISM is the USDA's official climatological data source (PRISM Climate Group 2012).

PRISM is an analytical model using point data, an underlying grid such as a digital elevation model (DEM), and a 30-year climatological average (e.g. 1971-2010 average), to generate gridded estimates of monthly and annual precipitation and temperature (as well as other climatic parameters). PRISM is well suited to regions with mountainous terrain, because incorporates a conceptual framework that addresses the spatial scale and pattern of orographic processes. Grids evaluated for this report have been modeled on a monthly basis (PRISM Climate Group 2012).

4.1.1. Precipitation

Within the Rocky Mountain influence area of Benewah County, winter storms bring moisture from the Pacific Ocean, generally traveling from the southwest to the northeast, and are uplifted by the terrain, creating a precipitation maximum on the windward side (western Cascade Mountain range) and a minimum on the leeward side (eastern Cascade Mountain range) (Mass 2008). Extratropical cyclone storms approach the coastline often drawing their moisture from the equatorial latitudes and the cold air from the Gulf of Alaska. Variations in the approach trajectory from the south to the northwest account for varying amounts of precipitation, wind, and rain versus snow at a given location. Another common vector for storm systems entering the region is from arctic cold fronts anchored in Canada that create moving weather systems from the north to the south and carrying cold temperatures in the winter.

Storms that approach from the north often contain relatively colder air and limited moisture. The rare cases where storms approach from the northeast, east, or southeast are characterized by light precipitation and little temperature change.

The effects of this system of regional weather patterns bring highly variable climate conditions to the region. Precipitation shows monthly variations that are responsive to the topographic variation with the lowest annual precipitation amount (20 inches per year) seen along the eastern extent of the County near the communities of Mowry, Desmet and Tensed. This pattern yields to the uplift provided by the terrain to witness the highest precipitation amounts along the northeastern corner of the County where totals reach 65 inches per year (Figure 22) (PRISM Climate Group 2012).

The timing of precipitation events within Benewah County is responsive to the seasons of the year. The months receiving the highest amount of precipitation include November through February when about half of annual precipitation arrives.

4.1.1. Temperature

Temperature deviation within Benewah County is equally variable in response to topographic lift and seasonal weather patterns. The average monthly hottest temperatures in the County are observed in July and August when the thermometer can climb to an average temperature of 85º F in St. Maries, Harrison, and other points along Coeur d'Alene Lake and up the St. Joe River. Conversely the average monthly high in July and August is only 69º F along the ridgelines (Moses Mountain) between the Benewah Valley and Sanders (Figure 24). That is not to say that the temperatures in the County do not exceed these values – they do, these numbers are averages. The determination of the highest average temperature is completed by recording the high temperature recorded each day of the month for a 30 year period and creating an average monthly temperature based on those values.

In contrast, the coolest month of the year in Benewah County is generally seen in January when the average monthly low temperature reaches only 16º F along the upper ridgeline elevations of the northeastern corner and along the ridgelines in the County. At the same time, average monthly low temperatures in St. Maries, Harrison, Rockford Bay and other points along Coeur d'Alene Lake will moderate to only 23º F (Figure 25). The western side of the County, on average, witnesses low temperatures in the neighborhood of 20º F during this coldest month of January. The outcome of these monthly low averages is determined much like the average high temperatures. In this case, the lowest daily temperatures are recorded each day of the month and then averaged for the entire month to determine the average low temperature across the County (PRISM Climate Group 2012).

Figure 22. Historic wildfire ignitions and fire perimeters of Benewah County.

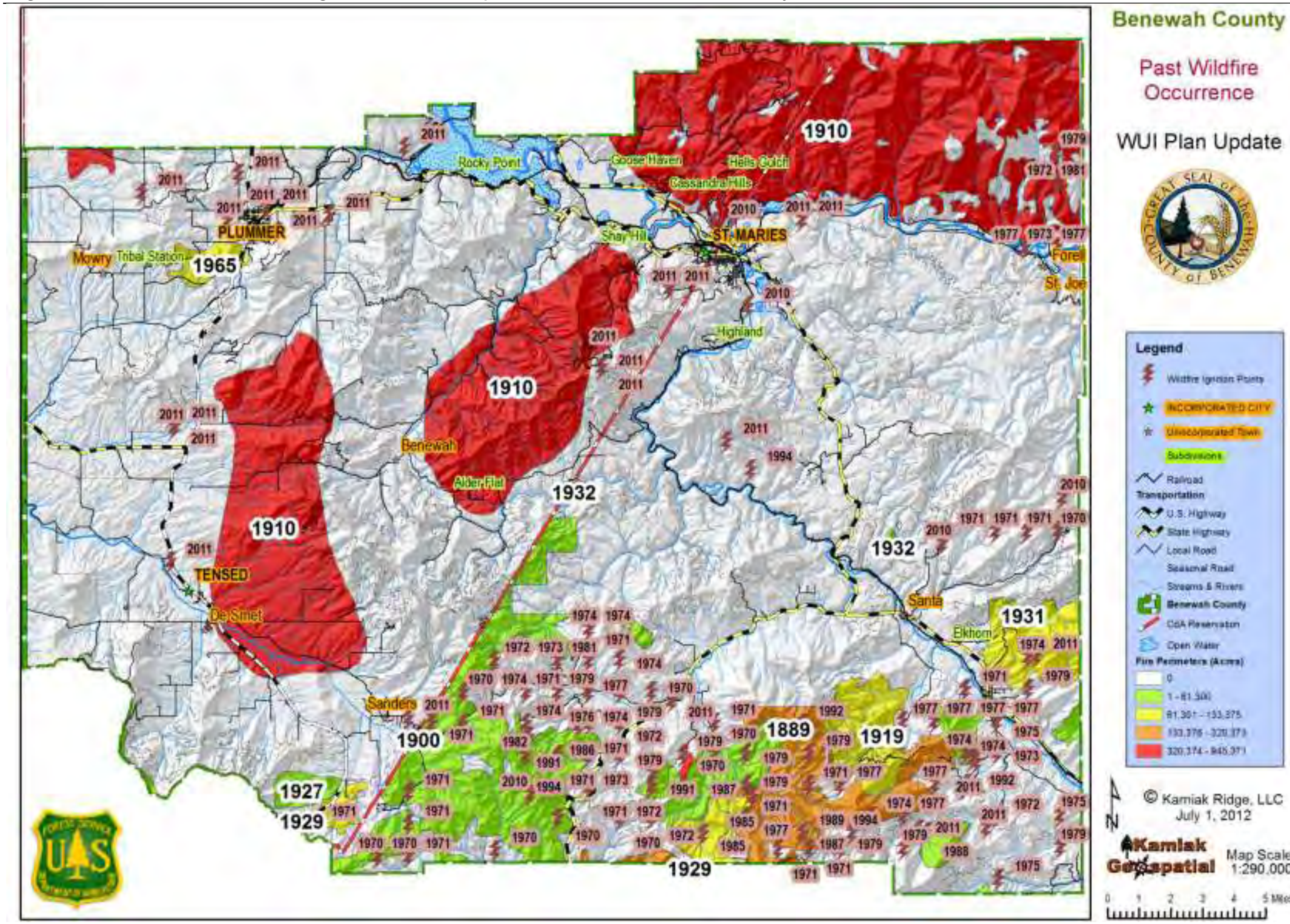


Figure 23. Annual Precipitation Derived from PRISM Datasets from 1971-2009 in Benewah County.

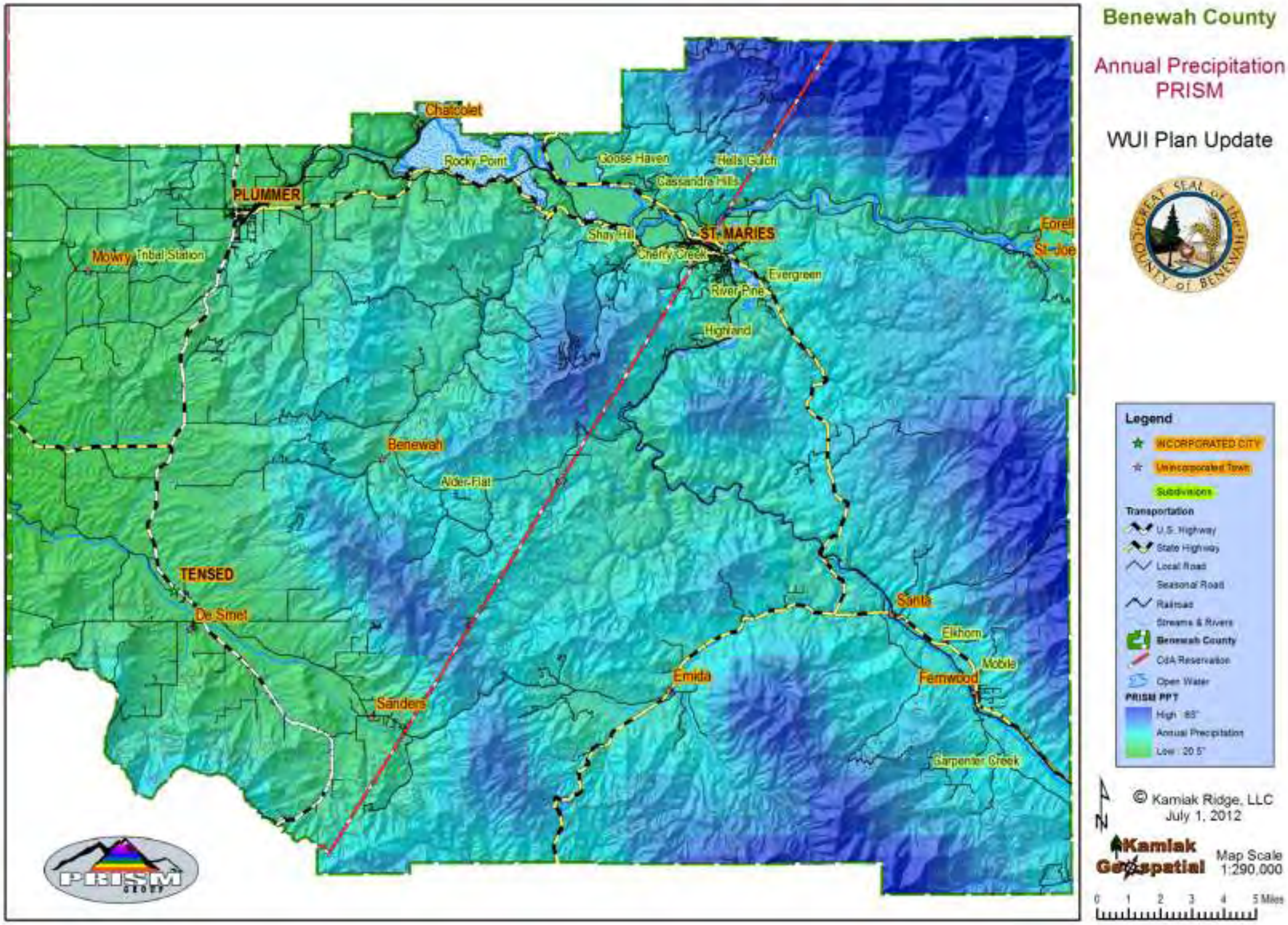


Figure 24. July Average High Temperatures in Benewah County (PRISM 2010).

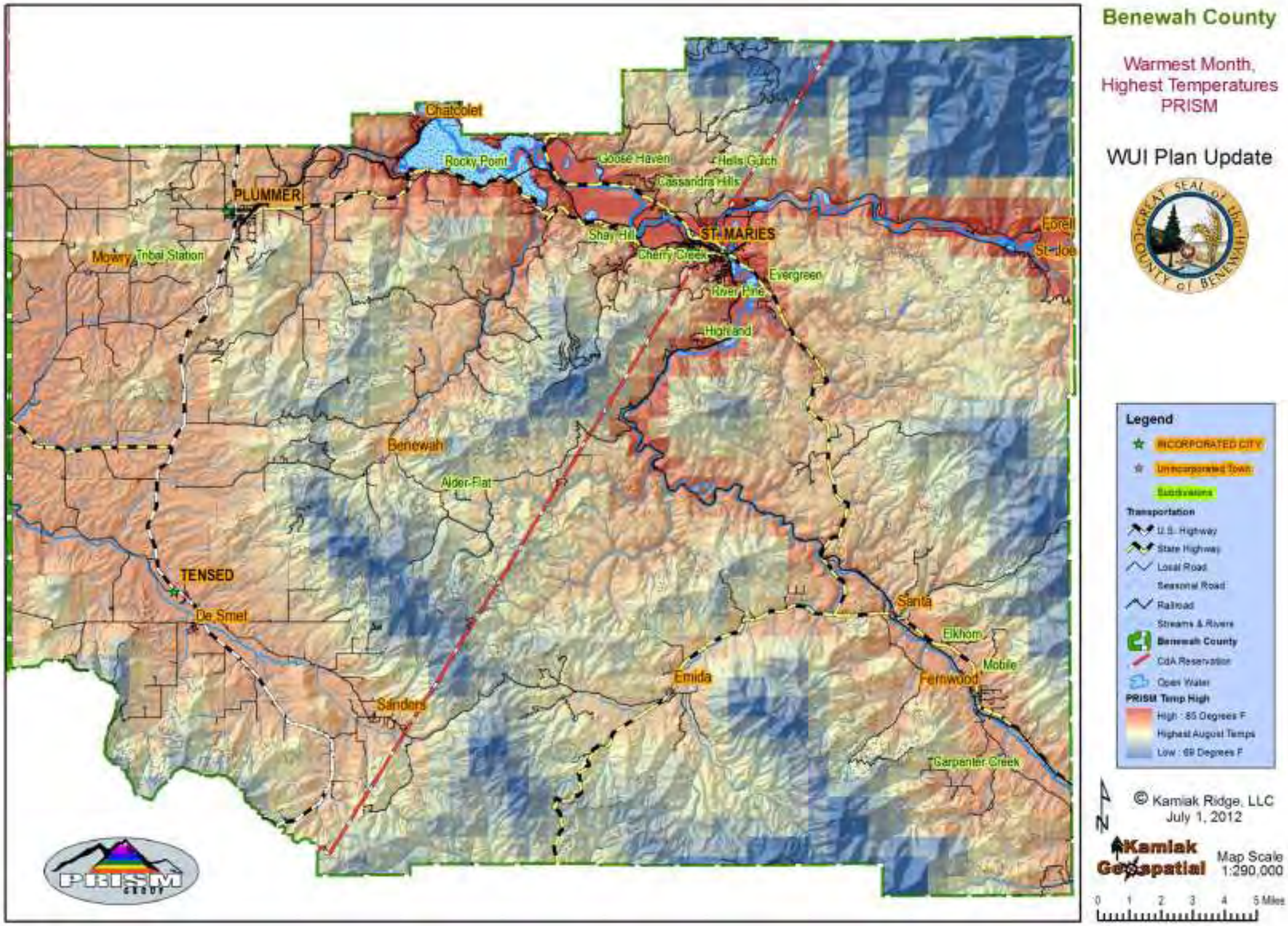
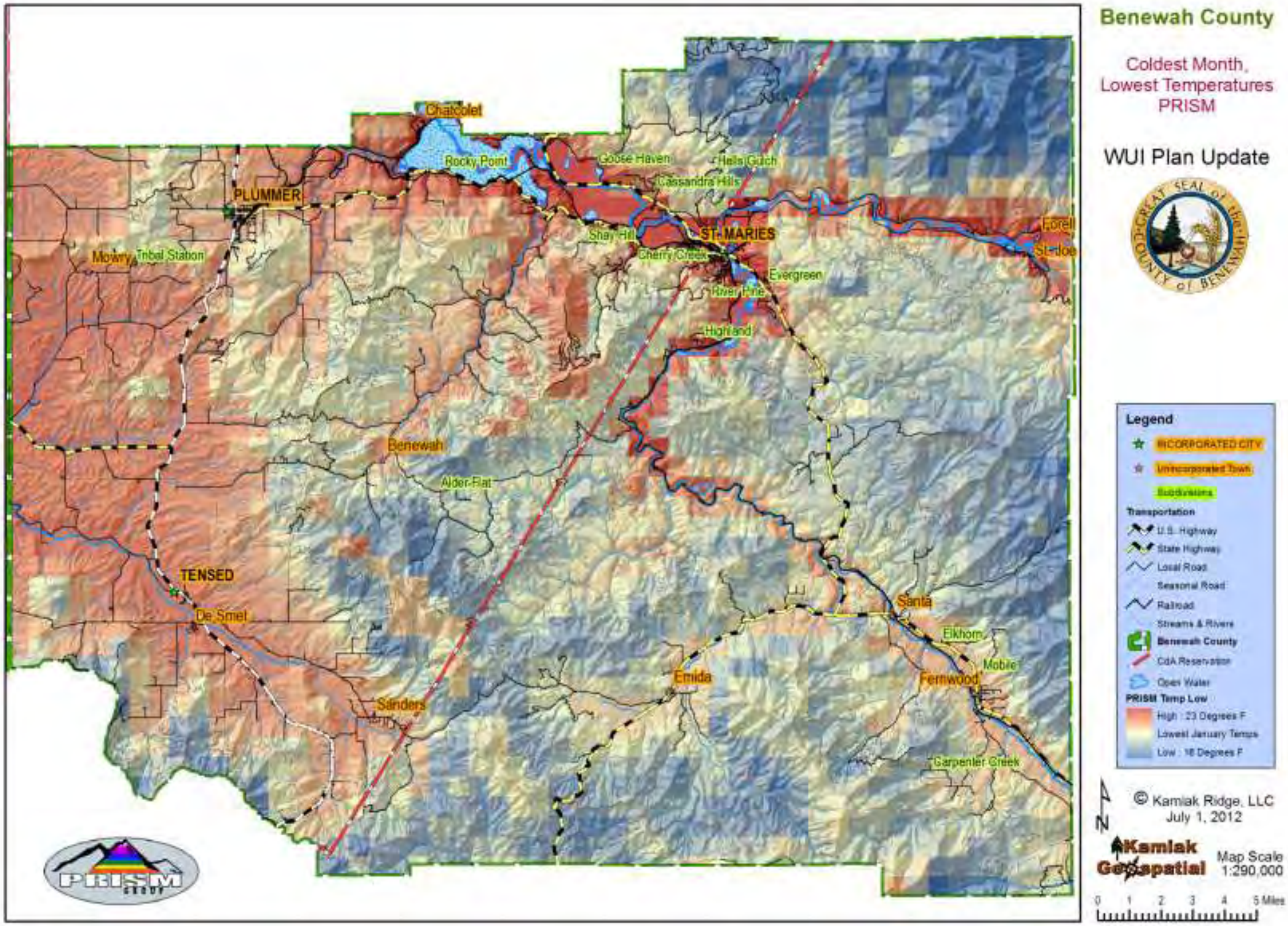


Figure 25. January Average Low Temperatures in Benewah County (PRISM 2010).



Monthly extremes of temperature show how the variation from the highest average monthly temperature in a selected month (e.g., July) may differ from the lowest average monthly temperature from the same month by as much as 40º F. At the other extreme, lowest average temperatures in January, the difference between the highest of the low daily temperatures and the lowest is nearly 20 º F (PRISM Climate Group 2012).

Clouds and precipitation are greatly enhanced when air is forced to ascend the windward slopes of mountain barriers. Most major Northwest flooding events start with an extensive region of light-to-moderate precipitation linked to a strong Pacific low-pressure system and its associated fronts. This precipitation is then greatly increased, sometimes by factors of two-to-five times, as air ascends the mountains (Mass 2008). When moisture-laden storms move up the Columbia River and are not forced over the Cascade Mountains, where precipitation often is dropped in the process, it results in a storm system composed of rain clouds that will rotate northward to the Rocky Mountain approach (North Idaho). As the front moves eastward, the topographic uplift causes the dropping of often significant amounts of precipitation from the foothills of the eastern side of the County to the ridgeline of the Rocky Mountains. Frequently, these storms in the spring and fall are delivered in combination with high winds, thunder, and lightning.

4.1.2. Characterizing Extreme Weather

The Upper Columbia Plateau is essentially a large topographic bowl surrounded to the west by the Cascade Mountains, to the north by the Okanogan highlands, and to the east by the Rocky Mountains. The Blue Mountains of southeast Washington provide yet another rim to the buffer of the region. Even the exposure to the south in Oregon is met with higher elevations of the Oregon plateau and differential pressure systems. The low topographic relief provided by the Columbia River gorge only yields 750 feet at Lewiston, Idaho. The exit to the Pacific Ocean by the Columbia River provides only a narrow drainage of atmospheric pressure.

These weather systems combine to usher in many different weather related complications to human habitation, including flooding, severe weather, freezing storms, and extreme fire weather. These situations have been described in the Benewah County Multi-Jurisdictional Hazards Mitigation Plan (Schlosser 2010) and the Coeur d'Alene Tribal Hazards Mitigation Plan (Schlosser 2011), and are incorporated into this document by reference. Some of the most significant weather related situations are described here.

4.1.2.1. Severe Thunderstorms

The North Idaho region has a long history of periodic, but infrequent, severe weather events impacting the economy and lives of people in the region. These events often come as storms that bring high winds, heavy rains, and are even combined with hail, snow, or freezing rain. Sometimes, the hardest hitting and largest impact storms are short bursts of a leading front moving from the Gulf of Alaska through the Cascade Mountains, into the Columbia Basin, and then into the region where the Rocky Mountain foothills begin to lift the front causing precipitation to fall and the winds to swirl (Mass 2008).

Severe thunderstorms are infrequent with the greatest hazard considered to be wildfire during the dry summer months. The extreme fire hazard weather is often seen when the storm system enters the continent to first traverse the Cascade Mountains where most of its precipitation is dropped. The weather system can still retain significant differential pressure systems accompanied by differential temperatures that conglomerate into lightning storms as the system is pressed into the Rocky Mountain foothills (Mass 2008). When these situations are seen, the impact to the region is rapid strike lightning storms accompanied by high wind gusts. Wildfire ignitions can number in the hundreds, or thousands, in one day.

Red-flag fire conditions occur annually when low humidity and high wind combine leading to dry conditions in the forests of the region. If preceded by a significant number of starts from lightning, the situation can be very hazardous and very difficult to contain.

4.1.3. Probability of Future Events

Severe weather includes a variety of events, generally grouped together into the moniker of "severe weather". These individual events can combine into larger incidents. Taken individually, they include heavy rain, high winds, heavy snowfall, hail, thunder, lightning, extreme and prolonged cold, extreme and prolonged heat, and drought. When considered as individual events, the frequency of severe weather is expected once every five years and more frequently. The future frequency of events is expected to be at least this common.

When considering the influence of global climate changes on the occurrence and behavior of natural disaster events, severe weather appears to be most vulnerable to changes in periodicity and destructive force. Anecdotal reports in the national media, scientific journals, and observations of events, have described increasing rainfall, warming temperatures even at higher elevations, and increased energy delivered by storms. At the same time, human habitation has expanded its reach into areas previously not suited for permanent homes, businesses, or infrastructure. The combined effect of the spread of human developments with increased storm force can lead to frequent (multiple times each year) destructive force events.

Severe weather is a driving force of energy for other hazards such as wildfire and flooding.

Predicting future severe weather events presents the same nature of predicting the weather next week, or next month. In general terms, the observer would expect that the future nature of severe weather events within Benewah County would be similar to the histories documented in this planning document that illustrate extreme weather fluctuations, from occasional extreme warmth in the winter, to cold in the summer.

Generalizations about this extreme weather probability cannot be articulated as predictably as some of the other natural hazards, but conceptually it can be articulated as being responsive to the impacts of global climate change. The changes to weather patterns have been observed during the past century. Unfortunately, that period of time limits our ability to make meaningful predictions about the ebb and flow of weather pattern changes. It is expected that severe weather impacts will influence the region with the same pattern of damages, although the location and severity will be variable. It is also expected that new extremes will be witnessed during the next 50 to 100 years for all measurements of severity (e.g., wind speed and duration, rainfall daily extremes, drought intensity, new high temperatures and new low temperatures).

It is expected that these extreme events will continue at this historic frequency into the future, with events recorded as frequently as semi-annually to once every 3 years.

4.2. Phase I Hazard Profile

In 2009, during the first Benewah County Multi-Jurisdictional Hazards Mitigation Plan Committee meeting, the attendees participated in a scoping exercise to subjectively place all relevant hazards into a matrix used to compare various hazard importance levels based on the potential for the hazard to occur and its capacity to negatively affect people, structures, infrastructure, and the economy of Benewah County. This exercise was based on the hazard profile first developed by the County in 2005, and helped to spark discussions about relative risks and the types of impacts commonly experienced. Resources for this discussion included tabular risk analysis data for all hazards experienced in the county, not only wildfire. These discussions were augmented with the extensive personal experiences of the combined planning committee membership.

For the purposes of the planning committee discussion the relative categories of Low, Medium, and High were considered as follows:

- Probability of Occurrence
    - Low – historically, the listed hazard has been observed with a frequency of one or fewer notable events within a ten year period. This category also includes infrequent hazard events that may occur only once a century.
    - Medium – the occurrence of the listed hazard has been observed more frequently than once in a ten year period, but less frequently than twice every five year period, on average.
    - High – the listed hazard has occurred more than twice every five years, and includes annual event hazards, and even multiple times per year hazards. To be considered for this ranking, the hazard does not necessarily occur every year, but when considered over a five year period, the hazard is witnessed three or more times per five year period.
- Potential to Impact People, Structures, Infrastructure, and the Economy
    - Low – the occurrence of the listed hazard has low potential to negatively impact the listed resources based on the exposure to developments and population centers, coupled with considerations for available resources to respond to these threats. The risk exposure potentially impacts no lives and less than 25 structures when it is witnessed.
    - Medium – the occurrence of the listed hazard has moderate potential to negatively impact the listed resources based on the exposure to developments and population centers, coupled with considerations for available resources to respond to these threats. The risk exposure potentially impacts fewer than 5 lives or less than 50 structures when it is witnessed.
    - High – the occurrence of the listed hazard has high potential to negatively impact the listed resources based on the exposure to developments and population centers, coupled with considerations for available resources to respond to these threats. The risk exposure potentially impacts more than 5 lives or more than 50 structures with each occurrence.

The findings of the planning committee are summarized in Table 12.

Table 12. Phase I Hazard Assessment of Benewah County.

Probability of Occurrence				
	High		Severe Winter Weather Wind Storms	Wildland Fire Flood
	Medium		Landslides	
	Low		Earthquake / Seismic Shaking	
		Low	**Medium**	**High**
		Potential to Impact People, Structures, Infrastructure, and the Economy		

These data presented the basis for evaluation in the Benewah County Multi-Jurisdictional Hazards Mitigation Plan update in 2009-2010 with the determination that the hazards to be considered in that effort. This ranking of hazards was carried forward into this Wildland-Urban Interface Wildfire Mitigation Plan update:

1. Flood
2. Wildland Fire
3. Earthquakes & Seismic Shaking Hazards
4. Landslides
5. Severe Winter Weather & Wind Storms

The planning committee widely recognized the existence of additional potential risks, but felt that the inclusion of additional hazards could not be justified in terms of the magnitude of these natural hazards.

4.3. Wildland Fire

A wildfire, also known as a wildland fire, forest fire, brush fire, or vegetation fire, is an uncontrolled fire often occurring in wildland areas, but also with the potential to consume houses and agricultural resources. Common causes are numerous and can include lightning, human carelessness, slash-and-burn farming, arson, volcanic activity, pyroclastic clouds, and underground coal fire. Heat waves, droughts, and cyclical climate changes such as El Niño can also dramatically increase the risk of wildfires (NWCG 1998).

Wildfires are common in climates that are sufficiently moist to allow the growth of trees but feature extended dry, hot periods, such as can be found in most of Idaho in late summer months. Wildfires can be particularly intense during days of strong winds and periods of drought. Fire prevalence is also high during the summer and autumn months, when fallen branches, leaves, grasses, and scrub dry out and become more flammable (NWCG 1998).

Wildfires are considered a natural part of the ecosystem of numerous forestlands and rangelands, where some plants have evolved to tolerate fires through a variety of strategies such as fire-resistant seeds and reserve shoots that sprout after a fire (Agee 1993). Smoke, charred wood, and heat are common fire cues that stimulate the germination of seeds (Agee 1998). Exposure to smoke from burning plants can even promote germination in some types of plants (Barrett 1979).

Natural fire ignition from lightning, as well as human carelessness or arson, are the main causes for most wildfires in north Idaho. These fires threaten homes located within the WUI, a zone of transition between developed areas and undeveloped wildland. However, structure fires can also threaten wildlands when these homes are located without a vegetation buffer, allowing the structure fire to spread to forestland or rangeland vegetation, then back to other homes in the area.

4.3.1. Wildfire Threats in Benewah County

Fires can be categorized by their fuel type as follows:

- **Smoldering:** involves the slow combustion of surface fuels without generating flame, spreading slowly and steadily.
- **Creeping:** surface fires that consume low-lying vegetation such as grass, leaf litter, and debris.
- **Ladder:** fires that consume material between low-level vegetation and tree canopies, such as small trees, low branches, vines, and invasive plants.
- **Crown:** fires that consume low level surface fuels, transition to ladder fuels, and also consume suspended materials at the canopy level. These fires can spread at an

incredible pace through the top of a forest canopy, burning entire trees, and can be extremely dangerous (sometimes called a Firestorm).

Smoldering fires involve the slow combustion of surface fuels without generating flame, while spreading slowly and steadily. They can linger for days or weeks after flaming has ceased, resulting in potential large quantities of fuel consumed. They heat the duff and mineral layers, affecting the roots, seeds, and plant stems in the ground. These are most common in peat bogs, but not exclusive to that vegetation.

Wildfires may spread by jumping or spotting, as burning materials are carried by wind or firestorm conditions. Burning materials can jump over roads, rivers, or even firebreaks and start distant fires. The powerful updraft caused by a large wildfire will draw in air from the surrounding area. These self-generated winds can also lead to the phenomenon known as a firestorm.

4.3.2. History

Wildland fire management in the interior west over the past hundred years has created a modified role for wildland fire. Because of a national awareness of wildfire impacts, forest managers increased protective measures to stop wildfires as soon as they are discovered.

Pre-European wildland fires of this region were allowed to burn unchecked with a fire return interval ranging from as few as five years to as many as a couple hundred years between fire events (Brown 1995, IFPC 2005). In those locations where fires were a frequent “visitor” the fire intensity was commonly low, and supported by surface fuels such as grasses, forest litter and debris. Occasionally, the fires would torch into single trees (via ladder fuels) or small groups of trees, but rarely were they sustained in the tree crowns (crown fire). Fire intensities created a mosaic of burned and un-burned areas located relatively close to each other.

In less frequent fire-return interval sites, the natural condition wildfires would burn with more intensity but a lower periodicity. The tree species occupying these sites would often be tolerant of some level of fire activity and sometimes regenerated by fire activity (such as ponderosa pine and lodgepole pine). These sites experienced wide-scale fires on a return interval of 60 to 120 years between wildfire events.

Other sites witnessed fire reoccurrence very infrequently (as much as 200 years between fire returns), where trees and other vegetation would thrive in the inter-fire period only to be destroyed by the next large event, commonly called a “Stand Replacing Fire” (Brown 1995).

Prior to about 1920, the lack of a well-developed road system in most of north Idaho generally, and Benewah County specifically, hindered fire protection services from accessing fires while they were still small enough to logistically control. As the road system of the region was better developed through increased timber harvesting activities, fire response time was greatly aided. After World War II, wildland firefighting agencies added two more features to their anti-incendiary tool-belt - air attack and smoke jumpers.

Both of these tools increased the effectiveness of the wildland firefighters, mainly employed by the USFS, Idaho Department of Lands, forest products companies, and others, to control fires while still small. Fire suppression efforts were so successful that the number of acres burning annually in north Idaho was only a small fraction of the region’s historical average. For instance, the Idaho Panhandle National Forest area averaged 31,000 acres burned each year from 1542 to 1931. The average number of acres burned annually between 1969 and 1998 was only 665 (IFPC 2005).

A parallel sequence of events occurred with this scenario. Technology to track lightning strikes as they occur improved critical quick response time in North America in the late 1960s (Brookhouse 1999). Lightning detection systems are able to record various characteristics of lightning strikes, including the type of strike (cloud-to-ground, cloud-to-cloud), polarity, intensity, and approximate location of the discharge. Each lightning strike emanates a radio signal that has a unique signature. USFS and BLM research has been instrumental in establishing lightning detection systems all across the Inland Northwest and all of the United States. The first lightning detectors in this region came into operation in 1968, with the location of ground strikes plotted manually. This manual form of triangulation was replaced by linking detectors to computers. This system is called "Automated Lightning Detection System" (ALDS).

This synergistic combination of resources and technology greatly reduced the average wildland fire size and therefore reduced risks to both the ecosystem and the rural and urban populations living in or near forestlands (such as all communities in Benewah County).

This break in the natural fire cycle introduced by large scale and effective firefighting led to the accumulation of natural fuels on sites where fire previously had re-occurred on a more frequent cycle with accompanying lower intensity fires. Other disruptions to the natural fire cycle included the introduction of exotic plant diseases, such as the white pine blister rust in 1910, which decimated millions of acres of western white pine in Idaho and other states (Worrall 2007). By 1940 the rust was epidemic in Idaho, infecting over 95% of the standing western white pine. Today, the amount of western white pine growing in north Idaho is approximately 93% less than it was just 40 years ago (IFPC 2005).

Figure 26. A monument to Western White Pine in Benewah and Latah County.

While wildland fire spread in the region has been drastically reduced, debris and normal forest fuels continue to accumulate in the forest. When fire does occur, it can burn hotter and longer than it did historically. These "out of natural historic range of variability" fires are common each summer across the nation, in Idaho, and in Benewah County.

With extensive urbanization of rangelands and forestlands, these fires often involve destruction of homes located in the WUI. On many occasions, wildfires have caused large-scale damage to private and public property, destroying many homes and causing deaths, particularly when they have reached urban fringe communities.

4.3.3. Wildland Fire History

Statewide, wildfires have been observed on a continuous and frequent cycle in all forested and rangeland ecosystems in Idaho. Many homes have been built within the WUI, leading to losses of private and public structures from wildfires. The reverse is also true, as homes have ignited and then spread to surrounding rangelands and forestlands, causing the loss of adjacent homes and natural ecosystems.

Wildfire events in Idaho that have impacted Benewah County and surrounding areas are summarized in Table 13.

Table 13. Significant Idaho wildland fires recorded in and near Benewah County.

Year	Disaster Declarations (1976-2000)	WUI Impact	Comments
1889			Legacy Fire dated 1889, burned 320,373 acres in North Idaho, including 11,531 acres in Benewah County (IPNF 2009).
1900			Legacy Fire dated 1900, burned 61,300 acres in North Idaho, including 21,242 acres in Benewah County (IPNF 2009).
1910	-	X	Eighty-five lives lost; fire consumes 1/6 of North Idaho forests, destroying many communities. The 1910 Wildfire burned approximately 87,490 acres in Benewah County (IBHS 2007).
1919			Legacy Fire dated 1919, burned 133,375 acres in North Idaho, including 4,652 acres in Benewah County (IPNF 2009).
1922			Legacy Fire dated 1922, burned 79,843 acres in North Idaho, including 173 acres in Benewah County (IPNF 2009).
1924			Legacy Fire dated 1924, burned 28,304 acres in North Idaho, including 87 acres in Benewah County (IPNF 2009).
1927			Legacy Fire dated 1927, burned 31,908 acres in North Idaho, including 6,684 acres in Benewah County (IPNF 2009).
1929			Legacy Fire dated 1929, burned 107,726 acres in North Idaho, including 3,406 acres in Benewah County (IPNF 2009).
1931			Legacy Fire dated 1931, burned 84,822 acres in North Idaho, including 4,975 acres in Benewah County (IPNF 2009).
1932			Legacy Fire dated 1932, burned 3,027 acres in North Idaho, including 1,093 acres in Benewah County (IPNF 2009).
1965			Legacy Fire dated 1965, burned 79,843 acres in North Idaho, including 1,407 acres in Benewah County (IPNF 2009).
1967	-		Ten counties in Panhandle affected; 50,000 acres burned in nine hours, and a total wildfire size of 79,843 acres, with 1,406 acres in Benewah County (IBHS 2007).
1985	State (2)		Two State-wide declarations (July and August) (IBHS 2007).
1986	State		State-wide declaration (IBHS 2007).
1989	State	X	The worst fires since 1910 burn thousands of acres in south central Idaho, partially destroying the town of Lowman and leading to State-wide declaration (IBHS 2007)..
1992	State (2)	X	One life lost in the worst fire season in Idaho history to date; one of two State-wide declarations was for an unusual spring event (April) (IBHS 2007)..
1994	State	X	One life lost and one home lost; summer wildfires burn a total of over 750,000 acres resulting in a State-wide declaration (IBHS 2007).
2000	State, Federal	X	More than 1,500 individual fires (IBHS 2007).
2007	State	X	1,394 Fires, 1,972,643 acres (IBHS 2007).

Within Benewah County, wildfire management is administered by the IDL and the Coeur d'Alene Tribe. While the USFS and BLM have significant landholdings in Benewah County, the IDL is the lead agency for wildfire initial attack and suppression. The IDL maintains a database of wildfire ignitions, the ignition's cause, cost of suppression, and final fire size, in addition to several other wildfire attributes. These data are maintained state-wide for the lands where the IDL manages wildfire suppression efforts (Table 14).

A review of information in the IDL wildfire database reveals that approximately 68.5 acres burned each year in Benewah County from an average of approximately 17 ignitions (Table 14). Wildfire suppression costs, on average, total approximately $159,819 each year from 1983-2011). Suppression costs are highly variable, with costs reported in 1983 at only $1,500, 2007 reaching $1.4 million, and 2008 totaling $1.2 million in suppression costs (Table 14).

Approximately 46% of all ignitions in Benewah County were recorded as lightning caused wildfires. Debris burning that escaped to become a wildfire accounted for 82 ignitions (17% of the total from 1983-2011), while miscellaneous ignitions accounted for another 86 wildfires (19% of the total). These statistics (Table 14) are fairly representative of a WUI interface county although the percent of total non-lightning caused ignitions is relatively high. Generally, it is desirable from a mitigation perspective to have ignitions caused by lightning totaling 75% of all ignitions, and non-lightning caused ignitions accounting for only 25% of the total.

Table 14. IDL Wildfire Ignition and extent profile for Benewah County.

Year	Number of Fires	Acres Burned	Number of Ignitions by Cause: Lightning	Campfire	Smoking	Debris Burning	Arson	Equipment Use	Railroad	Children	Miscellaneous	Cost
1983	6	0.6	2	0	0	0	1	0	0	0	3	$1,474
1984	20	10.7	5	0	0	3	1	1	0	0	10	$18,082
1985	10	14.3	4	3	0	0	0	0	0	0	3	$31,646
1986	9	3.1	4	0	0	1	0	2	0	0	2	$11,487
1987	17	31.7	3	1	1	2	0	0	0	0	10	$25,540
1988	5	3.5	3	0	0	0	0	0	0	2	0	$3,124
1989	11	9.8	8	0	1	1	0	0	0	0	1	$20,906
1990	3	3.3	2	0	0	0	0	0	0	0	1	$5,663
1991	15	64.6	7	2	0	0	0	0	0	0	6	$33,197
1992	24	32.9	9	2	2	3	0	3	0	0	5	$41,644
1993	11	72.3	1	2	0	4	0	1	0	0	3	$12,556
1994	50	151.5	29	4	2	10	0	1	0	0	4	$413,322
1995	13	2.0	7	0	0	3	0	0	0	1	2	$7,939
1996	19	127.6	12	0	0	2	0	1	0	0	4	$69,411
1997	6	5.3	5	0	0	0	0	0	0	0	1	$12,171
1998	23	14.5	11	1	0	6	0	1	0	0	4	$45,133
1999	23	98.1	12	2	0	4	2	2	0	0	1	$295,254
2000	15	4.7	5	0	1	0	0	0	0	1	8	$26,895
2001	17	6.5	9	4	0	2	0	0	0	0	2	$35,960
2002	12	130.3	2	0	0	2	4	1	0	0	3	$256,724
2003	19	25.5	10	0	1	5	0	2	0	0	1	$65,732
2004	17	7.2	13	1	0	1	0	0	0	0	2	$43,262
2005	7	12.0	2	0	0	3	0	0	0	0	2	$69,275
2006	40	87.3	24	1	0	9	0	2	0	3	1	$255,988
2007	24	534.7	8	1	0	7	0	5	0	1	2	$1,361,551
2008	18	386.6	1	0	0	6	6	2	2	0	1	$1,172,942
2009	29	132.7	13	2	0	7	3	1	0	0	3	$171,110
2010	8	10.2	4	3	0	0	0	1	0	0	0	$79,010
2011	17	4.3	7	4	0	1	3	1	0	0	1	$47,738
Total	**434**	**1,840.6**	**198**	**24**	**8**	**74**	**14**	**24**	**2**	**8**	**82**	**$4,336,875**
		Percent by Cause	**46%**	**6%**	**2%**	**17%**	**3%**	**6%**	**0%**	**2%**	**19%**	
Average/Year	**16.8**	**68.5**										**$159,819**

4.3.4. Analysis Tools to Assess Wildfire Risk Exposure

Analysis tools to assess the risk exposure to wildland fires in Benewah County are numerous. Each analysis tool has specific applications to unique needs and can be considered in light of the site being addressed; none of them will replace professional expertise of fire behavior analysts on the ground. These techniques are presented for consideration of the risk exposure to Benewah County residents. Wildland fire is arguably one of the most widespread hazards affecting Benewah County.

4.3.4.1. Mean Fire Return Interval

Broad-scale alterations of historical fire regimes and vegetation dynamics have occurred in many landscapes in the U.S. through the combined influence of land management practices, fire exclusion, ungulate herbivory, insect and disease outbreaks, climate change, and invasion of non-native plant species. The LANDFIRE Project (LANDFIRE 2012) produces maps of simulated historical fire regimes and vegetation conditions using the LANDSUM landscape succession and disturbance dynamics model. The LANDFIRE Project also produces maps of current vegetation and measurements of current vegetation departure from simulated historical reference conditions. These maps support fire and landscape management planning outlined in the goals of the National Fire Plan, Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act.

The Simulated Historical Mean Fire Return Interval data layer (LANDFIRE MFRI 2011) quantifies the average number of years between fires under the presumed historical fire regime. This data layer is derived from vegetation and disturbance dynamics simulations using LANDSUM (Keane, Holsinger and Pratt 2006, Keane, Parsons and Hessburg 2002, Pratt, Holsinger and Keane 2006). LANDSUM simulates fire dynamics as a function of vegetation dynamics, topography, and spatial context in addition to variability introduced by dynamic wind direction and speed, frequency of extremely dry years, and landscape-level fire size characteristics. This layer is intended to describe one component of simulated historical fire regime characteristics in the context of the broader historical time period represented by the LANDFIRE Biophysical Settings layer and LANDFIRE Biophysical Settings Model Documentation.

Mean fire return interval is calculated from the simulation length divided by the number of fires that were measured on each pixel. The simulations used to produce this layer were 10,000 years in duration to observe the most complete representation of the fire regime characteristics within spatially complex landscapes, given computational limitations. However, it is important to note that these simulations are not intended to accurately represent the last 10,000 years of measurable history, which includes spatially and temporally dynamic factors such as climate change, vegetation species dispersal, and anthropogenic influences on vegetation and fire characteristics.

Simulated historical mean fire return intervals were classified into 22 categories of varying temporal length to preserve finer detail for more frequently burned areas and less detail for rarely burned areas. Additional data layer values were included to represent Water, Snow / Ice, Barren land, and Sparsely Vegetated areas. Vegetated areas that never burned during the simulations were included in the category "Indeterminate Fire Regime Characteristics"; these vegetation types either had no defined fire behavior or had extremely low probabilities of fire ignition (Keane, Parsons and Hessburg 2002).

The results of the Mean Fire Return Interval analysis for Benewah County (Table 15) reveals that almost half the land area in Benewah County is subject to a return interval of under 80 years, while the other half of the land area is exposed to mean fire return intervals of greater than 80 years and up to 200 years. Over 90% of the land area is subject to mean fire return intervals of under 150 years (Table 15). The data are extremely variable, with the largest land area value (mode), representing 17% of the total land area in the county, situated in the mean fire return interval of 101-125 years. These data indicate that the role of wildland fire is highly variable and operating on temporal scales exceeding most planning efforts.

The spatial distribution of these data is presented on Figure 27. An investigative study of these maps demonstrates the variability and distribution of this analysis component to understanding the role of wildland fire in this region.

Table 15. Mean Fire Return Intervals in Benewah County.

Mean Fire Return Interval		Acres	Percent of Total Area
11-15 Years		37	0.0%
16-20 Years		980	0.2%
21-25 Years		4,951	1.0%
26-30 Years		17,940	3.6%
31-35 Years		26,758	5.3%
36-40 Years		23,938	4.8%
41-45 Years		20,053	4.0%
46-50 Years		19,1423	3.8%
51-60 Years		42,123	8.4%
61-70 Years		43,136	8.6%
71-80 Years		45,046	9.0%
81-90 Years		49,394	9.8%
91-100 Years		43,111	8.6%
101-125 Years		87,030	17.3%
126-150 Years		36,614	7.3%
151-200 Years		21,058	4.2%
201-300 Years		5,057	1.0%
301-500 Years		1,125	0.2%
501-1000 Years		117	0.0%
>1000 Years		31	0.0%
Water		5,613	1.1%
Snow / Ice		0.2	0.0%
Barren		895	0.2%
Sparsely Vegetated		0.7	0.0%
Indeterminate Fire Regime Characteristics		8,803	1.8%
(LANDFIRE MFRI 2011)	**Total**	**502,953**	

Figure 27. Mean Fire Return Interval Map of Benewah County.

4.3.4.2. Fire Prone Landscapes

Schlosser (2012), updated a methodology he developed during the administration of wildfire mitigation projects for counties and reservations in the western US, to assess the location of fire prone landscapes on forested and non-forested ecosystems. This assessment technique has been completed for County and Tribal level fire mitigation plans and FEMA hazard mitigation plans, for Bureau of Indian Affairs and BLM Fire Management Plans and Environmental Assessments on over 60 project areas in Idaho, Montana, Nevada, Oregon, and Washington to determine fire prone landscape characteristics.

The goal of developing the Fire Prone Landscapes analysis is to make inferences about relative risk factors across large geographical regions (multiple counties) for wildfire spread. This analysis uses the extent and occurrence of past fires as an indicator of characteristics for a specific area and its propensity to burn in the future. Concisely, if a certain combination of vegetation cover type, canopy closure, aspect, slope, and position on the hillside, have burned with a high frequency in the past, then it is reasonable to extrapolate that they will have the same tendency in the future, unless mitigation activities are conducted to reduce this potential.

The basis of the analysis technique is to bring all of these factors together in a geospatial model (GIS layers) to determine the area of each combination of input variables that is available to burn, and then determine how much of this area actually burned in past fire events. For this analysis, the areas of Benewah County, Shoshone County, Latah County, and Kootenai County were considered in order to guarantee a robust sample area.

Past fire extents represent those locations on the landscape that have previously burned during a wildfire. Past fire extent maps were obtained from a variety of sources for the north Idaho area including the USFS Panhandle National Forest and the USFS Clearwater National Forest, IDL, and BLM.

This FPL analysis has been completed in Benewah County in 2004, 2005, 2010, and 2011; each analysis using new data to update the results. The most recent update completed in 2012 took advantage of newly released geospatial data and wildfire event data.

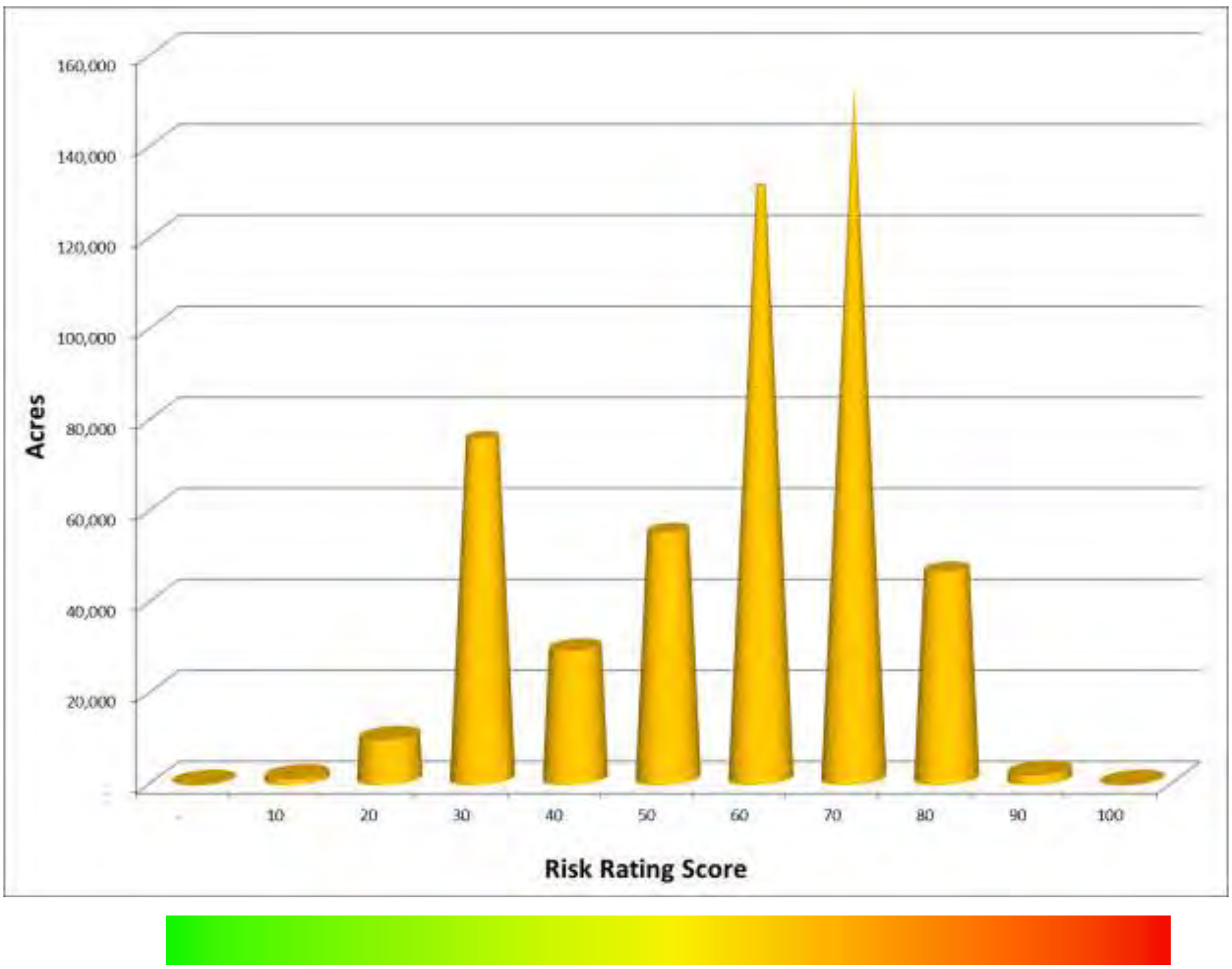
The maximum derived Fire Prone Landscapes rating score for Benewah County was 88, with a low of 6 (from a scale of 0 to 100 – low to high). Table 16 details the distribution of these categories while Figure 28 graphically displays these results. The highest proportion of Benewah County (88%) is ranked between scores of 31 and 80.

The Fire Prone Landscapes analysis is an appropriate tool for assessing the risk in the WUI to people, structures, and infrastructure. This analysis tool geographically shows where landscape components combine to create conditions where past fires have burned. It does not show predicted rate of spread or burn intensity, but it does show where resources are potentially at-risk to wildfire loss. Thus, Fire Prone Landscapes data are useful for community protection prioritization and WUI home defensibility precedence.

Table 16. Fire Prone Landscapes Analysis (2012) for Benewah County.

Risk Category	Acres	Percent
0	-	0%
1-10	1,228	0%
11-20	9,736	2%
21-30	75,311	15%
31-40	29,180	6%
41-50	54,919	11%
51-60	130,336	26%
61-70	151,999	30%
71-80	46,297	9%
81-90	2,075	0%
91-100	-	0%
Total	**490,807**	**501,081**

Figure 28. Fire Prone Landscapes assessment results in Benewah County.



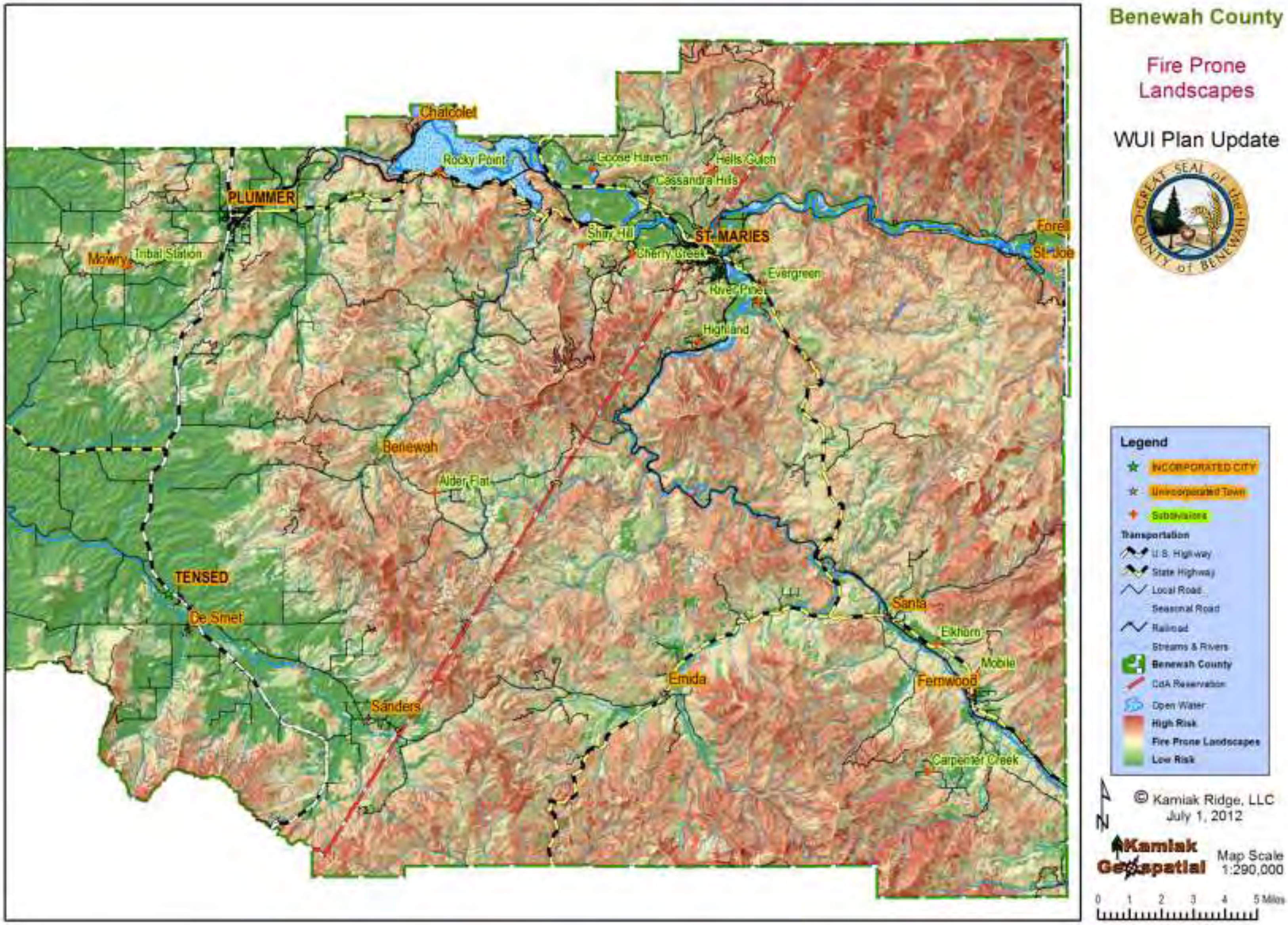
The risk values developed in this analysis should be considered **ordinal data**, that is, while the values presented have a meaningful ranking, they do not have consistent scale between numbers. Rating in the “40” range is not necessarily twice as “risky” as rating in the “20” range. These category values also do not correspond to a rate of fire spread, a fuel loading indicator, or measurable potential fire intensity. Each of those scales is greatly influenced by weather, seasonal and daily variations in moisture (relative humidity), solar radiation, and other factors. The risk rating presented here serves to identify where certain constant variables are present, aiding in identifying where fires typically spread into the largest fires across the landscape.

A risk rating score of zero represents no relative risk and a score of one hundred is considered extreme risk. In practice, very few areas of the highest risk category (100) are found. This rating scale should be considered as nominal data producing values which can be ordered sequentially, but the actual values are not multiplicative. The scale provides relative comparisons between sites.

In order to put these numbers in terms of probability of occurrence, the Fire Prone Landscapes rating score can be modified to represent a probability of a wildfire event occurring during a given period of time. The lower the Fire Prone Landscapes rating score, the lower the probability of witnessing a wildfire event in that area. Directly, the Fire Prone Landscapes rating score can be converted to a probability by stating the relative score as a probability of occurrence within a 50-year period. Using the conversion defined by the Extreme Value Theory (Castillo 1988), the 50-year wildfire probability event would be stated as the Fire Prone Landscapes rating score converted to a percent. Thus, a Fire Prone Landscapes rating score of 25 would represent a 25% probability of witnessing a 50-year wildfire event. This conversion is intended for illustrative purposes only and the actual probability of occurrence may differ from these estimates.

Further extrapolation of these data can be made in order to better understand the probability of future wildfire events in Benewah County. If the site is left undisturbed and unmitigated, the risk of future wildfire events for each area evaluated can be estimated by the risk rating score expressed as a percent (rating score of 15, expressed as 15%). This modified score can then be treated as an expression of the likelihood of that area experiencing a wildfire event within the next 50-year period. Of course, mitigation measures can be expected to decrease the likelihood of large-scale wildfire events. This expression of potential probability of occurrence is based on anecdotal information and should be used for general reference only.

Figure 29. Fire Prone Landscapes (2012).



4.3.4.3. Historic Fire Regime

The USFS, Northern Fire Plan Cohesive Strategy Team, in Kalispell, Montana, completed an analysis of Historic Fire Regime (HFR) in 2002 and revised it again in 2005 for distribution to land managers and analysts. This report uses those data and GIS layers to represent HFR (NFPCST 2005). These data were used in the 2005 Benewah County All Hazards Mitigation Plan, approved by FEMA and adopted by the County and municipalities. Since that time, the LANDFIRE (2012) project has revised this analysis substantially to include new and insightful data analysis techniques. These updated data (LANDFIRE HFRG 2012) are used for the analysis of the Historic Fire Regime in Benewah County for this analysis effort.

In the fire-adapted ecosystems of Idaho, fire is undoubtedly the dominant process in terrestrial systems that constrains vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand HFR (that is, fire frequency and fire severity prior to settlement by Euro-Americans) to be able to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historic fire regimes vary across the landscape.

Many ecological assessments are enhanced by the characterization of the historical range of variability which helps managers understand: (1) how the driving ecosystem processes vary from site to site; (2) how these processes affected ecosystems in the past; and (3) how these processes might affect the ecosystems of today and the future. Obviously, HFR is a critical component for characterizing the historical range of variability in the fire-adapted ecosystems of Idaho. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

The Simulated Historical Fire Regime Groups data layer categorizes simulated mean fire return intervals and fire severities into five fire regimes defined in the Interagency Fire Regime Condition Class Guidebook (Hann, et al. 2004). The classes are defined as:

- Fire Regime I: 0 to 35 year frequency, low to mixed severity
- Fire Regime II: 0 to 35 year frequency, replacement severity
- Fire Regime III: 35 to 200 year frequency, low to mixed severity
- Fire Regime IV: 35 to 200 year frequency, replacement severity
- Fire Regime V: 200+ year frequency, any severity

This data layer is derived from vegetation and disturbance dynamics simulations using LANDSUM (Keane, Parsons and Hessburg 2002, Keane, Holsinger and Pratt 2006, Pratt, Holsinger and Keane 2006). LANDSUM simulates fire dynamics as a function of vegetation dynamics, topography, and spatial context in addition to variability introduced by dynamic wind direction and speed, frequency of extremely dry years, and landscape-level fire size characteristics. This layer is intended to describe one component of simulated HFR characteristics in the context of the broader historical time period represented by the LANDFIRE Biophysical Settings layer and LANDFIRE Biophysical Settings Model Documentation.

Fire is the dominant disturbance process that manipulates vegetation patterns in Idaho. The HFR data were prepared to supplement other data necessary to assess integrated risks and opportunities at regional and subregional scales. The HFR theme was derived specifically to estimate an index of the relative change of a disturbance process, and the subsequent patterns of vegetation composition and structure.

A historical (natural) fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee, Fire ecology of the Pacific Northwest Forests 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed (Hardy, et al. 2001, Schmidt, et al. 2002) and interpreted for fire and fuels management (Hann and Bunnell 2001).

As the scale of application becomes finer these five classes may be defined with more detail, or any one class may be split into finer classes, but the hierarchy to the coarse scale definitions should be retained.

General Limitations

These data were derived using fire history information from a variety of different sources. These data were designed to characterize broad scale patterns of HFR for use in regional and subregional assessments. Any decisions based on these data should be supported with field verification, especially at scales finer than 1:100,000. Although the resolution of the HFR theme is a 30 meter cell size, the expected accuracy does not warrant their use for analyses of areas smaller than about 10,000 acres (for example, assessments that typically require 1:24,000 data).

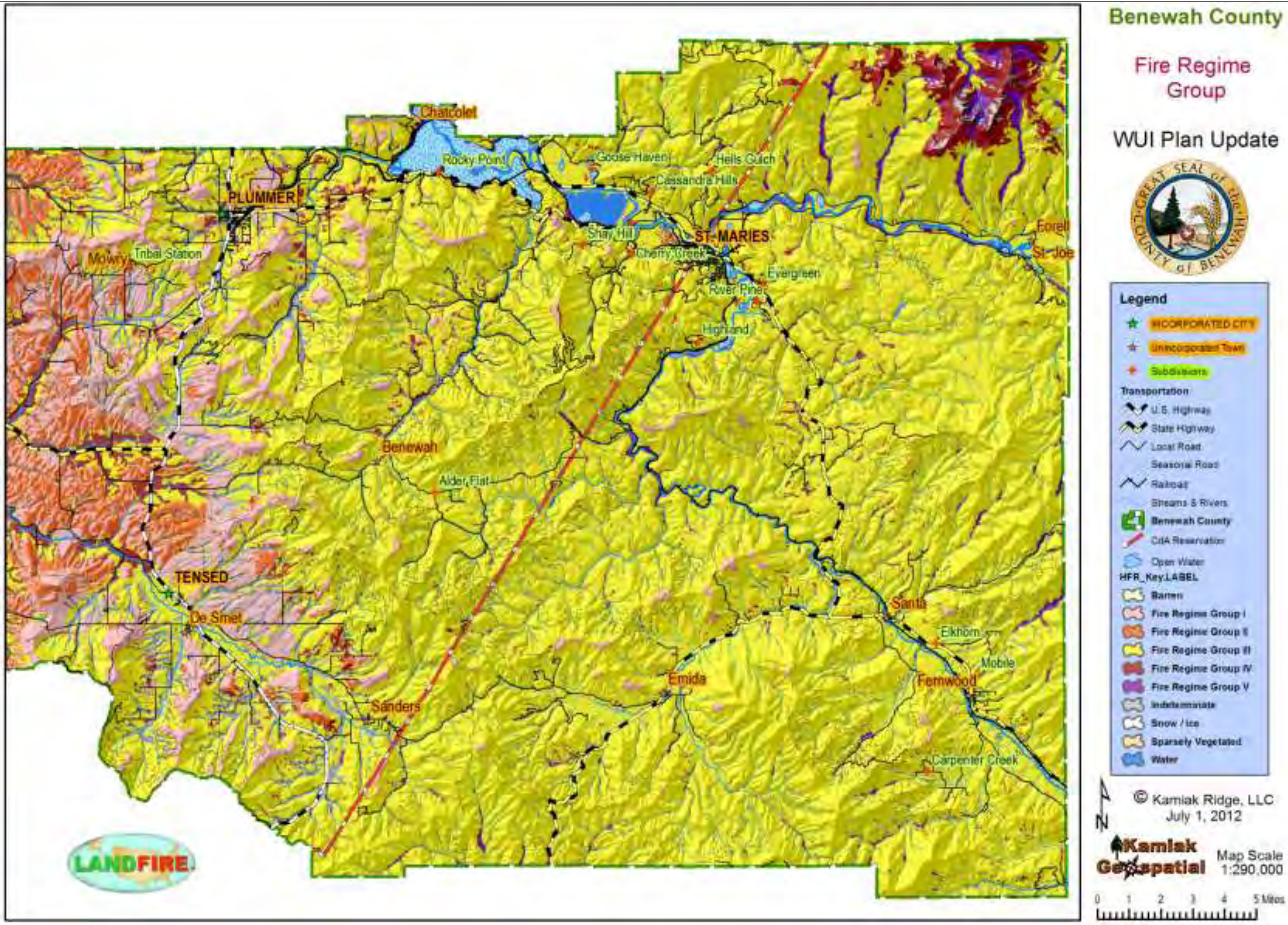
HFR identified in Benewah County are presented in Table 17 and these data labels should be considered nominal data (they are not measurements).

Table 17. Historic Fire Regime Group Analysis or Benewah County.

Fire Regime	Description	Acres	Percent
Fire Regime Group I	<= 35 Year Fire Return Interval, Low and Mixed Severity	33,516	7%
Fire Regime Group II	<= 35 Year Fire Return Interval, Replacement Severity	17,846	4%
Fire Regime Group III	35 - 200 Year Fire Return Interval, Low and Mixed Severity	401,341	82%
Fire Regime Group IV	35 - 200 Year Fire Return Interval, Replacement Severity	22,172	5%
Fire Regime Group V	> 200 Year Fire Return Interval, Any Severity	5,212	1%
Water	Water	4,797	1%
Snow / Ice	Snow / Ice	87	0%
Barren	Barren	277	0%
Sparsely Vegetated	Sparsely Vegetated	140	0%
Indeterminate Fire Regime Characteristics	Indeterminate Fire Regime Characteristics	3,867	1%
(LANDFIRE HFRG 2012)	**Total**	**489,254**	

The most commonly represented HFR in Benewah County (82% of land area, 401,341 acres) is Regime III, which is characterized by 35 to 200 year fire return intervals and low or mixed severity fires (Table 17). The next most represented historic fire regime is Regime I, characterized by low or mixed severity fires of a short interval occurring as frequently as once every 35 years (Table 17). Maps of these areas are prepared and included in separate mapping documents to accompany this planning document.

Figure 30. Fire Regime Groups in Benewah County.



4.3.4.4. Fire Regime Condition Class

The USFS Northern Fire Plan Cohesive Strategy Team, in Kalispell, Montana, completed an analysis of Fire Regime Condition Class in 2002 and revised it again in 2005 for distribution to land managers and analysts (NFPCST 2005). These data were used in the 2005 Benewah County All Hazards Mitigation Plan, that was approved by FEMA, and adopted by the County and municipalities. Since that time (LANDFIRE 2012) project has revised this analysis substantially to include new and insightful data analysis techniques. These data are used for the analysis of Fire Regime Condition Class (FRCC) in Benewah County for this analysis effort.

A FRCC is a classification of the amount of current departure from the natural fire regime (Hann and Bunnell 2001). Coarse-scale FRCC classes have been defined and mapped (Hardy, et al. 2001, Schmidt, et al. 2002). They include three condition classes for each fire regime. The classification is based on a relative measure describing the degree of departure from the historical natural fire regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g. insect and disease mortality, grazing, and drought). All wildland vegetation and fuel conditions or wildland fire situations fit within one of the three classes.

The three classes (nominal data) are based on low (FRCC 1), moderate (FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) fire regime (Hann and Bunnell 2001, Hardy, et al. 2001, Schmidt, et al. 2002). The central tendency is a composite estimate of vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated natural disturbances. Low departure is considered to be within the natural (historical) range of variability, while moderate and high departures are outside this range (Table 18).

Characteristic vegetation and fuel conditions are considered to be those that occurred within the natural (historical) fire regime. Uncharacteristic conditions are considered to be those that did not occur within the natural (historical) fire regime, such as invasive species (e.g. weeds, insects, and diseases), “high graded” forest composition and structure (e.g. large trees removed in a frequent surface fire regime), or repeated annual grazing that maintains grassy fuels across relatively large areas at levels that will not carry a surface fire. Determination of the amount of departure is based on comparison of a composite measure of fire regime attributes (vegetation characteristics; fuel composition; fire frequency, severity and pattern) to the central tendency of the natural (historical) fire regime. The amount of departure is then classified to determine the FRCC. A simplified description of the FRCC and associated potential risks are presented in Table 18. FRCC in Benewah County is presented on Figure 31.

Table 18. Fire Regime Condition Class Definitions.

Fire Regime Condition Class	Description	Potential Risks
FRCC I	Sites are determined to be within the natural (historical) range of variability of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are similar to those that occurred prior to fire exclusion (suppression) and other types of management that do not mimic the natural fire regime and associated vegetation and fuel characteristics. Composition and structure of vegetation and fuels are similar to the natural (historical) regime. Risk of loss of key ecosystem components (e.g. native species, large trees, and soil) is low.
FRCC II	Moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are moderately departed (more or less severe). Composition and structure of vegetation and fuel are moderately altered. Uncharacteristic conditions range from low to moderate. Risk of loss of key ecosystem components is moderate.
FRCC III	High departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances.	Fire behavior, effects, and other associated disturbances are highly departed (more or less severe). Composition and structure of vegetation and fuel are highly altered. Uncharacteristic conditions range from moderate to high. Risk of loss of key ecosystem components is high.

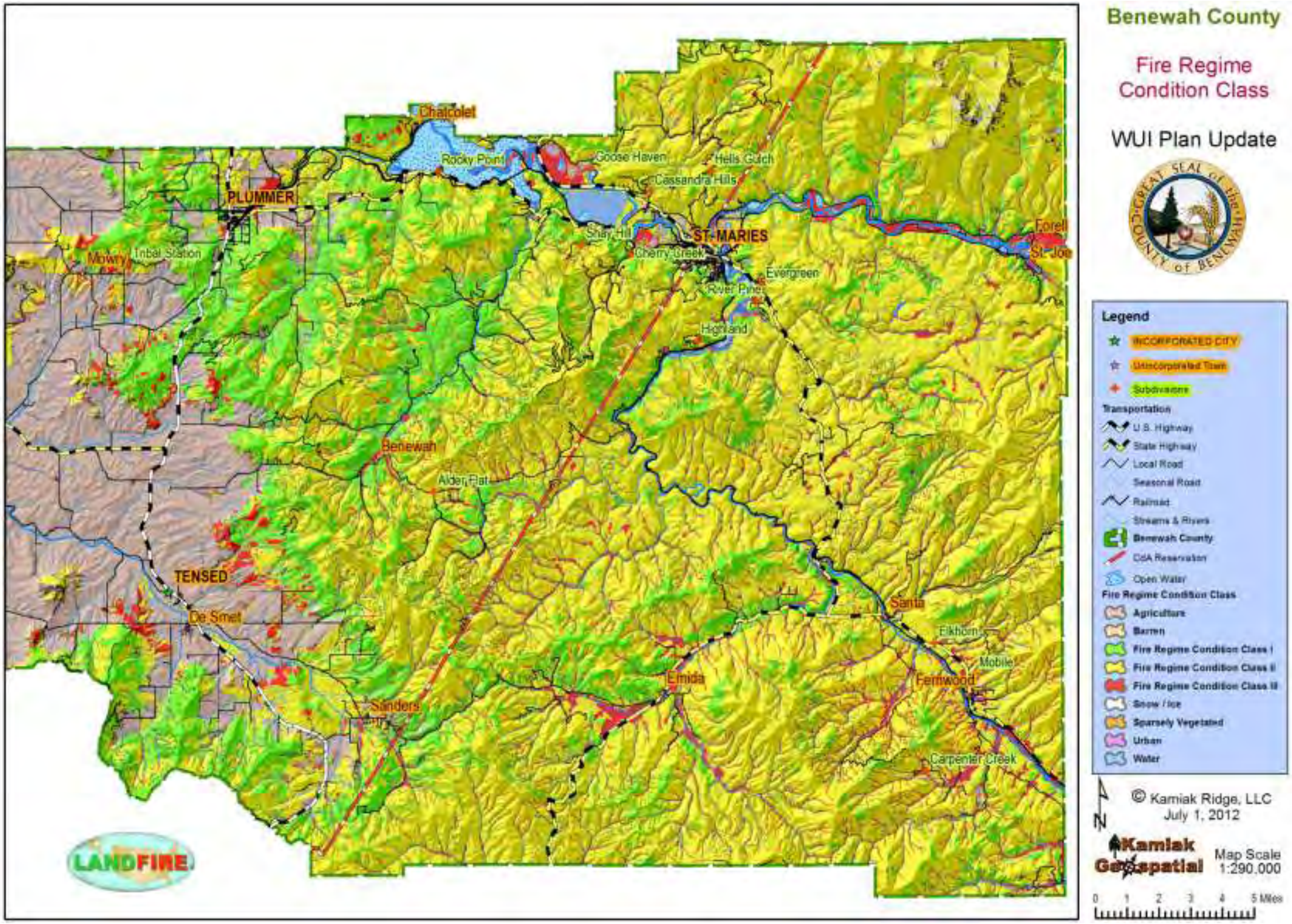
An analysis of FRCC in Benewah County shows that approximately 17% of the County is in FRCC I (low departure from historical), just about 63% is in FRCC II (moderate departure), with 8% of the area in FRCC III (Table 19).

Table 19. FRCC by Area in Benewah County.

Fire Regime Condition Class		Acres	Percent of Area
Fire Regime Condition Class I	Low Vegetation Departure	81,253	17%
Fire Regime Condition Class II	Moderate Vegetation Departure	301,236	63%
Fire Regime Condition Class III	High Vegetation Departure	36,411	8%
Water		5,613	4,820
Snow / Ice		0	106
Urban		6,102	1,371
Barren		895	266
Sparsely Vegetated		1	100
Agriculture		59,852	52,950

These data represent a substantial adjustment to the USFS Northern Fire Plan Cohesive Strategy Team (Kalispell, Montana) analysis of Fire Regime Condition Class in 2002 (NFPCST 2005), and a moderate update from the layers released in 2009 and used in the last Benewah County Multi-Jurisdictional Hazards Mitigation Plan (Schlosser 2010). The LANDFIRE (LANDFIRE 2012) data used in this analysis provide a substantially improved analysis basis and updated input data, leading to a better assessment of derivative data for both HFR and FRCC.

Figure 31. Fire Regime Condition Class in Benewah County.



4.3.4.5. Application of Assessment Tools Presented

The introduction of this section included a statement that each wildfire analysis tool has an appropriate application for illuminating different wildfire management questions. Mean Fire Return Interval, HFR, and FRCC were developed by the federal land management agencies (LANDFIRE 2012) in order to quantify vegetation characteristic departures from historical conditions. These become extremely valuable tools in ecosystem restoration efforts when attempting to return the natural cycle of vegetation, fire, wildlife, soil and water processes, and other ecosystem management questions. Neither Historic Fire Regime or Current Condition Class can be taken independently from the other; they are an integrated set of analysis tools.

The Fire Prone Landscapes assessment tool was developed specifically to address WUI wildfire risk challenges. This tool is not intended to illuminate the departure from historical conditions. This tool sheds a light on fire risk based on topographic and vegetative conditions. Where areas possess a high risk rating and those high risk ratings are continuous over large areas (seen as a large "splash of red" on the map in Figure 29) surrounding or adjacent to homes and infrastructure, a wildfire risk is interpreted.

An evaluation of this information reveals that many of the non-assessed improvements on property in Benewah County are located on a mix of wildfire risk exposures, from the lowest risk categories to the higher risk categories. This situation justifies increased attention to the placement of public structures within the WUI and justifies mitigation treatments such as defensible space and other practices.

4.3.1. Potential Site Damage by Wildfire

4.3.1.1. Soil Data Viewer

The USDA Natural Resources Conservation Service (NRCS) maintains the soil survey (NRCS Soil Survey Staff 1999) of the lands within the US and provides them to users in a GIS format with tabular data (Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture 2012). The NRCS developed and released an electronic utility called the Soil Data Viewer (SDV) (NRCS 2011). The SDV is a tool built as an extension to ArcMap that allows a user to create soil-based thematic maps. The application can also be run independent of ArcMap, but output is then limited to a tabular report.

The soil survey attribute database associated with the spatial soil map is a complicated database with more than 50 tables. The SDV provides users access to soil interpretations and soil properties while shielding them from the complexity of the soil database. Each soil map unit, typically a set of polygons, may contain multiple soil components that have different use and management. The SDV makes a streamlined procedure to compute a single value for a map unit and display results, relieving the user from the burden of querying the database, processing the data and linking to the spatial map.

The SDV contains processing rules to enforce appropriate use of the data. This provides the user with a tool for quick geospatial analysis of soil data for use in resource assessment and management.

The analysis results presented below were generated using the SDV version 6.0 in ArcGIS version 10.0 and a Windows 7 operating system.

4.3.1.2. Risk Ratings

The potential for site damage to soils from wildfire damage were rated within the SDV application applied to two related soil surveys in Benewah County: ID607 and ID608. The former survey, ID607, was released on January 31, 2008, and includes those areas of Benewah County within the Coeur d'Alene Reservation (west side of the county). The later soil survey, ID608, was also released on January 31, 2008, includes areas on the eastern side of Benewah County and portions of Shoshone County. The surveys were combined within Benewah County and reduced to include only areas within the county.

Using the SDV, determinations were made to determine the Potential Damage to Soils from Wildland Fire. The details of these findings are conveyed from the NRSC SDV program.

The ratings in this interpretation indicate the potential for damage to nutrient, physical, and biotic soil characteristics by fire. The ratings involve an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

The ratings are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope.

The ratings are both nominal and numerical. The soils are described as having a "low," "moderate," or "high" potential for this kind of damage. "Low" indicates that fire damage is unlikely. Good performance can be expected, and little or no maintenance is needed. "Moderate" indicates that fire damage can occur because one or more soil properties are less than desirable. Fair performance can be expected, and some maintenance is needed. "High" indicates that fire damage can occur because of one or more soil properties and that overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration.

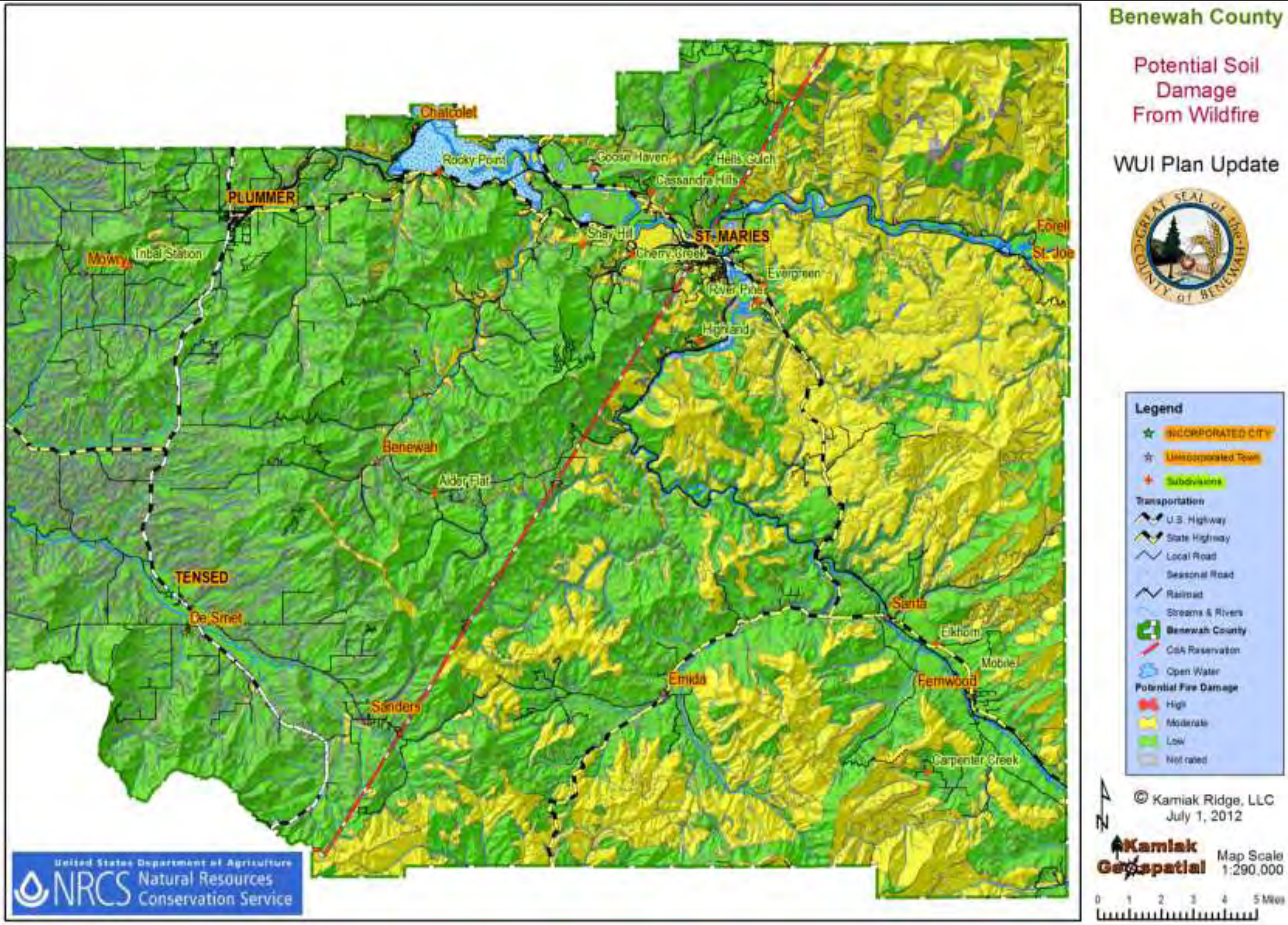
The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

Within Benewah County these analyses of potential soil damage by wildfire has been applied to reveal that risks to soil damage from "hot fires" is rated as low on 336,526 acres of the county (Figure 32). Moderate risks are observed on approximately 158,761 acres, and only 38 acres show the characteristics of High risk. An observation of the mapped units of this soil characteristic (Figure 32), shows that overall the west side of the County, within the Coeur d'Alene Reservation, is dominated by Low risk sites while the east side shows more Moderate risk sites.

These differences may indicate a variable soil development characteristic between these two areas, but it may also reveal the alteration resulting from two different NRCS soil survey teams completing these analyses at different times. Specific site assessments should always accompany the application of these data to validate these interpretations and to confirm the identity of the soil on a given site.

Figure 32. Potential Soil Damage from Wildfire Events.



4.3.2. Fire Protection in Benewah County

Within Benewah County the Coeur d'Alene Tribe and the Idaho Department of Lands provide wildfire protections across all lands (Figure 33).Five structure fire Departments provide fire protection to homes and wildlands in Benewah County (Figure 34).

4.3.3. Resources at Risk

4.3.3.1. Private Property Improvement Values at Risk to Wildfire Loss

In Section 2 of this document (Table 2), a summary of community populated places and structure values were presented. That table combines the values assessed by the Benewah County Assessor's office and the insured values presented by agencies and organizations that are not liable for a property tax by the county. This section of the document combines the structure improvements with the Fire Prone Landscapes assessment to determine relative risk from wildfires.

The parcel layer in GIS was combined with the Fire Prone Landscapes assessment scores to evaluate the exposure of structures to wildfire risks based on location. The assessed value given by the Benewah County Assessor was combined with insured values provided by cooperators for identified areas to determine structure values. This follows the same approach used in the Benewah County Multi-Jurisdictional Hazards Mitigation Plan (Schlosser 2010), and the Coeur d'Alene Tribal Hazards Mitigation Plan (Schlosser 2011).

The resulting tabular summary (Table 20) provides insights to where risks are elevated (Fire Prone Landscapes) and improvements are concentrated (assessed improvement values and insured public structures). For the purposes of this report, it is assumed that the improvement value of a parcel with a structure is completely attributed to the structure or structures on that parcel.

Within Table 20, several descriptive risk ratings are provided under the heading of "Fire Prone Landscape Risk Rating (0-100)". Those labels are defined as:

- MIN: minimum FPL score within the community area.
- MAX: maximum FPL score within the community area.
- MEAN: mathematical average for all values within the community area.
- MAJORITY: the single most represented FPL value within the community area.
- MINORITY: the single least represented FPL value within the community area.
- MEDIAN: the numerical value separating the higher half of the FPL values in the community area from the lower half.

These FPL risk ratings, the WUI condition, number of structures, and the value of those structures, can become a key attribute of developing Benefit/Cost Ratios for Benewah County WUI Wildfire Mitigation Projects.

An in-depth review of the data presented in Table 20 reveals that the FPL risk distributions are arranged in an interesting ranking from low to high in association with the WUI status:

- Interface, average FPL score of 21
- Intermix, average FPL score of 43
- Rural 95%, average FPL score of 47
- Rural 100%, average FPL score of 60

Overall the average FPL score across the county is 55, but the specific risk rating scores for each community will provide the reader with accurate, and preferable ratings.

Table 20. Structure Values sorted by WUI Area, value, structure count, and Fire Prone Landscapes Risk Category.

	Fire Prone Landscapes Risk Rating (0-100)								Private and Public	
WUI COMMUNITY AREA	MIN	MAX	MEAN	MAJORITY	MINORITY	MEDIAN	WUI Class	Number of Structures	Structure Values	Acres
Alder Creek Intermix	15	71	48	59	28	47	Intermix	57	$ 1,127,520	517
Alder Creek Rural	15	81	55	58	22	58	Rural 95%	130	$ 2,797,000	7,802
Bear Springs	15	66	49	59	42	55	Intermix	12	$ 417,650	86
Blackwell Divide	6	75	56	61	20	59	Rural 95%	136	$ 5,120,810	6,790
Carpenter Creek	15	77	49	59	72	55	Intermix	80	$ 1,228,110	667
Central	6	81	57	68	22	59	Wildland	0	$ -	10,336
Central Benewah Valley	52	70	60	52	61	56	Wildland	0	$ -	1
Chatcolet	16	75	42	16	21	49	Intermix	59	$ 2,750,000	383
Cherry Hill	24	69	57	59	31	59	Intermix	23	$ 753,390	128
Chief MOC-TEL-ME*	15	76	43	29	27	45	Rural 95%	12	$ 81,450	790
County Wide Low Density Rural Expanse*	6	88	57	60	17	60	Rural 100%	63	$ 612,970	221,109
Eastern Central	15	88	60	57	27	61	Wildland	0	$ -	19,693
Emida	6	74	44	40	67	45	Intermix	96	$ 2,189,327	867
Fernwood	6	71	47	61	22	51	Intermix	445	$ 12,299,957	3,352
Forever Green	24	63	50	41	30	51	Intermix	74	$ 4,393,530	818
Garnet*	25	66	44	47	33	47	Intermix	8	$ 1,065,050	42
Lovell Valley*	15	40	26	25	40	25	Rural 95%	5	$ -	89
North Central Rural Expansion*	6	86	49	29	17	54	Rural 95%	1598	$ 47,515,448	88,838
North Eastern	6	88	69	68	15	70	Wildland	0	$ -	15,225
Palouse Divide	31	81	64	62	43	63	Rural 95%	8	$ 627,446	399
Parkline*	15	74	54	63	22	58	Intermix	73	$ 3,055,000	565
Plummer Interface*	6	51	17	16	36	16	Interface	172	$ 31,408,492	121
Plummer Intermix*	6	80	38	29	74	31	Intermix	664	$ 32,065,084	3,777
Rock Creek Valley*	15	51	25	25	35	25	Rural 95%	7	$ 151,560	549
Rocky Point*	6	69	31	16	32	16	Intermix	62	$ 4,500,000	426
Santa Rural	15	81	59	60	81	60	Rural 95%	45	$ 919,040	-

Table 20. Structure Values sorted by WUI Area, value, structure count, and Fire Prone Landscapes Risk Category.

WUI COMMUNITY AREA	Fire Prone Landscapes Risk Rating (0-100)						WUI Class	Number of Structures	Private and Public Structure Values	Acres
	MIN	MAX	MEAN	MAJORITY	MINORITY	MEDIAN				
Sanders	15	66	34	25	21	29	Intermix	26	$ 1,279,475	266
Santa	6	71	47	55	71	51	Intermix	189	$ 5,830,982	1,899
Santa Creek	15	78	53	45	78	55	Intermix	85	$ 1,762,760	728
Skyline Divide*	15	73	58	60	69	60	Rural 95%	3	$ 35,410	177
South Central	23	81	64	62	23	63	Wildland	0	$ -	2,234
South Eastern	15	88	67	70	26	67	Wildland	0	$ -	9,151
South Eastern Rural Expansion	6	81	55	55	14	58	Rural 95%	464	$ 12,037,834	30,298
South Western	15	81	61	60	78	62	Wildland	0	$ -	4,896
Southwestern Rural Zone*	15	81	36	29	78	29	Rural 95%	760	$ 13,855,825	45,944
St. Joe	6	77	40	25	21	38	Intermix	95	$ 1,383,625	917
St. Joe Riverside	6	75	35	25	49	34	Intermix	37	$ 174,140	190
St. Maries Interface*	6	81	31	20	81	25	Interface	1371	$ 116,630,221	1,144
St. Maries Intermix*	6	81	43	25	12	42	Intermix	1474	$ 91,978,614	11,928
Tensed & Desmet*	15	61	26	25	61	25	Intermix	227	$ 14,385,611	1,835
Western Liberty Butte*	25	44	28	29	44	29	Rural 95%	3	$ 47,450	131
Willard*	15	29	23	25	29	25	Intermix	17	$ 510,350	20
Windfall / Lolo Pass*	15	81	43	29	76	45	Rural 95%	58	$ 1,657,040	4,299

* Community Areas that include property within the Coeur d'Alene Reservation may include parcels and property not assessed by the Benewah County Assessor, such as Tribal Trust or Indian Allotments.

Figure 33. Wildland Fire Protection Districts.

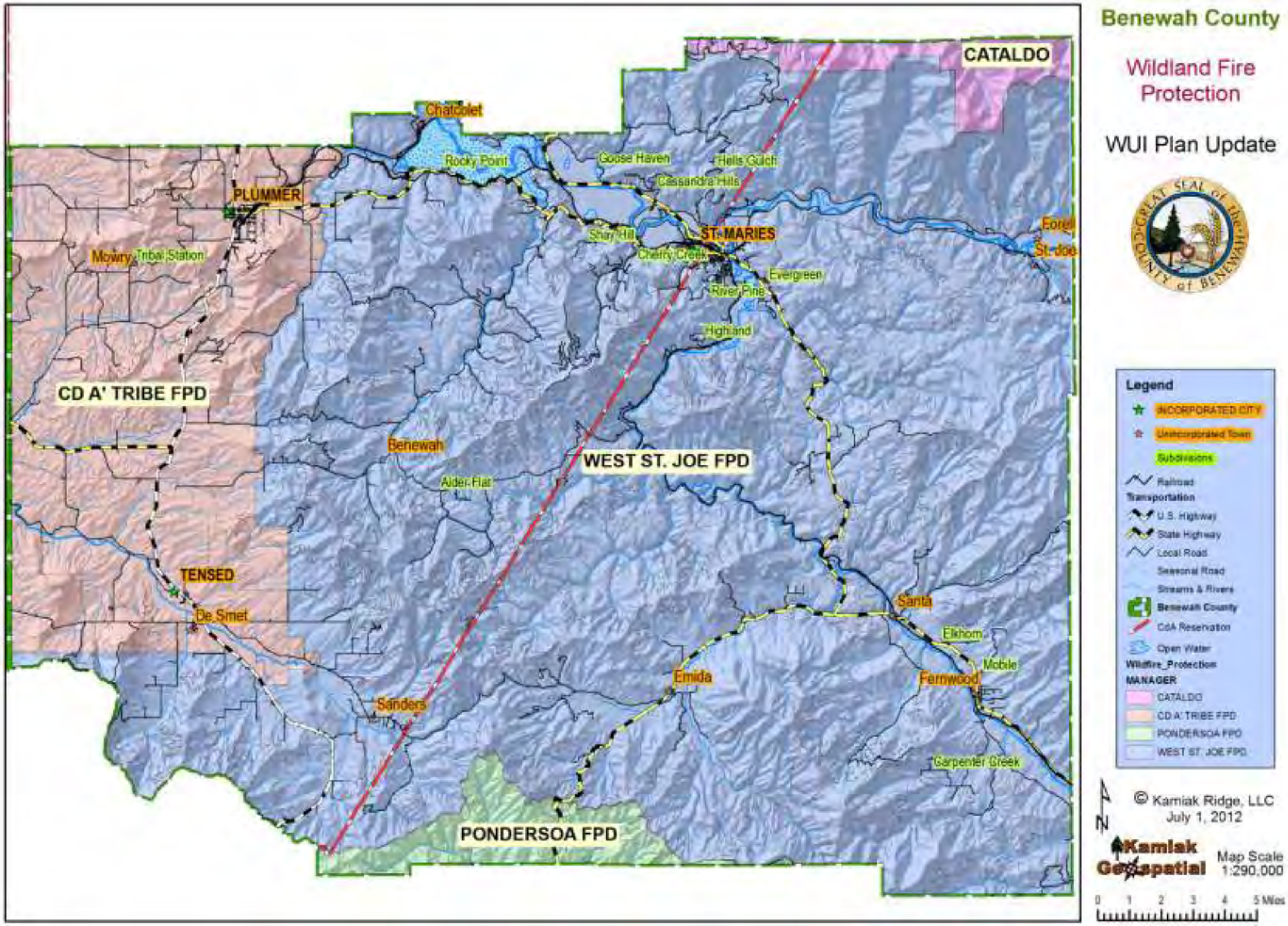
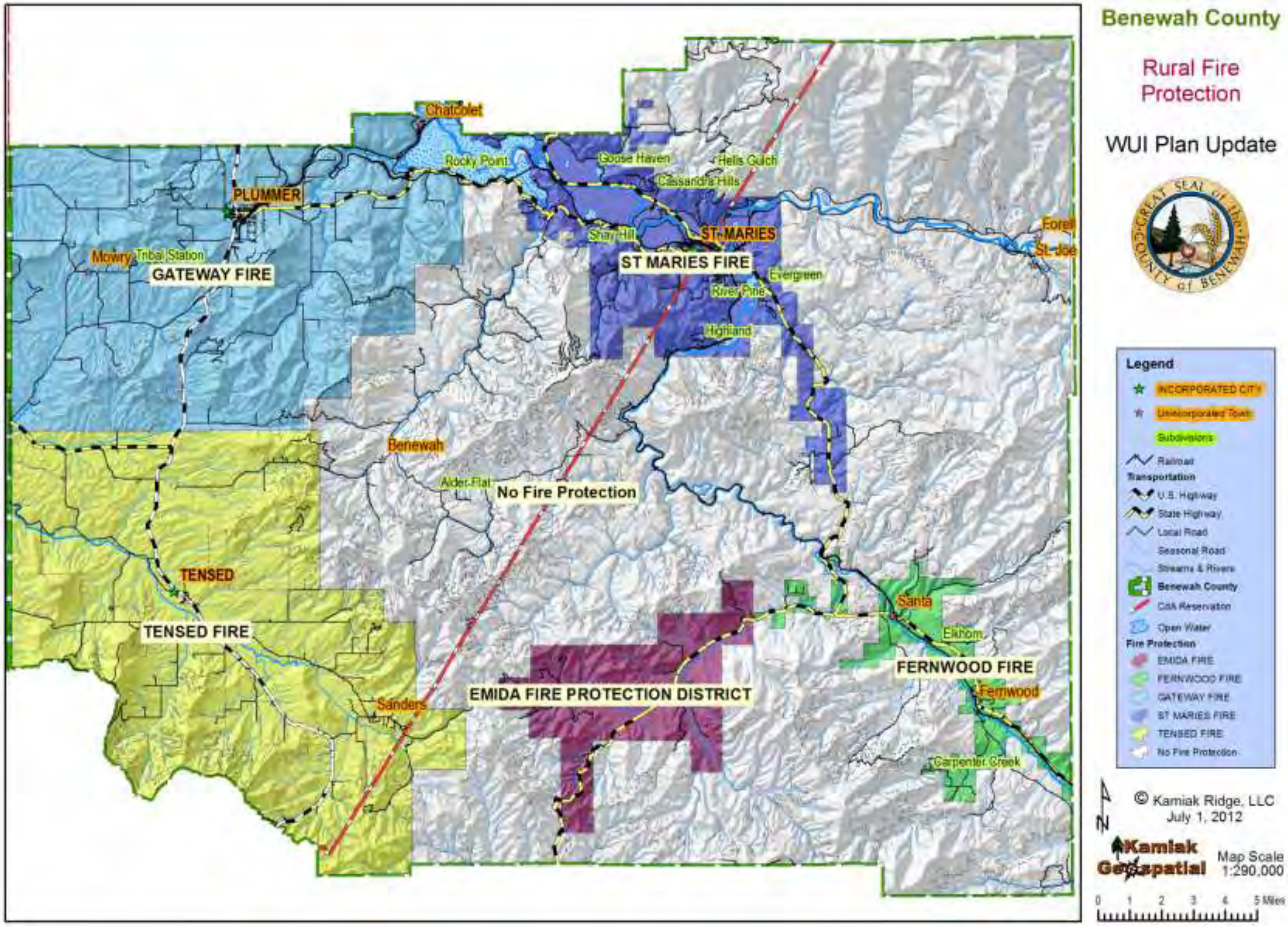


Figure 34. Benewah County Rural Structure Fire Protection Departments.



This is typical of communities built within the WUI where aesthetic tendencies are favored over utilitarian preferences. Fortunately, these sites generally respond well to wildfire mitigation efforts concentrated around homes and infrastructure. Notable exceptions to this location tendency are observed, especially in the rural areas that have become popular home sites during the past many decades, such as Alder Creek, Emida, Flat Creek, Santa, St. Joe, Benewah, and Fernwood, and other remote and rural areas. In these areas, more improvement values are located in higher risk categories at 45 and more.

Although this tendency is positive and informative, the analyst must recognize the need to give special attention to properties with home sites at-risk to wildfire losses. A reasonable approach would be to start by prioritizing those community areas that 1) show high risk exposure, 2) possess high values at-risk to wildfire loss, and 3) represent areas where mitigation measures are likely to result in favorable results, as a place to emphasize wildfire mitigation activities such as home defensibility activities (e.g., fuel mitigation).

4.3.4. Benewah County Potential Mitigation Activities

For many decades in the 20th century the policy of the USFS and other agencies was to suppress all wildfires. This policy was epitomized by the mascot Smokey Bear and was also the basis of parts of the Disney produced Bambi movie. The previous policy of absolute fire suppression in the United States has resulted in the higher than historical buildup of fuel in some ecosystems such as dry ponderosa pine forests. In acute cases, forest species composition has transitioned from a fire tolerant species mix of ponderosa pine, lodgepole pine, Douglas-fir, and western larch, to a mixture of these species plus a substantial component of grand fir. When fire is suppressed long enough, grand fir forests can dominate these sites. Grand fir has a significantly different fire response profile than the species it replaces and also provides substantially altered ecosystem mechanisms for wildlife, watersheds, fisheries, and biodiversity. This example provides only a small insight to the forest ecosystem changes across north Idaho brought about by 20th century fire management policies.

In addition to the loss of human life from direct firefighting activities, homes designed without consideration of the fire prone environment in which they are built have been a significant reason for the catastrophic losses of property and life experienced in wildfires.

The risk of major wildfires can be reduced partly by a reduction or alteration of fuels present. In wildland areas, reduction can be accomplished by various methods: first, conducting controlled burns (prescribed burning); second, the alteration of fuel mechanics, which involves reducing the structure of fuel ladders. Fuel alteration can be accomplished by hand crews with chain saws or by large mastication equipment that shreds trees and vegetation to a mulch. Another method is changing the vegetative component by replacing vegetation with less fire-susceptible species. Such techniques are effective within the WUI.

People living in fire prone areas can take a variety of precautions, including building their homes out of flame-resistant materials, reducing the amount of combustible fuel near the home or property (including firebreaks, effectively their own miniature control lines), and investing in their own firefighting tools (hand tools, water tanks, pumps, and fire-hose). Rural farming communities are also often threatened directly by wildfire. Expanding urban fringes have spread into forested areas, and communities have literally built themselves in the middle of highly flammable forests.

A major emphasis in previous wildfire mitigation planning in Benewah County has been the creation of defensible spaces around homes and neighborhoods to increase the success potential of fire fighters in the case of wildfire emergency. This reduction of the “resistance to control” focused primarily on removing vegetation immediately adjacent to homes, improving ingress and egress, and replacing flammable structure materials with fire-resistant materials (e.g., decks and roofing). In addition, past planning efforts have identified several opportunities to bolster the response ability of the fire districts in the county to effectively respond with appropriate equipment, staff, and volunteers to save homes and people from wildfire threat.

Since the planning recommendations have been put in place, implementation has been targeted and effective. Homes have been “protected” and activities such as rural home addressing have been implemented. A complete analysis of which measures were implemented and which were not, is presented in a subsequent section of this plan.

4.3.5. Protection

A key component in meeting the underlying wildfire control need is the protection and treatment of fire hazard in the WUI. These WUI areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to a risk to urban developments. Reducing the fire hazard in the WUI requires the efforts of federal, state, and local agencies and private individuals. Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures. With treatment, a WUI area can provide firefighters a defensible area from which to suppress wildland fires or defend communities. In addition, a WUI that is properly thinned will be less likely to sustain a crown fire that enters or originates within it.

Tools are available to emergency service responders and managers to assess wildfire fuels, structural risks, and infrastructure components. Computer programs such as RedZone® Software are written to assist fire departments and emergency services efforts to assess individual structures, communities, and regions to understand relative risk components of wildfire exposure and delineate these components of risk in a GIS map. RedZone Software’s suite of products provides agencies a comprehensive solution to data collection, visualization, and map production (Red Zone Software 2009). Benewah County began using this software in 2009 to better map and mitigate relative wildfire risks in the WUI.

By reducing hazardous fuel loads, ladder fuels, and tree densities, creating new defensible space, and reinforcing existing defensible space, landowners would protect the WUI, the biological resources of the management area, and adjacent property owners by:

- Minimizing the potential of high-severity surface, ladder, and crown fires entering or leaving the area around homes.
- Reducing the potential for firebrands (embers carried by the wind in front of the wildfire) impacting the WUI. Research indicates that flying sparks and embers (firebrands) from a crown fire can ignite additional wildfires as far as 1¼ miles away during periods of extreme fire weather and fire behavior.
- Improving defensible space in the immediate areas for suppression efforts in the event of wildland fire.

Chapter 5. Community Assessments

Several of the populated places named in this document have been given assessments to determine the specific risks and associated potential mitigation measures for those areas. In most communities a summary of recent WUI wildfire mitigation projects and proposed new mitigation measures is provided.

5.1. Benewah and Alder Creek

5.1.1. Community Assessment

The primary risk to structures from wildfire in the Benewah and Alder Creek communities (Figure 35) is the large spread of structures that are scattered throughout the many forested draws and mountain sides of the Benewah Valley. There are also many homes located throughout the valley bottom that are better protected from forestland wildfires due to the agricultural lands and valley grasses surrounding the structures (Figure 36). Many of those located within the forestlands have reasonable defensible space, properly posted street signs and well maintained driveways for access; the geographic spread of structures is the greatest concern for wildfire protection.

Figure 35. Benewah Valley Community Center.

Figure 36. Agricultural land surrounding residences in Benewah Valley.

Timber harvesting and thinning projects have been completed in the area since 2002 by the Coeur d'Alene Tribe, mostly located on the South and West facing slopes. Some work has been done since the 2005 Benewah County WUI Mitigation Plan and 2011 Coeur d'Alene Reservation Tribal Hazard Mitigation Plans were adopted along the much needed locations near Windfall Pass and Benewah Creek Roads (Figure 37).

Figure 37. Historical thinning project, in need of follow-up mitigation projects.

The spread of homes and structures reduces the efficiency of firefighting techniques in providing protection to whole communities due to the need for spreading out resources across the valley to protect individual homes or small clusters of structures. Individual home assessments can provide further information for wildfire protection personnel to understand more about access and building materials for prioritizing mitigation efforts and protection in the event of a wildfire. Many of these homes are mainly built with combustible siding, roofing, and decking; thus further increasing their risk of ignition. Along with the heavier fuel loading, steep topography, and combustible construction materials, the homes located within the mountain sides and draws of the valley are at the highest risk of loss due to a wildfire event.

Recreation activities in the area provide for an additional source of ignition, but logging activities and presence provide fire breaks located around the clusters of homes that may provide protection against a large and uncontrollable wildfire event.

The primary access into the Benewah Valley is from Benewah Road, a gravel two-lane route that travels through the valley and continues to the north and south. Alder Creek is accessed by the Alder Creek Road either from the Benewah Road or the St. Maries River Road. There are only a few additional escape routes that lead away from these communities including Mutch Creek-Carlin Creek Road, Windfall Pass, and Coon Creek Road; however, some segments may be restricted throughout parts of the year due to logging activities. Additionally, some of these roads are steep, windy, and narrow making emergency evacuation difficult and dangerous. Most of these forest routes are located in areas at high fire risk due to the close proximity of continuous fuels along the roadway (Figure 38). In the event of a wildland fire, it is likely that one or more of the escape routes would become impassable. Posting signs showing unrestricted alternate escape routes could reduce confusion and save time in a wildfire situation. Additionally, many homes are located on high risk one-way in, one-way out secondary roads and/or private driveways that could become threatened by wildland fire. One-way in, one-way out access roads are not only dangerous for firefighters; they also increase the likelihood of residents becoming trapped. As of the writing of this assessment, access to the Alder Creek area is accessible only by the Benewah Road due to road improvement being completed along the St. Maris River road access.

Figure 38. Sections of Benewah Valley Road; heavily forested, needing fuels mitigation (left). A well-maintained and thinned section of road (right).

Road names and signs listing homeowners' names are present at road intersections, especially those leading into the Benewah Valley from U.S. 95 and State Route 5. Many of the bridges in the vicinity of Benewah and Alder Creek lack adequate signing and weight ratings. Most residences access water and power through personal wells and above ground power lines. There is no formal structural fire protection in this area; however, the Coeur d'Alene Tribe in cooperation with the Idaho Department of Lands provides wildland fire protection.

5.1.2. Potential Mitigation Activities

Since 2005, when the Benewah County WUI Wildfire Mitigation Plan was adopted, there have been additional structures built in the Benewah Valley and Alder Creek communities. This spread of homes has been mostly into the surrounding mountain sides and draws. Although the wildfire risk is primarily for individual homes scattered all through the surrounding areas, some areas are starting to develop clusters of homes that should have surrounding forestland fuels mitigation programs to keep the risk of wildfire to a minimum. Throughout the years, many logging activities have reduced the overall wildfire risk by thinning of fuels and creating fire breaks (Figure 39). But there are still many heavily vegetative areas in and around these clusters of homes and along some of the main access roads leading to these communities.

Figure 39. Logging Activity in Benewah Valley.

Logging activities throughout the surrounding areas of Benewah Valley create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures (Figure 40).

Figure 40. Large brush piles along Benewah Valley Road in need of burning.

Individual home sites and clusters of homes should receive site evaluations to increase the awareness and education of homeowners on proper defensible space and the benefits it provides in a wildfire event. It is also a valuable tool for identifying those individual homes and clusters of homes that are at highest risk of loss in a wildfire. This is useful information for the safety of firefighting personnel and equipment, as well as for prioritizing wildfire mitigation efforts. Clustering of homes can be found along Wittrock Road, Whitetail Draw, Windfall Pass, Alder Creek Loop, and Vernon Road. These areas should be prioritized for thinning and grazing efforts on the topographically lower sides of the clusters to improve protection from heavy fuel loading below the structures.

Most homes in the area have very well posted signs showing addresses and road access (Figure 41). It is important to keep these access roads, many of which are one-way in one-way out roads, free and clear of overhanging vegetation and large piles of brush and debris to ensure safe passage of wildfire fighting equipment into the area, as well as passage by home owners out of the area in the event of an evacuation (Figure 42).

Figure 41. Clear posting of residents at the entrance to Benewah Valley from St. Maries.

Figure 42. Trees overhanging roads need to be cleared for safe passage.

Specifically, access to the Alder Creek community area via the St. Maris River road presents many opportunities to maintain this road as suitable access in and out by heavy firefighting equipment for faster access from St. Maris. Currently (spring 2012), logging activities are being conducted along the St. Maris River road for better access to these communities (Figure 43). These activities are currently on-going and may be a temporarily hazardous area due to many downed trees and heavy brush piles located on the lower elevations of the mountain sides leading to this community and the Highlands community south of St. Maries. In addition, work needs to be done where the road crosses railroad tracks to repair damage and increase the width of roads in these areas. Bridge access to Alder Creek via Benewah Road is also in need of weight restrictions signs and reinforcement to ensure the safe passage of heavy equipment.

Figure 43. Road construction and access issues to Alder Creek from St. Maries.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines (Figure 44). Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing near the WUI can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow restrictions concerning campfires and trail use in designated recreation areas.

Figure 44. Power lines through Benewah Valley needing clearing.

5.1.3. Recommendations:

1. Perform individual home site evaluations (approximately 30-40) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around the approximately 15-20 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges on applicable sections of Alder Creek Road, Alder Creek Loop, Benewah Road, Windfall Pass, and Mutch Creek-Carlin Creek Road.
4. Increase the frequency, and widen turnouts, on Alder Creek Road, Mutch Creek-Carlin Creek Road, and Alder Creek Loop.
5. Maintain previously thinned and burned forest areas by periodically removing accumulated surface fuels and regeneration.
6. Continued maintenance of logged areas to reduce ignition potential in dead downed debris and logs.
7. Remove or prune trees away from power line corridors.
8. Maintain meadows around Alder Creek by periodically removing encroaching tree regeneration.
9. Sign and provide weight rating information on all bridges and cattle guards on access roads (Figure 45).
10. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
11. Widen and improve road surface of Windfall Pass in order to provide an additional escape route and shorter access route for fire response capabilities from the west side of the county.

12. Keep clear lines of communication open with the Idaho Department of Lands, USDA Forest Service, and the Coeur d'Alene Tribe.
13. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

Figure 45. Access bridge to Alder Creek from Benewah Valley Road, needs weight posting and guard-rails.

5.1.4. Community Maps

Community Maps (Figure 46 - Figure 54) of the Benewah Valley and Alder Creek are provided to give the reader a better understanding of the area, and the concepts shared here.

Figure 46. Benewah Valley & Alder Creek NAIP Aerial Imagery.

Figure 47. Benewah Valley & Alder Creek Topography.

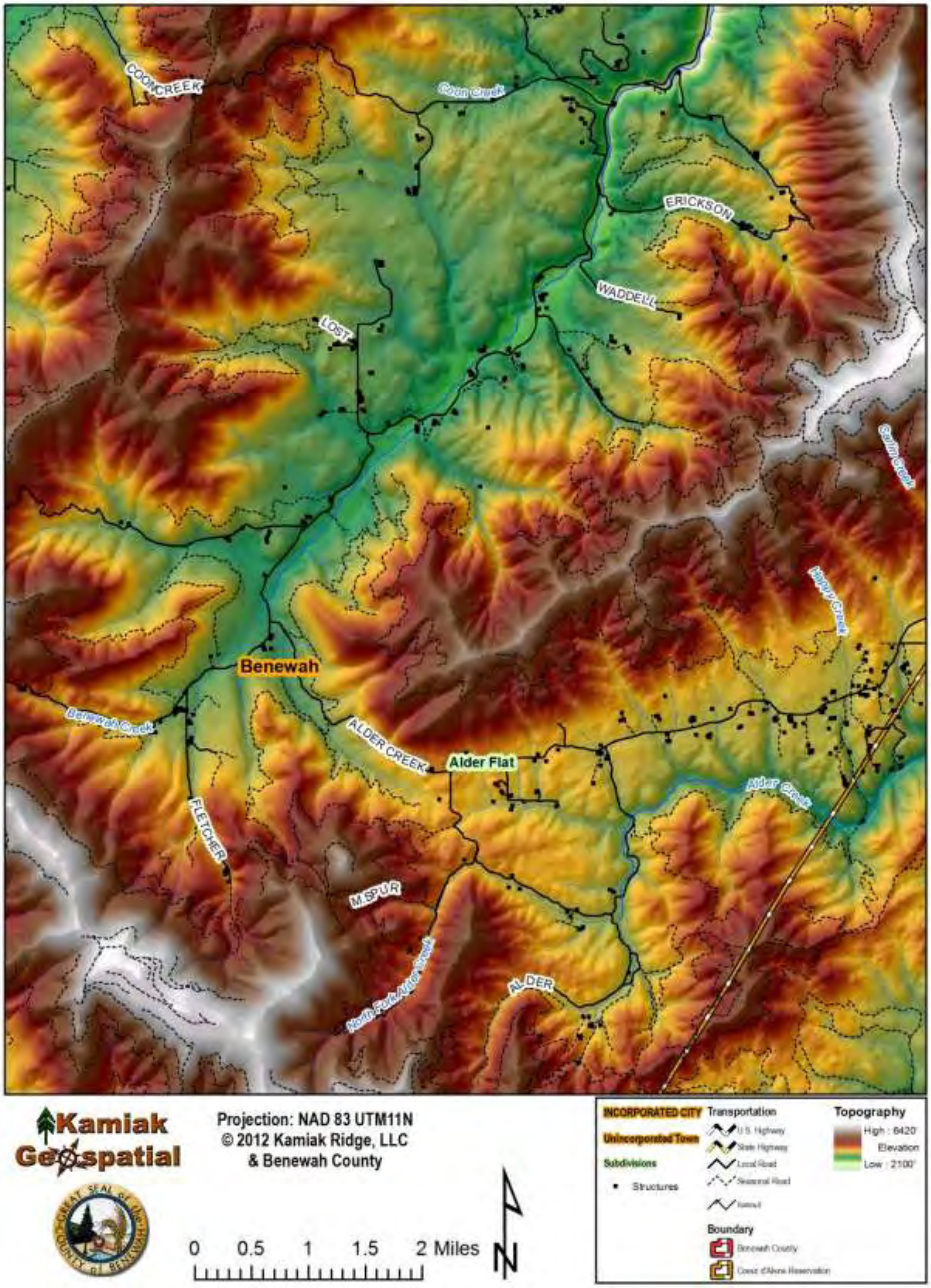


Figure 48. Benewah Valley & Alder Creek Land Ownership.

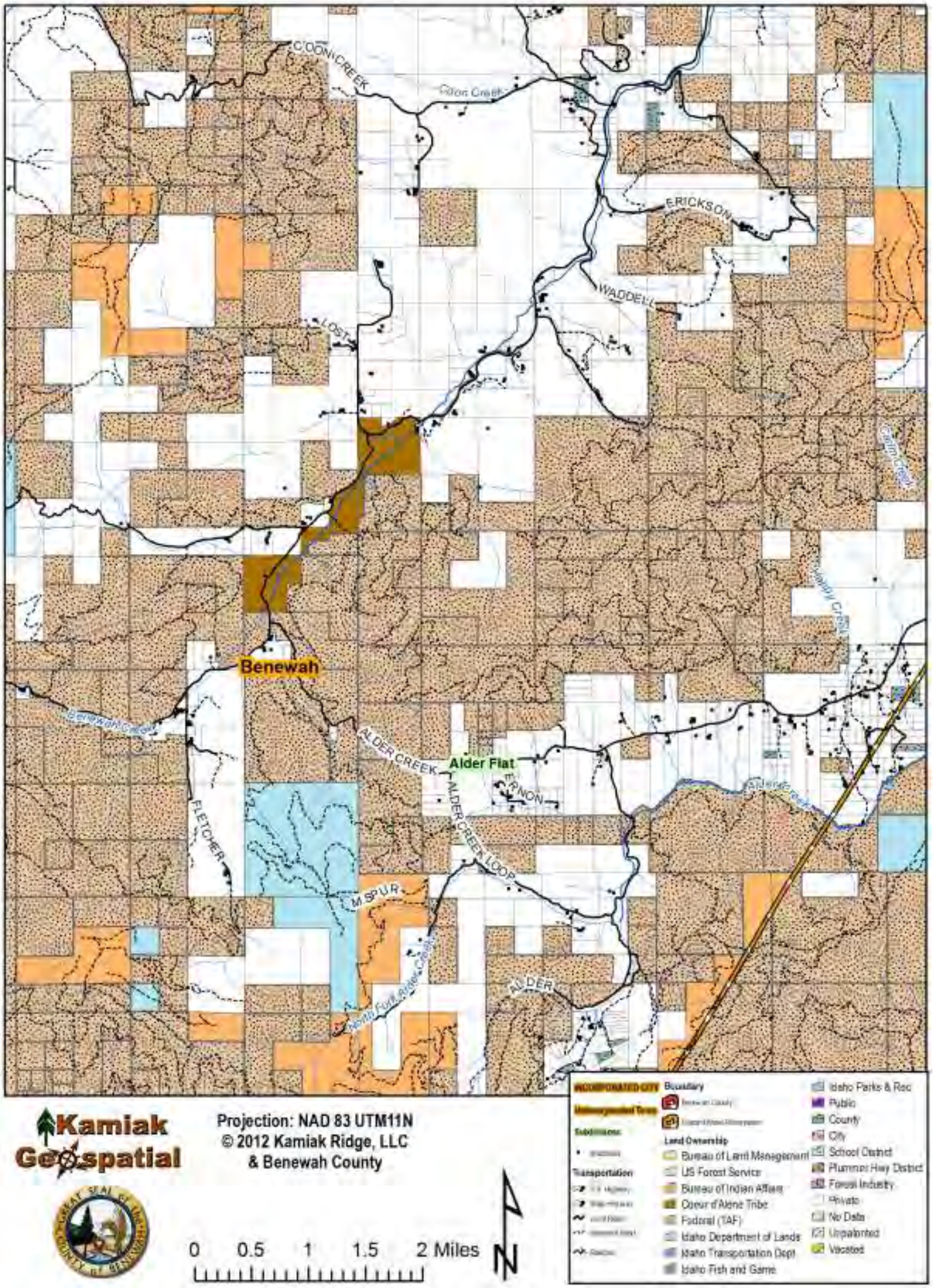


Figure 49. Benewah Valley & Alder Creek Wildland-Urban Interface Zones.

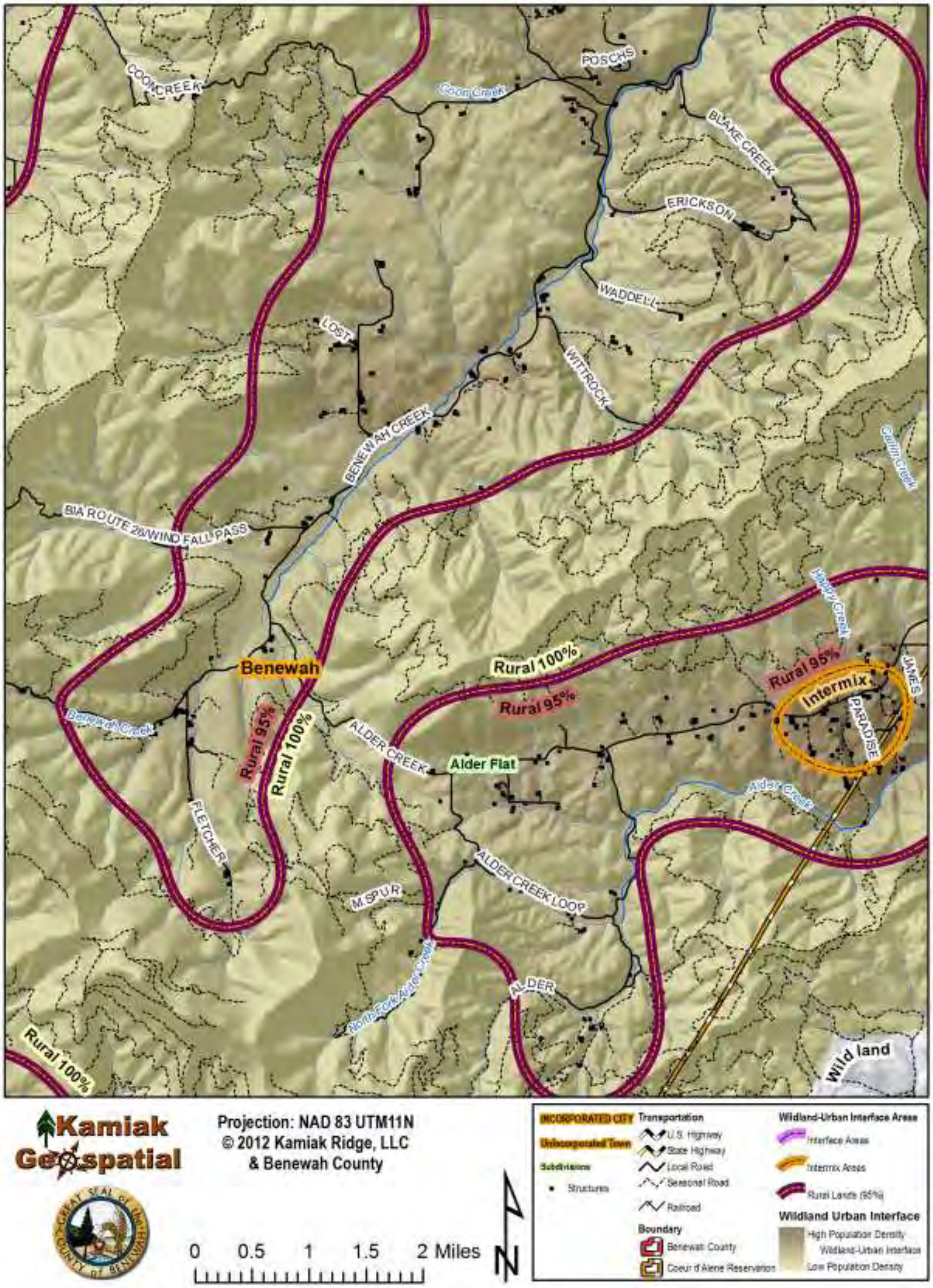
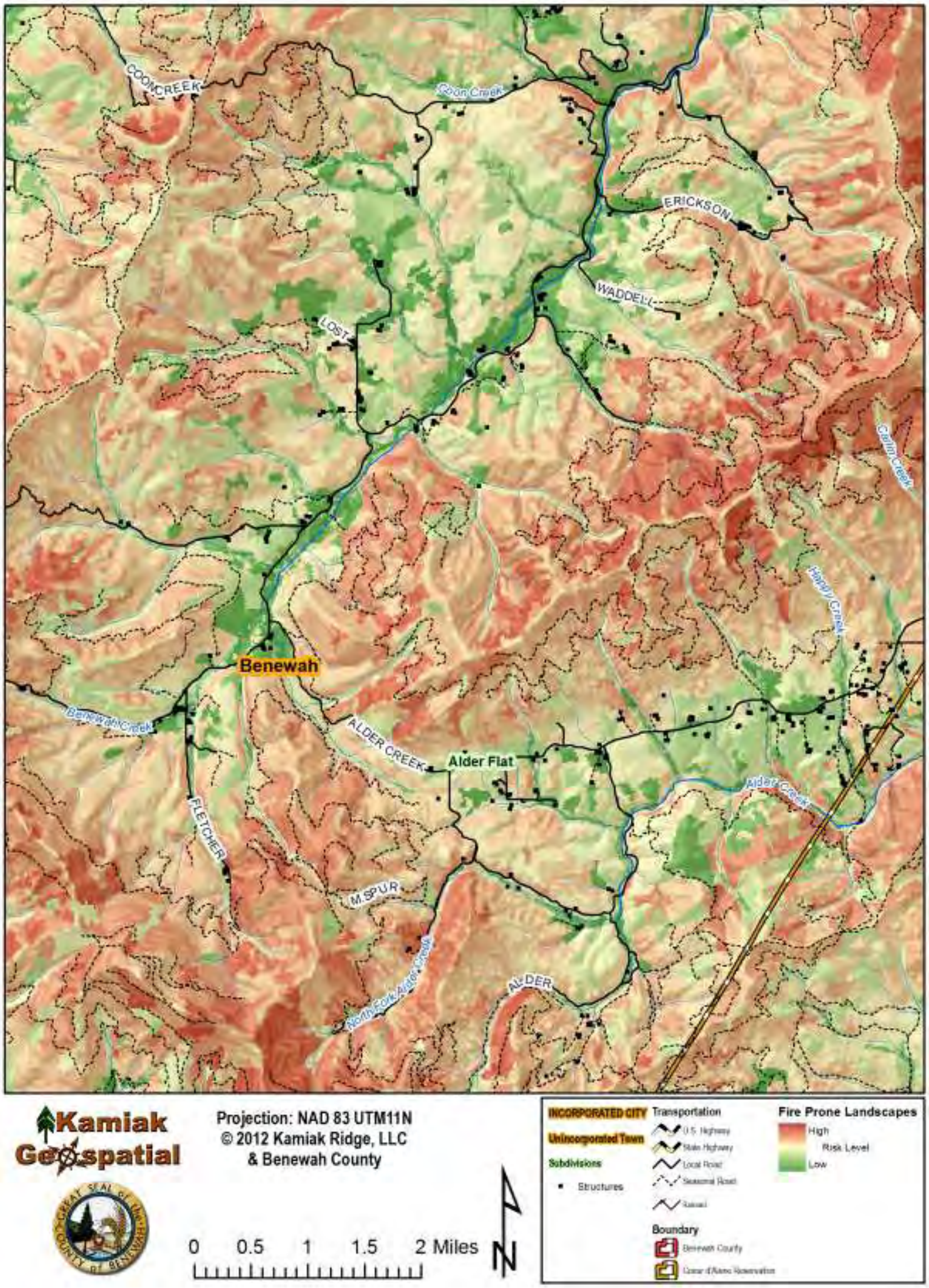
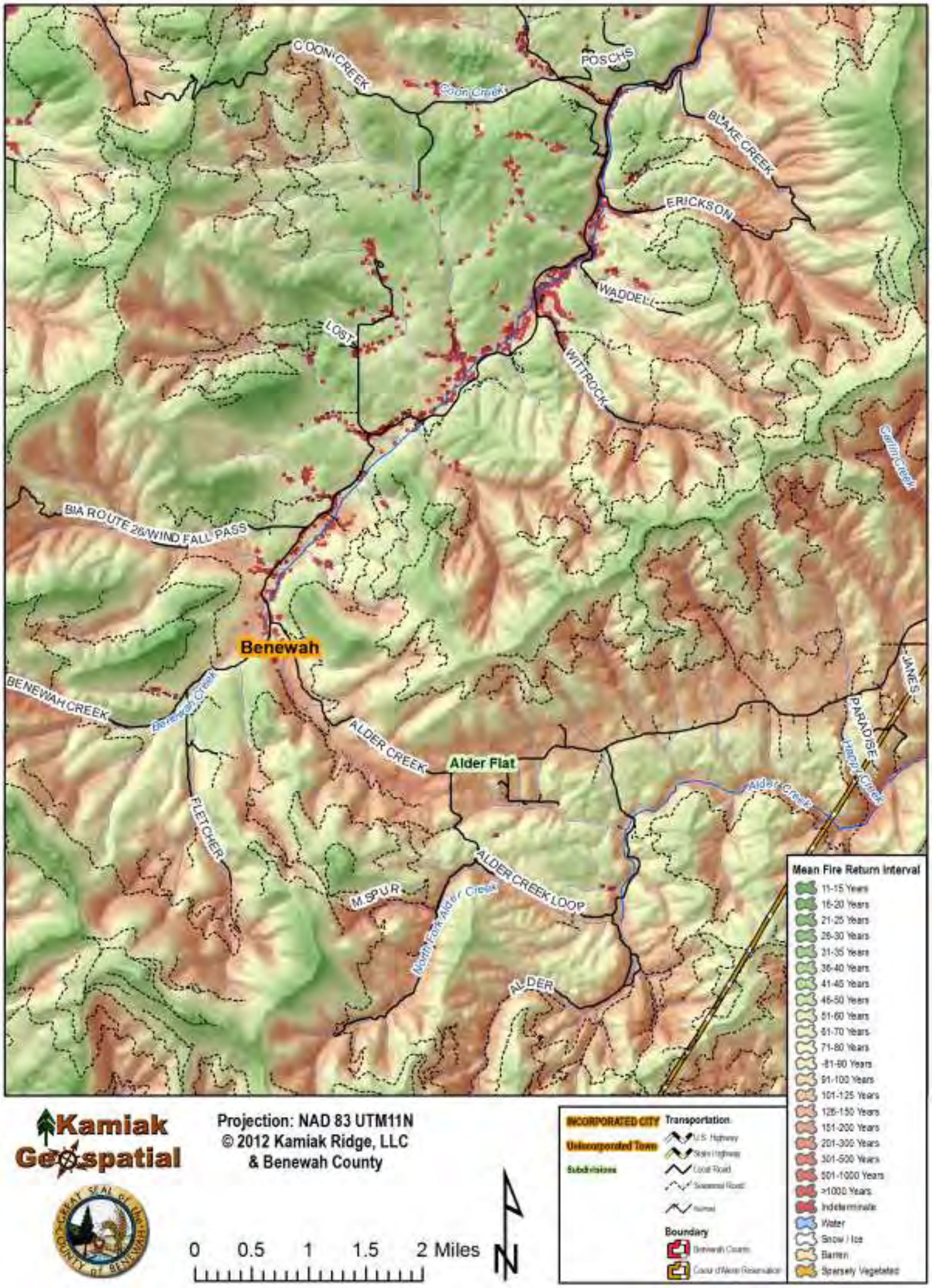


Figure 50. Benewah Valley & Alder Creek Fire Prone Landscapes.





COON CREEK
Coon Creek
POSCHS
BLAKE CREEK
ERICKSON
WADDELL
LOST
WITTROCK
Carlin Creek
BIA ROUTE 26/WIND FALL PASS
Benewah
BENEWAH CREEK
Benewah Creek
ALDER CREEK
Alder Flat
JAMES
PARADISE
Alder Creek
FLETCHER
M.SPUR
North Fork Alder Creek
ALDER CREEK LOOP
ALDER
Mean Fire Return Interval
Kamiak Geospatial
Projection: NAD 83 UTM11N
© 2012 Kamiak Ridge, LLC
& Benewah County
0 0.5 1 1.5 2 Miles
N
INCORPORATED CITY
Unincorporated Town
Subdivisions
Transportation
Boundary

Figure 52. Benewah Valley & Alder Creek Historic Fire Regime Groups.

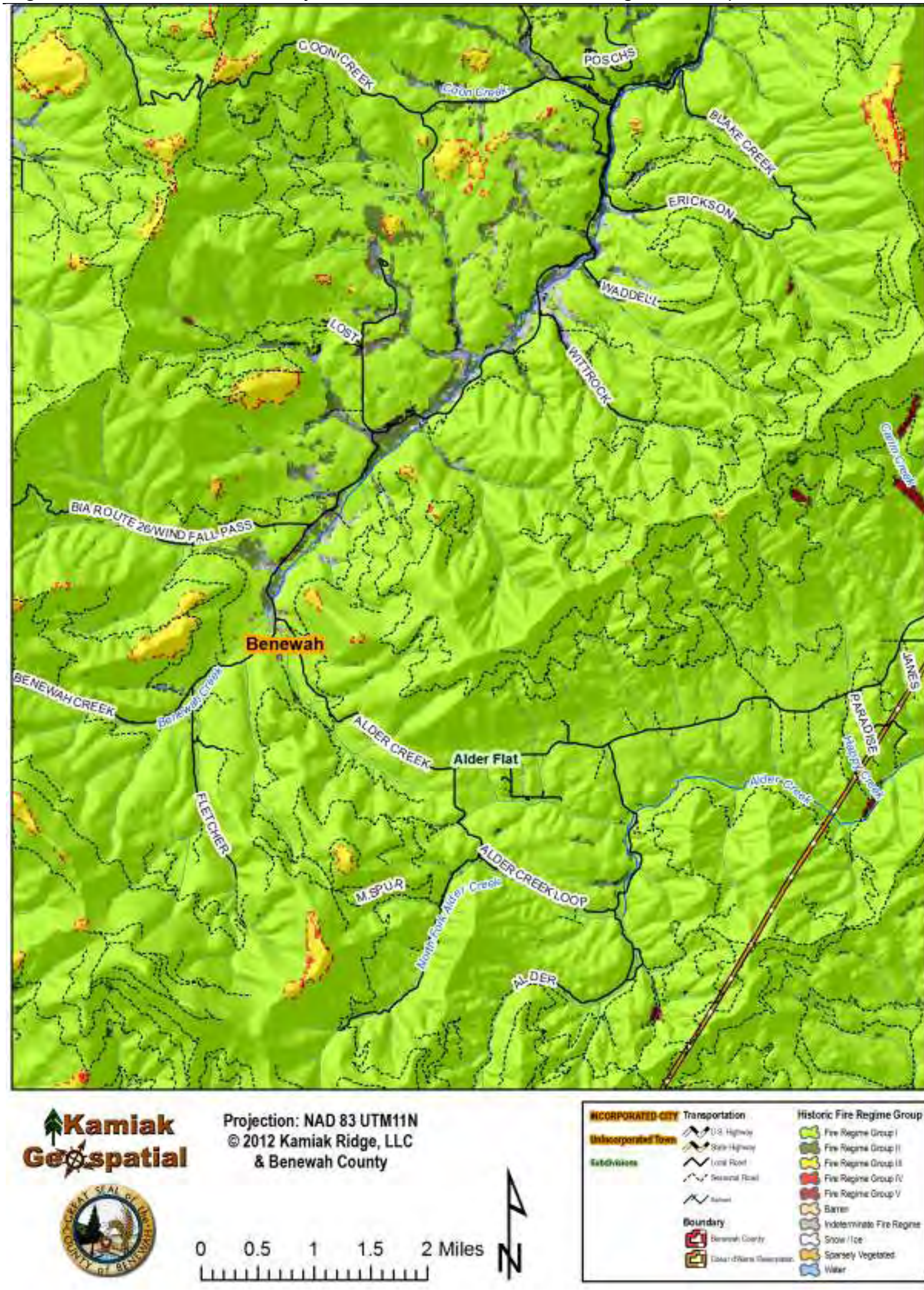


Figure 53. Benewah Valley & Alder Creek Fire Regime Condition Class.

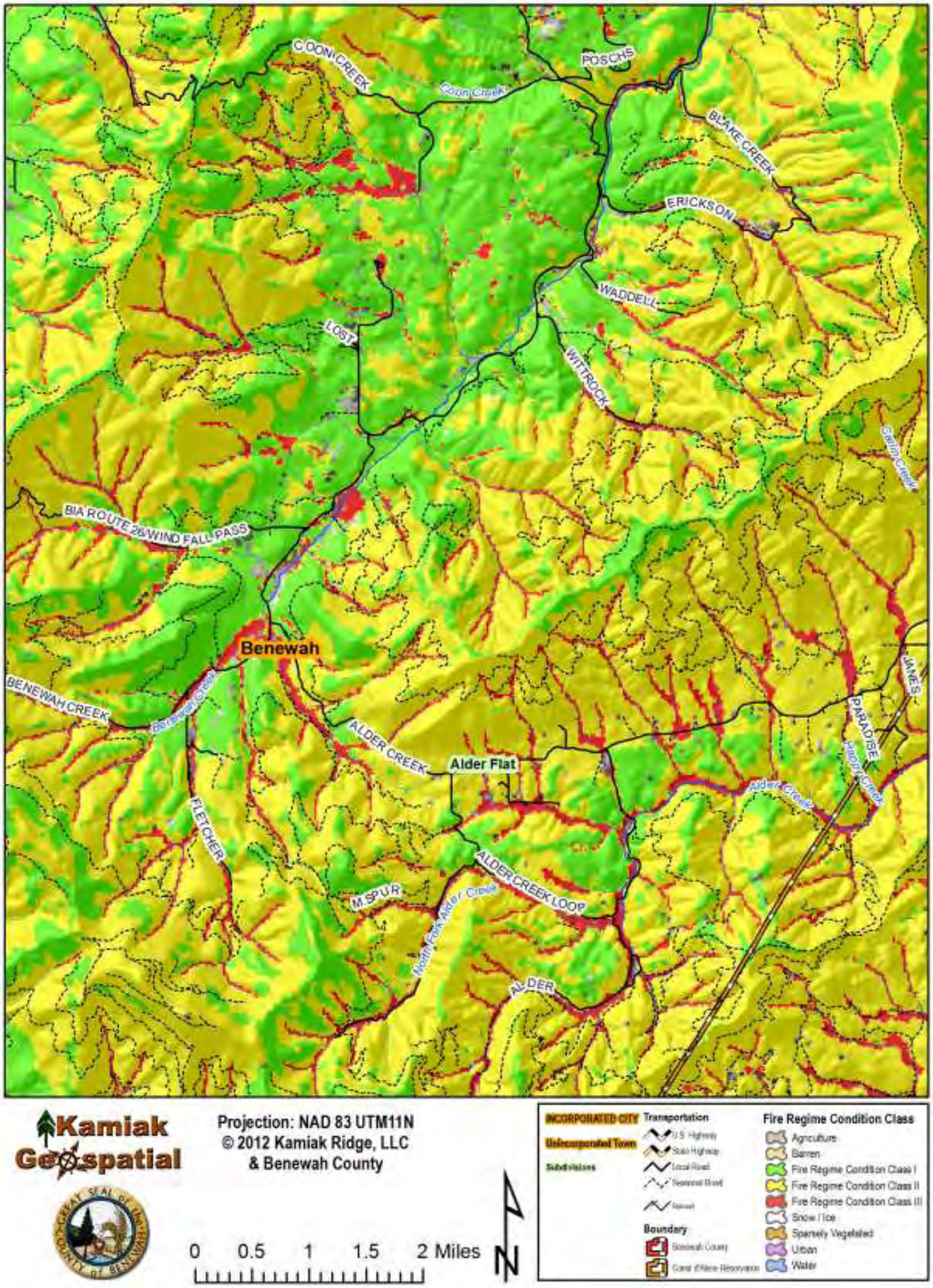
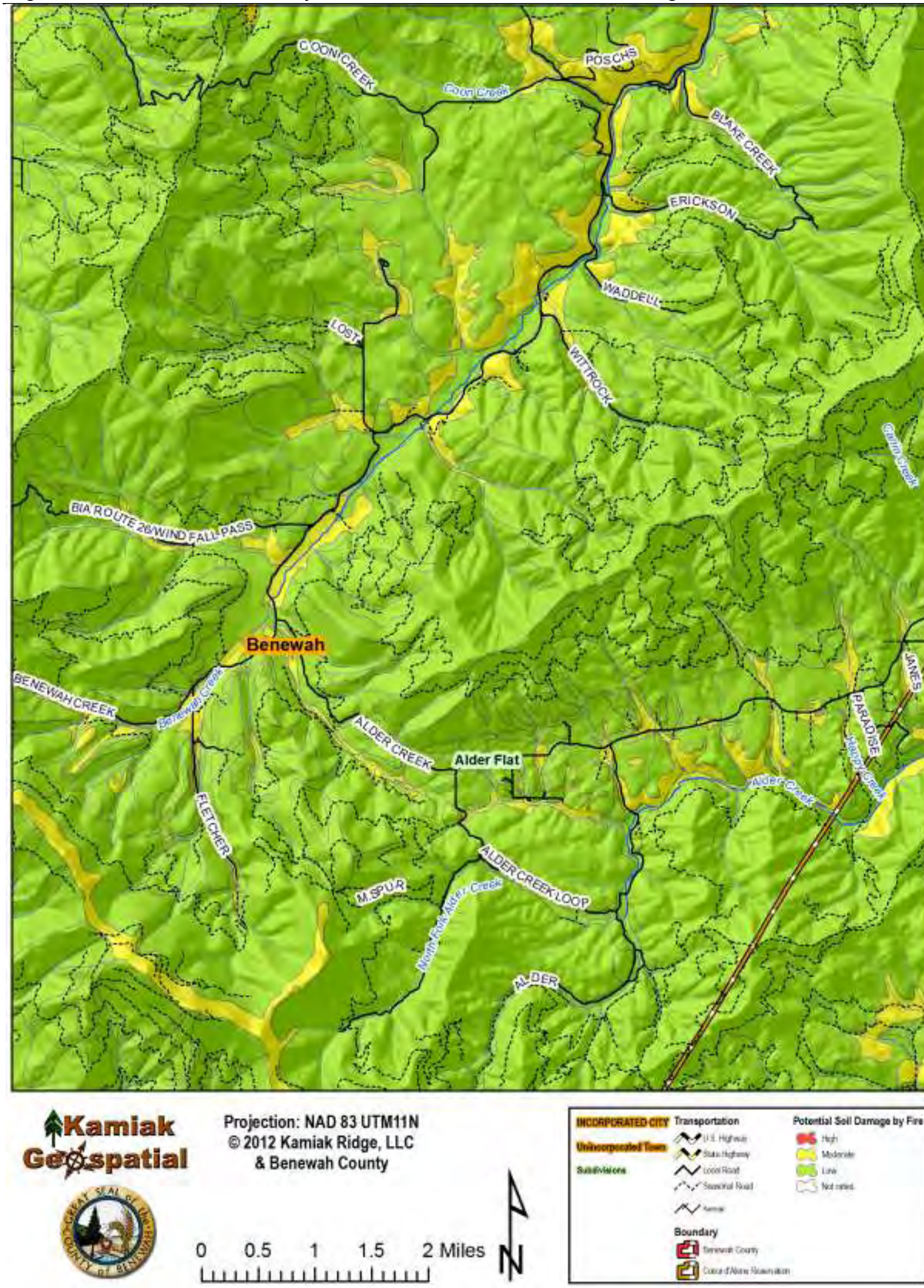


Figure 54. Benewah Valley & Alder Creek Potential Soil Damage from Intense Fires.



5.2. Chatcolet and Heyburn State Park

5.2.1. Community Assessment

Approximately 59 structures are located in the Chatcolet community; the majority used as vacation or second homes. The juxtaposition of Heyburn State Park increases the wildfire risk due to heavy recreational use in a forested area (Figure 55). Overnight campgrounds in the area as well as the nearby railroad; increase the possibility of ignition in the area. A 300 foot buffer zone was established during community development, helping protect the area from wildfire spread, but needs to be maintained to ensure its effectiveness. Defensible space around homes is going to be the best protection from wildfire spread; some residences need further work on expanding their defensible space.

Figure 55. Heyburn State Park map.

Over the past 10 years, some Wildland fuel mitigation projects have been completed within Heyburn State Park and Chatcolet community areas. Thinning along State Highway 5 and other projects completed by the Parks department have been completed in the past few years to help protect access to the park, as well as historic park structures. In 2010 and 2011, Benewah County place goats up Plummer Creek in the difficult to access region to eat weed infestation which would reduce fuel for fires.

The primary access into the area is from Chatcolet Road, a paved two lane route, which connects State Highway 5, through Heyburn State Park (and Chatcolet), and continues in the direction of Worley. There are several secondary roads running through the residential area that form loops back to Chatcolet Road, which provides the only escape routes out of the park.

Road names and house numbers are present throughout the area, although some may be difficult to see. Most residences access power through above ground power lines and water from the 225,000 gallon community reservoir well.. This community and surrounding areas are protected by the Heyburn State Park and Idaho Department of Lands Fire Crews.

5.2.1.1. Heyburn State Park

There are two additional small communities located within the Heyburn State Park boundaries; Benewah Lake and Rocky Point. The Benewah Lake community is located on the eastern shore of Chatcolet Lake, accessible by the one-way in, one-way out Benewah Road, which is not directly accessible from St. Maries. This community is made up of approximately 10-15 structures, most of which are mobile home construction, located on an east facing slope with good thinning and defensible space. The primary risk to this community is the lack of access from within Benewah County. In addition, those structures located highest on the hillside are accessible by only a long winding and steep driveway, with little or no defensible space.

The Rocky Point community is located on the south shore of Chatcolet Lake along State Highway 5. The state highway helps protect this community from wildfire risk coming from the heavily forest hillside to the south. The primary risk to wildfire for this community comes from within the community itself. The approximately 84 structures are all located on a hill leading up from the lake on the east and west sides. This area is heavily forested and provides little to no defensible space for the residences of the area. Many structures have overhanging tress, large buildup of debris on rooftops, and a large amount of surface fuels allow a wildfire to spread rapidly during wildfire weather conditions. Access is difficult for larger equipment, due to the small road that loops through the community (Figure 56).

Figure 56. Home with vegetation growing against structure, in need of defensible space.

5.2.2. Potential Mitigation Activities

The highest risk to the community of Chatcolet and those other communities in Heyburn State Park come from their location with respect to recreational activities (Figure 57). Buffers built and maintained around these communities helps to keep them at moderate risk to wildland fire. These buffers must be maintained to ensure good protection from wildfire that may start within the park lands and try to spread to these communities. Access to these communities must also be maintained and in some places needs some thinning projects in order to keep access open for firefighters as well as for homeowners escaping the area in the event of an evacuation. The community of Rocky Point is at a higher risk of loss due to wildfire due to the very steep slopes, lack of defensible space, and recreation points located below the structures on the hillsides.

Figure 57. Recreation sites within Heyburn State Park.

Many of the homes in Heyburn State Park were constructed with building materials and landscaping techniques unfavorable for protecting them against wildfire. Individual home site evaluations can increase homeowners' awareness, and when implemented, improve the survivability of structures in the event of a wildfire. Creating a defensible space around structures can significantly reduce the potential loss of life and property. This can be accomplished by individual residents by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating firewood piles, propane tanks, and other flammable objects away from the home. Assessments of homes can address the issue of escape routes and home defensibility characteristics (Figure 58). Educating homeowners about techniques for protecting their property is critical in areas where heavy fuels are present.

Figure 58. Home built with metal roofing, but wooden siding and deck with vegetation growing against the structure; in need of defensible space.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the

WUI can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas.

5.2.3. Recommendations:

1. Perform individual home site evaluations (approximately 40-50) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 30-40 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges on applicable sections of Chatcolet Road, Benewah Road and Rocky Point Loop.
4. Maintain a fire resistant buffer along State Highway 5 throughout the Heyburn State Park area.
5. Post clear regulations on fire use within recreational areas and provide fire escape resistant fire rings and barbecue pits.
6. Sign and provide weight rating information on all bridges on access roads.
7. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
8. Post signs identifying unrestricted escape routes.
9. Keep clear lines of communication open with the Idaho Department of Lands, USDA Forest Service, and the Coeur d'Alene Tribe.
10. Remove or prune trees away from power line corridors.
11. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.2.4. Community Maps

Community Maps of the Heyburn State Park and Chatcolet are provided to give the reader a better understanding of the area, and the concepts shared here (Figure 59-Figure 67).

Figure 59. Heyburn State Park & Chatcolet NAIP Aerial Imagery.

Figure 60. Heyburn State Park & Chatcolet Topography.

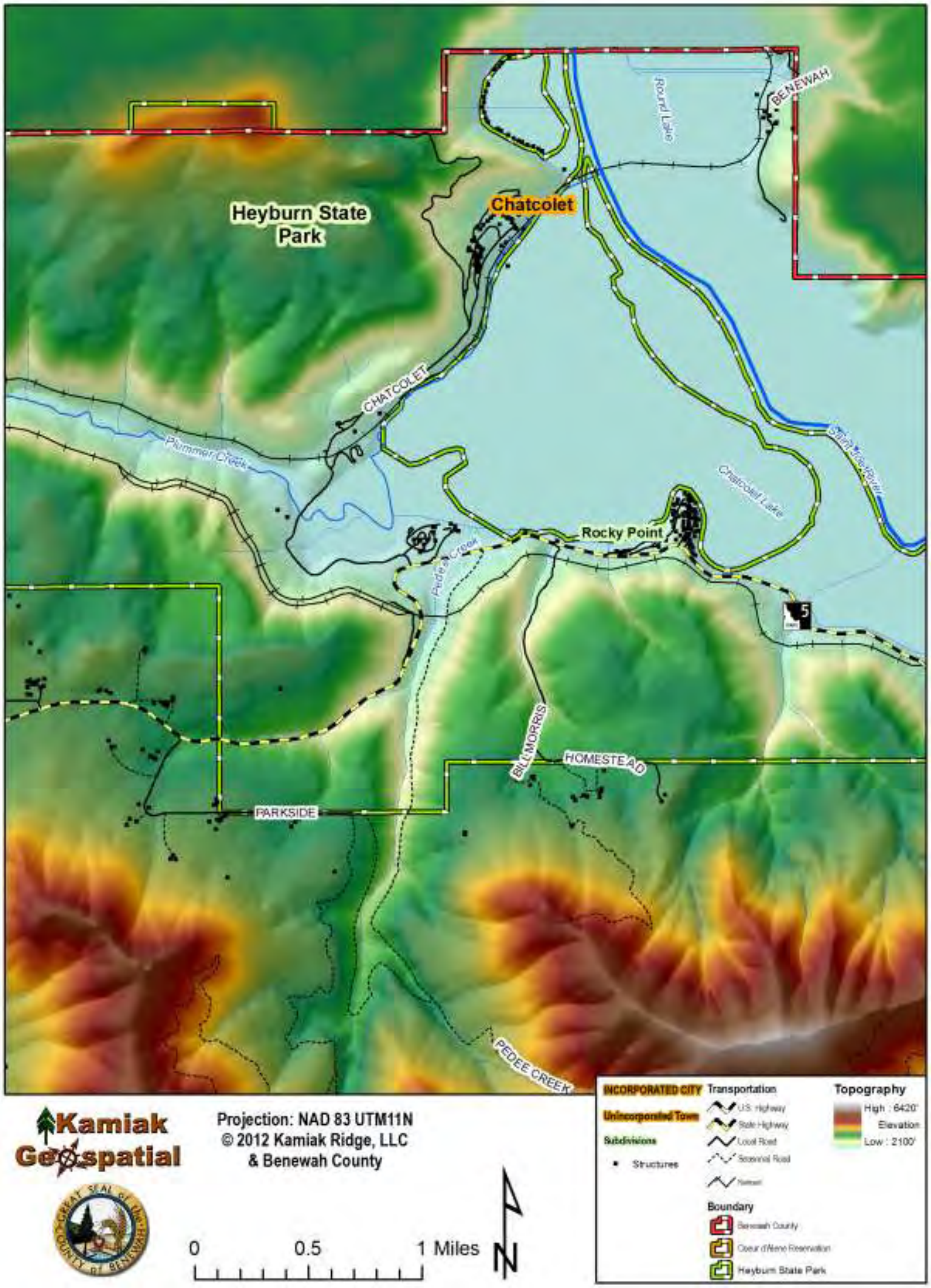


Figure 61. Heyburn State Park & Chatcolet Land Ownership.

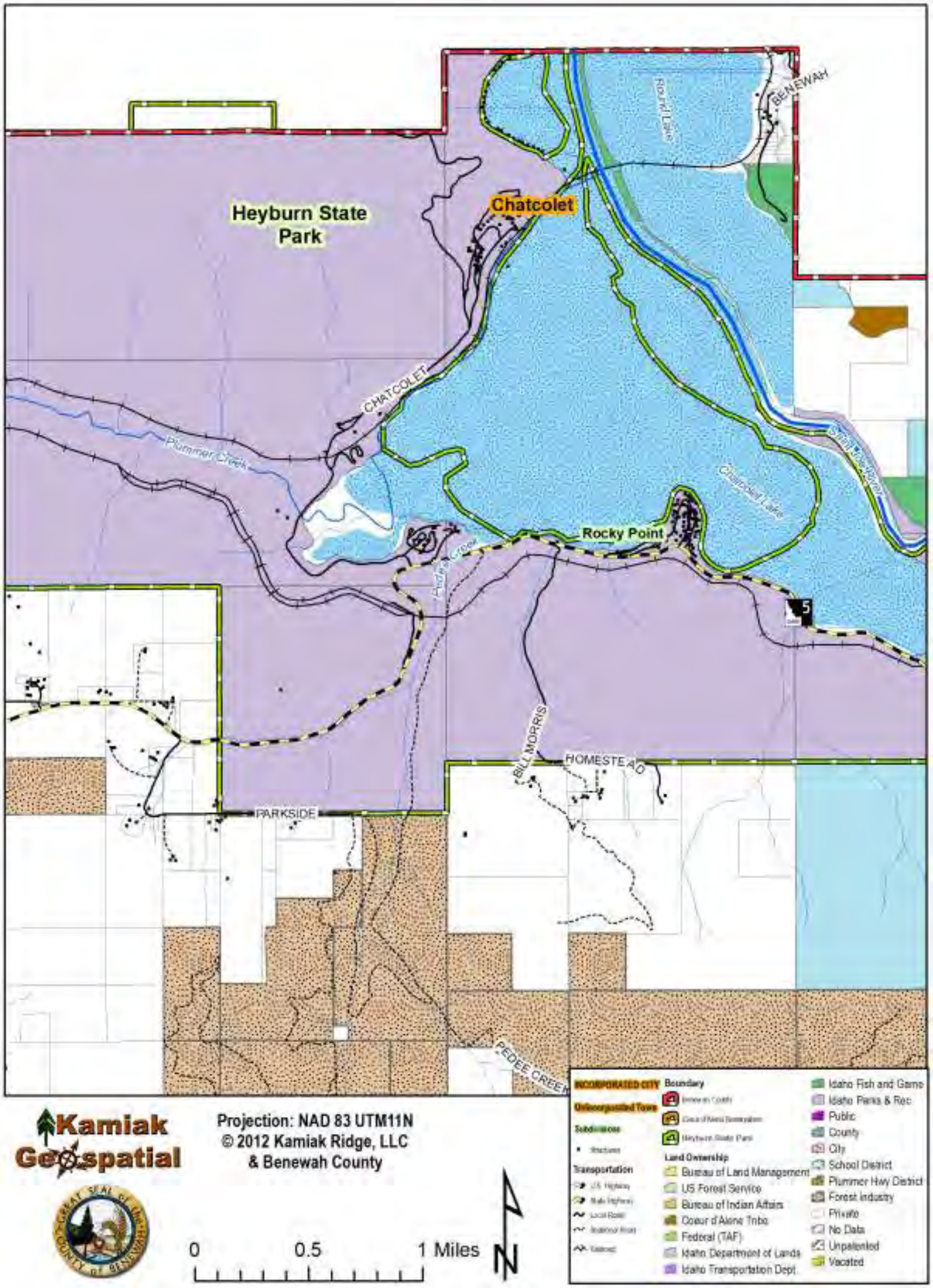


Figure 62. Heyburn State Park & Chatcolet Wildland-Urban Interface Zones.

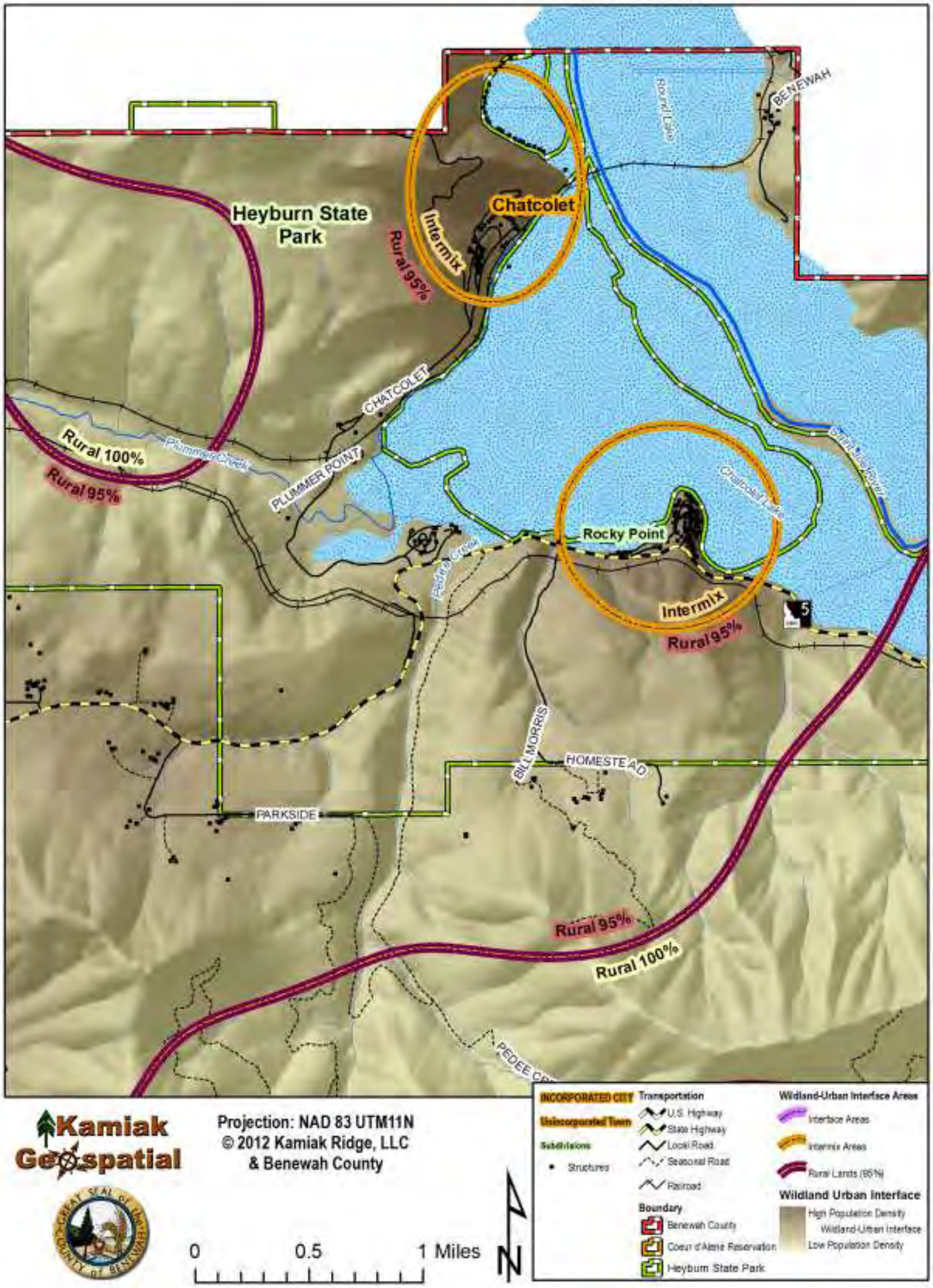


Figure 63. Heyburn State Park & Chatcolet Fire Prone Landscapes.

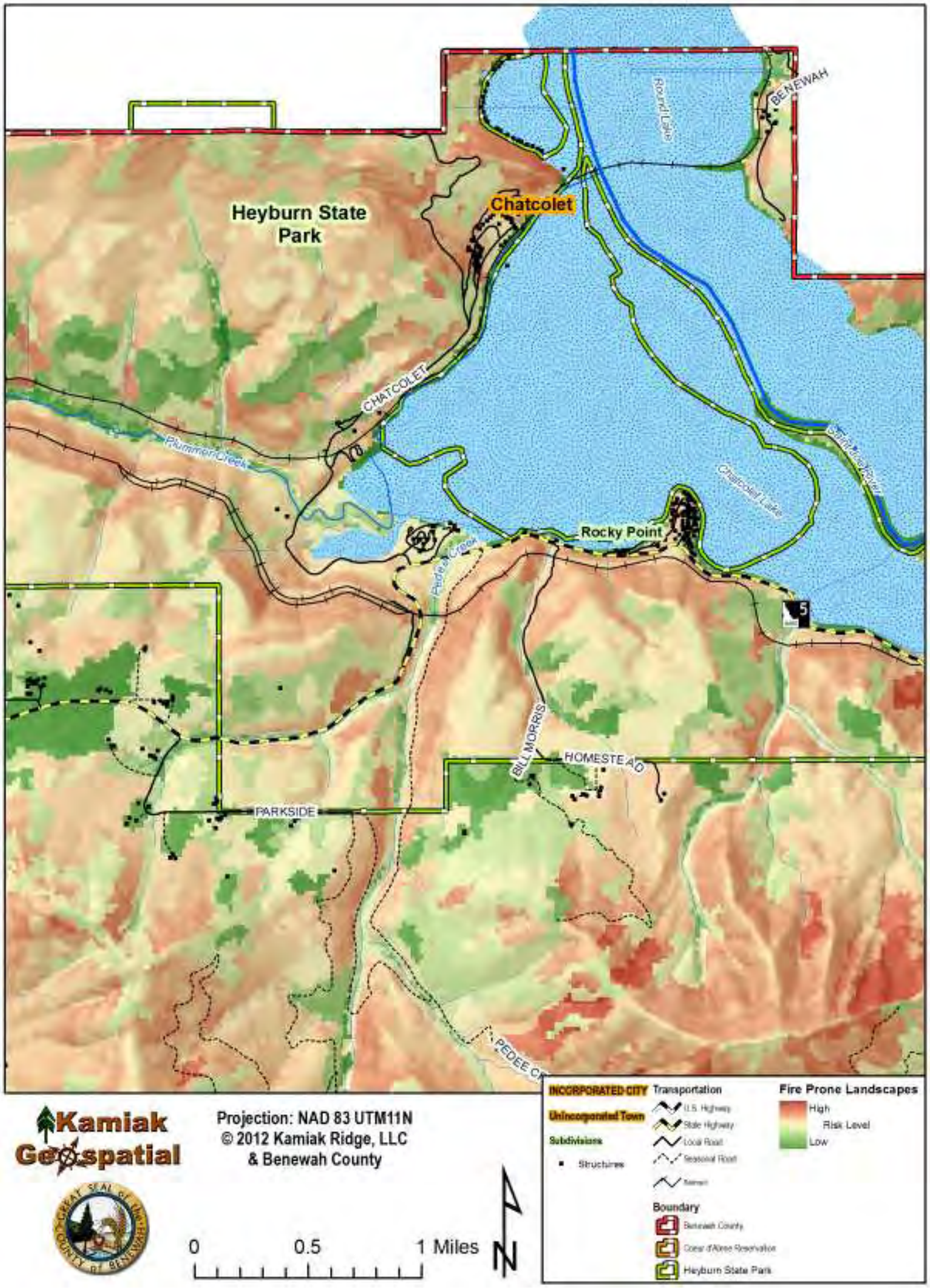


Figure 64. Heyburn State Park & Chatcolet Mean Fire Return Interval.

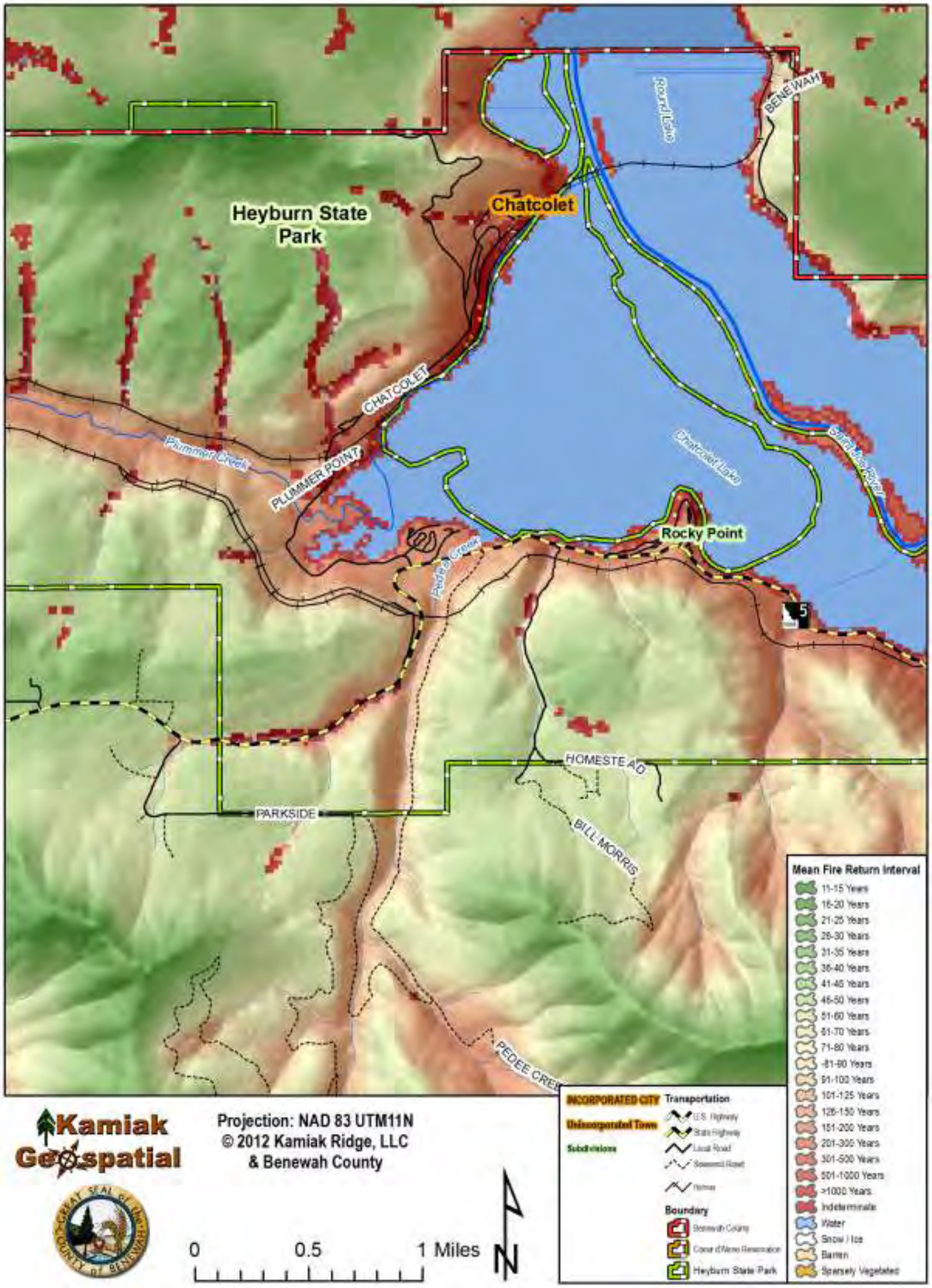


Figure 65. Heyburn State Park & Chatcolet Historic Fire Regime Groups.

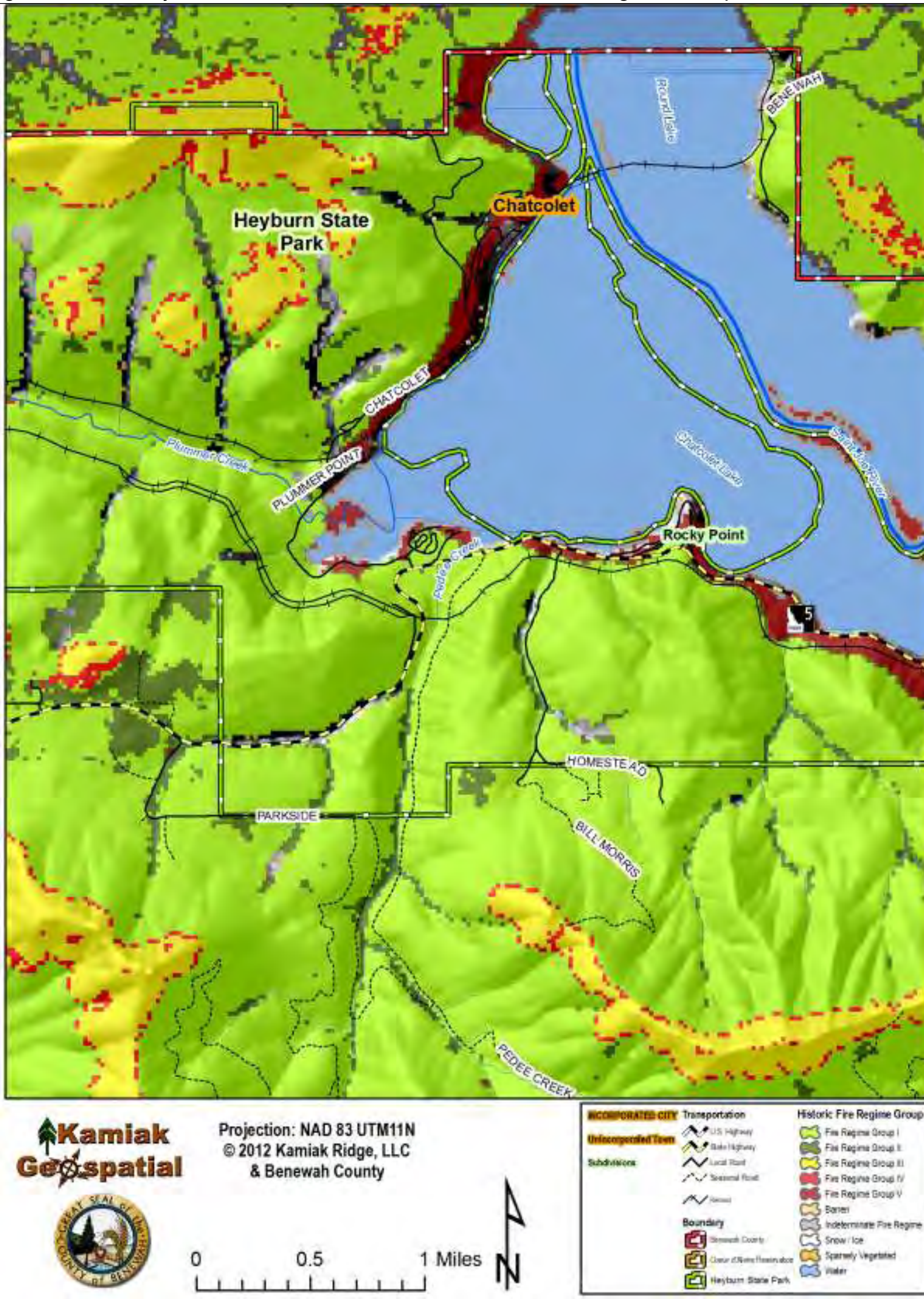


Figure 66. Heyburn State Park & Chatcolet Fire Regime Condition Class.

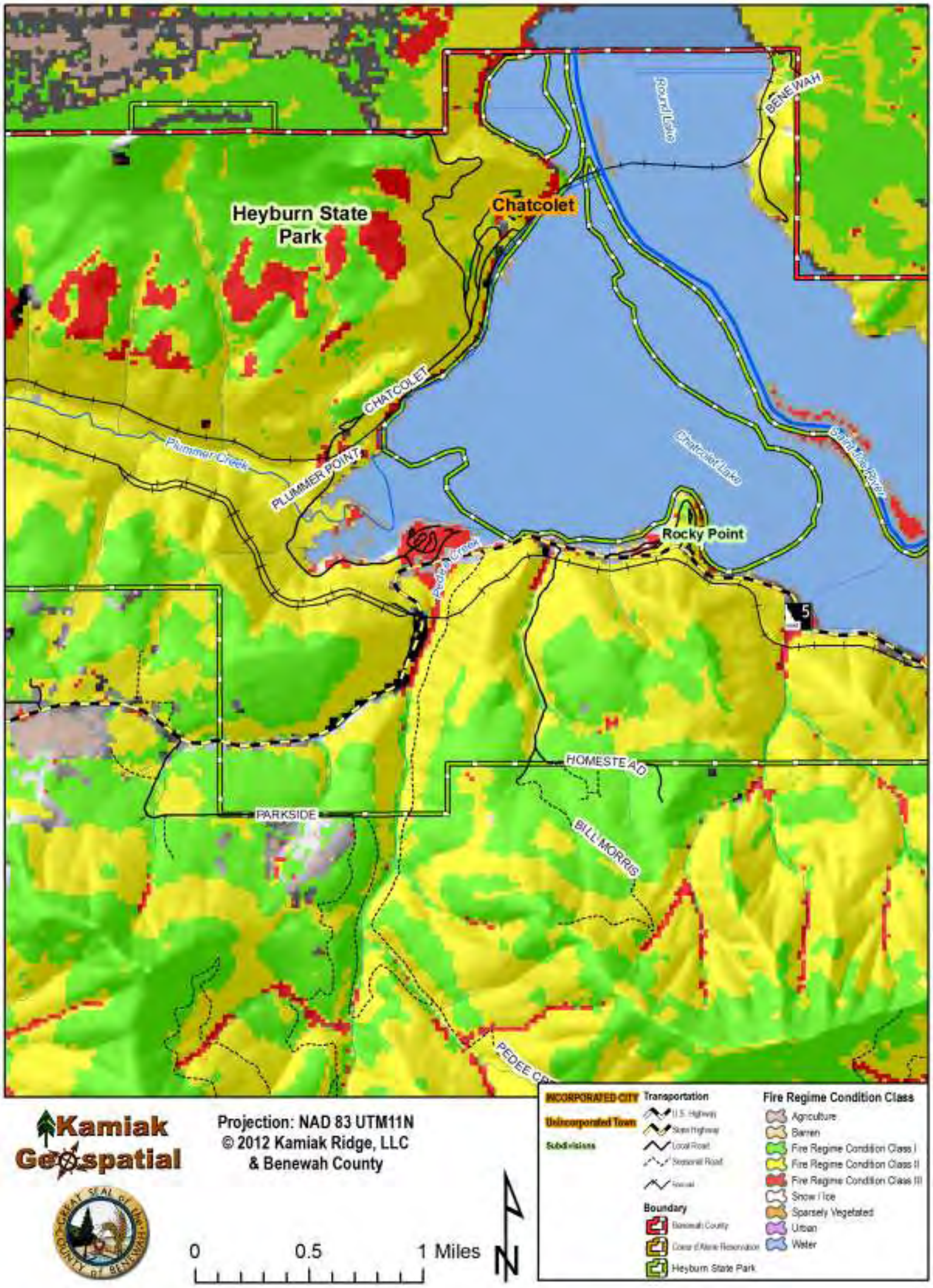


Figure 67. Heyburn State Park & Chatcolet Potential Soil Damage from Intense Fires.

5.3. Emida

5.3.1. Community Assessment

The Emida community is home to approximately 150 structures along State Highway 6 about 20 miles south of St. Maries. The primary risk to wildfire loss is in the northwestern part of town where the hillsides are forested and abut some structures located near the main part of town. To the east and south are large swaths of farm land that provide the community with areas of low resistance to wildfire control and offer clear access to structures and fire protection efforts. Structures located on the east facing hillsides north of Sanders road are located in more heavily forested areas than other parts of town are at the highest potential risk of loss (Figure 68).

Figure 68. Combustible wood siding structure with heavy wildland fuels abutting.

To combat the potential dangers of this forested area, there were large thinning and grazing projects completed in 2009 located west of town, on the immediate downslopes from structures to prevent wildfire spread (Figure 69). Benewah County crews built fuel breaks on the southeast side of Emida along the Forest Service ownership in 2010. The fuel break along the West edge of town was built in 2011. In addition, good defensible space has been implemented by these homeowners ensuring minimal risk of a fire spreading from the structures to the forest or vice versa.

Figure 69. Thinning and grazing fuels mitigation projects around Emida.

The primary access into the area is on State Highway 6 extending to the north and south, a paved two lane route. Sanders Road and Charlie Creek Road offer additional escape routes to the west and south. All of these roads are located in areas at moderate to high fire risk due to the close proximity of continuous fuels along the roadway. In the event of a wildland fire, it is likely that one or more of the escape routes would be impassable.

5.3.1.1. Santa Creek Area

The headwaters of Santa Creek have been developed into a community including 50-60 structures located on the ridge top leading off of Sanders Road approximately 4 miles West of Emida. This community is a mix of low grassy pasture and heavy timber lands (Figure 70).

Figure 70. Low grassy lands (left); heavily forested lands (right).

The longer access roads to homes in this area are generally thin and forested on both sides restricting access by firefighting equipment and escape by residents in the event of a wildfire (Figure 71).

Figure 71. Long, forested access road.

Many of the homes in the community of Emida have been built using wood siding and decking, which is unfavorable for protection against wildfire. Also, some homeowners stack firewood under decks or against structures. Homes built within the grassy valley bottom generally have an adequate defensible space; however, those in outlying areas are commonly adjacent to or within heavier fuels.

Road names and house numbers are present throughout the area, yet bridges on many access roads lack adequate signing showing load weight ratings. Most residences in the area access water and power through personal wells or city water hook ups and above ground power lines. The power line corridor stretching from Emida to Sanders travels through sections of very heavy fuels of the St. Joe National Forest. This corridor has been cut and pruned; however, this area still maintains a very high risk of wildfire spread due to remaining surface fuels and nearby forest fuels (Figure 72). Structural fire protection is provided by the Emida Fire Protection District, which was created in 2009. The Idaho Department of Lands provides wildland fire protection.

Figure 72. Well-maintained power line corridor between Emida and Sanders.

5.3.2. Potential Mitigation Activities

The community of Emida is at a low risk of wildfire loss thanks to the fuels mitigation efforts on the Eastern facing slopes to protect those homes located on the west side of the community. These areas are still at the risk of loss for the community due to the surrounding areas being heavily forested, especially along roads used as escape routes. Vegetation thinning has been applied to many of the roads, but there are areas that could benefit from continued thinning and brush control.

Logging activities throughout the surrounding areas of Emida create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures.

Access to structures in the community is provided by a single lane bridge located on the east side of the neighborhood (Figure 73). This bridge could benefit from a widening as well as proper weight limit postings to ensure safe escape routes for home owners as well as access by heavy firefighting equipment.

Figure 73. One lane bridge, needing weight-limits posting.

Other homes on the west side of town, but located at the bottom of slopes, should be evaluated for increased defensible space and vegetation management. Some of these homes have large brush piles in and along the edge of the forest line, which should be burned or removed during the appropriate prescribed and brush burning times as designated by the county and state.

Emida is currently building a new fire department located just to the north of the current fire department (Figure 74). The town actively works to educate it's homeowners on wildfire safety, and hosts yearly fire fighter trainings to ensure proper preparation.

Figure 74. On-going construction to new Emida Fire Department.

In general, communities in this area should focus on small projects that will increase the safety of residents and property in the event of a wildfire emergency. These projects could include a) providing signs showing weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing escape routes in residential areas, and d) pruning trees around power lines. Setting up a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Thinning and grazing on lands near the wildland-urban interface can significantly reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas.

5.3.3. Recommendations:

1. Perform individual home site evaluations (approximately 20-30) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 15-30 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Maintain previously thinned and burned forest areas by periodically removing accumulated surface fuels and regeneration.
4. Sign and provide weight rating information on all bridges and cattle guards on access roads.
5. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
6. Post signs identifying unrestricted escape routes.
7. Post clear regulations on fire use within recreational areas and provide escape proof fire rings and barbecue pits.
8. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.3.4. Community Maps

Community Maps of Emida and Santa Creek are provided to give the reader a better understanding of the area, and the concepts shared here (Emida: Figure 75 - Figure 83, Santa Creek: Figure 84 - Figure 92).

Figure 75. Emida NAIP Aerial Imagery.

Figure 76. Emida Topography.

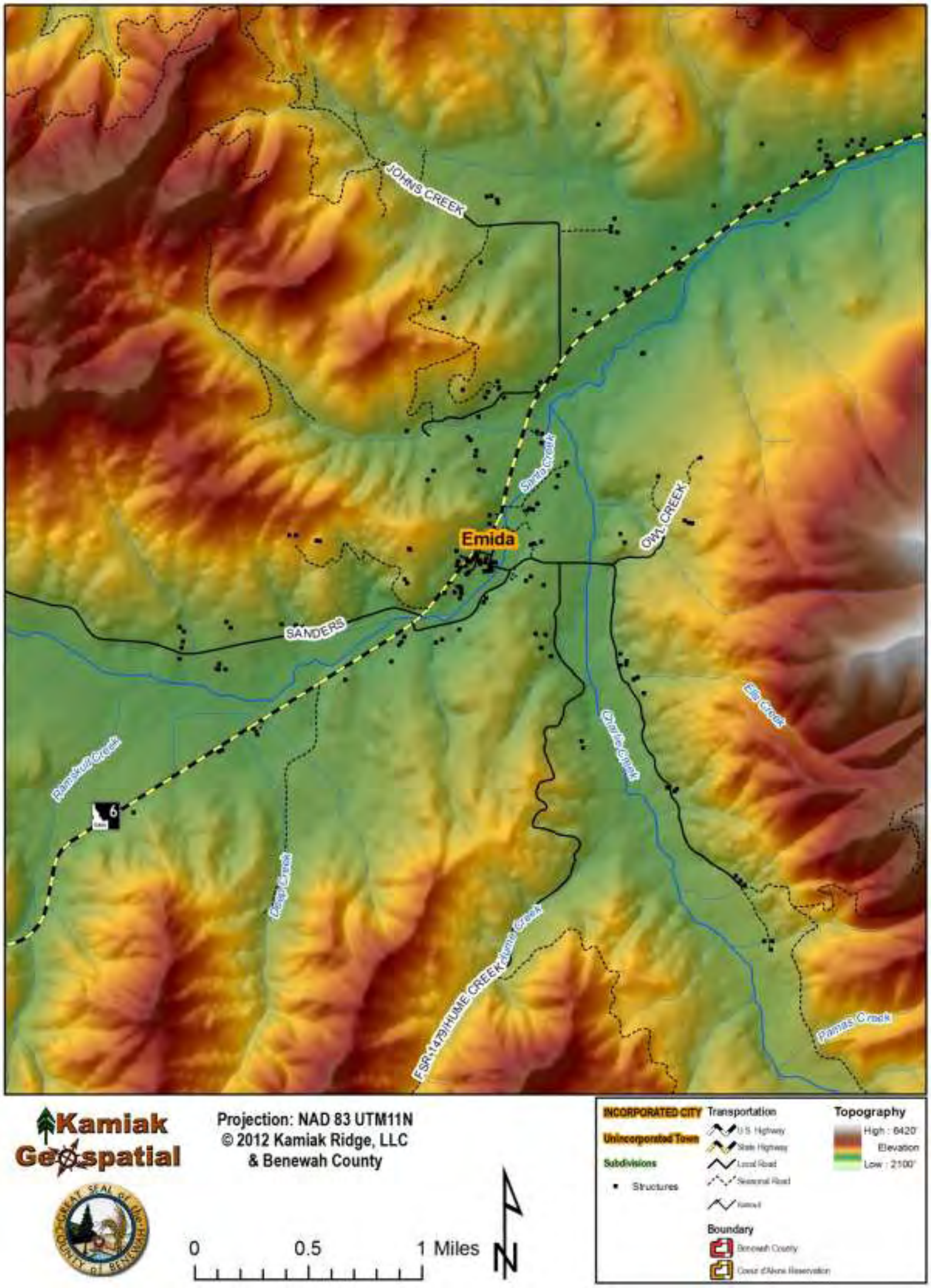


Figure 77. Emida Land Ownership.

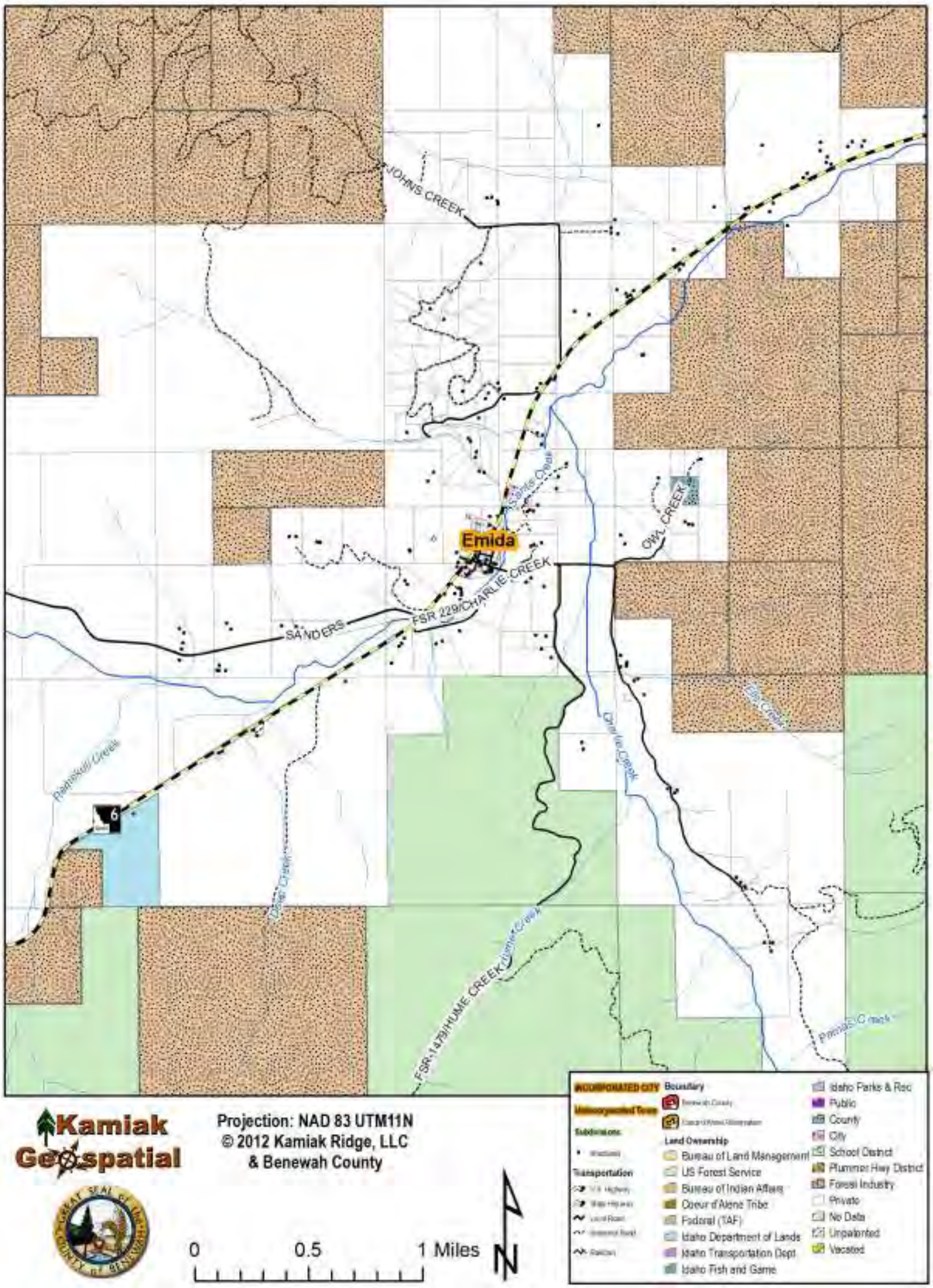


Figure 78. Emida Wildland-Urban Interface Zones.

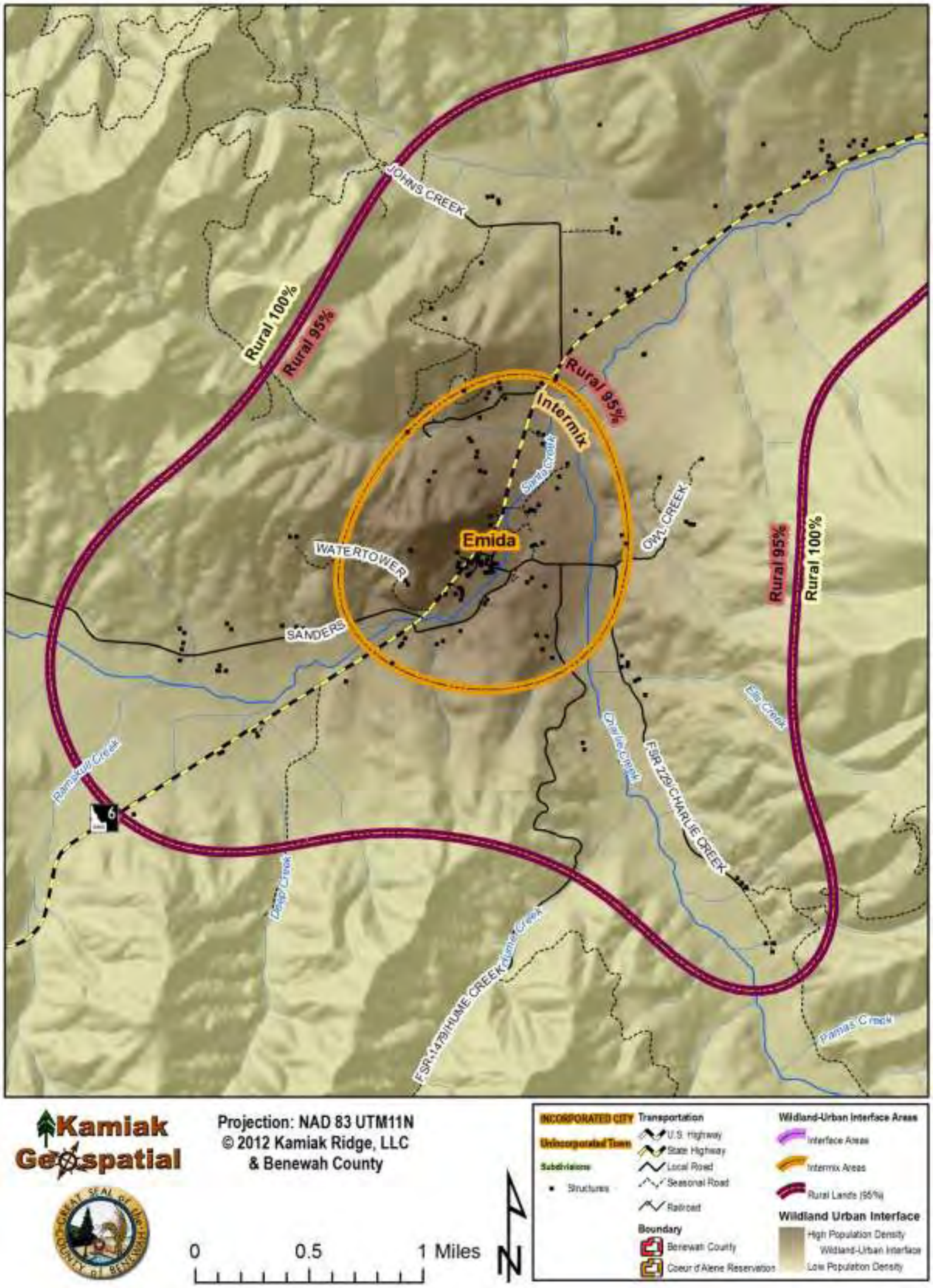


Figure 79. Emida Fire Prone Landscapes.

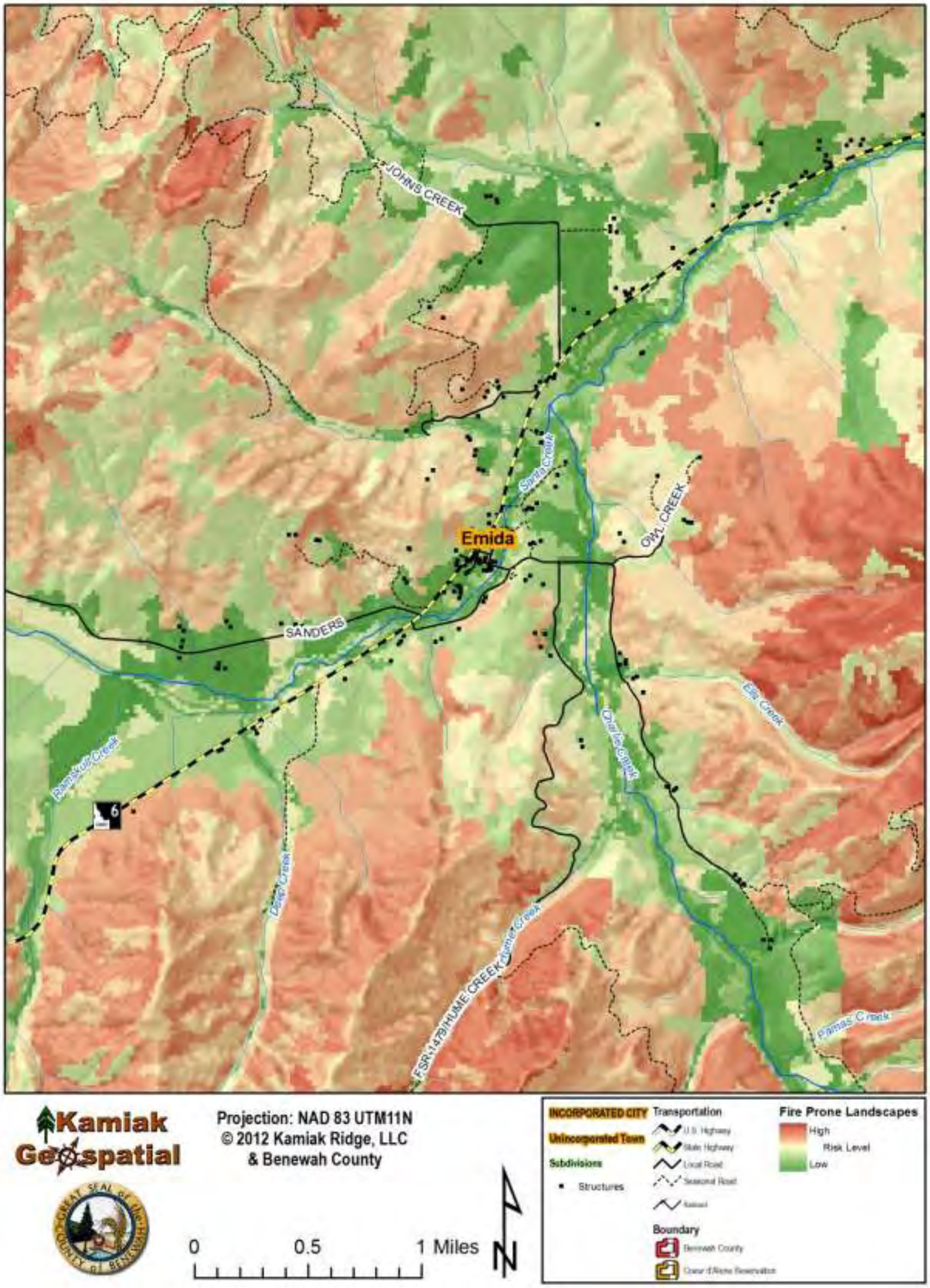


Figure 80. Emida Mean Fire Return Interval.

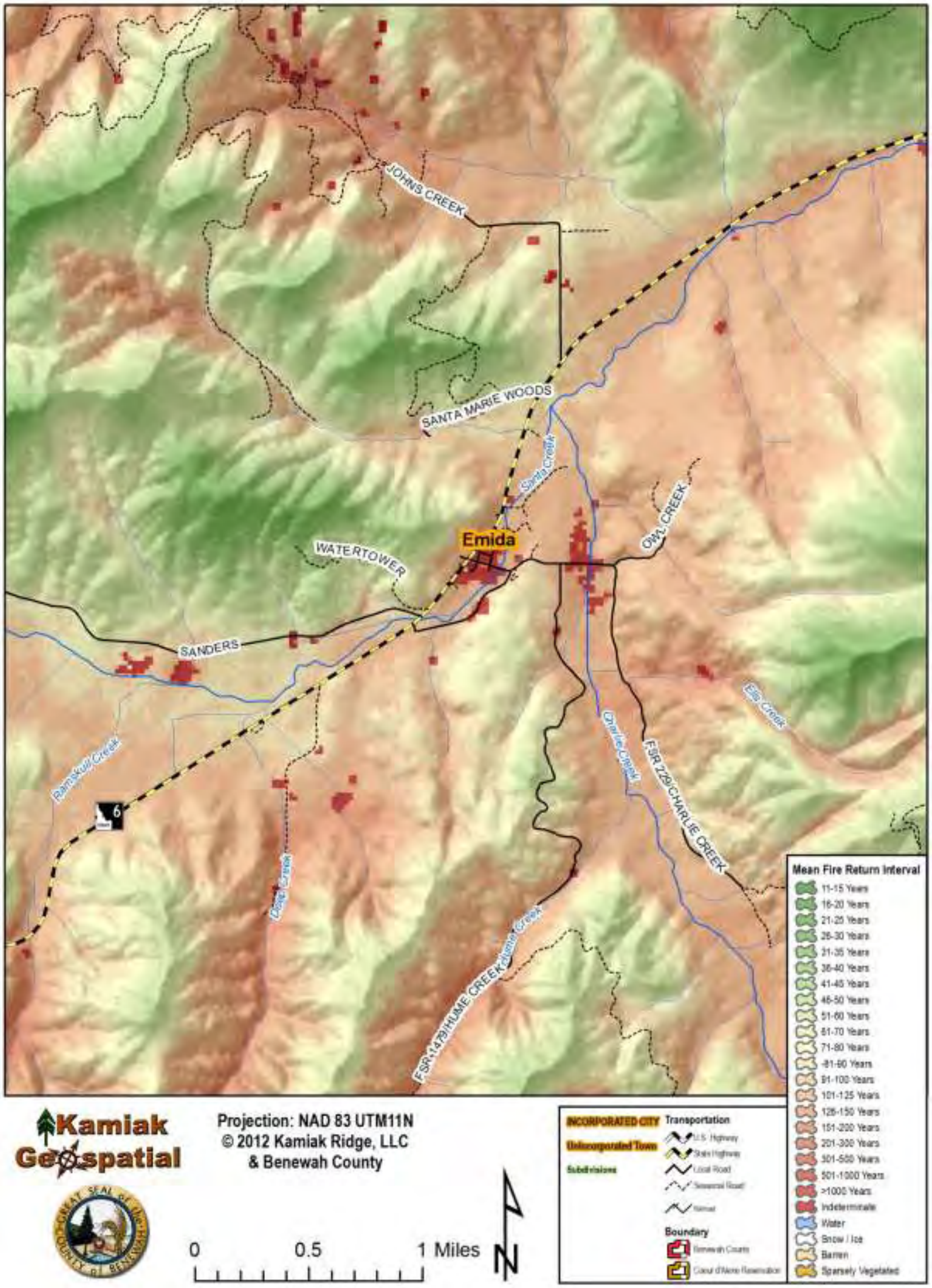


Figure 81. Emida Historic Fire Regime Groups.

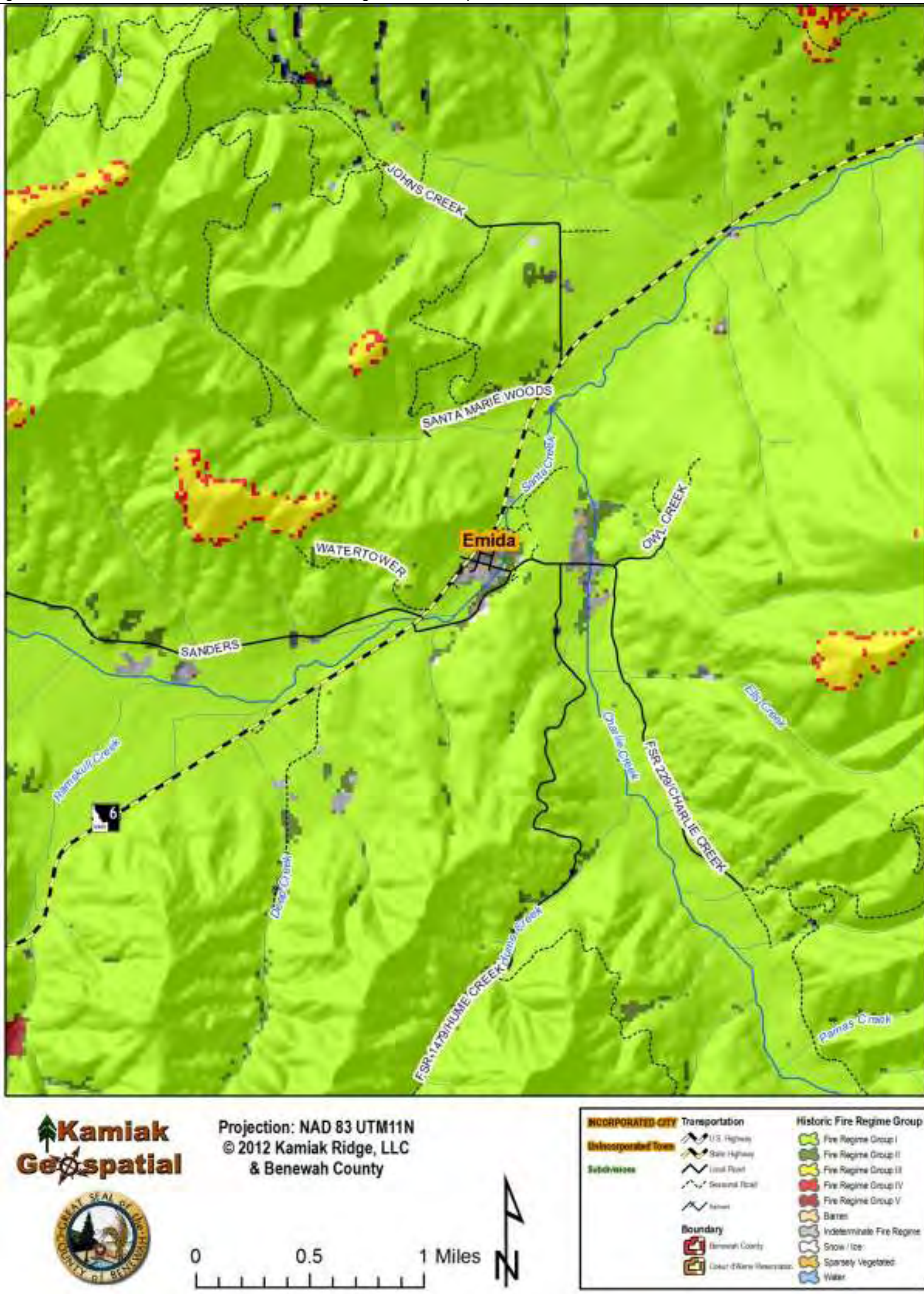


Figure 82. Emida Fire Regime Condition Class.

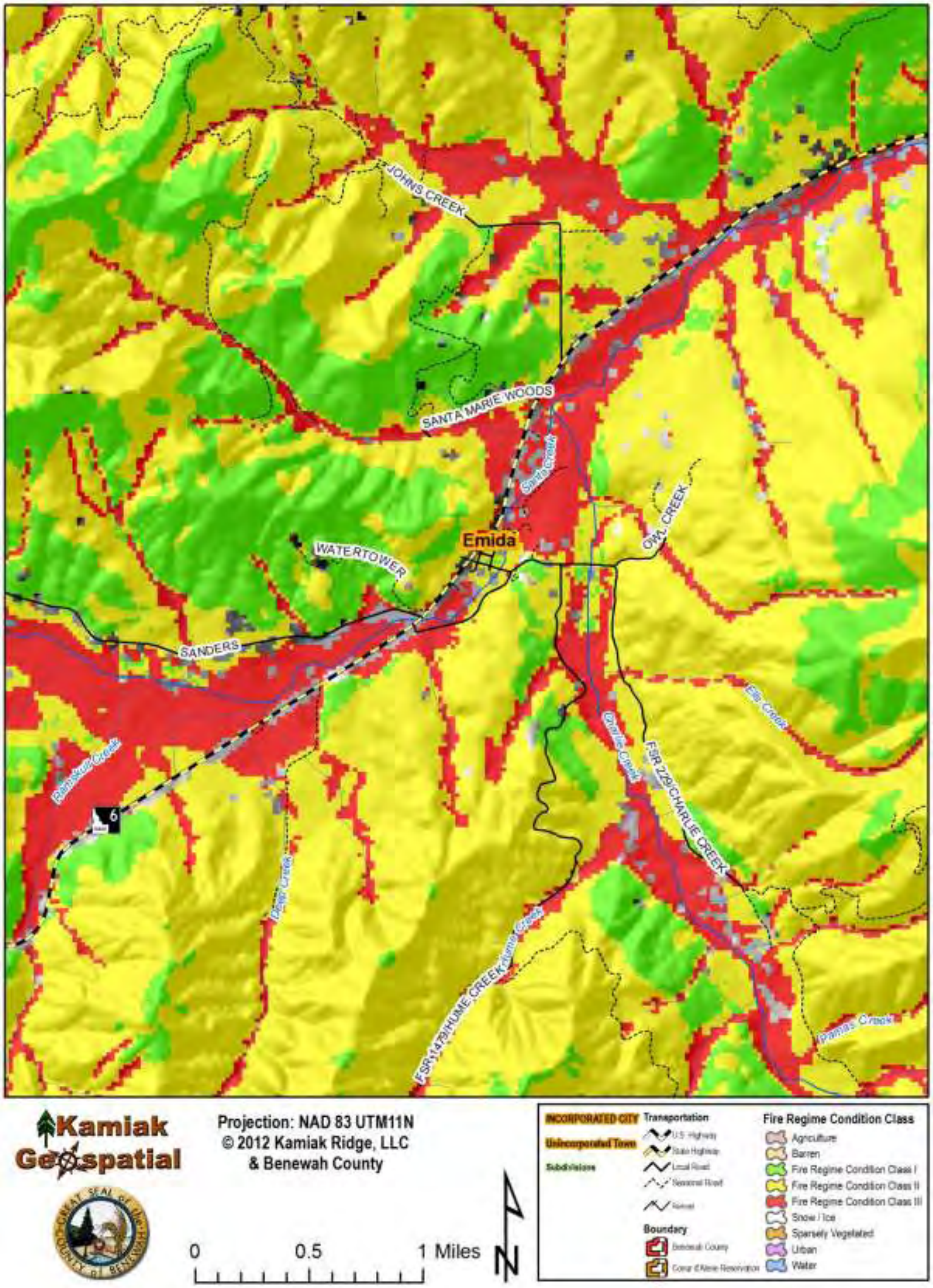


Figure 83. Emida Potential Soil Damage from Intense Fires.

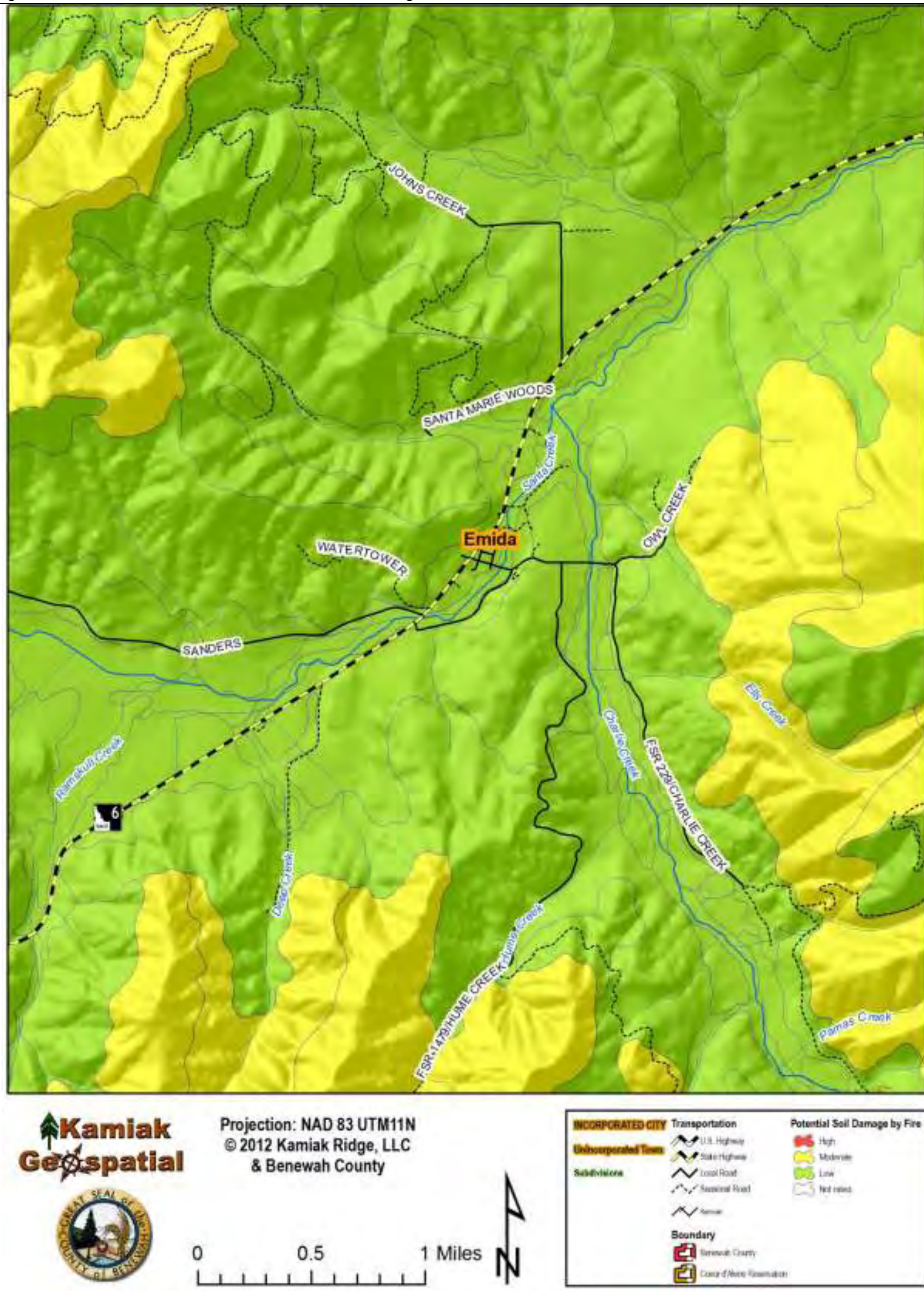


Figure 84. Santa Creek NAIP Aerial Imagery.

Figure 85. Santa Creek Topography.

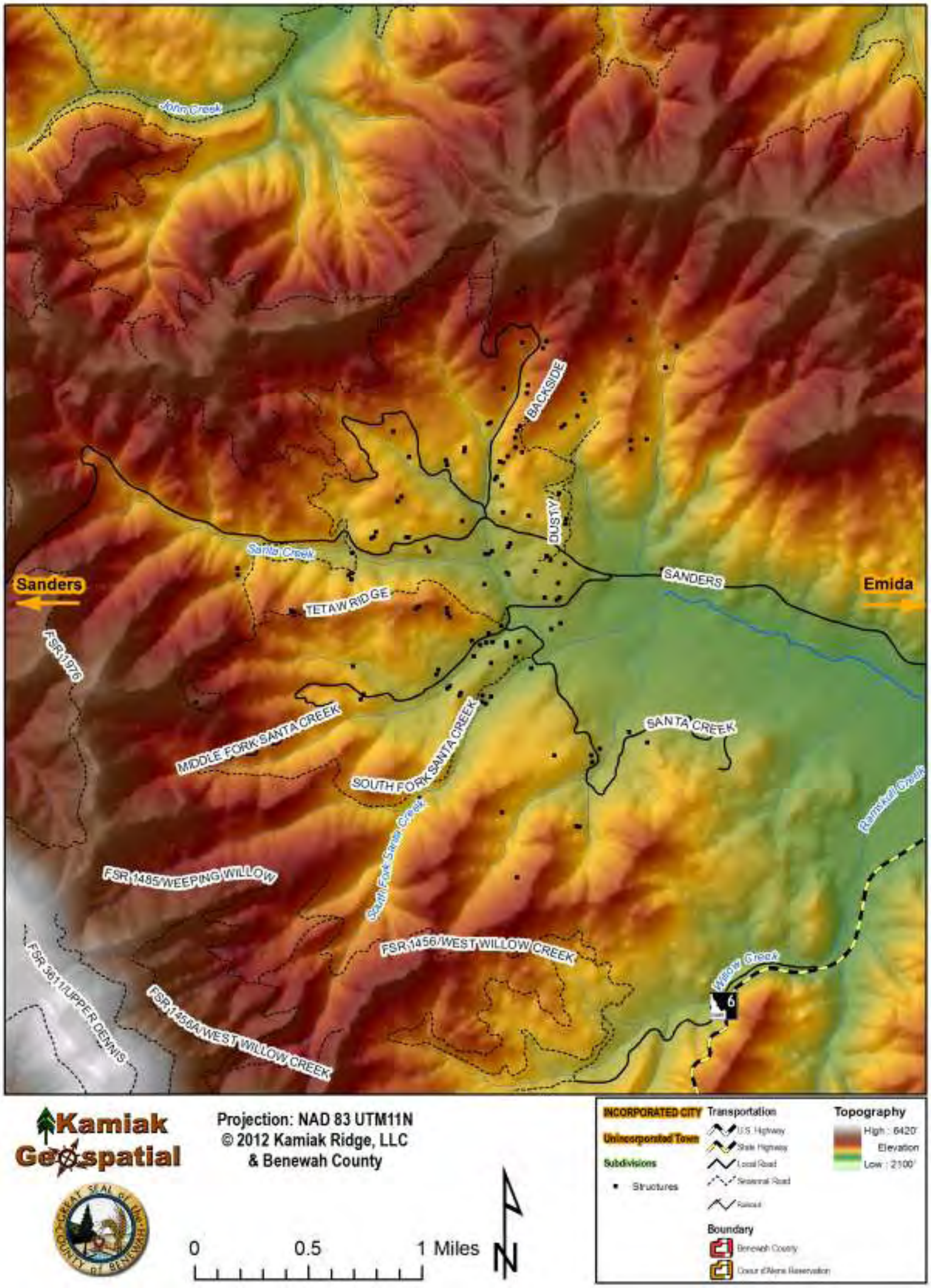


Figure 86. Santa Creek Land Ownership.

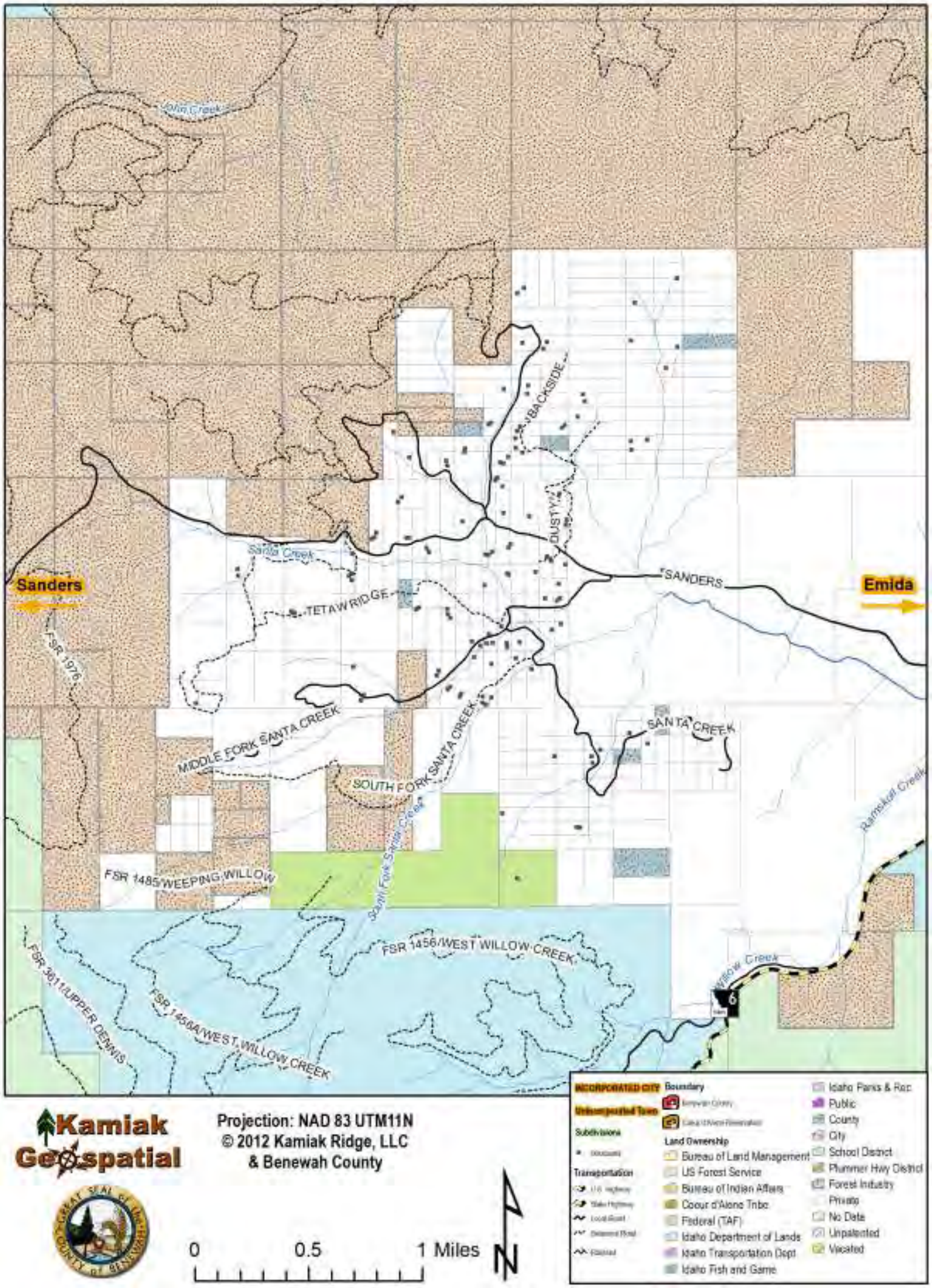


Figure 87. Santa Creek Wildland-Urban Interface Zones.

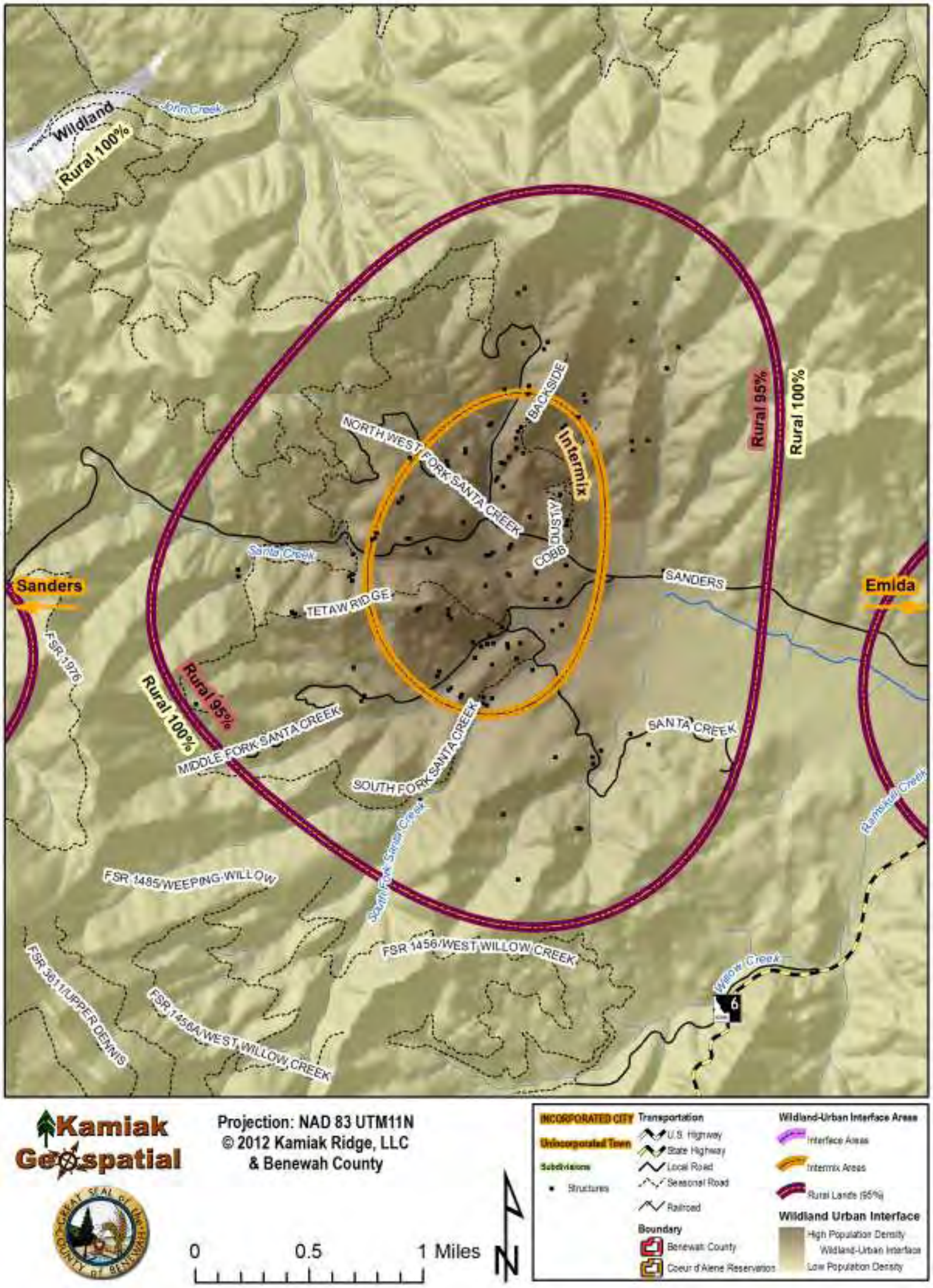


Figure 88. Santa Creek Fire Prone Landscapes.

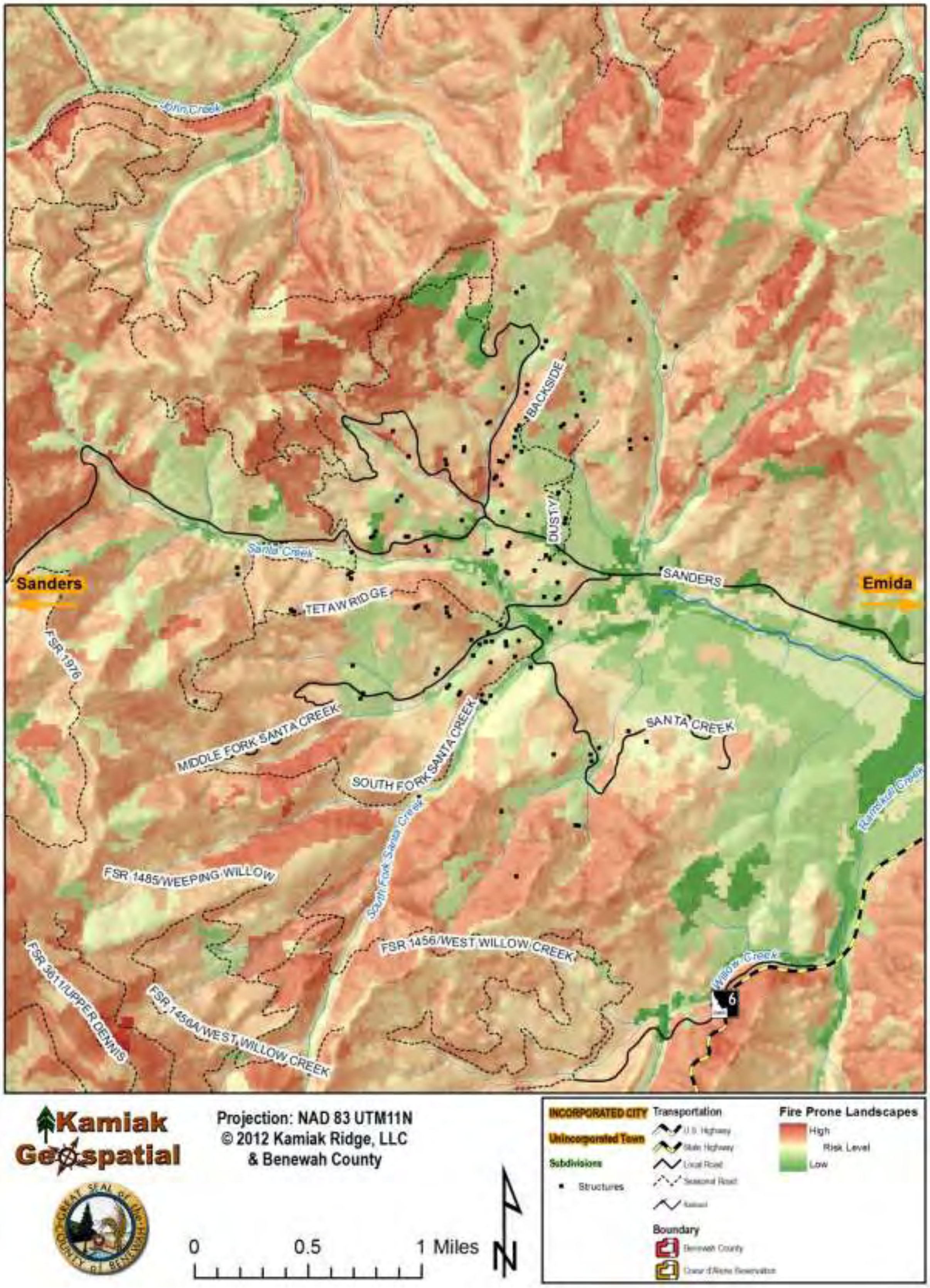


Figure 89. Santa Creek Mean Fire Return Interval.

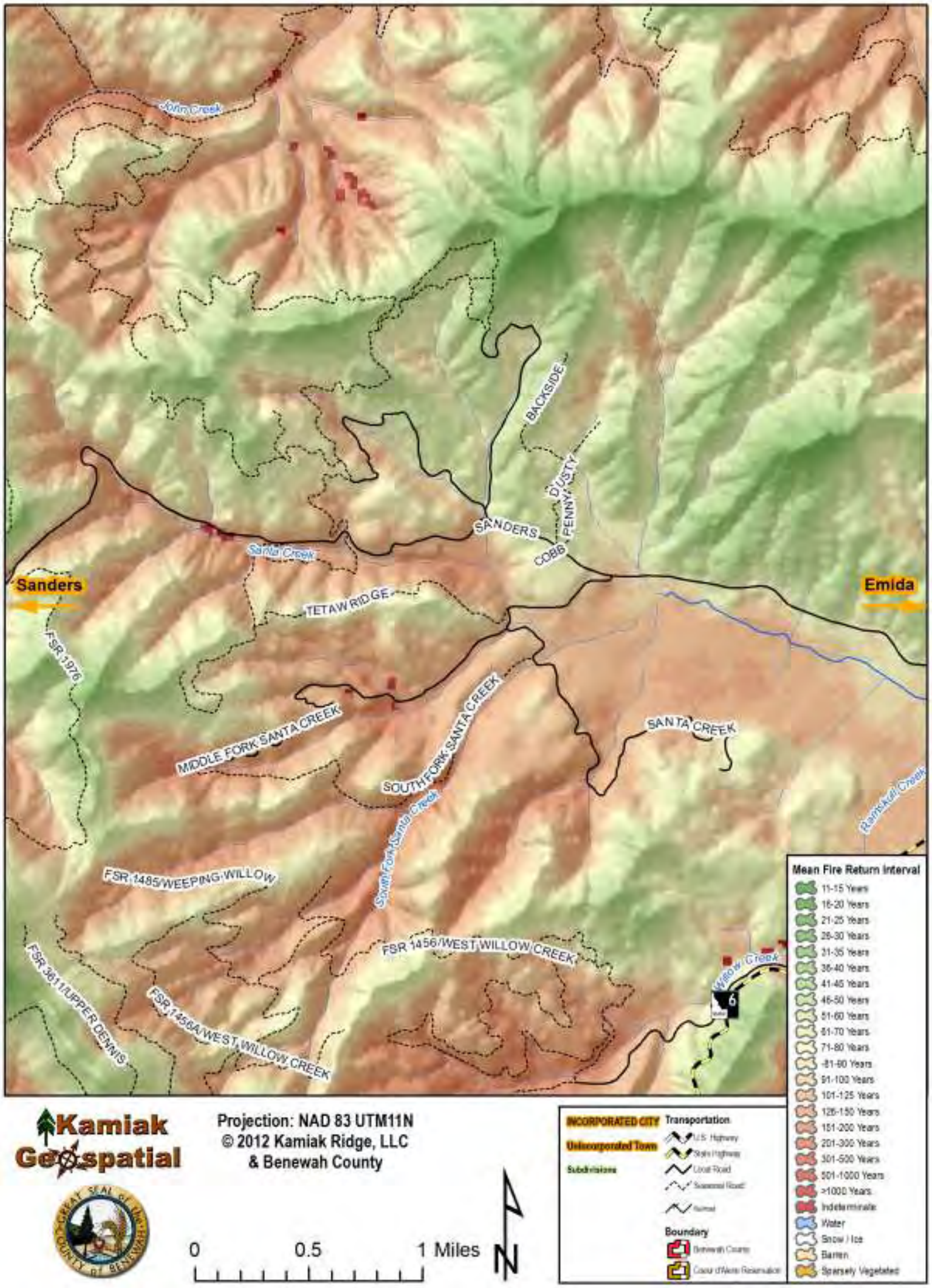


Figure 90. Santa Creek Historic Fire Regime Groups.

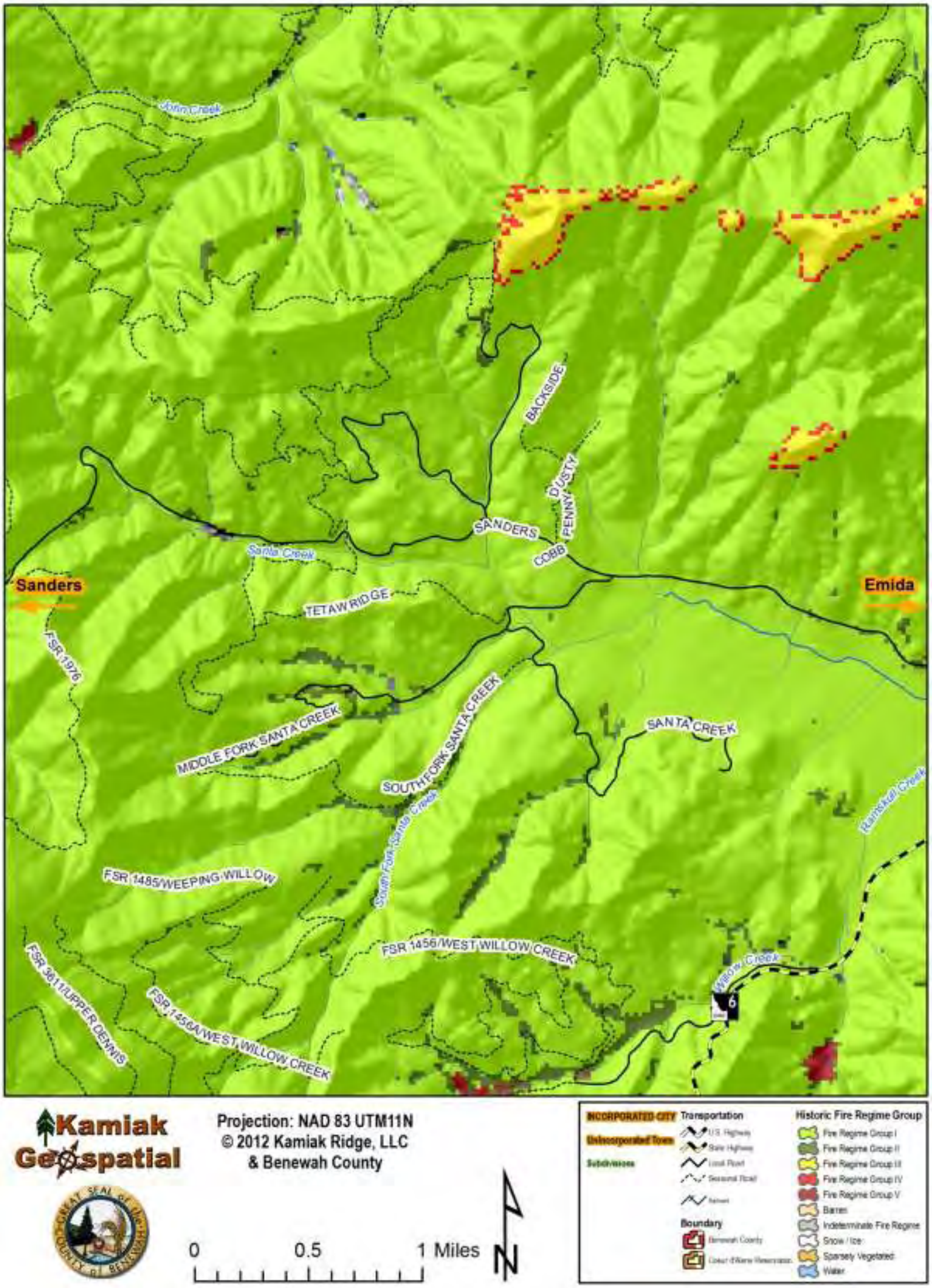


Figure 91. Santa Creek Fire Regime Condition Class.

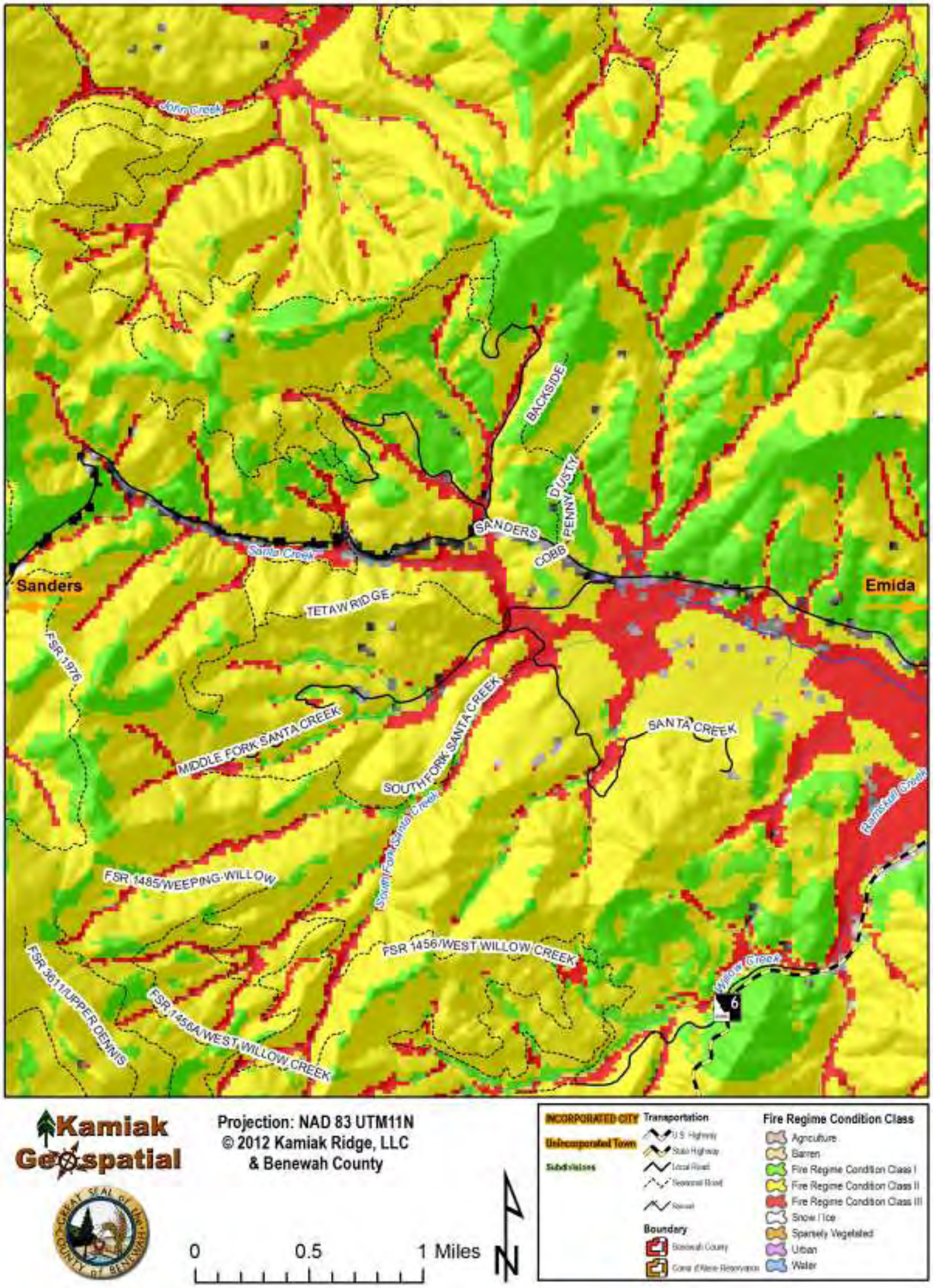
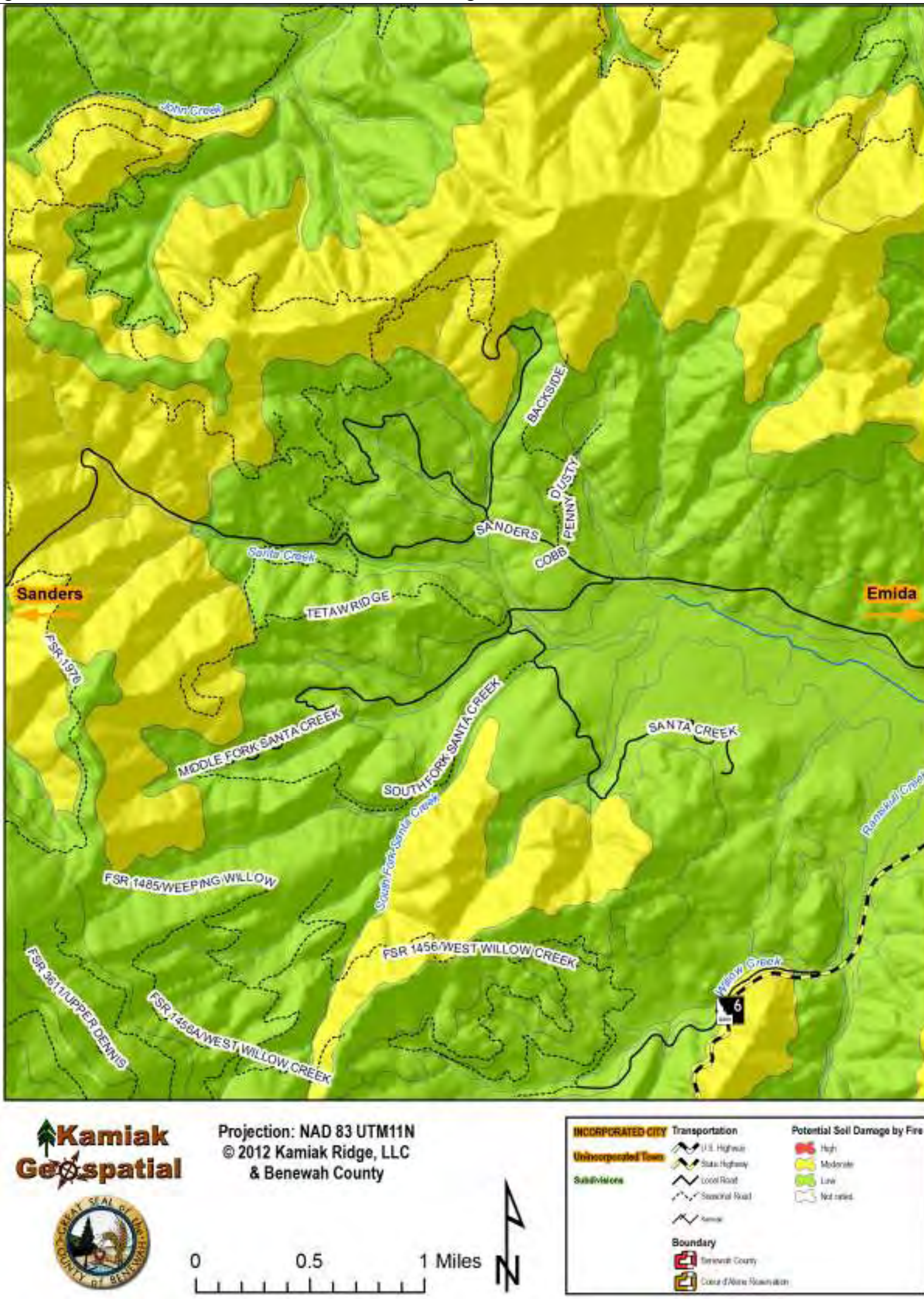


Figure 92. Santa Creek Potential Soil Damage from Intense Fires.



5.4. Fernwood and Santa

5.4.1. Community Assessment

Fernwood and Santa are located along State Highway 3, approximately 14 to 19 miles south of St. Maries. Santa includes about 250 structures and Fernwood about 320-350 structures. The primary risks to wildfire to these two communities lie with those structures located in the forested areas and along the roads leading into the foothills to the east and west. These structures are at elevated risk due to their juxtaposition of heavily forested areas surrounding populated places, as well as difficult access to individual homes along those roads. Individual home assessments can help identify those structures that are at the highest risk due to a lack of suitable defensible space and clearly marked driveways leading to homes and outbuildings (Figure 93). Some of these structures are located in very steep areas, where wildfire can spread with a faster rate, and are susceptible to higher wind gusts.

Figure 93. Home built along forest line with a heavily forested, steep hillside behind structure resulting in poor defensible space although the front of the property is well-protected.

Wildfire fuel treatment projects have taken place in and around these communities in 2010 and 2011. The majority of these projects have taken place in the needed areas of Carpenter Creek and Crystal Creek. The wildland fuels mitigation projects applied to thin vegetation along Tamarack Road should also be applied to Renfro Creek and Bigelow Mill Roads; the results were effective.

The primary access into the area is from State Highway 3, a paved two-lane highway that extends to the north and south. There are several additional escape routes on forest roads that lead away from these communities in all directions; however, some may be restricted by gates or logging activities. Most of these forest routes are located in areas at high fire risk due to the close proximity of continuous fuels along the roadway. In the event of a wildland fire, it is likely that one or more of the escape routes would become impassable. Signs identifying alternate escape routes would reduce confusion and save time in a wildfire situation. Additionally, many homes are located on high risk one-way in, one-way out secondary roads and/or private driveways that could become threatened by wildland fire. One-way in, one-way out access roads not only increase the likelihood of residents becoming trapped; they are also dangerous for responding firefighters.

Road names and house numbers are generally present throughout the area, yet many of the bridges in the vicinity of Fernwood and Santa lack adequate signs showing weight ratings. Power to these communities is provided through above ground power lines. Fernwood relies on a surface water system from the Adams Creek Watershed as their primary source of water; however, a backup well has been installed for residences within the main population of town. Santa depends solely on a municipal well. The Adams Creek Watershed should be given a high priority for potential fire mitigation treatments. Both communities are encompassed by the Fernwood Fire Department district boundaries.

5.4.1.1. Little Carpenter Creek Road

There are approximately 100 structures located along the Little Carpenter Creek Road accessed from Forest Roads 494 & 1944. This area has grown significantly since the 2005 Benewah County WUI Wildfire Mitigation Plan was adopted. Wildfire fuels mitigation such as: timber thinning, brush clearing, and grazing projects have been undertaken to protect the community (Figure 94). There are many areas throughout the community that have fuel breaks, but there are additional areas where this work is needed. Roads accessing clusters of homes should be given special attention as the community continues to grow so as to ensure safe access by firefighting equipment and escape by home owners in the event of an evacuation. Although this area is being actively managed to provide additional protection to homes, it is a remote community and is located within heavily forested areas.

Figure 94. Thinning mitigation project completed in 2011 (left). Section along access from in need of thinning mitigation project (right).

5.4.1.2. Crystal Creek Mobile Home Park

There are approximately 20-25 structures located adjacent to the Crystal Creek Road and Tamarack Road areas. This community is located approximately ½ mile north of the main downtown area of Fernwood. This cluster of homes is located in a fairly low-risk area due to tree thinning projects located along State Highway 3 and Crystal Creek Road (Figure 95). In addition, there has been thinning and brush clearing completed along Tamarack Road, leading to a few individual homes to the northeast side of town. This area is at reduced wildfire risk thanks to these mitigation activities.

Figure 95. Completed thinning mitigation project; continued maintenance needed to ensure longtime safety.

5.4.1.3. Elkhorn Meadows

There are approximately 50-60 structures considered part of the Elkhorn Meadows area. The majority are located on, or surrounded by, meadow and farmland, making wildfire risks relatively low (Figure 96). Those structures located along Forest Service Road 3330, in general, have good defensible space established and have a good access road in and out of the area. This road is a one-way in one-way out road, and is surrounded by a heavily forested area leading into the foothills. There has not been wildfire mitigation measures taken in the past few years to protect homes from wildfire, and some thinning and brush clearing could help better protect this area.

Figure 96. Agricultural land between Santa and forest line.

5.4.1.4. Sheep Creek Road

There are approximately 35-40 structures located along Sheep Creek Road. Located to the Southwest of the community of Santa, approximately 2 miles off State Highway 3, it is accessible by Sheep Creek Road only, due to a Potlatch gate restricting access to the north or west. This area has been logged and converted from forested land to agricultural land (Figure 97). Structures located here have a moderate risk of loss due to wildland fire due to the lack of access.

Figure 97. Some areas that have been converted to agricultural lands.

5.4.2. Potential Mitigation Activities

Since the 2005 Benewah County WUI Wildfire Mitigation Plan was adopted, the communities of Fernwood and Santa, as well as their surrounding smaller communities, have grown in size bringing more structures and possible loss in a wildfire event. Older homes in this area located in the downtown areas of Fernwood and Santa, and in the St. Maries River Valley, are at a low risk of loss due to wildland fire because of the many surrounding grass fields and agricultural swaths of land provide good fire breaks and low resistance to wildfire control. Those homes located along forest roads leading into the foothills are at a significantly higher risk to wildfire.

Logging activities throughout the surrounding areas of Fernwood and Santa create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures (Figure 98).

Figure 98. Brush piles, no matter how large, should be burned and cleared from forest lines.

Homes located along steep hillsides and surrounded by the heavily forested lands of the area should be individually assessed for suitable defensible space and access in and out of the community. Continued thinning and brushing projects should be encouraged, especially in areas that help protect larger clusters of homes located to the east of Fernwood and to the Northwest of Santa.

As some of the smaller communities surrounding Fernwood and Santa continue to grow, consideration for improved access into these areas should be assessed. Paved roads can greatly increase the safety of homeowners escaping wildfires in the event of an evacuation, as well as grant safe access to firefighters and their equipment. Power lines leading to these communities need to be protected from the threat of falling trees through vegetation removal projects that decrease the risk of trees falling on power lines, thereby starting a wildfire with heavy fuels located in the immediate area (Figure 99).

Figure 99. Road maintenance: power line protection needed (left); good vegetation management along Tamarack Road (right).

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the wildland-urban interface can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas along four-wheeler tracks and community campgrounds.

5.4.3. Recommendations:

1. Perform individual home site evaluations (approximately 150) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of wildfire ignition.

2. Create a defensible space around approximately 40-50 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.

3. Create a fire resistant buffer along both edges of secondary roads or one-way in, one-way out driveways that access homes identified as having risk; specifically along Bigelow Mill and Renfro Creek Roads.

4. Maintain previously thinned and burned forest areas by periodically removing accumulated surface fuels and regeneration.

5. Continue to sign and provide weight rating information on all bridges and cattle guards on access roads (Figure 100).

6. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.

7. Post signs identifying preferred escape routes.

8. Post clear regulations on fire use within recreational areas and four-wheeler tracks and provide escape proof fire rings and barbecue pits.

9. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

Figure 100. Bridge weight-limit signage accessing Carpenter Creek.

5.4.4. Community Maps

Community Maps of the Fernwood and Santa are provided to give the reader a better understanding of the area, and the concepts shared here. The following set of community maps are for Fernwood and Santa (Figure 101 - Figure 109), and the Carpenter Creek area (Figure 110 - Figure 118).

Figure 101. Fernwood and Santa NAIP Aerial Imagery.

Figure 102. Fernwood and Santa Topography.

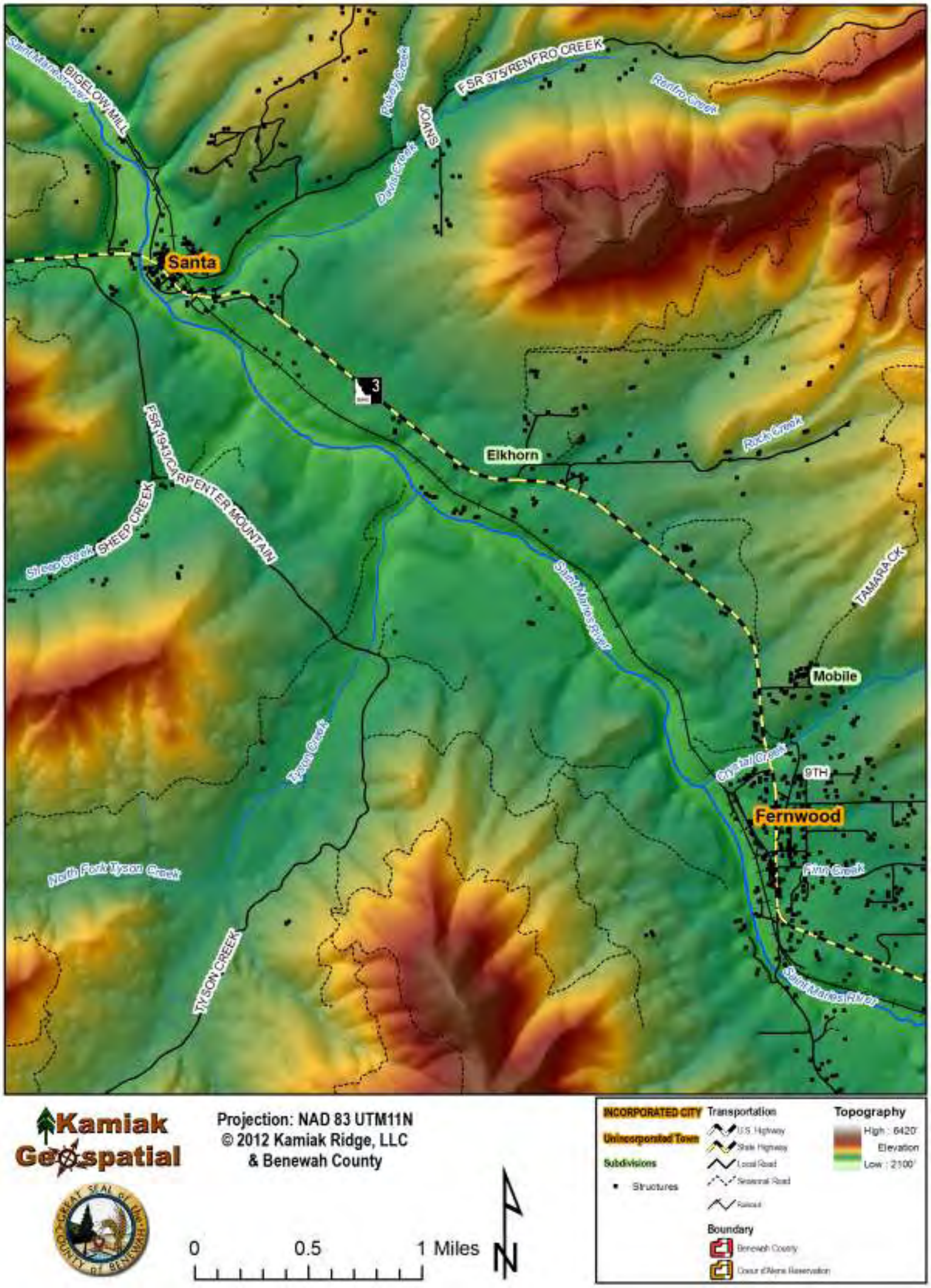


Figure 103. Fernwood and Santa Land Ownership.

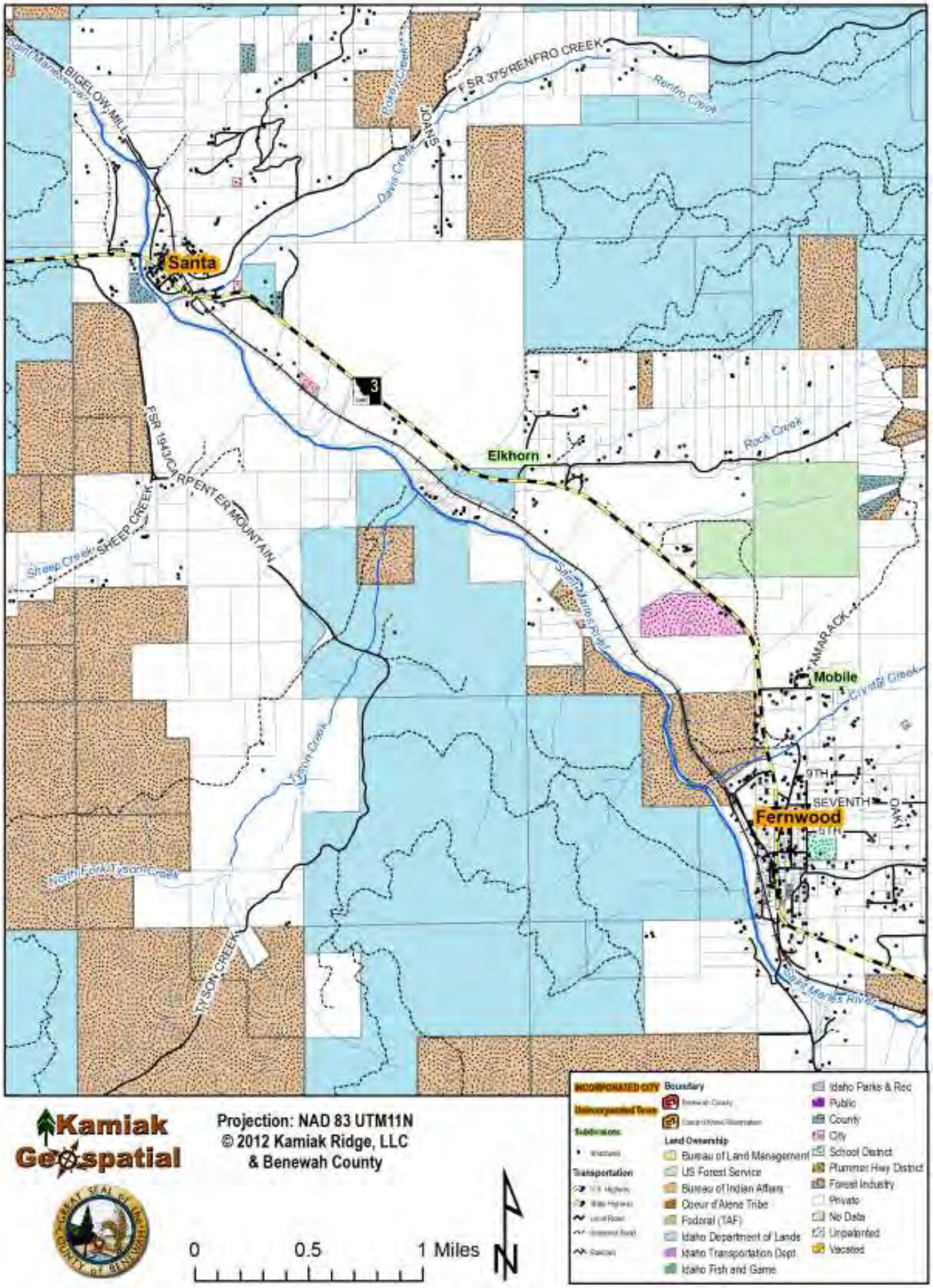


Figure 104. Fernwood and Santa Wildland-Urban Interface Zones.

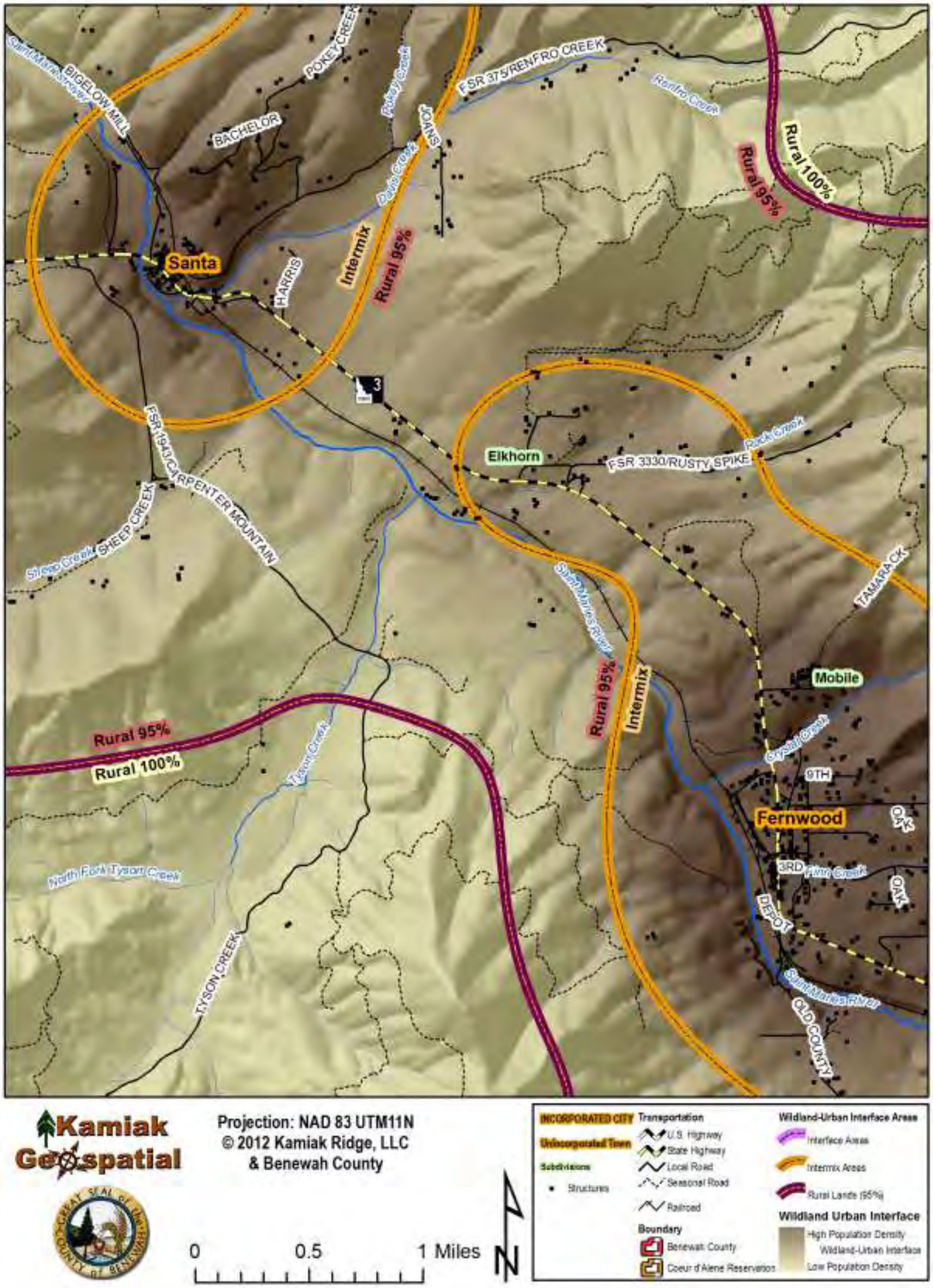


Figure 105. Fernwood and Santa Fire Prone Landscapes.

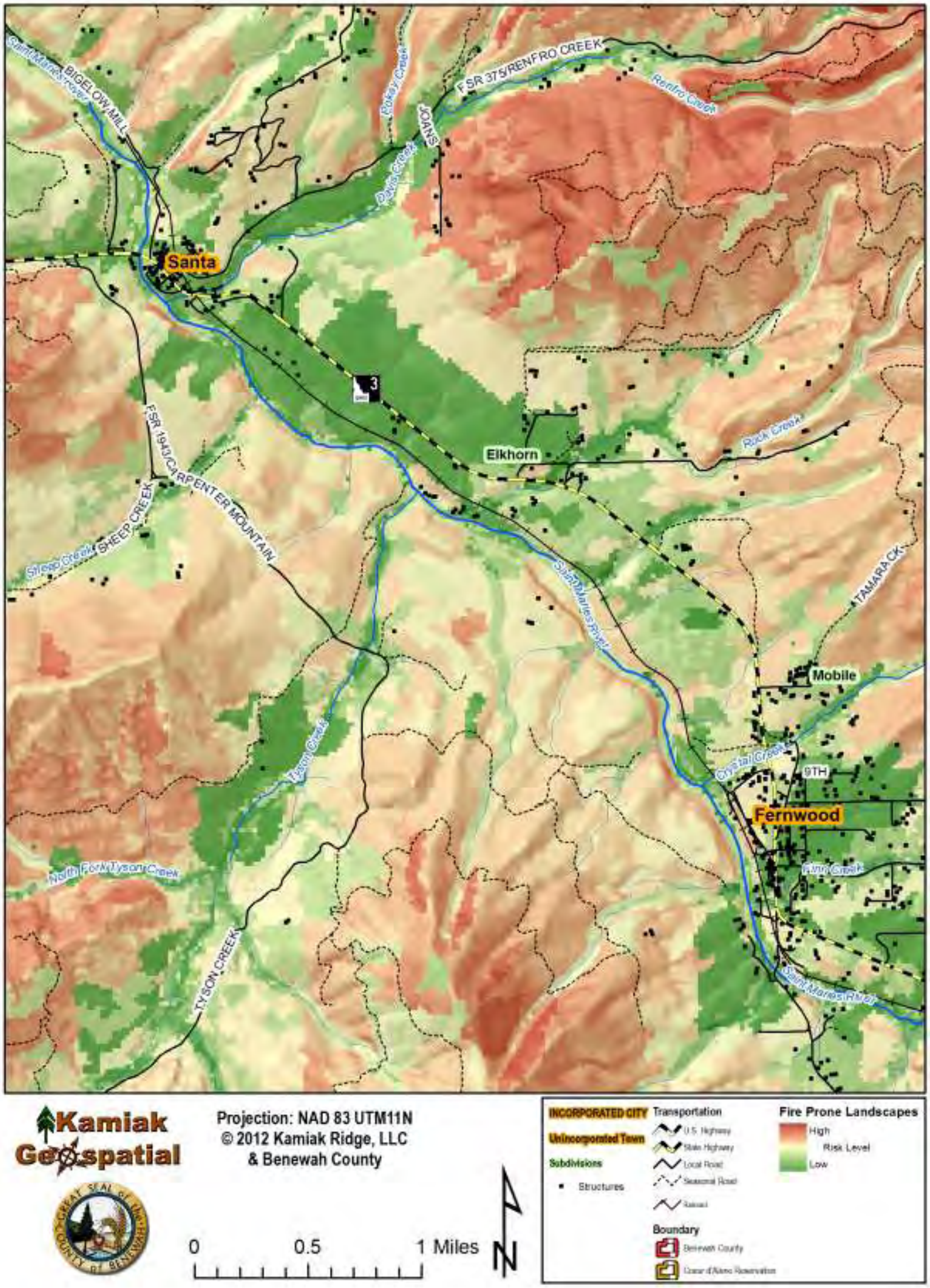


Figure 106.   Fernwood and Santa Mean Fire Return Interval.

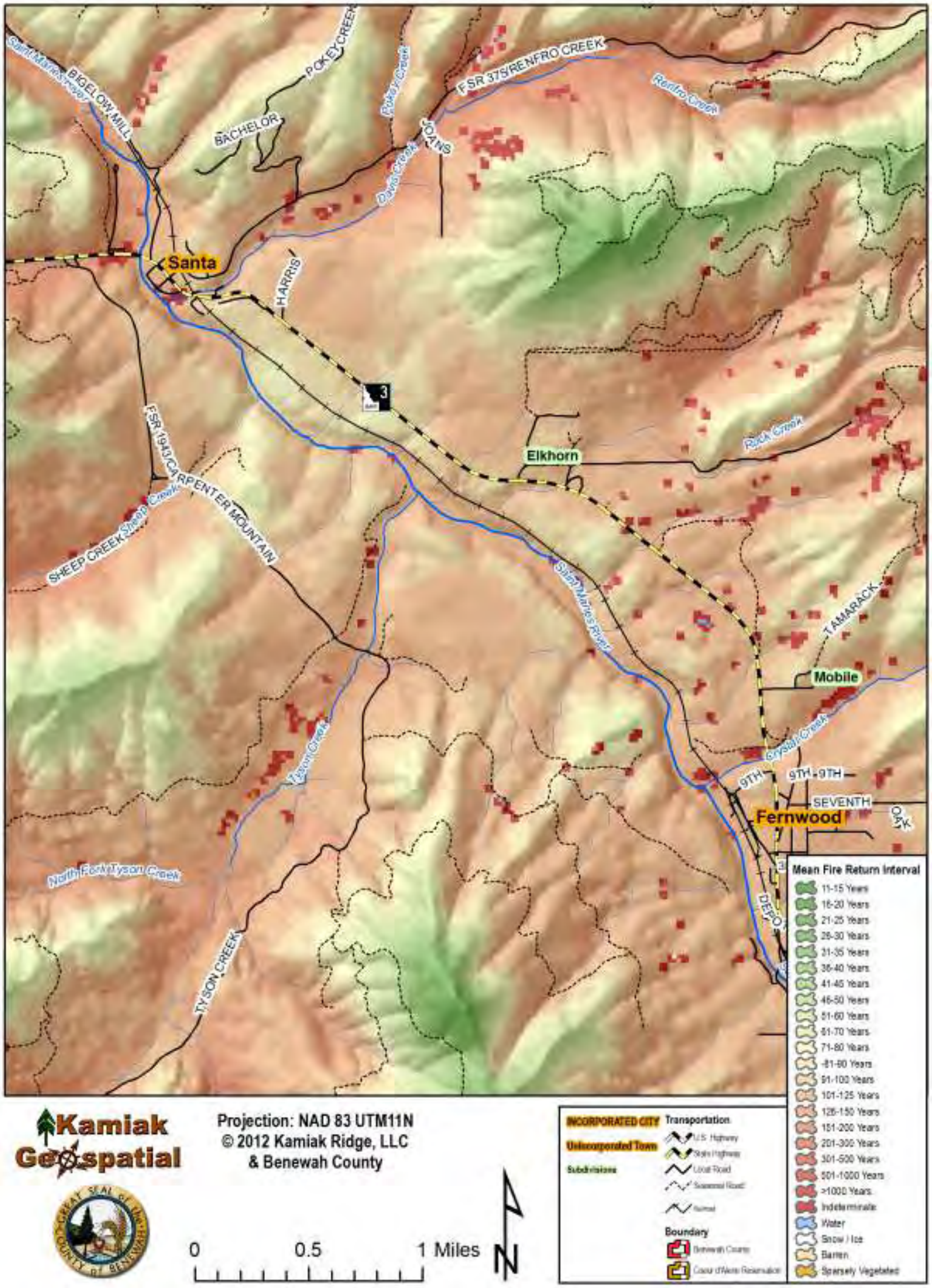


Figure 107. Fernwood and Santa Historic Fire Regime Groups.

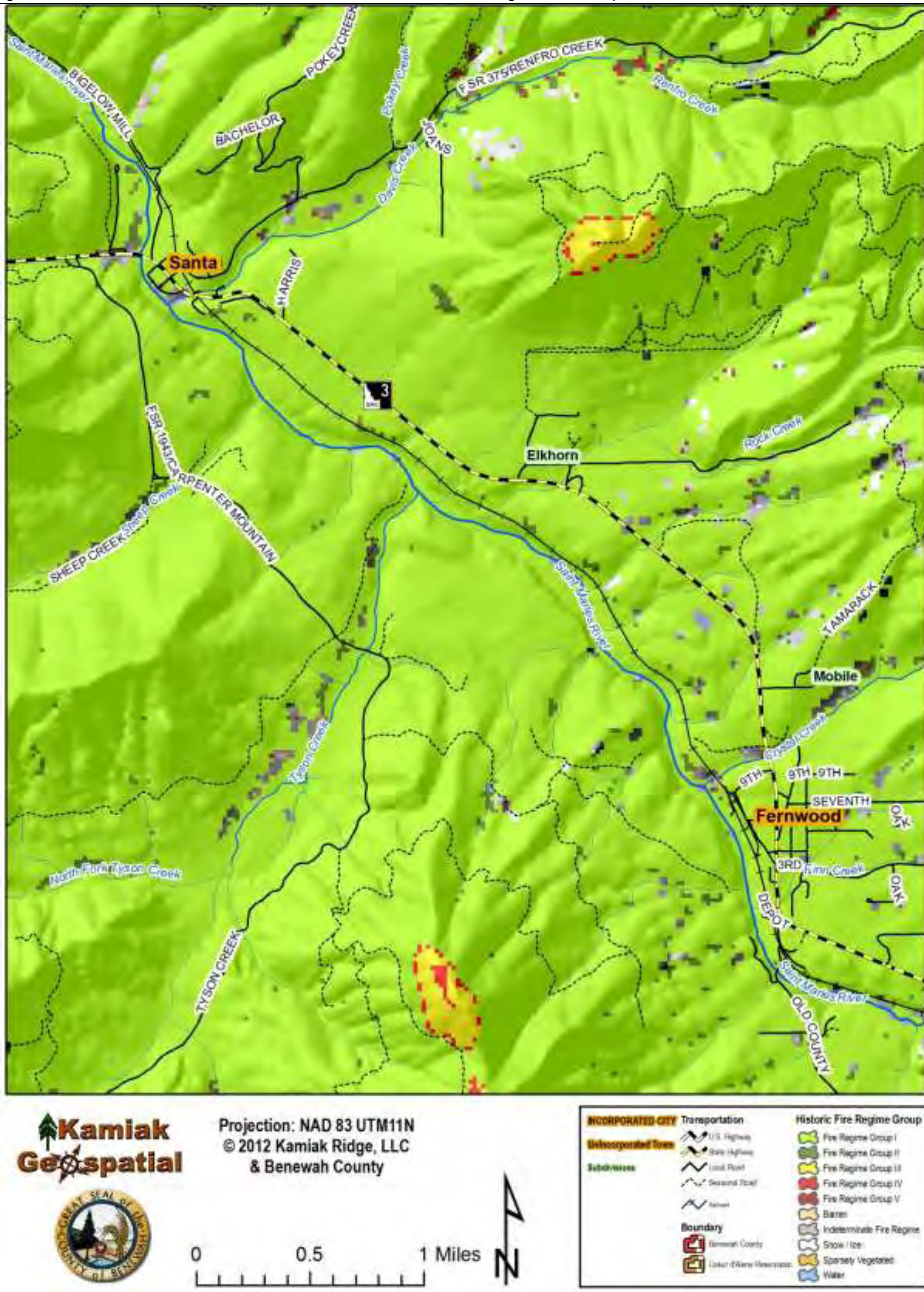


Figure 108. Fernwood and Santa Fire Regime Condition Class.

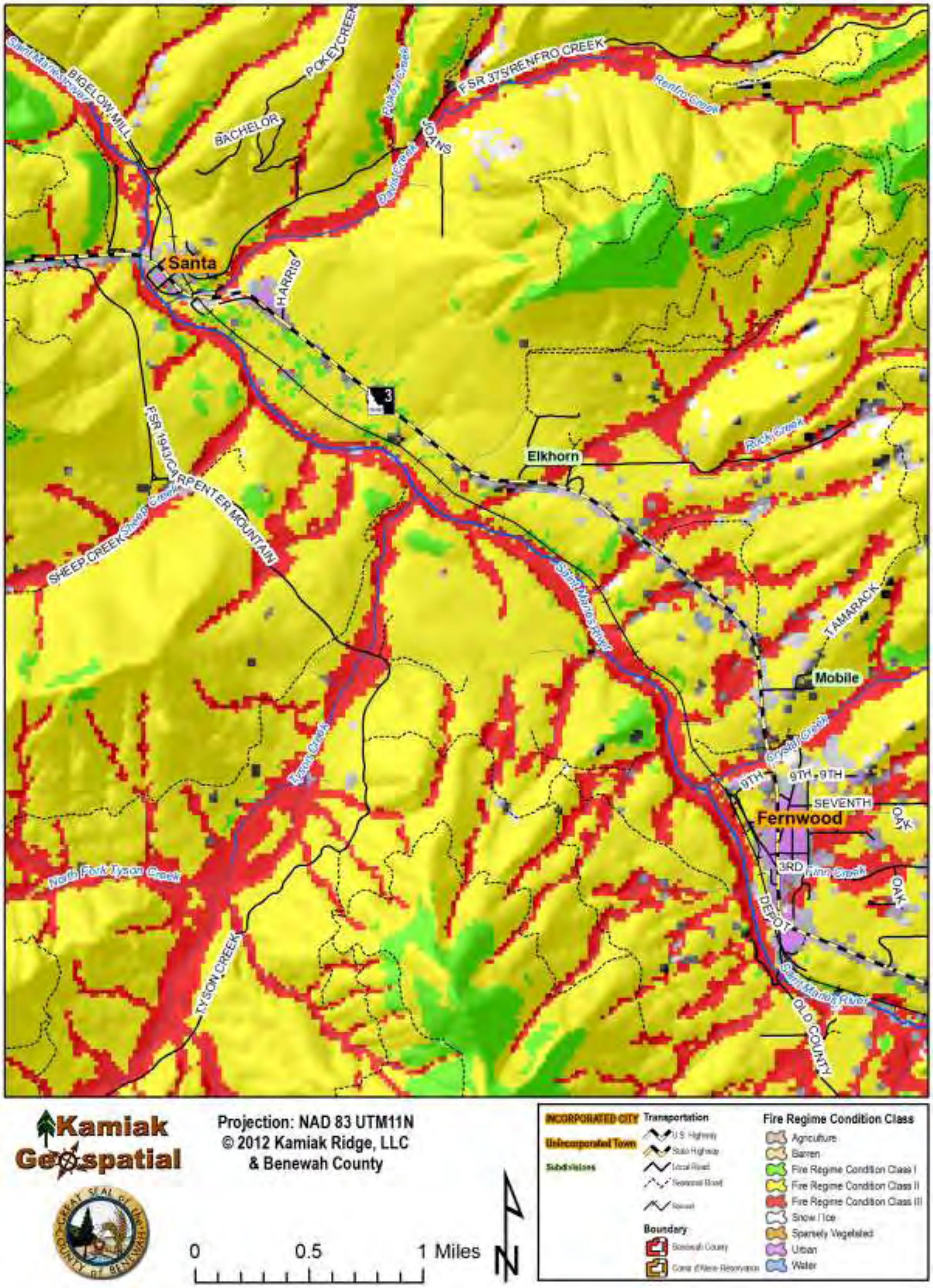


Figure 109.	Fernwood and Santa Potential Soil Damage from Intense Fires.

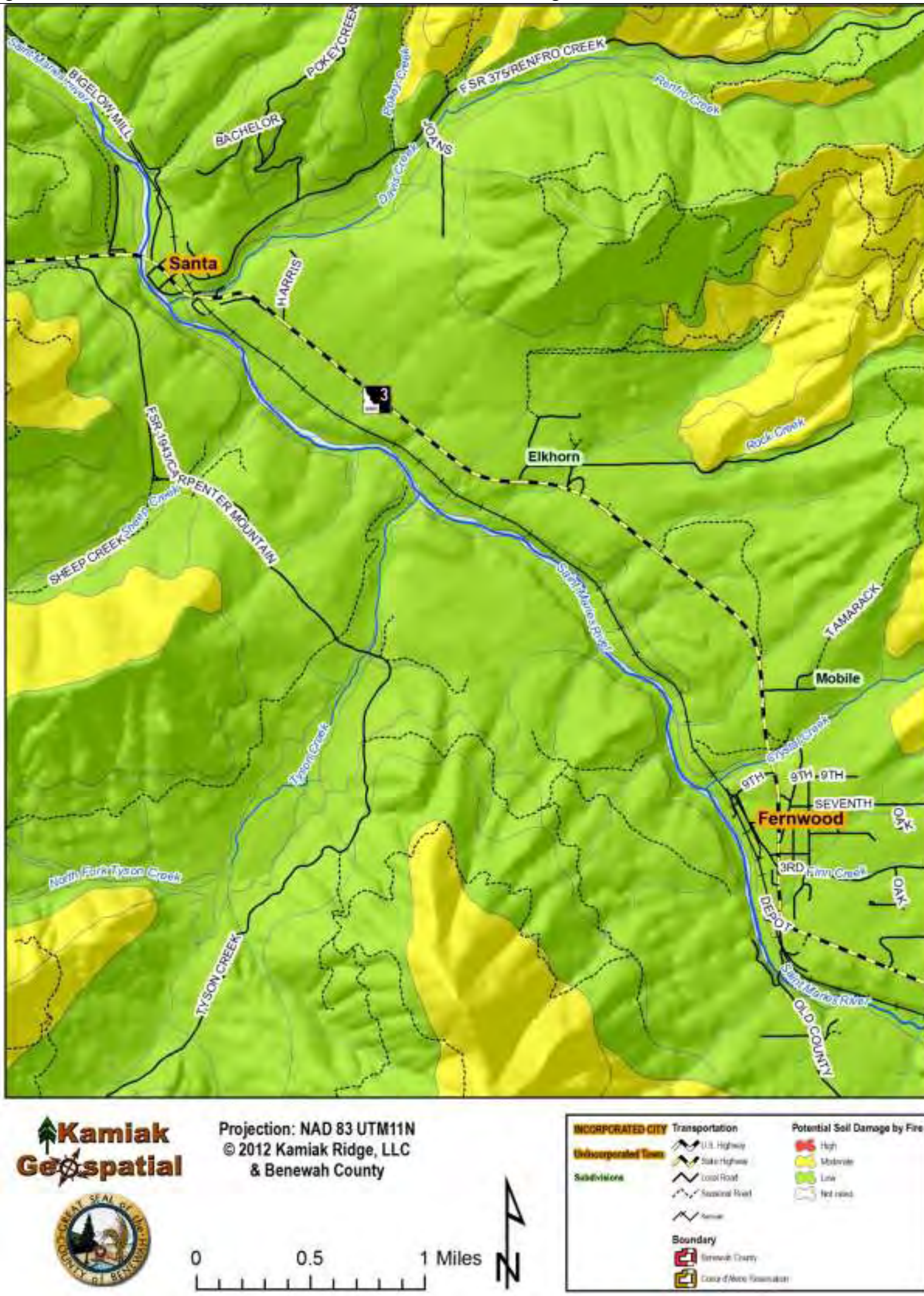


Figure 110. Carpenter Creek NAIP Aerial Imagery.

Figure 111. Carpenter Creek Topography.

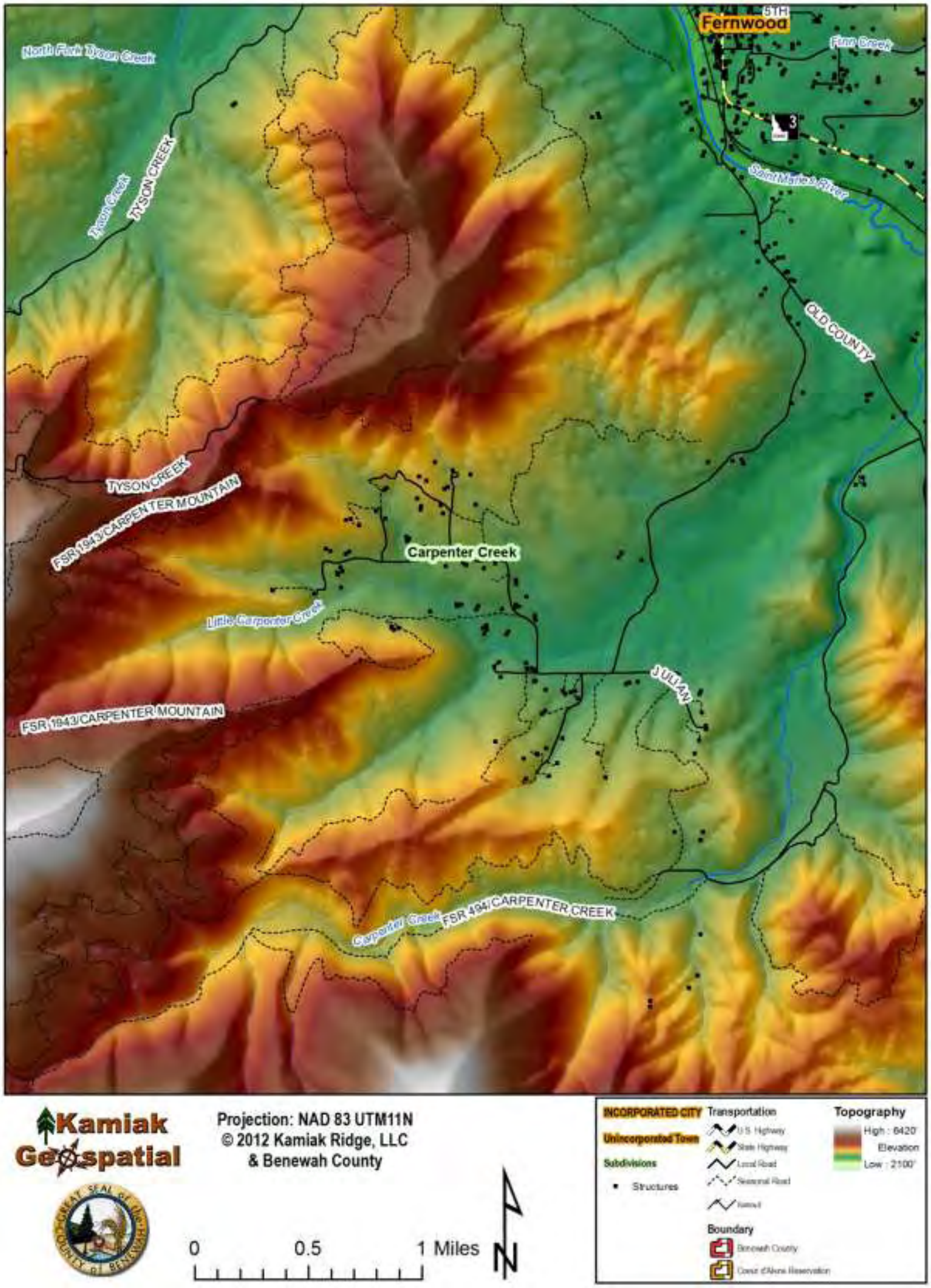


Figure 112. Carpenter Creek Land Ownership.

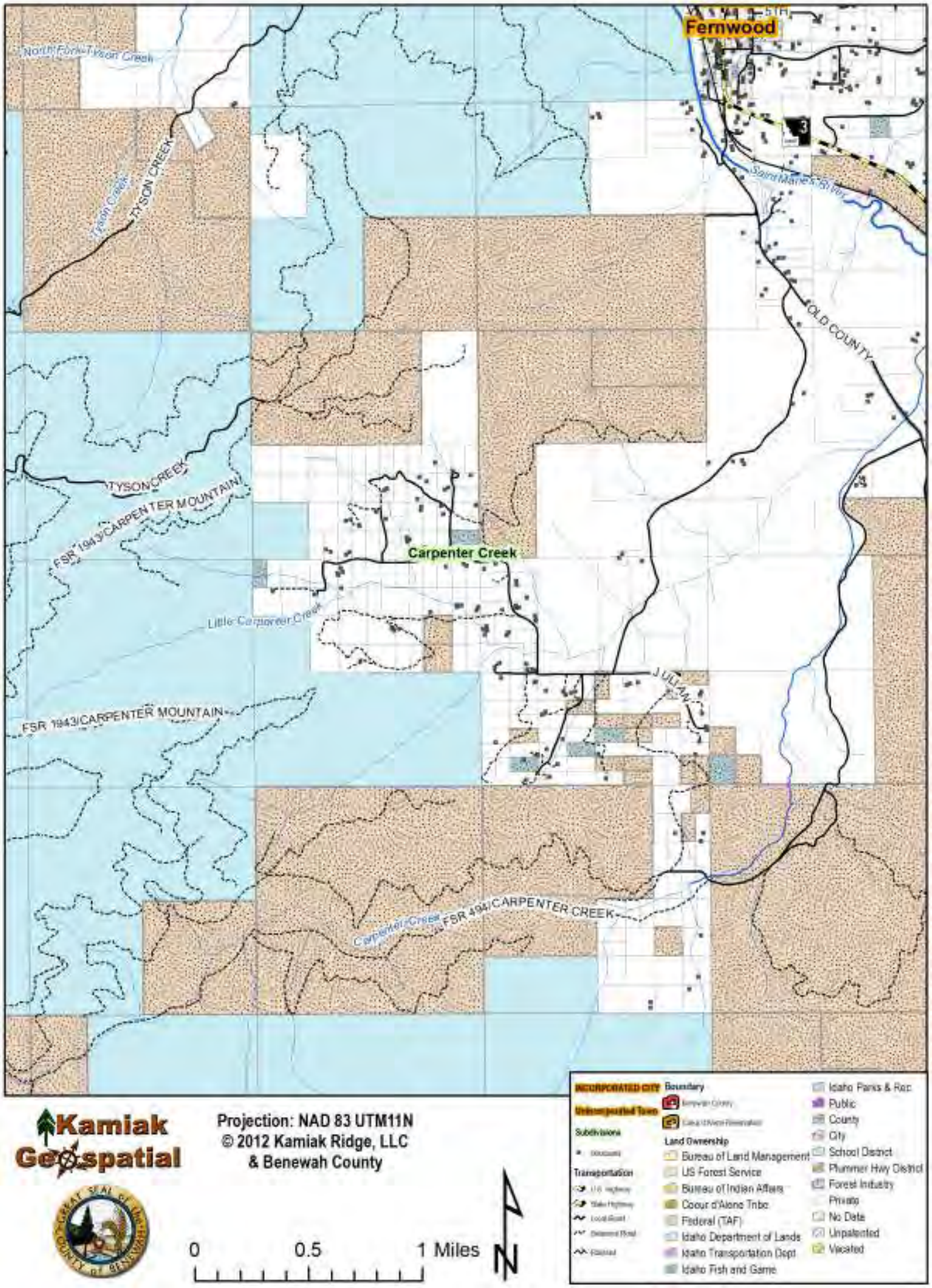


Figure 113. Carpenter Creek Wildland-Urban Interface Zones.

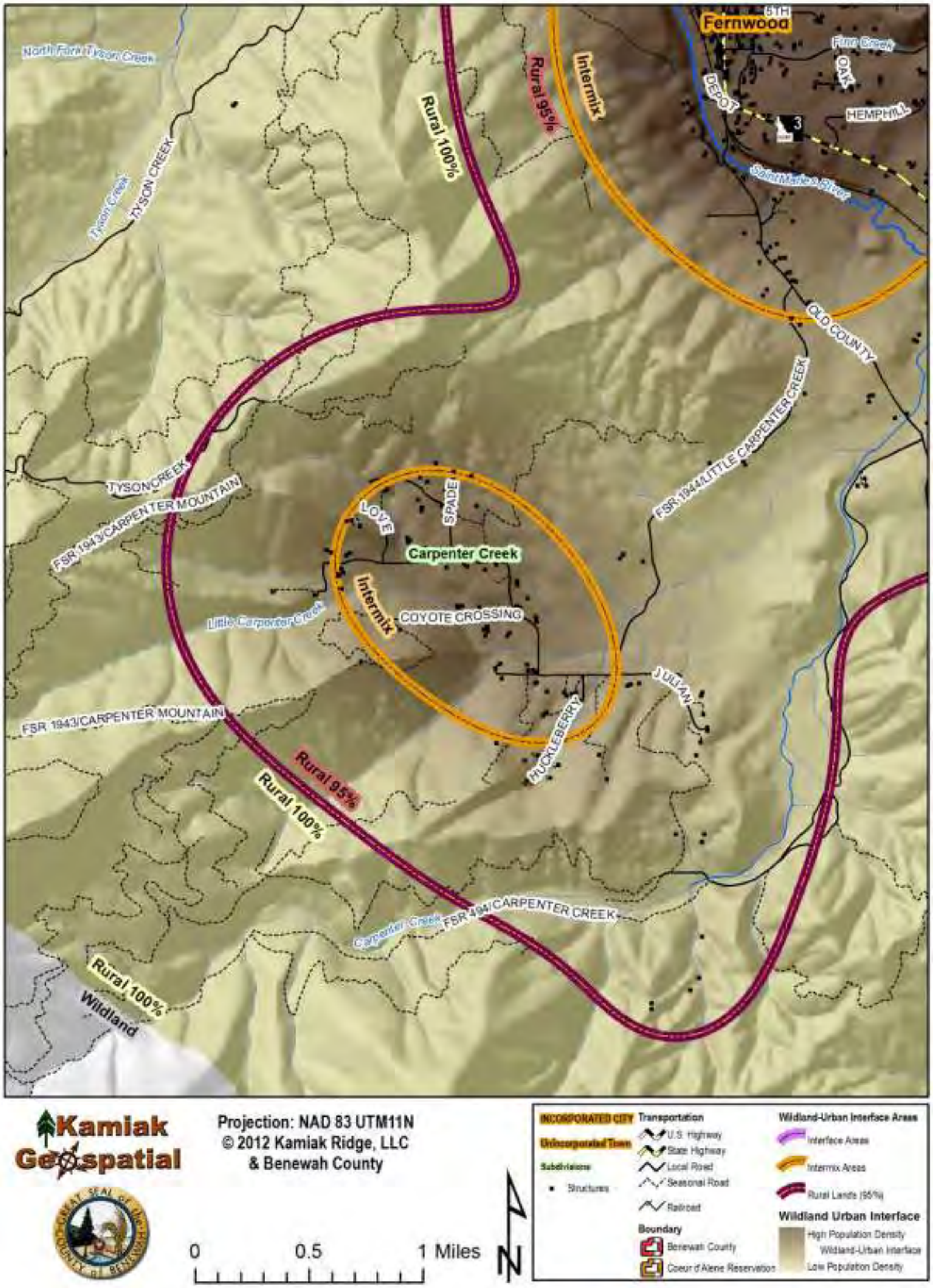


Figure 114. Carpenter Creek Fire Prone Landscapes.

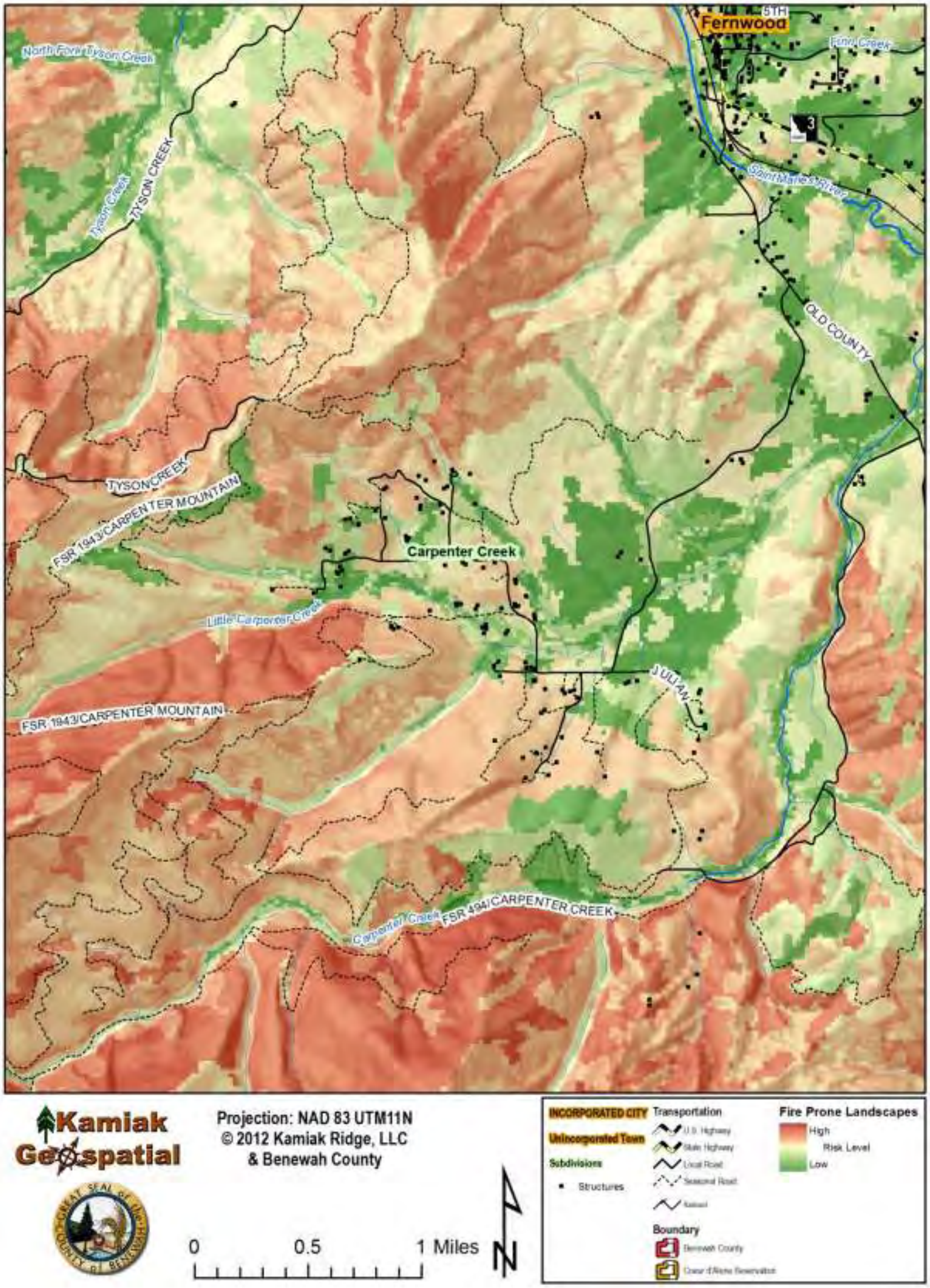


Figure 115. Carpenter Creek Mean Fire Return Interval.

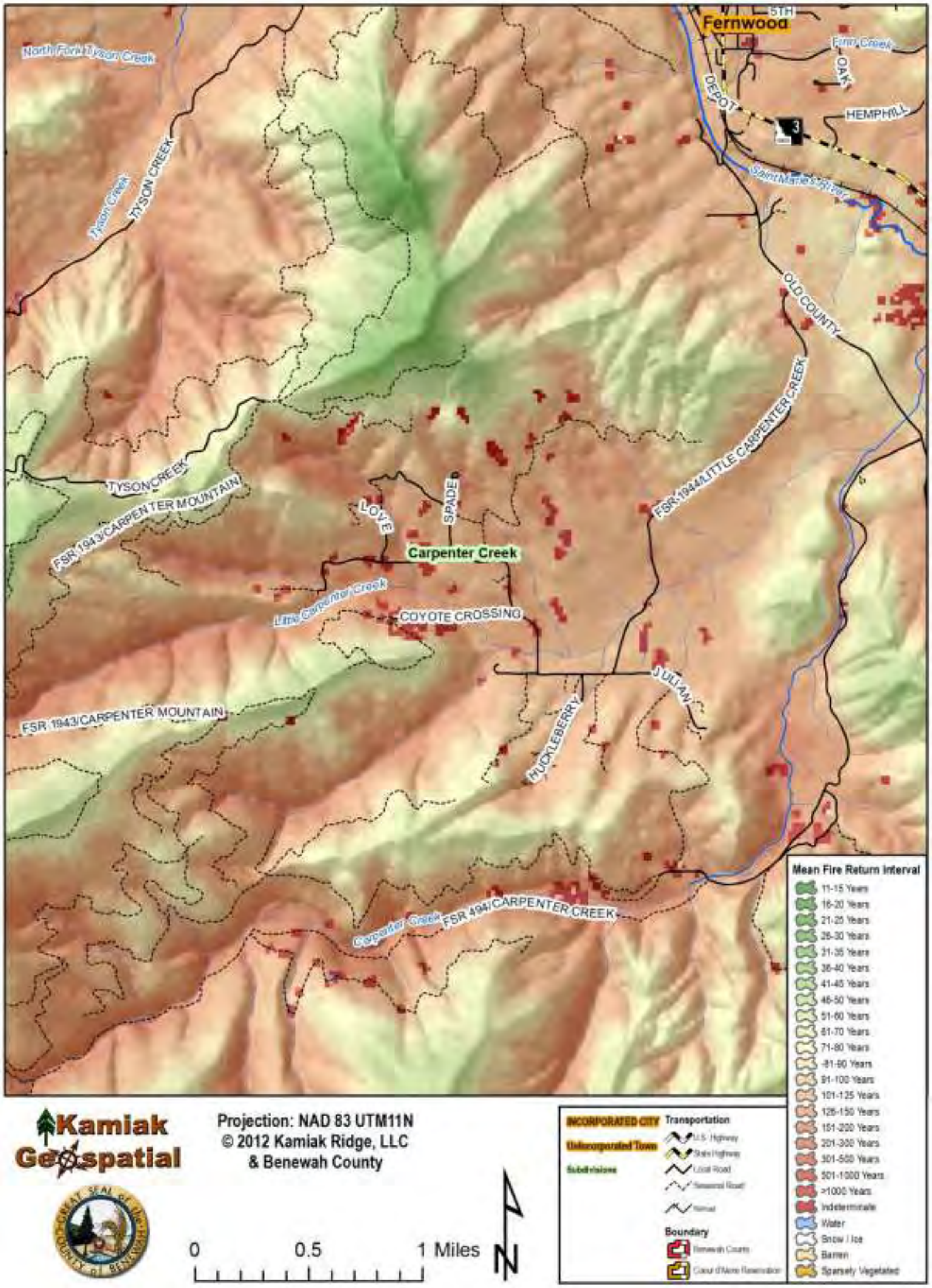


Figure 116. Carpenter Creek Historic Fire Regime Groups.

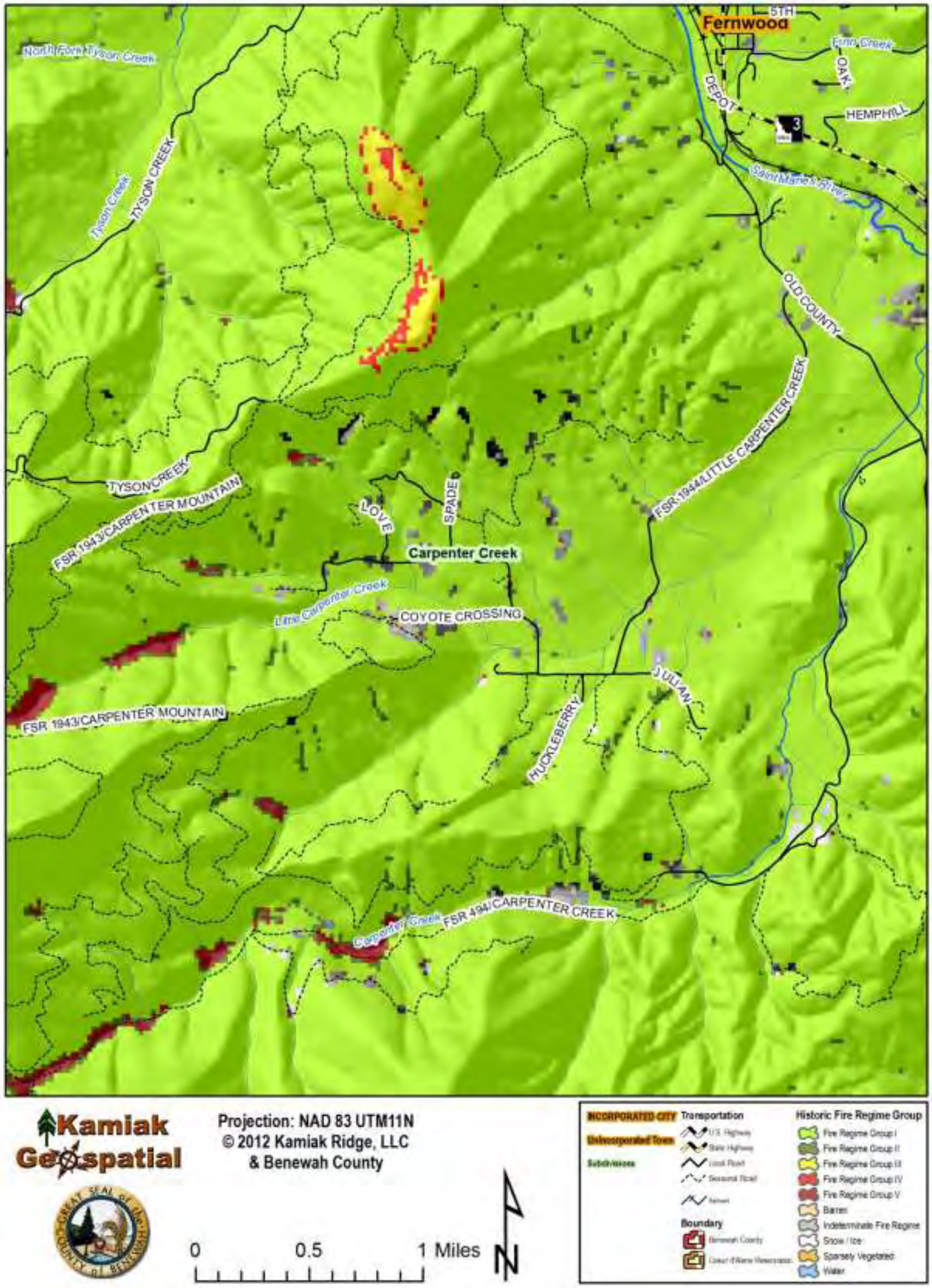


Figure 117. Carpenter Creek Fire Regime Condition Class.

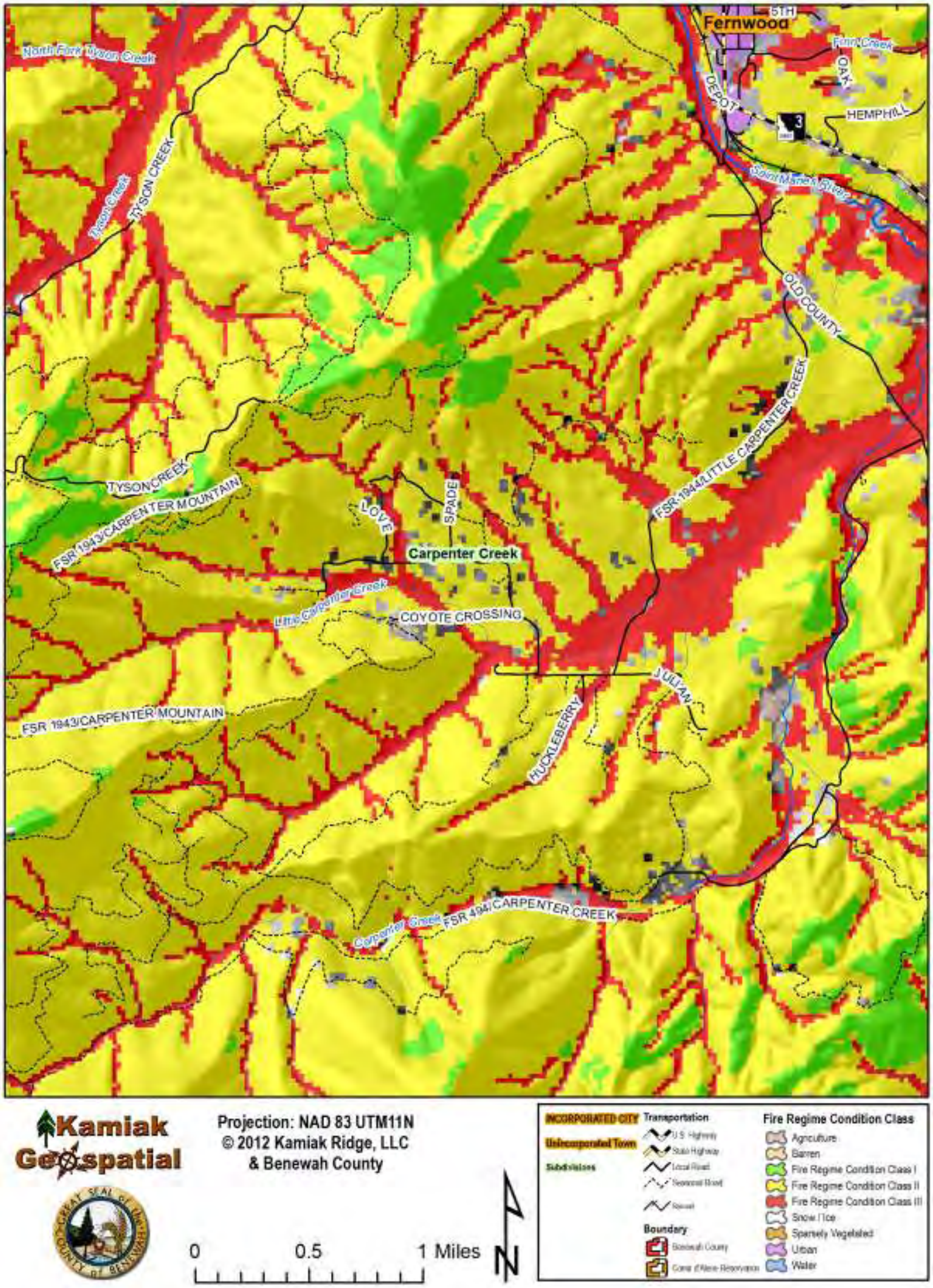
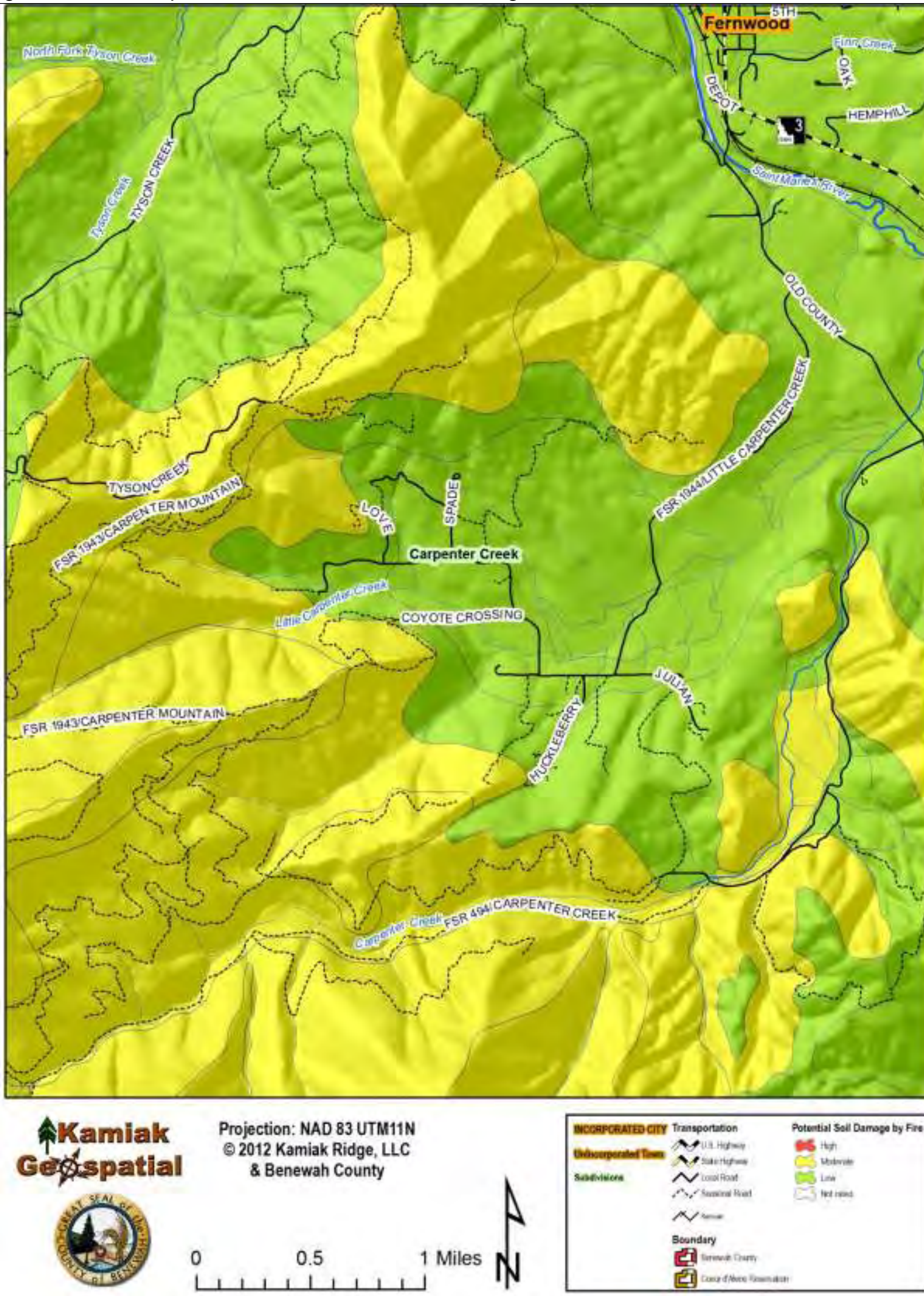


Figure 118. Carpenter Creek Potential Soil Damage from Intense Fires.



5.5. Plummer

5.5.1. Community Assessment

The majority of structures in the community of Plummer are located in the city, and are surrounded by agricultural land and light brush fields. The primary risk to wildfire is located to the southeast of the community in the foothills of Plummer Butte where 50-60 structures have been built into the steep, heavily forested slopes. Residences are located on long, one-way in, one-way out driveways and access roads. Likewise, there are approximately 60-70 structures located to the west along the hillsides of Zurcher Mountain located along Haynes and Fairfield Roads.

Fuels treatment activities have taken place in the surrounding areas of Plummer, specifically along the areas southeast of town along Cooper, First, and Promise Streets; most activities took place from 2002 through 2008 (Figure 119). Some areas are beginning to see the previously thinned and masticated fuels return and may require some follow-up treatments.

Figure 119. Wildland fuels mitigation efforts around home.

The Trail of the Coeur d'Alenes is a paved bike path that follows the Union Pacific Railroad's right-of-way from Plummer to the city of Mullan near the Montana border. The section of the trail that falls within Benewah County's borders travels between the community center of Plummer, through Heyburn State Park, and exits Benewah County near the Causeway sportsmen's access site, just north the Chatcolet bridge crossing and approximately 5 miles south of Harrison. The beginning of this part of the trail is bordered by gently rolling grasslands transitioning into dry ponderosa pine and Douglas-fir forest stands located alongside the trail as it passes through Heyburn State Park towards the St. Maries River crossing near Chatcolet. The slopes rising from the path also become much steeper near the park's western boundary; thus, increasing the fire danger. Receptive fuels, slopes, and increased human activity along the Trail of the Coeur d'Alenes and throughout Heyburn State Park greatly increases the likelihood of an ignition.

Many homes in Plummer and surrounding areas have been built using wood siding, roofing, and decking, which is unfavorable for protection against wildfire (Figure 120). Some homeowners stack firewood under decks or against other structures. Homes built within the grassy valley bottoms generally have an adequate defensible space; however, those in hilly areas are commonly surrounded by heavier forested fuels. Many homes are located on long, one-way in, one-way out roads (Agte Road, Parkside, etc.) or private drives. The primary access into the area is on U.S. Highway 95 or State Highway 5, both of which are paved two lane routes. Plummer Road, Lovell Valley Road, and Minaloosa Road offer additional escape routes traveling in all directions away from the community. Most of these roads are located in areas at low risk of wildland fire due to agricultural development.

Figure 120. Combustible wood siding homes built along forest line.

Road names are present throughout the area, yet bridges on many access roads lack adequate signs showing weight ratings. House numbers are generally very visible and present across the city of Plummer, although in some areas seem to be missing or difficult to see (Figure 121). Most homes access water and power through city water hook ups and personal wells and above ground power lines. The community of Plummer and the surrounding area is protected by the Gateway Fire Protection District (Figure 122).

Figure 121. Good road name signage and addressing.

Figure 122. Gateway Fire Department located in Plummer, Idaho.

5.5.1.1. Coeur d'Alene Tribal Agency

The Coeur d'Alene Tribal Agency is located approximately 3 miles southwest of Plummer on Agency Road. There has been an increase in residential development in this area throughout the past 5-7 years, including a large tribal housing community of 18-units named the Gathering Place in 2010 (Figure 123). Additional improvements have been made in 2011 and are proposed for 2012. The newest structures have been built using non-combustible materials such as stucco, concrete and metal roofing. However, many of the older structures were built using wood siding, roofing, and decking, which is unfavorable for protection against wildfire. To protect this new community and the large financial investment for the Tribe, many thinning and fuels reduction projects have been completed to protect this community from wildfire risk. Yet, the inherent location of this community having been built on a hilltop area with heavily forested areas below is still the primary wildfire risk for the community.

Figure 123. The Gathering Place.

5.5.2. Potential Mitigation Activities

The main community of Plummer is at a low fire risk due to the agricultural land and low grasses surrounding the area (presenting a low resistance to wildfire control; Figure 124). Road access in and out of the community is very clearly marked and well maintained to ensure safe access by firefighting equipment and escape by home owners in the event of an evacuation. Homes on the eastern part of the community closer to the more heavily forested Plummer Creek valley, and on the west side with the Boswell Hill/Fairfield area, and the southwest side along the Zurcher Mountain Road, are at a moderate risk of wildfire due to their location within forested areas.

Figure 124. Structures surrounded by low grasses.

Logging activities throughout the surrounding areas of Plummer create a distinct wildland fire risk and reward. Areas following a logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures (Figure 125).

Figure 125. Pile burning needed after forest thinning project.

Individual home sites and clusters of homes in this area may need site evaluations to increase the awareness and education of homeowners about effective structure defensible space, and the benefits it provides in a wildfire event (Figure 126). It is also a valuable tool for identifying those individual homes, and clusters of homes, that are at highest risk of loss in a wildfire. This is useful information for the safety of firefighting personnel and equipment, as well as for prioritizing mitigation efforts. Clustering of homes can be found along the following locations: Minaloosa Road approximately 4 miles south of Plummer; Agte Road and Canyon Ridge Road approximately 3 miles to the east of Plummer; and along Fairfield Road, Haynes Road and Agency Road about 2 miles west. Further efforts to thin brush fuels around the community would help lessen the probability of a wildland fire reaching the town site. Creating and widening turnouts and thinning fuels along all long driveways and access routes would reduce the risk of residents becoming trapped and increase the safety and ability of suppression vehicles and personnel to respond. Educating homeowners in techniques for protecting their homes is critical in areas where heavy fuels are present near structures and along access roads.

Figure 126. Defensible space being installed around homes near Agency.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the wildland-urban interface can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas along the Trail of the Coeur d'Alenes within other forested campsites around Plummer.

5.5.3. Recommendations:

1. Perform individual home site evaluations (approximately 100 throughout the community) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around the approximately 50-60 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges of secondary roads or one-way in, one-way out driveways that access homes identified as having risk; specifically along Fairfield and Haynes roads.
4. Maintain previously thinned and burned forest areas by periodically removing accumulated surface fuels and regeneration.
5. Continued maintenance of logged areas to reduce ignition potential in dead downed debris and logs.
6. Increase use of U.S.D.A. Forest Service "Smokey Bear" type fire danger signs along bike paths and recreation areas.
7. Sign and provide weight rating information on all bridges and cattle guards on access roads.
8. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.

9. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.5.4. Community Maps

Community Maps of the Plummer area are provided to give the reader a better understanding of the area, and the concepts shared here (Figure 127 - Figure 135).

Figure 127.	Plummer NAIP Aerial Imagery.

Figure 128. Plummer Topography.

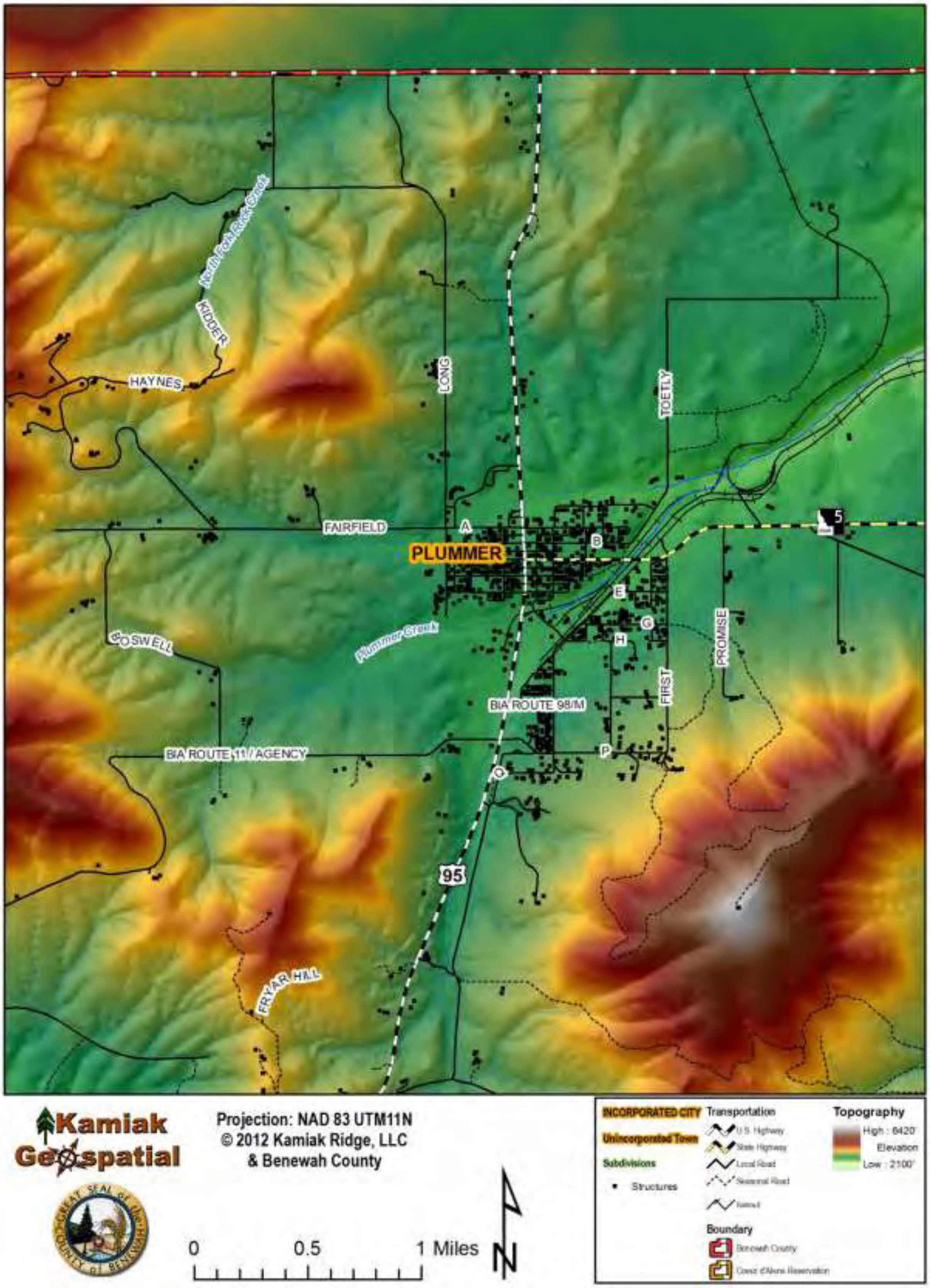


Figure 129. Plummer Land Ownership.

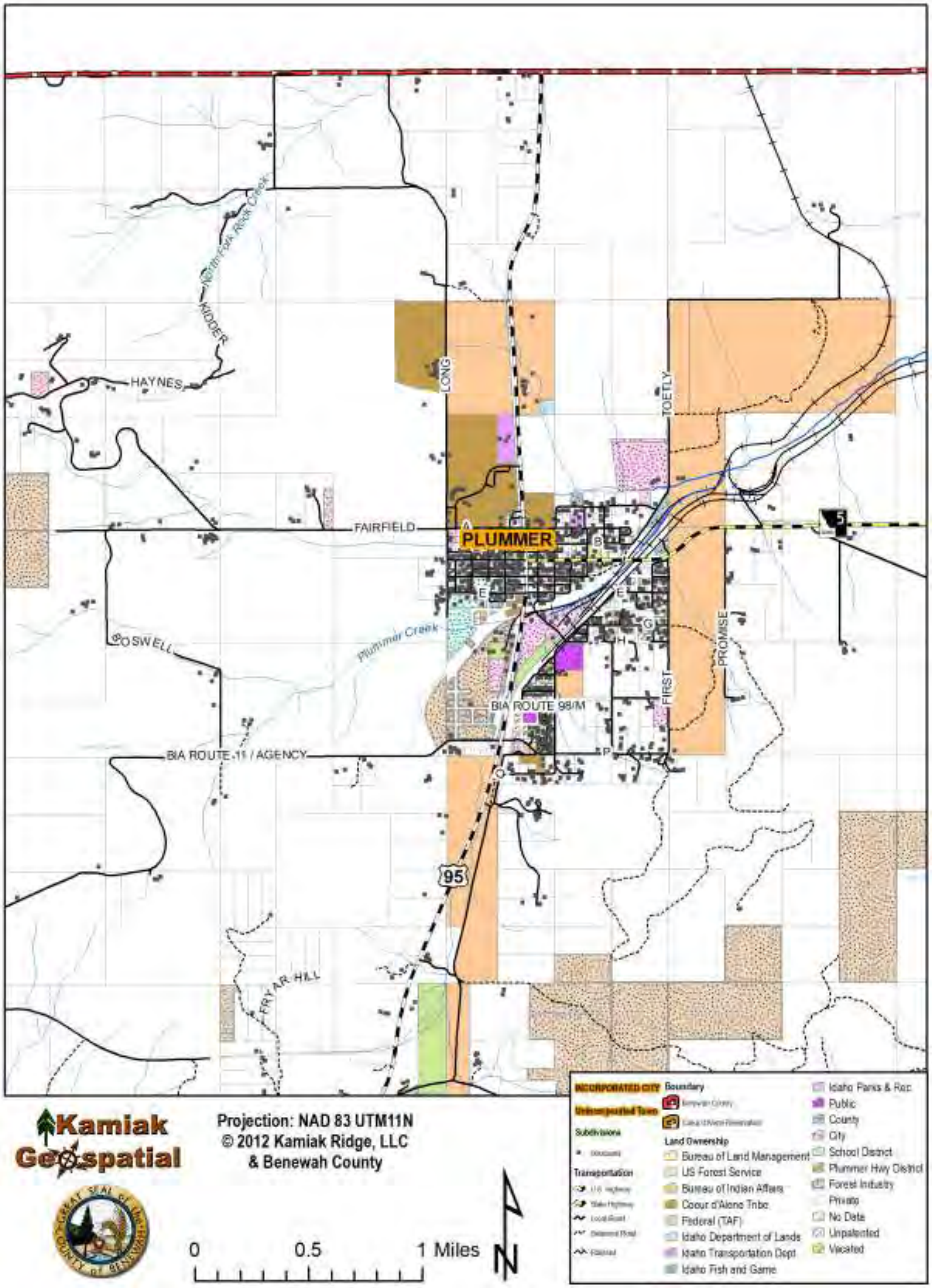


Figure 130. Plummer Wildland-Urban Interface Zones.

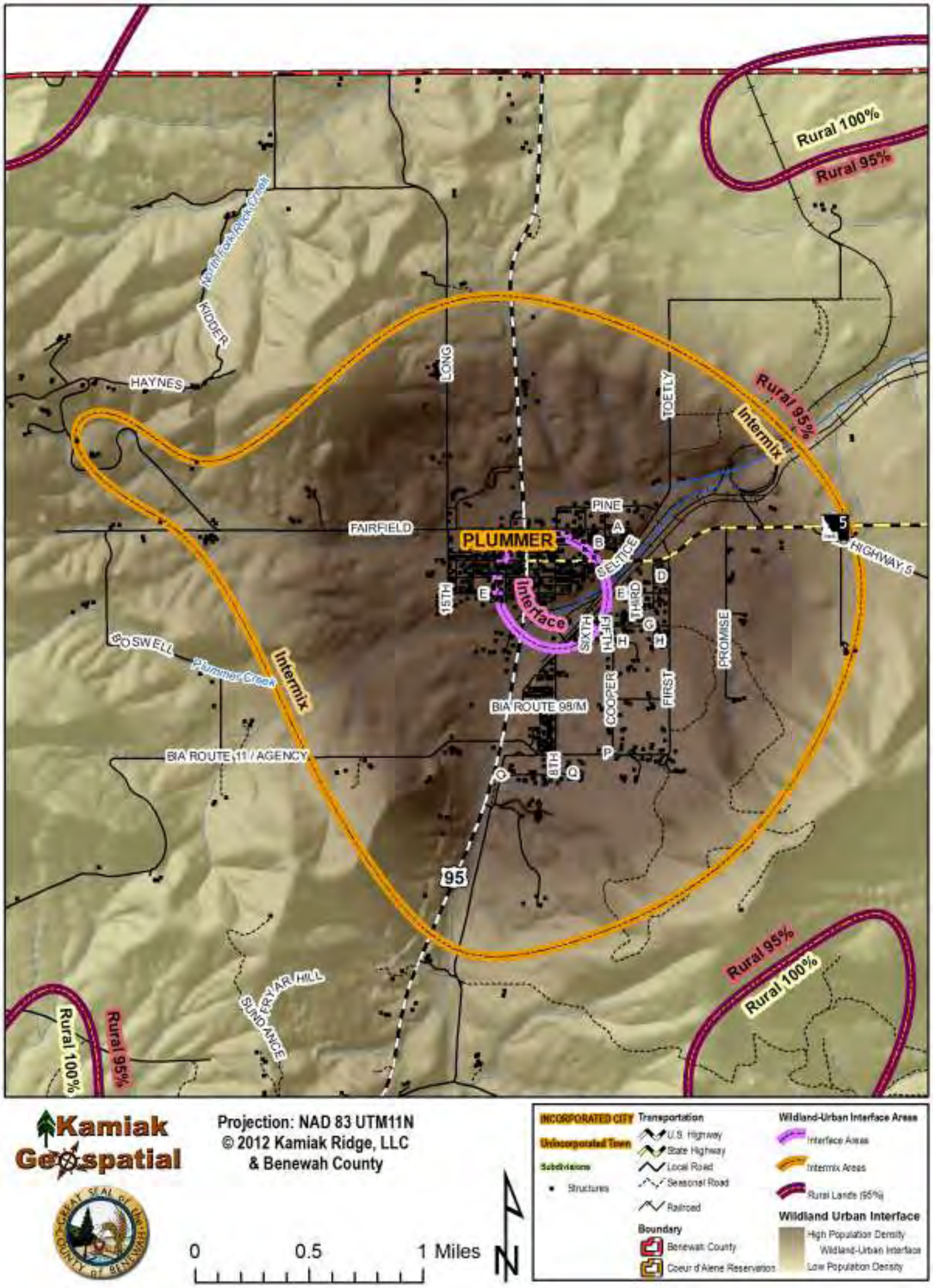


Figure 131. Plummer Fire Prone Landscapes.

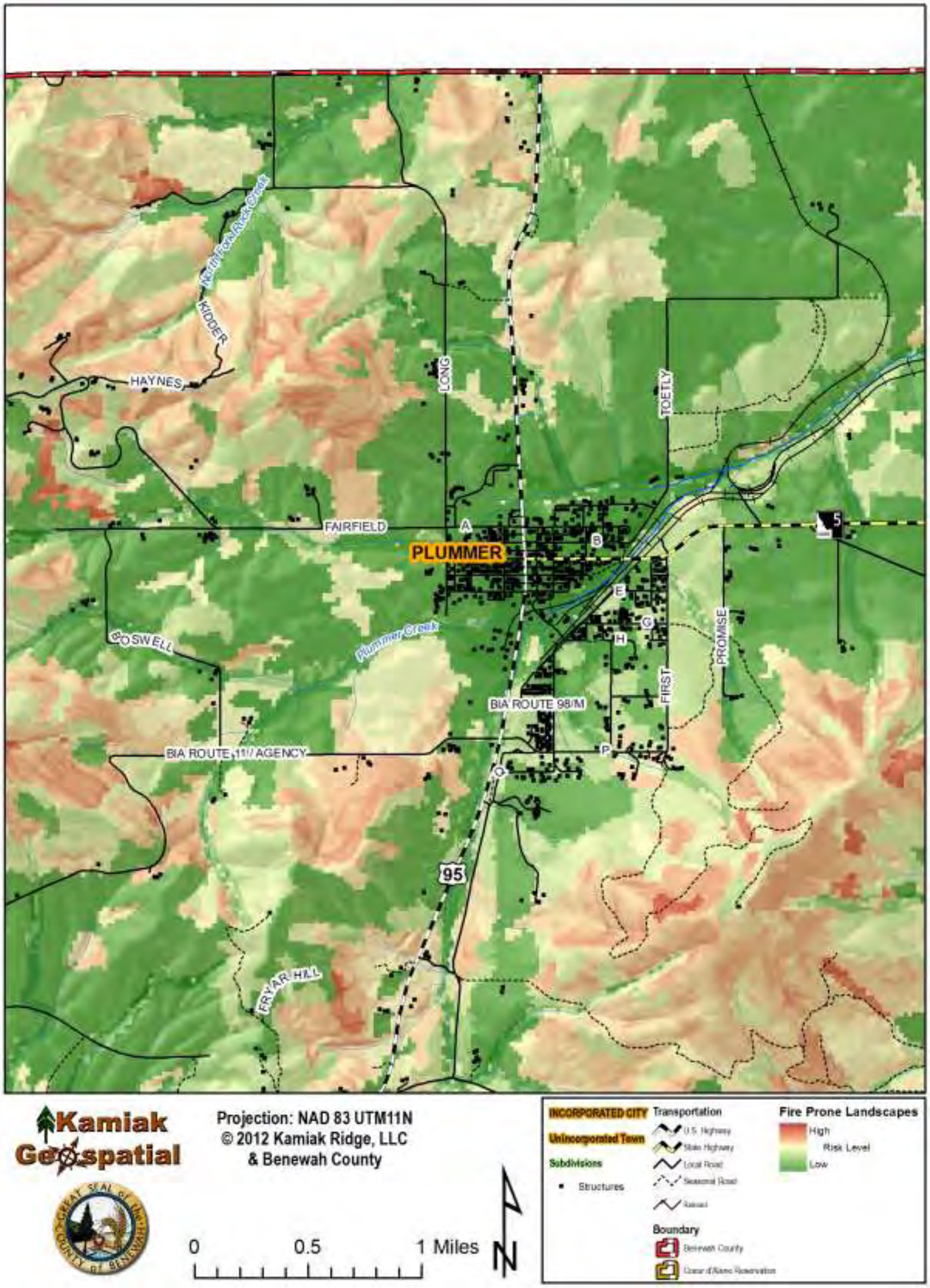


Figure 132. Plummer Mean Fire Return Interval.

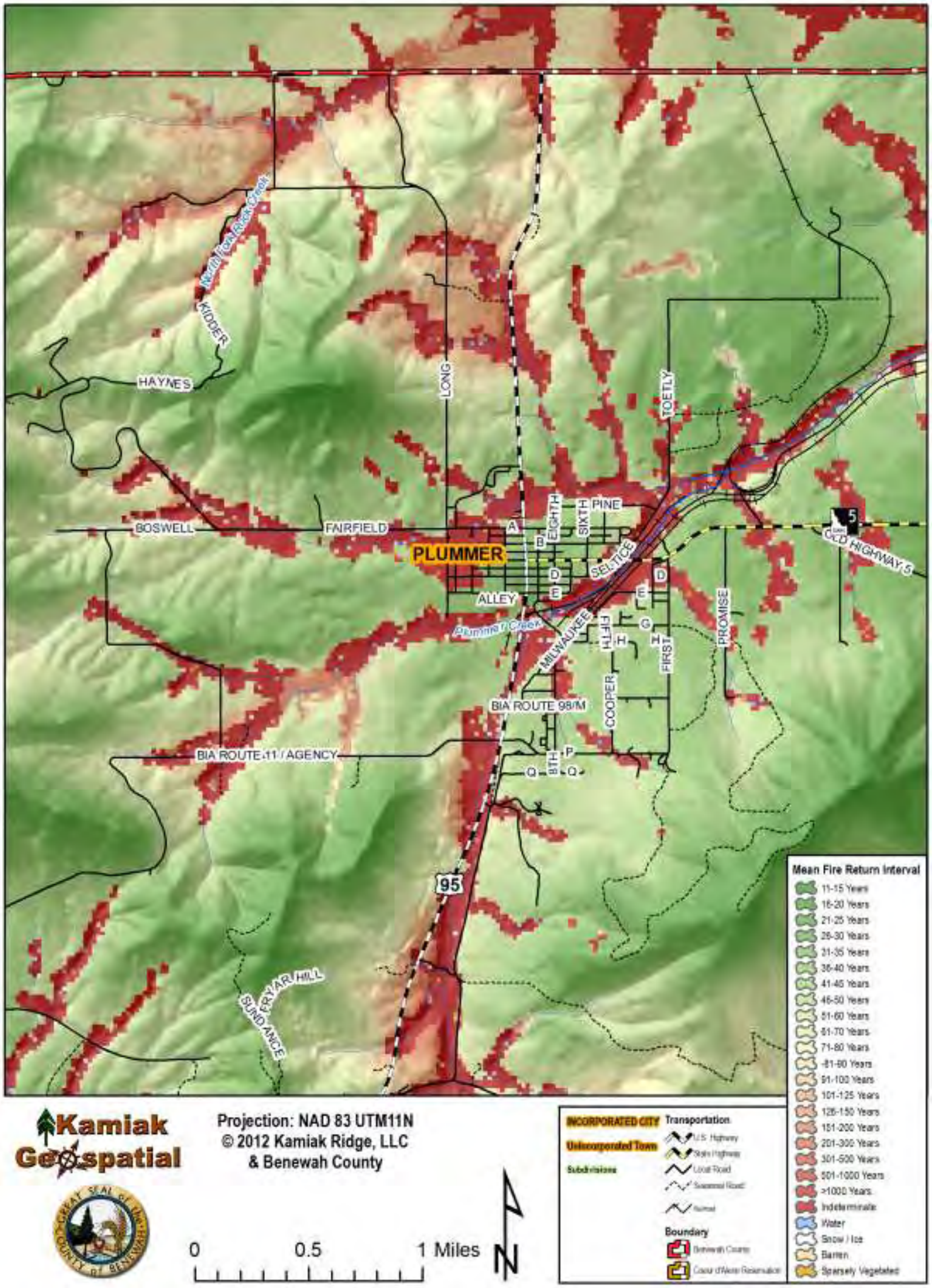


Figure 133. Plummer Historic Fire Regime Groups.

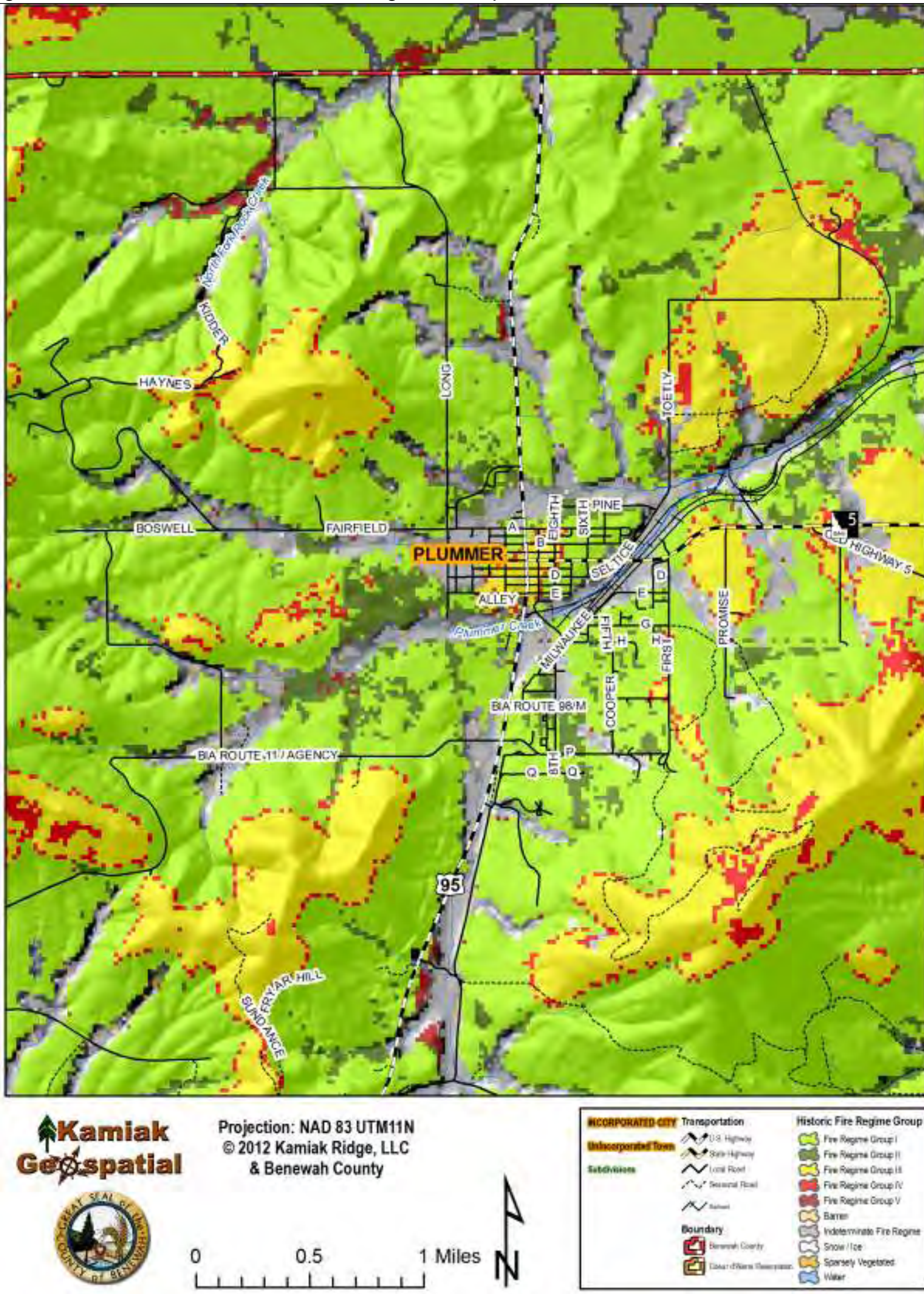


Figure 134. Plummer Fire Regime Condition Class.

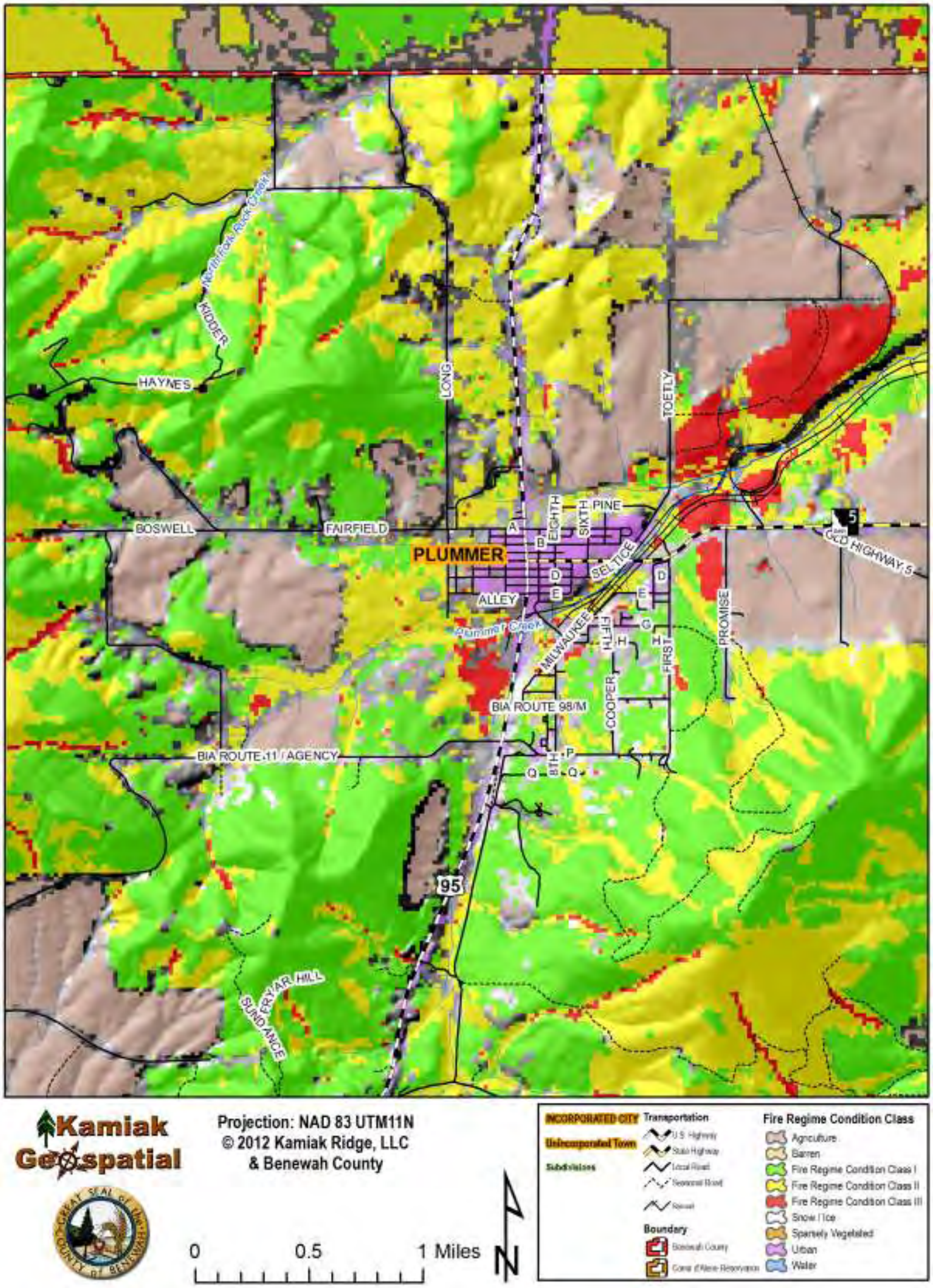
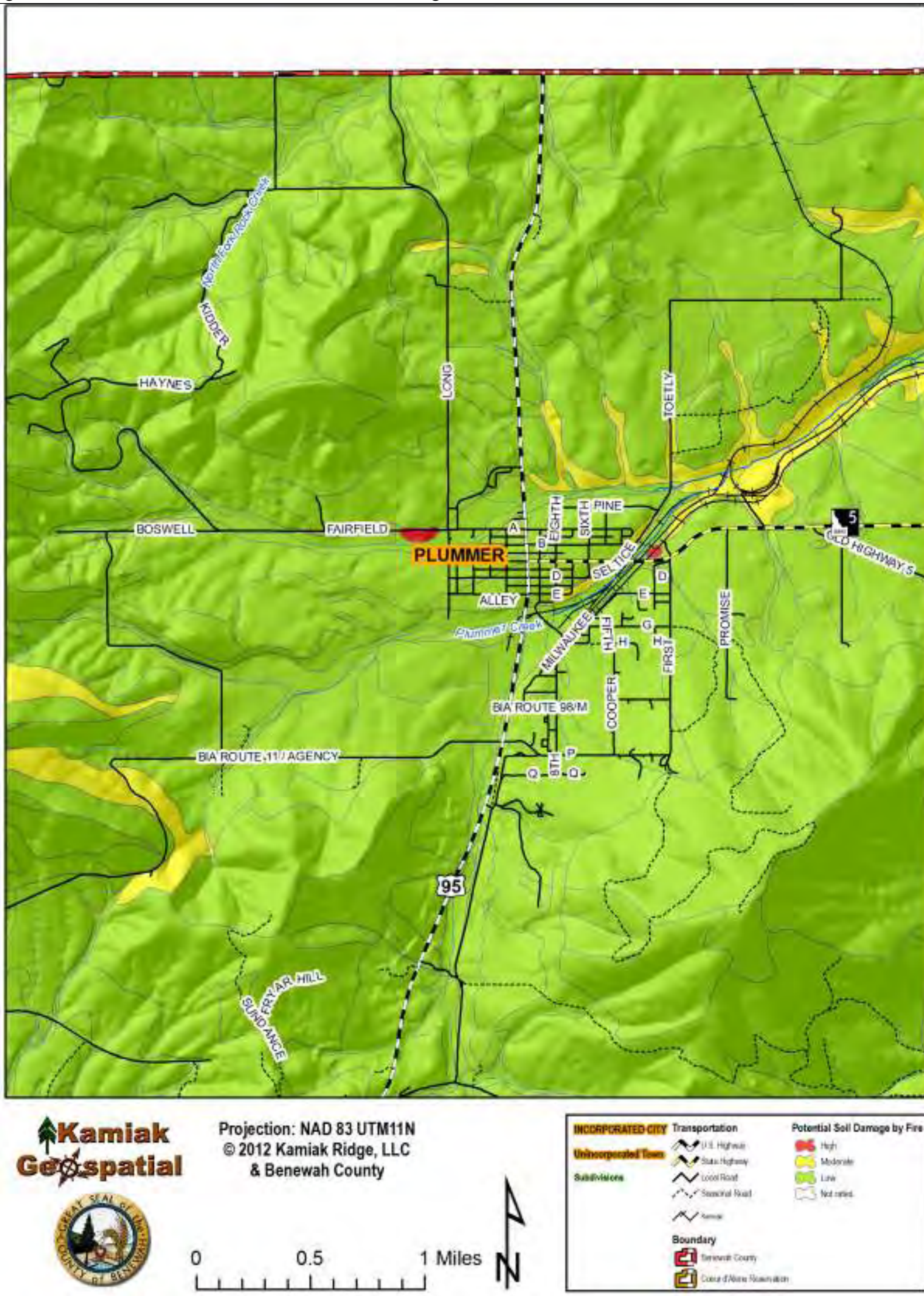


Figure 135. Plummer Potential Soil Damage from Intense Fires.



5.6. Sanders

5.6.1. Community Assessment

The town of Sanders is located approximately 7 miles east of Tensed and consists of about 30 homes and 60-70 structures in total. Sanders is generally agricultural land, with hardwood and softwood trees surrounding the community (Figure 136). The primary risk to wildfire for the community of Sanders is located in the draw to the north of town up Indian Creek drainage. Structures located in this area, however, are clustered at the lowest point of the draw and are still at a low risk to limited escape from a large wildfire event. There is evidence of years of logging activities in and around the community; the majority of debris left from the logging activities has been burned in brush piles over the years. The largest threat to the community is the undergrowth fuels that have grown up under the large ponderosa pines in the area, allowing for a fire starting in the community itself to spread throughout the area because of continuous surface fuels. This activity would likely cause a low-level and controllable fire. The surrounding agricultural lands significantly reduce this community's threat of spreading wildfire from surrounding forestlands, or from a fire from within the community spreading to the forest.

Figure 136. Sander's store surrounded by hardwood & softwood fuels.

There have been very few wildland fuels treatment projects completed in the Sanders area. Along Old Sanders road leading from Desmet, some thinning was completed in 2007 & 2008.

Many of the homes in the community have been built using wood siding and decking, which is unfavorable for protection against wildfire. Some homeowners also stack firewood under decks or against structures (Figure 137). Nevertheless, large fields surrounding most of the homes in this area provide an adequate defensible space against oncoming wildfires.

Figure 137. Wood siding home with wooden deck; excess fuels surrounding home.

The primary access into the area is on Sanders Road, a two lane graveled road from the west (1.5 miles) on U.S. Route 95, or from the east, about 10 miles at Emida and State Highway 6 (White Pine Drive). Along most of the route from Emida, heavy forest fuels abut both sides of the roadway, presenting a risk of becoming threatened in the event of a wildfire. Some areas have been harvested, leaving dead, downed fuels (Figure 138). Additional potential escape routes including Old Sanders Road towards Tensed, located in low fire risk area near the community and in the direction of U.S. Route 95. Many of the homes in this area are located on one-way in, one-way out forest routes or private drives, some of which are bordered by timber. This not only increases the risk of the residents becoming trapped, it also complicates wildfire response abilities.

Figure 138. Timber harvesting along Old Sanders Road east of Sanders.

Road names and house numbers are present throughout the area. Most residences in the area access water and power through personal wells and above ground power lines. The power line corridor stretching from Emida to Sanders travels through sections of very heavy fuels on the St. Joe National Forest. This corridor has been cut and pruned; however, this area still maintains a very high risk of ignition due to remaining surface fuels and nearby forest fuels. Most of the Sanders area is protected by the Tensed Fire Department.

5.6.2. Potential Mitigation Activities

The community of Sanders is at low risk of wildland fire due primarily to its agricultural development and nearness to U.S. Route 95. Power lines leading to the community pass through areas that have been well thinned and are regularly maintained. The higher risk, forested areas upslope of the community, could potentially experience a severe wildland fire; however, the likelihood of a fire reaching the community is low. Homes in outlying areas to the north and east and closer to or surrounded by timber are at much higher risk (Figure 139).

Figure 139. Home built upslope of community, with good defensible space.

Logging activities throughout the surrounding areas of Sanders create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures (Figure 140).

Figure 140. Thinning mitigation project leaving dead, downed fuels that need removal and burning.

Individual home site evaluations can increase homeowners' awareness and, when implemented, improve the survivability of structures in the event of a wildfire. Home assessments can address the issue of escape routes and home defensibility characteristics. Creating a defensible space around structures can significantly reduce the potential loss of life and property. This can be accomplished by individual residents by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating wood piles, propane tanks, and other flammable objects away from the home. Creating and widening turnouts and thinning fuels along access routes would reduce the risk of residents becoming trapped and increase the responsiveness and safety of suppression vehicles and personnel (Figure 141). Educating homeowners in techniques for protecting their homes is critical in areas where heavy fuels are present.

Figure 141. Narrow access road, potential need for thinning and widening.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines (Figure 142). Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the wildland-urban interface can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community.

Figure 142. Good power line protection between Sanders and Emida.

5.6.3. Recommendations:

1. Perform individual home site evaluations (approximately 10-20) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 20 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along entire length of Sanders road, concentrating on areas between Sanders and Emida.
4. Maintain meadows around Sanders by periodically removing encroaching tree regeneration, or continuing agriculture and livestock management.
5. Remove surface fuels such as slash, and dead and down wood from harvested areas around the community.
6. Keep clear lines of communication open with the Idaho Department of Lands, USDA Forest Service, and the Coeur d'Alene Tribe.
7. Educate homeowners of the risk of wildfire and precautions they can take to protect their families and property such as using FireSafe building materials and landscaping techniques and planning escape routes.
8. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.6.4. Community Maps

Community Maps of Sanders are provided to give the reader a better understanding of the area, and the concepts shared here (Figure 143 - Figure 151).

Figure 143. Sanders NAIP Aerial Imagery.

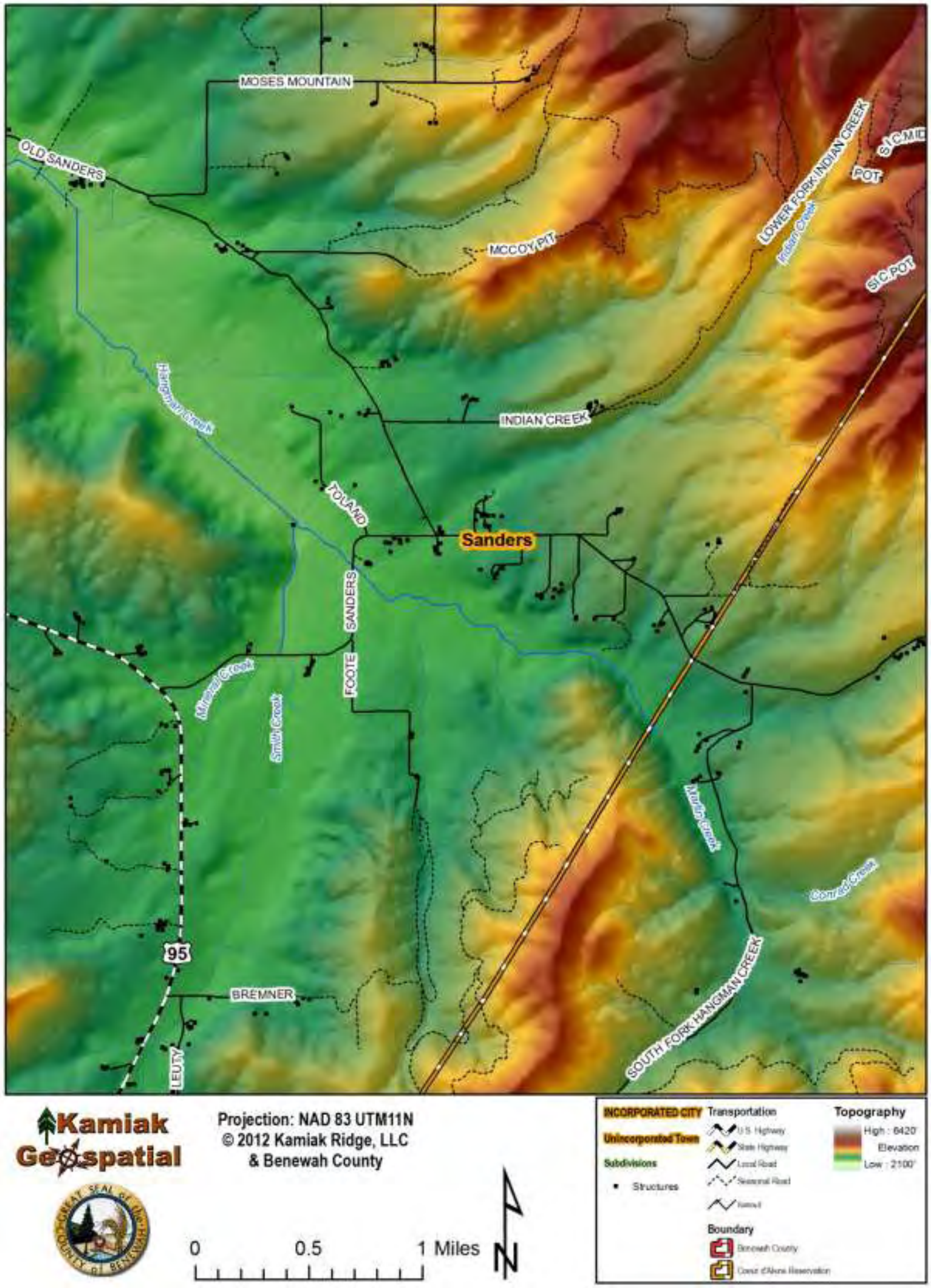

MOSES MOUNTAIN
OLD SANDERS
MCCOY PIT
LOWER FORK INDIAN CREEK
Indian Creek
POT
S/C POT
Hangman Creek
INDIAN CREEK
TOLAND
Sanders
SANDERS
FOOTE
Mineral Creek
Smith Creek
Martin Creek
Conrad Creek
95
BREMNER
LEUTY
SOUTH FORK HANGMAN CREEK
Kamiak Geospatial
Projection: NAD 83 UTM11N
© 2012 Kamiak Ridge, LLC
& Benewah County
0
0.5
1 Miles
N
INCORPORATED CITY
Unincorporated Town
Subdivisions
Structures
Transportation
Boundary
Topography
High : 6420'
Elevation
Low : 2100'

Figure 145. Sanders Land Ownership.

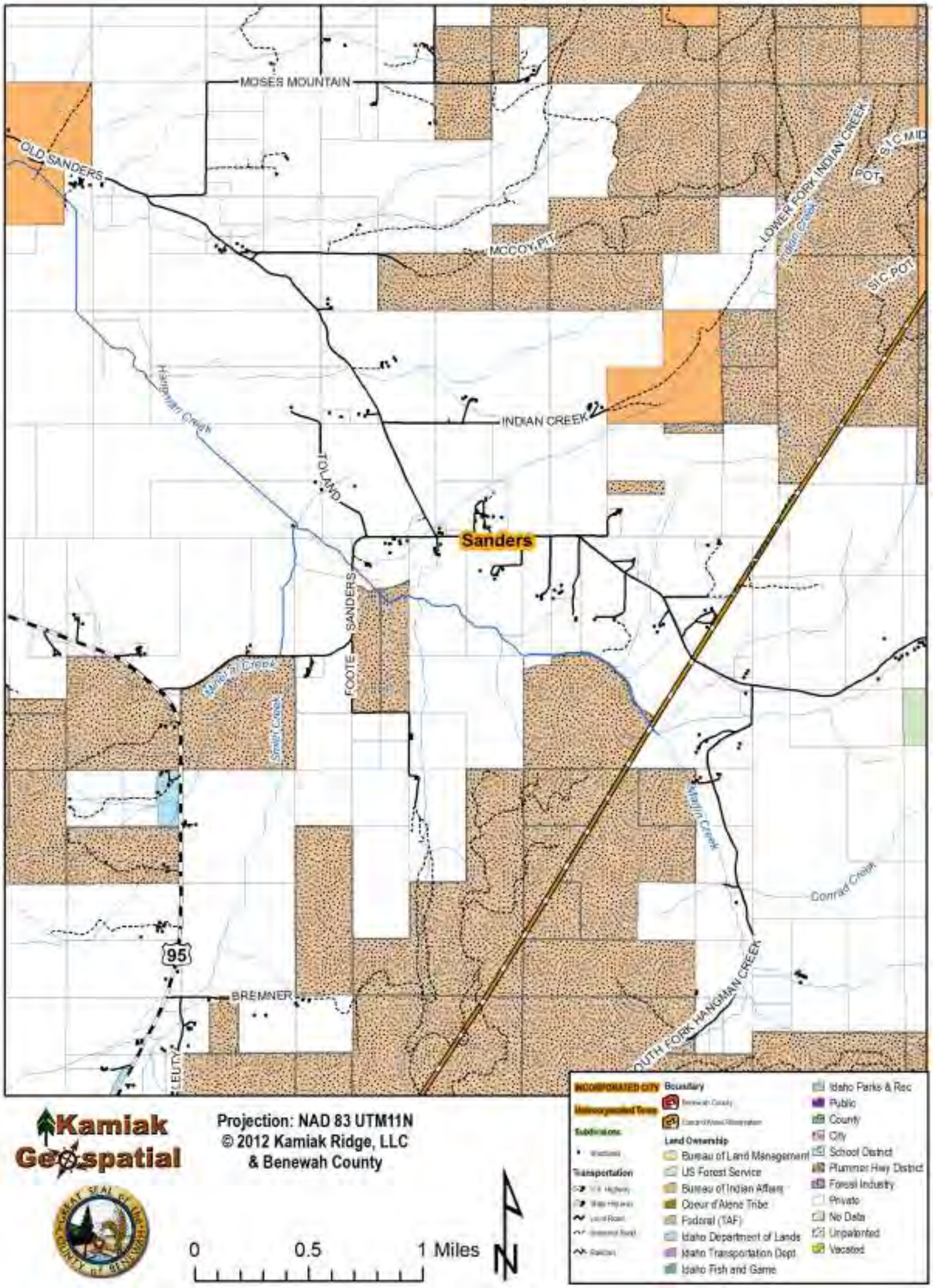


Figure 146. Sanders Wildland-Urban Interface Zones.

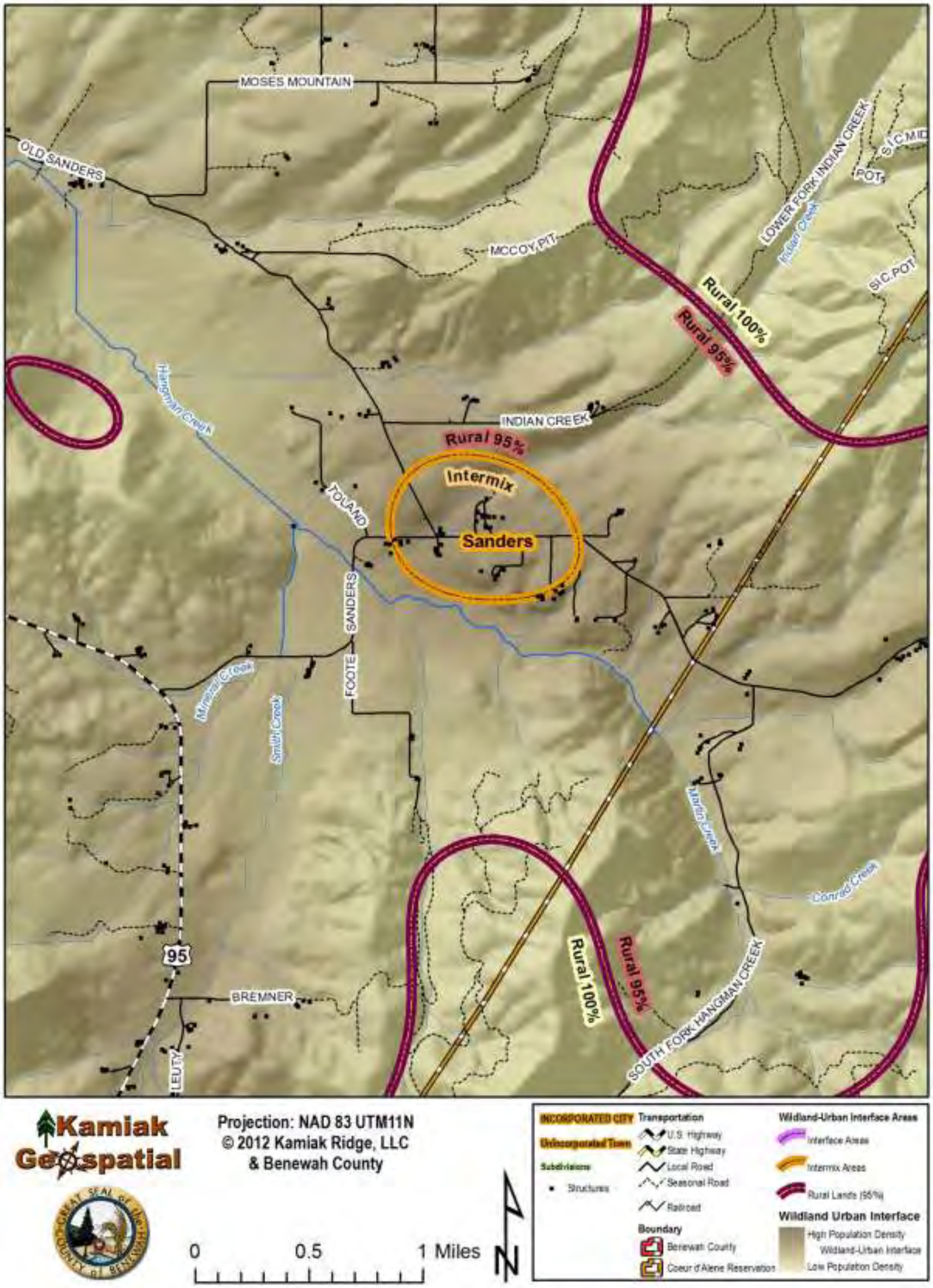


Figure 147. Sanders Fire Prone Landscapes.

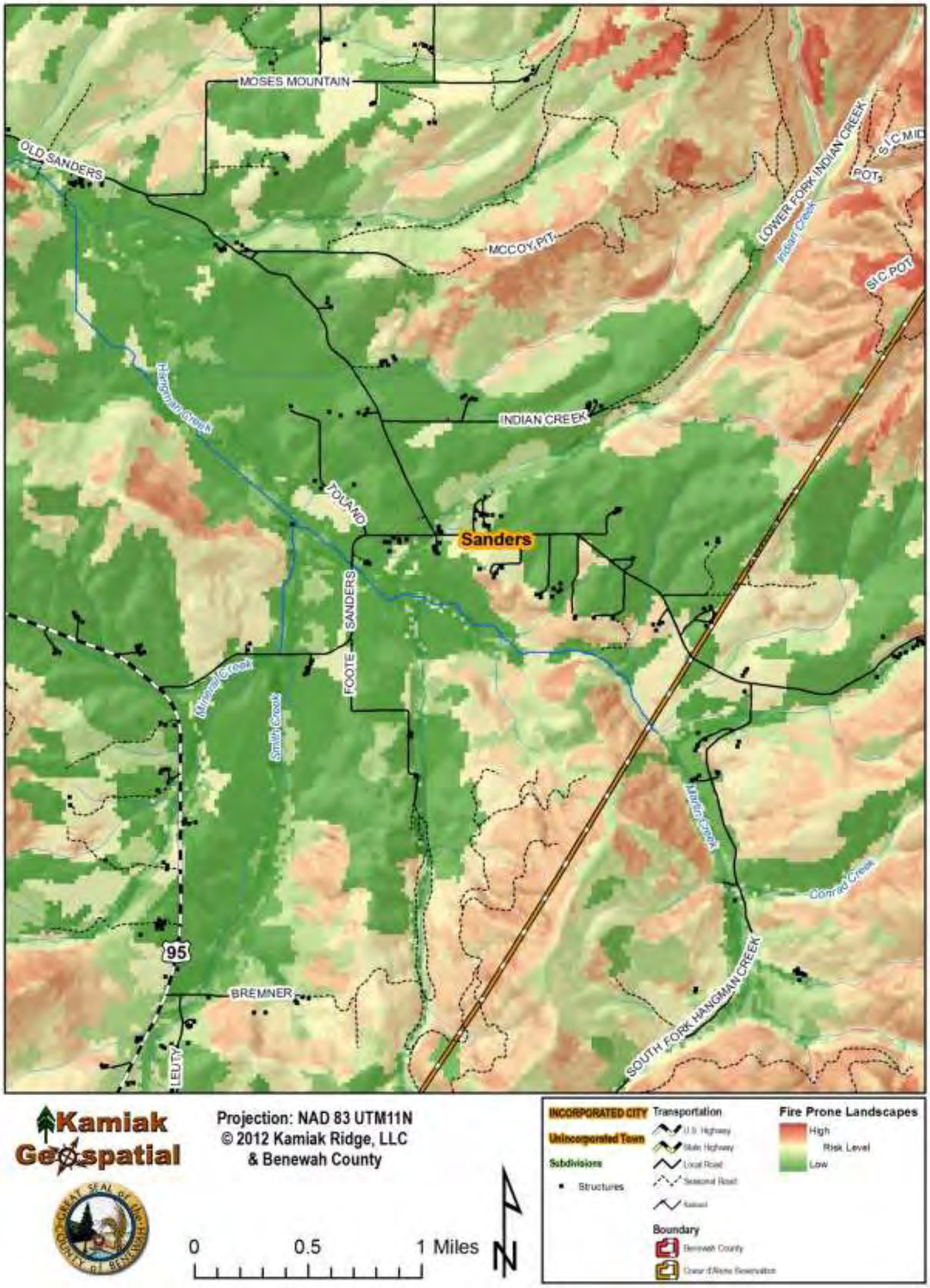


Figure 148. Sanders Mean Fire Return Interval.

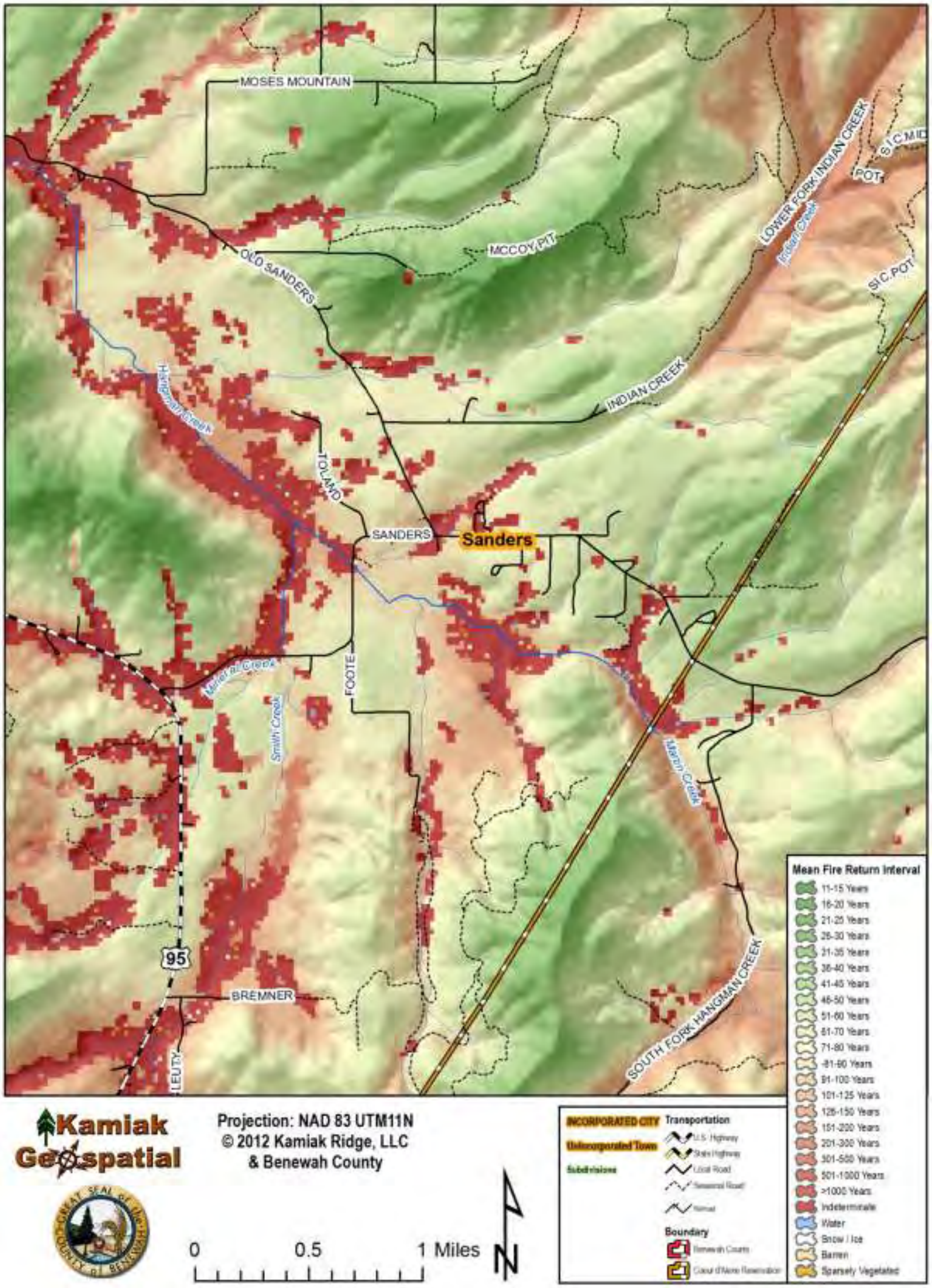


Figure 149. Sanders Historic Fire Regime Groups.

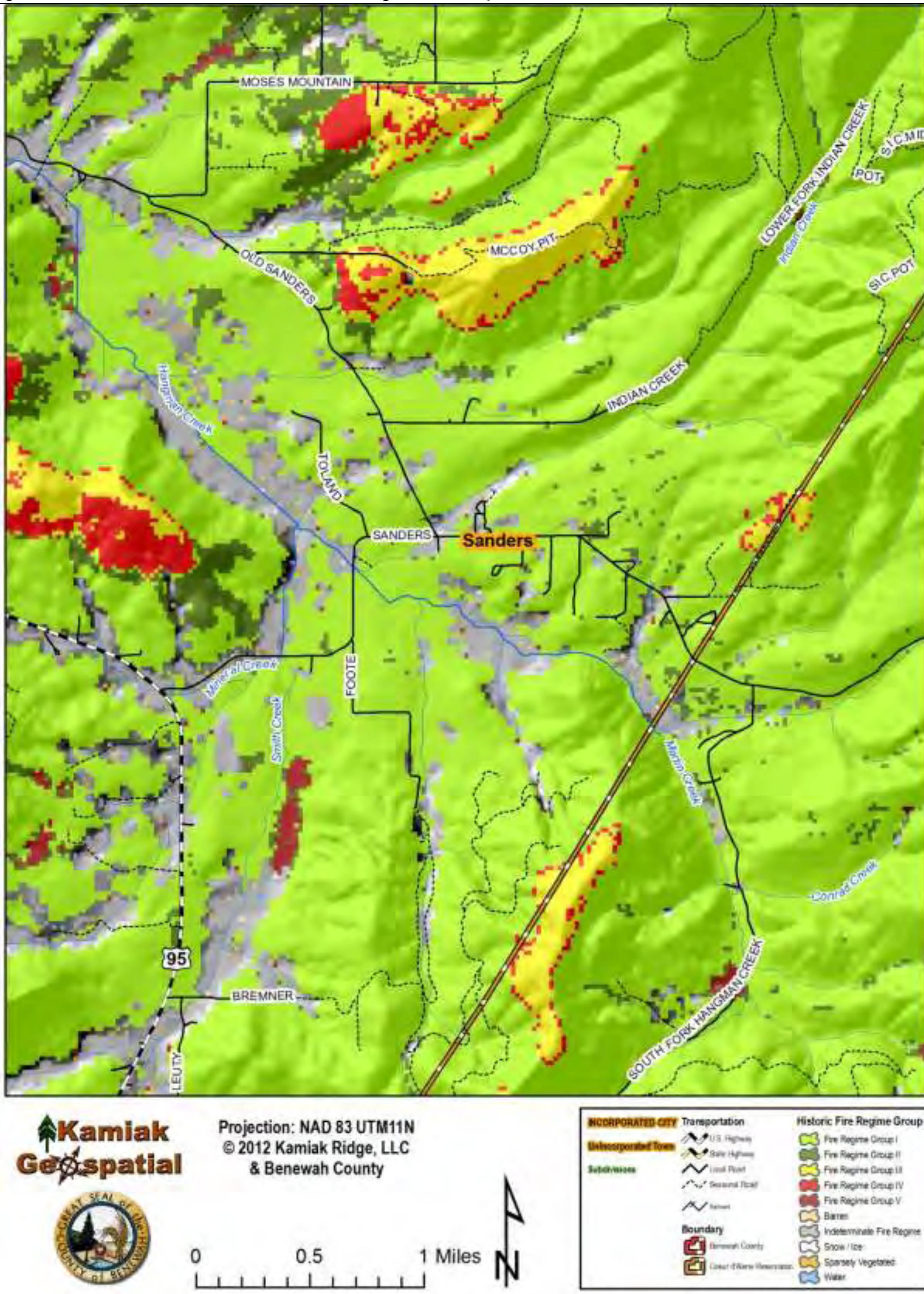


Figure 150. Sanders Fire Regime Condition Class.

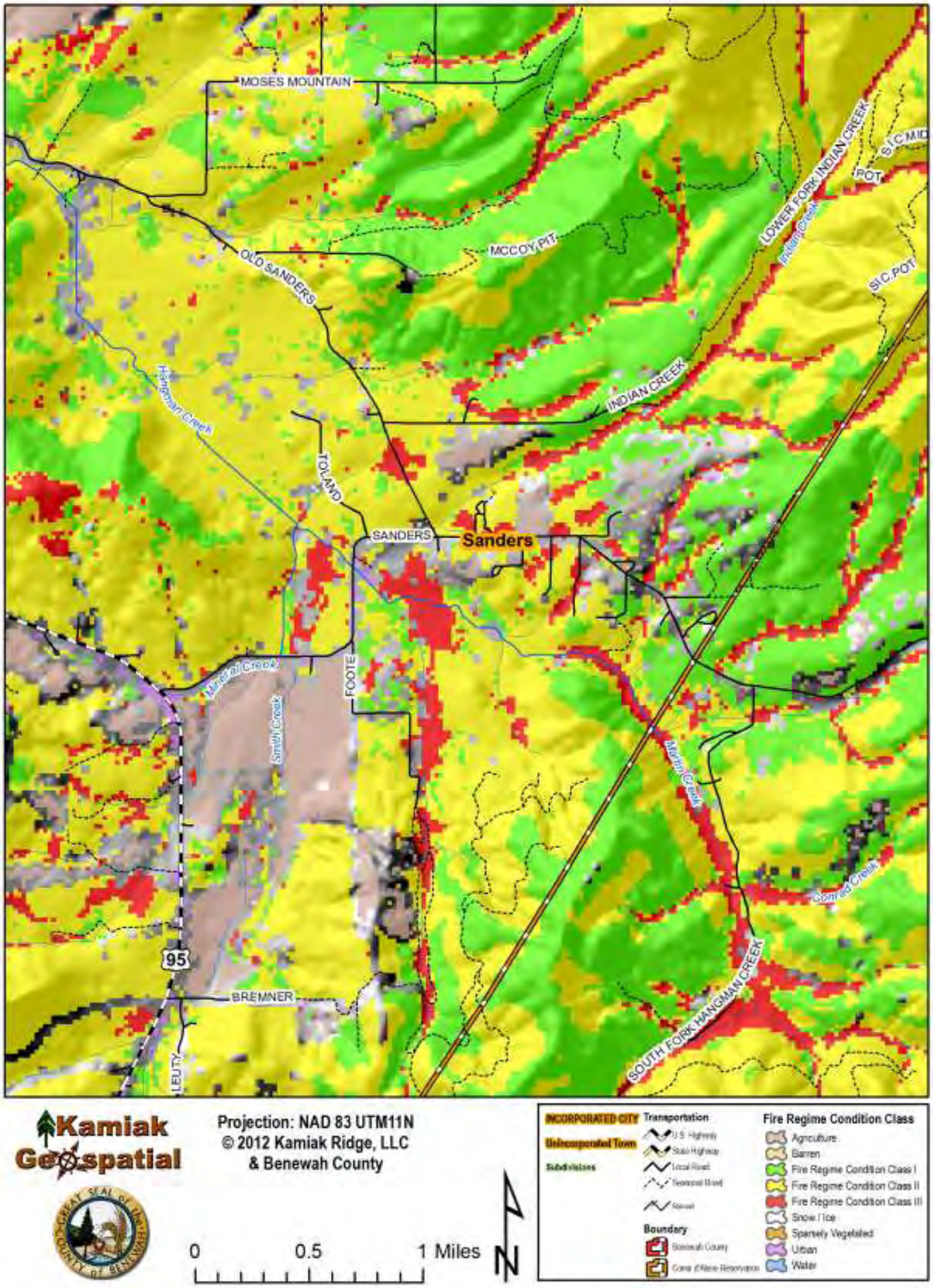
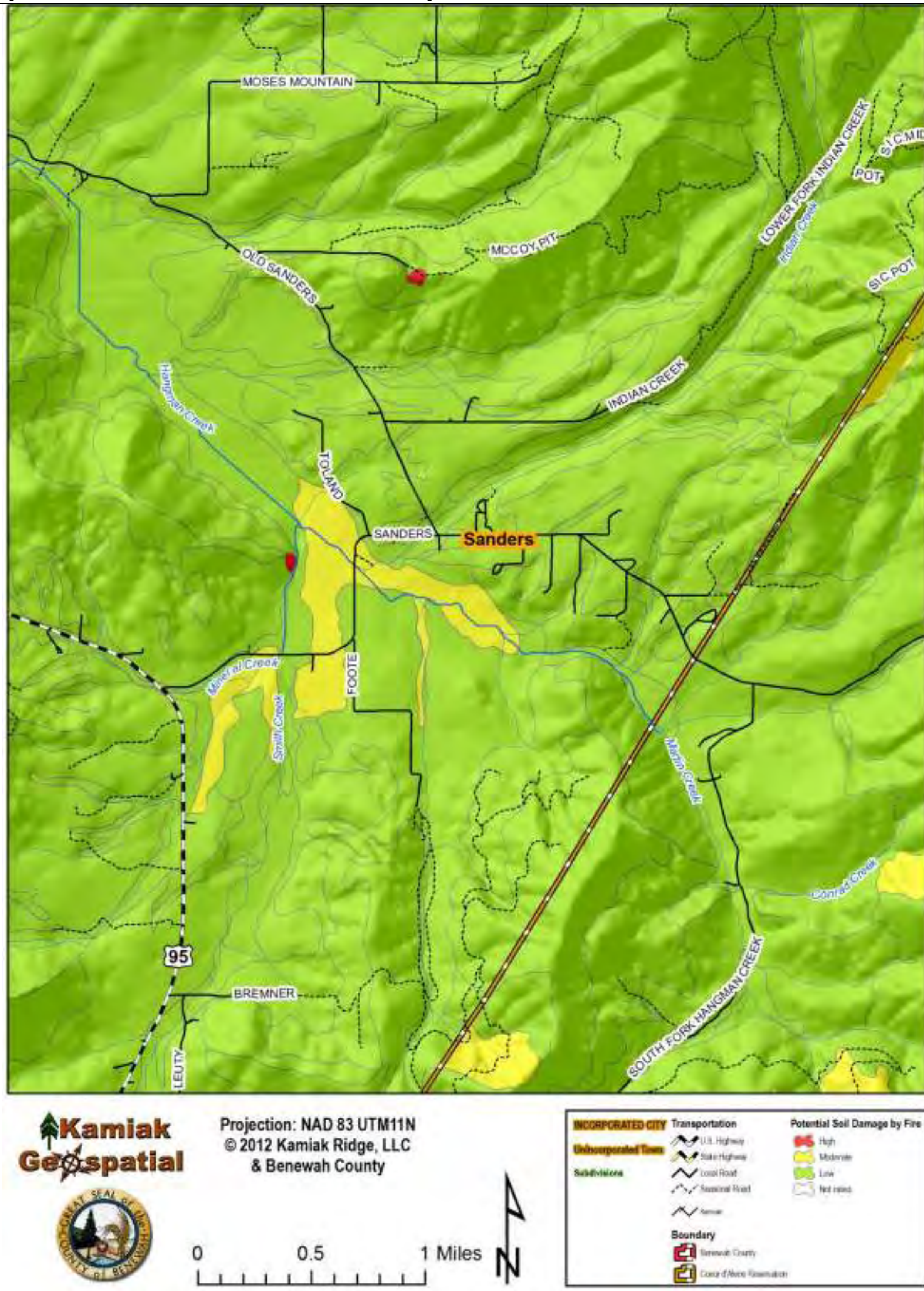


Figure 151. Sanders Potential Soil Damage from Intense Fires.



5.7. St. Maries

5.7.1. Community Assessment

The primary risk to structures from wildfire loss for the community of St. Maries is located in the small subdivisions located to the south of the downtown area of St. Maries, as well as with those structures located along the forest line to the west and south of the main community area. These structures are generally located along access roads that are heavily forested and do not have adequate defensible space to protect homes and outlying structures in the event of a wildfire. Areas located on the south facing slopes on the north side of the St. Maries River are heavily forested with dry ponderosa pine and Douglas-fir stands. Homes throughout the areas are frequently built using wood siding and decks and roofing materials that make the home harder and unsafe for firefighters to defend.

There have been many wildland fuel mitigation projects completed in the St. Maries area from 2007 through 2011. Some have been completed by the Coeur d'Alene Tribe in 2007, and more recently Benewah County fuels crews have been working in the Cassandra Hills and Highland Springs areas. Beginning in 2012, the St. Maries River Road has been undergoing a thinning / harvesting project to better protect direct access to Alder Creek from St. Maries. Continued maintenance of all these projects is necessary to ensure continued protection from possible wildland fire events (Figure 152).

Figure 152. St. Maries River Road improvements between St. Maries and Alder Creek.

St. Maries is accessed along two state highways: State Highway 5 from Plummer (to the west), and State Highway 3 from Harrison (to the north) passing through St. Maries and across the St. Joe River, then continuing to Fernwood and Emida (to the south). The St. Joe River Road begins in St. Maries and follows along the north side of the St. Joe River travelling east and passing through St. Joe and Ferrell before leaving Benewah County into Shoshone County, through Avery, and ultimately to Montana.

These are all paved two-lane roads. There are several additional escape routes on forest roads that lead away from St. Maries in all directions. Most of these forest routes are located in areas at moderate fire risk due to the close proximity of continuous fuels along the roadway. In 2010 and 2011 an extensive fuel break was constructed along the south city boarder. In the event of a wildland fire, it is possible that one or more of the escape routes could become impassable.

Posting temporary emergency evacuation signs of unrestricted escape routes would reduce confusion and save time in a wildfire situation. Additionally, many homes are located on high risk one-way in, one-way out secondary roads and/or private driveways that could become threatened by wildland fire. One-way in, one-way out access roads are not only dangerous for firefighters; they also increase the likelihood of residents becoming trapped.

Efforts have been made by the community to ensure that road names and house numbers are present throughout the area, yet many of the bridges in the vicinity of St. Maries lack adequate signs showing weight ratings. Most residences access power through above ground power lines. Rochat Watershed provides much of the community with water; however, homes and parks outside the city limits have drilled personal single dwelling wells or multi-home wells. The Rochat Watershed should be given a high priority for potential fire mitigation treatments.

This community and surrounding areas are protected by the St. Maries Fire Protection District (structural) (Figure 153) and the Idaho Department of Lands (wildfire).

Figure 153. Good signage throughout St. Maries Fire District.

5.7.1.1. Goose Haven Lake

There are approximately 50 structures located in the Goose Haven Lake area, located on the north side of the St. Maries River nearly 5 miles to the northwest of downtown St. Maries. Accessible by State Highway 3, this well thinned and protected road is at low risk for hazards restricting the ability of firefighter's access to the community. To the west of the community is mostly agricultural land and to the north and east are heavily logged forest areas with good thinning and brush control that greatly reduces the risk of this community to wildfire.

5.7.1.2. Cassandra Hills

There are approximately 50-60 structures located in the Cassandra Hills area, located on the north side of the St. Maries River about 4 miles to the northwest of downtown St. Maries. This area is accessible from State Highway 3, a well thinned and protected road at low risk for hazards. The main road into this community is Cassandra Hills Road which is steep with switchbacks, possibly restricting the ability of firefighter's access to the community. Many thinning projects have taken place throughout this community to protect it from the dry hillsides and steep south facing gulch this community is located in. These thinning projects, taking place in 2009 & 2010, along with continued road maintenance and re-grading must be maintained to ensure a moderate wildfire risk assessment (Figure 154).

Figure 154. Thinning mitigation project near Cassandra Hills community.

5.7.1.3. Hells Gulch

Hells Gulch is a community of approximately 100 structures, located about 8 miles to the north of St. Maries. The highest risk to this community is the limited access to the area for firefighters. Main access is from the southwest along Deep Creek Road, a well maintained gravel road that loops to an access point behind the high school. Access from the east or southeast is by mostly seasonal, very steep roads. Although the main aspects of the area are south facing, dry and heavily forested hillsides, the majority of structures in this area are adjacent to agricultural lands, reducing their risk to an extreme wildfire catastrophe.

5.7.1.4. Milltown

Approximately 150 structures make up the community of Milltown. Located about 1½ miles northeast of St. Maries, the community is accessible from Milwaukee Road, a well maintained and paved road. Most residences are located along short driveways and streets and would be easily accessible by firefighters in the event of a wildfire. The majority of structures are surrounded by good defensible space, wet valley grasses and well thinned forests to the east. Those at the highest risk are located along the forest line to the east, but due to logging projects in this area, the forests have been well thinned and brush piles removed for the most part. The community as a whole is at low risk of a wildfire threat.

5.7.1.5. Evergreen Terrace

The community of Evergreen Terrace is located approximately 1½ miles south of downtown St. Maries. This community is accessible from Evergreen Terrace Road, along State Highway 3. This is a gravel road with steep slopes on the north side of the community. Forested draws to the north of the community increase the risk of wildland fire loss to structures in the area. The nearly 200 structures located in the area are located on a southwest facing aspect, increasing the probability of dry, downed and dead fuels. Access roads and hillsides should be further assessed for wildland fuels mitigation projects to help protect the community in the event of a wildfire.

5.7.1.6. River Pine Estates

The River Pine community is located approximately 2 miles south of downtown St. Maries and to the immediate west of the St. Maries River flowing into town from the south. It is accessible from Garden Tracts Road along State Highway 3. This looping access road, as well as the nearly 150 structures in the community, are generally surrounded by valley grasses and are well protected from heavy fuels that might threaten the community in the event of a wildfire. This community is also located very close to the St. Maries River offering a great water source for protection. Defensible space must be preserved to maintain the low risk this community has to wildfire.

5.7.1.7. Highland Springs

The Highland Springs community is made up of approximately 60 structures and is located along Highland Springs Road, a loop road about 3½ miles to the south of St. Maries. Access to this community is along the St. Maries River Road, flanked on the east and south sides by a nearly year-round wetland area. The road leading up into the community is steep and forested on both sides. In 2009, many thinning projects took place throughout the community to protect the roads for safe access by firefighters and escape routes for homeowners in the event of an evacuation (Figure 155). Due to this community's location on a south facing slope, in forested lands, the highest risk to the area is from below, due to a railroad line and gravel road that increases chances of ignition.

Figure 155. Completed thinning mitigation project (left); area along St. Maries River Road needing fuels mitigation (right).

5.7.1.8. Cherry Creek Road

This collection of about 50 structures is located approximately 2 miles west of St. Maries along State Highway 5. The majority of the community is located on a northeast facing slope that has scattered forested areas intermixed with agricultural lands. Those structures located farther up the drainage, however, are at a higher risk to wildfire due to steep south and west facing slopes, with little or no defensible space. The community had thinning projects completed in 2009 along the roads on the drainage bottom to reduce the risk of wildfire spreading up the hillside into the community. Additional defensible space is needed for those structures located on the hillsides without thinning work to protect those homes in a wildfire event.

5.7.1.9. Shay Hill

The Shay Hill community is made up of approximately 30-40 scattered structures along a winding, steep, forested road. Shay Hill Road is accessible from State Highway 5, about 3 miles west of St. Maries. Generally, residences are located along long, winding driveways that are heavily forested and not always well maintained. There have been years of logging projects throughout the area that has left the forest thinned, while smaller growth trees are beginning to grow. Projects are needed to help homeowners maintain driveways by thinning brush along the roads and creating turnouts on the long driveways, making access safer for firefighters to protect the residences and for homeowners to evacuate in the event of a wildfire.

5.7.1.10. Flat Creek

The Flat Creek community is made up of approximately 100 structures located in heavily forested land with steep slopes throughout and surrounding the area. This community spans State Highway 3 on the east and west sides, approximately 8 miles south of St. Maries. This area has many logged areas surrounding the community, some of which are active, possibly restricting access to some evacuation routes. Most access roads and driveways are long, winding and overgrown with vegetation on both sides. Fuels thinning along roads and expansion of defensible space projects are needed to help protect infrastructure and homes. Many homes are also missing adequate signage providing addresses for effective emergency response.

5.7.2. Potential Mitigation Activities

The highest risk to wildfire for the overall community of St. Maries lies with those communities and structures located in the outlying areas along steep, and often narrow, forest lined roads. The downtown area of St. Maries is at a significantly lower risk to a wildfire entering the community, but may still experience the effects of wildfire with the surrounding communities due to smoke and resource allocation needs. The thinning projects that have taken place in the area from 2009-2011 have helped greatly to reduce the fuels that produce a catastrophic wildfire.

Logging activities throughout the surrounding areas of St. Maries create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures (Figure 156).

Figure 156. Prescribed burning and structure protection after a forest thinning project.

Many of the homes in the St. Maries area were constructed with building materials and landscaping techniques unfavorable for protecting them against wildfire. Individual home site evaluations can increase homeowners' awareness and improve the survivability of structures in the event of a wildfire. Creating a defensible space around structures can significantly reduce the potential loss of life and property (Figure 157). This can be accomplished by individual residents by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating wood piles, propane tanks, and other flammable objects away from the home. Assessments of homes or subdivisions in the outlying areas should also address the issue of escape routes and home defensibility characteristics. Educating homeowners in techniques for protecting their property is critical in areas where heavy fuels are present.

Figure 157. Good defensible space surrounding structure in town.

The smaller communities surrounding St. Maries, located on long winding and steep roads, can benefit from individual home site evaluations to increase homeowners' awareness and instruct homeowners how to improve the survivability of structures in the event of a wildfire. Home assessments can address the issue of escape routes and home defensibility characteristics. Creating a defensible space around structures can significantly reduce the potential loss of life and property. This can be accomplished by individual residents by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating wood piles, propane tanks, and other flammable objects away from the home. Continued efforts to thin fuels around the community would help lessen the probability of a wildland fire reaching the town site. Creating and widening turnouts, thinning fuels, and repairing bridges along access routes would reduce the risk of residents becoming trapped and increase the responsiveness and safety of suppression vehicles and personnel. Educating homeowners in techniques for protecting their homes is critical in areas where heavy fuels are present.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the WUI can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas within forested campsites around St. Maries.

5.7.3. Recommendations:

1. Perform individual home site evaluations (approximately 130-150) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 60-70 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges on applicable sections of Hells Gulch Road, Highland Springs Road, Evergreen Terrace Road, and St. Maries River Road below Highland Springs and continuing South to Alder Creek and the Benewah Valley (Figure 158).
4. Remove surface fuels such as slash, natural regeneration, and dead and down wood from harvested areas around the Hells Gulch community.
5. Sign and provide weight rating information on all bridges and cattle guards on access roads.
6. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
7. Keep clear lines of communication open with the Idaho Department of Lands, USDA Forest Service, and the Coeur d'Alene Tribe.
8. Post clear regulations on fire use within recreational areas and provide escape proof fire rings and barbecue pits.
9. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

Figure 158. Brushing mitigation project along St. Maries River Road; needs maintenance to ensure safety.

5.7.4. Community Maps

Community Maps of St. Maries are provided to give the reader a better understanding of the area, and the concepts shared here. First is the St. Maries area (Figure 159 - Figure 167), then the Flat Creek area's maps (Figure 168 - Figure 176).

Figure 159. St. Maries NAIP Aerial Imagery.

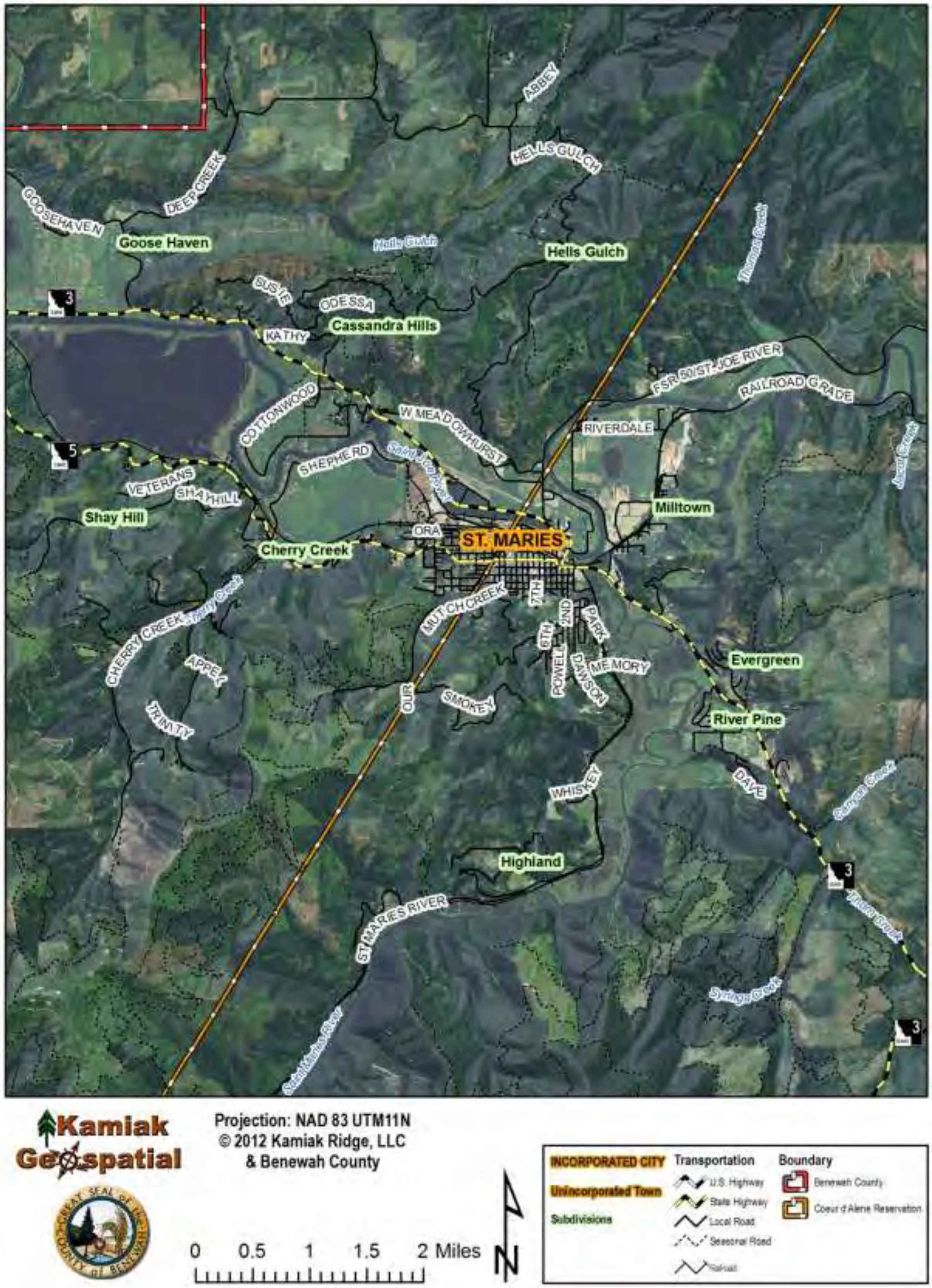


Figure 160. St. Maries Topography.

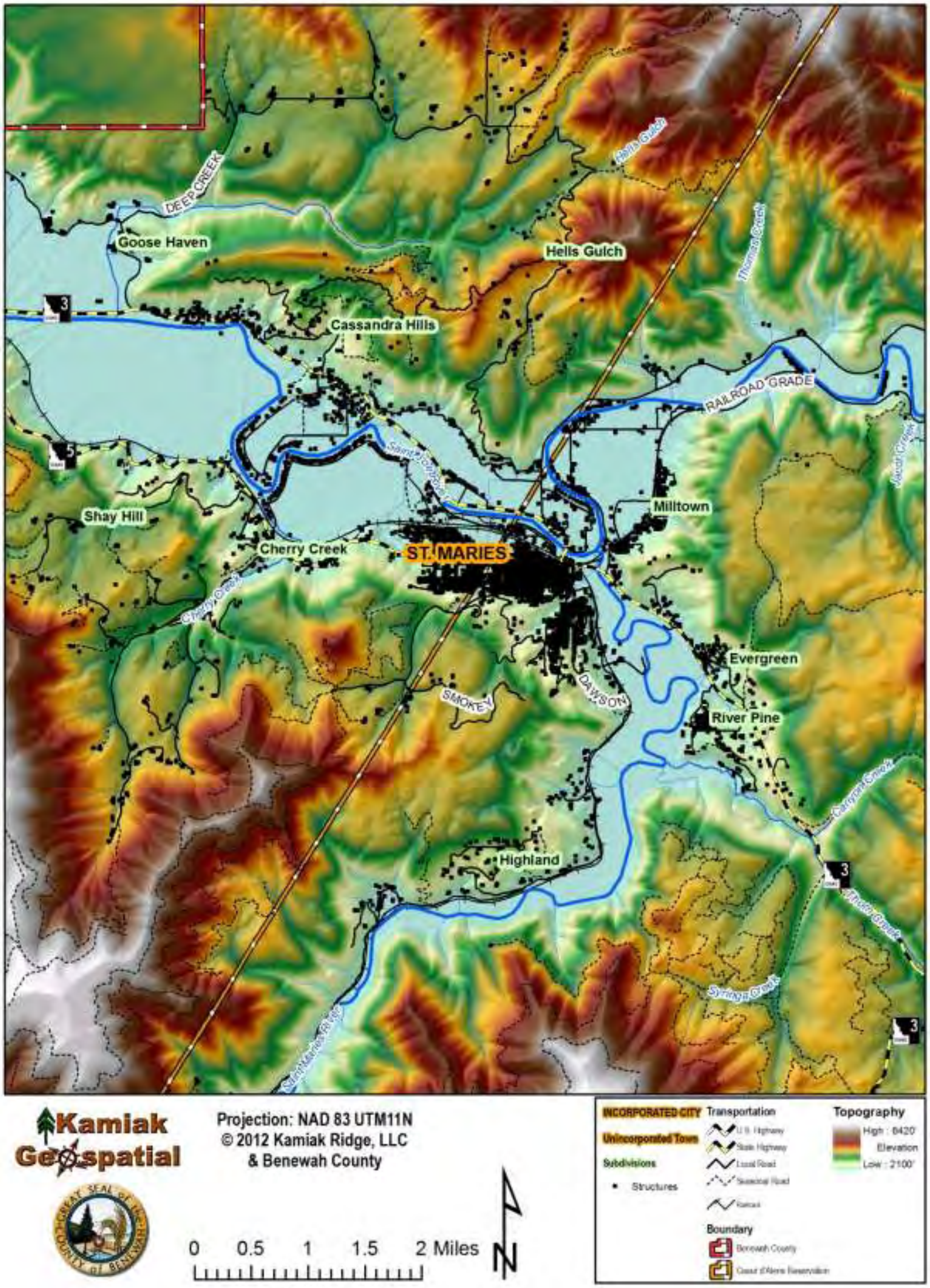


Figure 161. St. Maries Land Ownership.

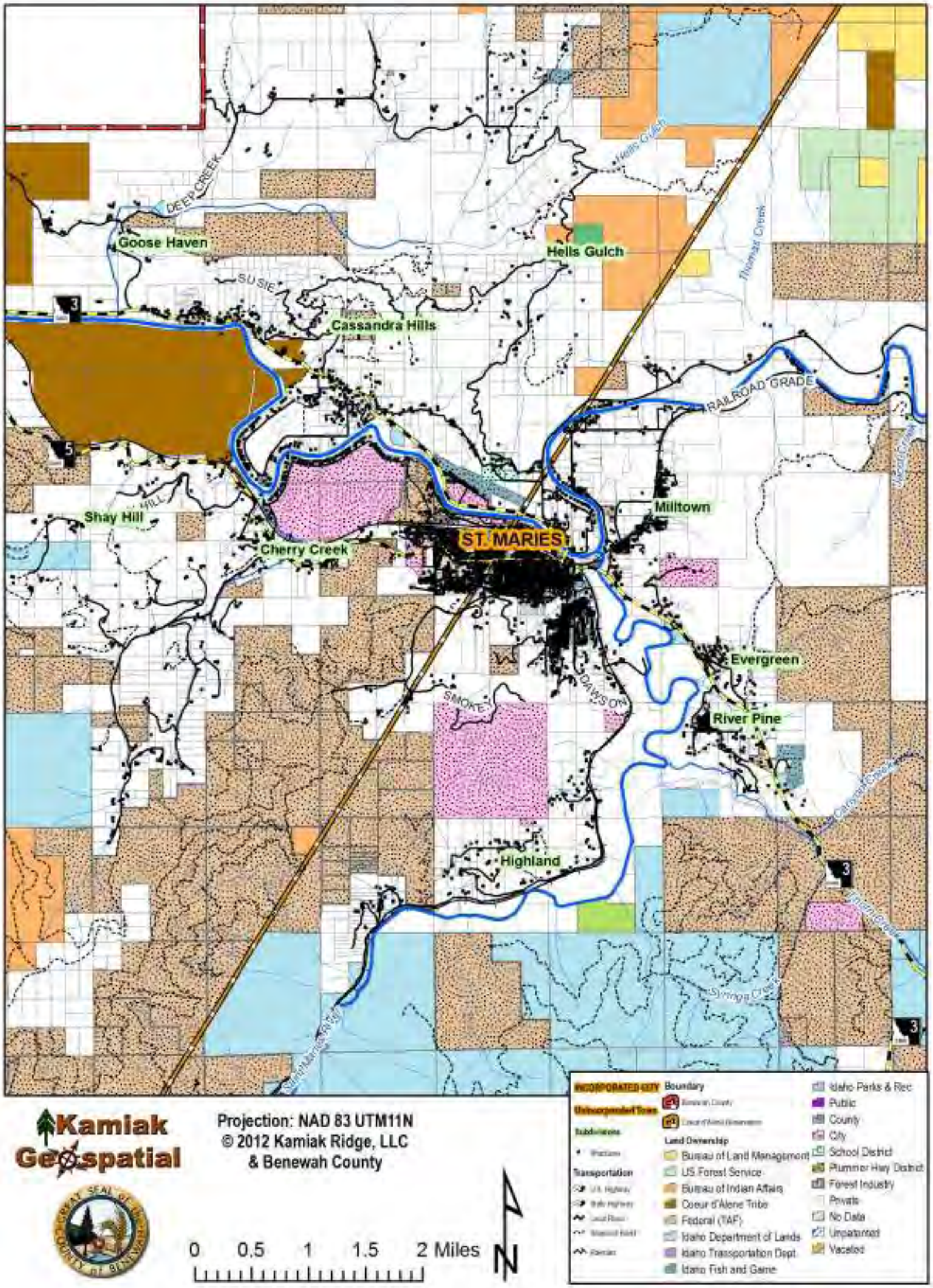


Figure 162. St. Maries Wildland-Urban Interface Zones.

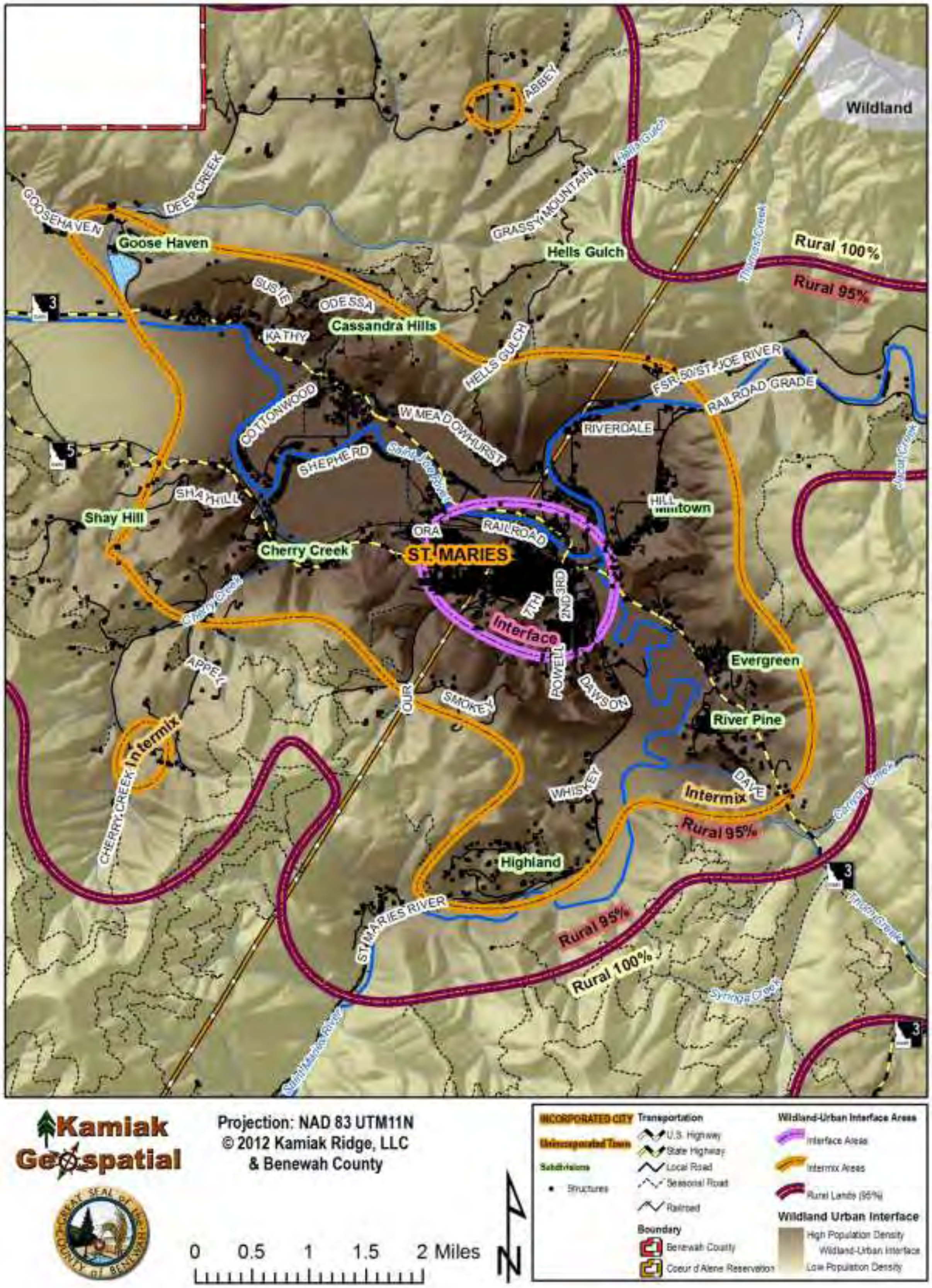


Figure 163. St. Maries Fire Prone Landscapes.

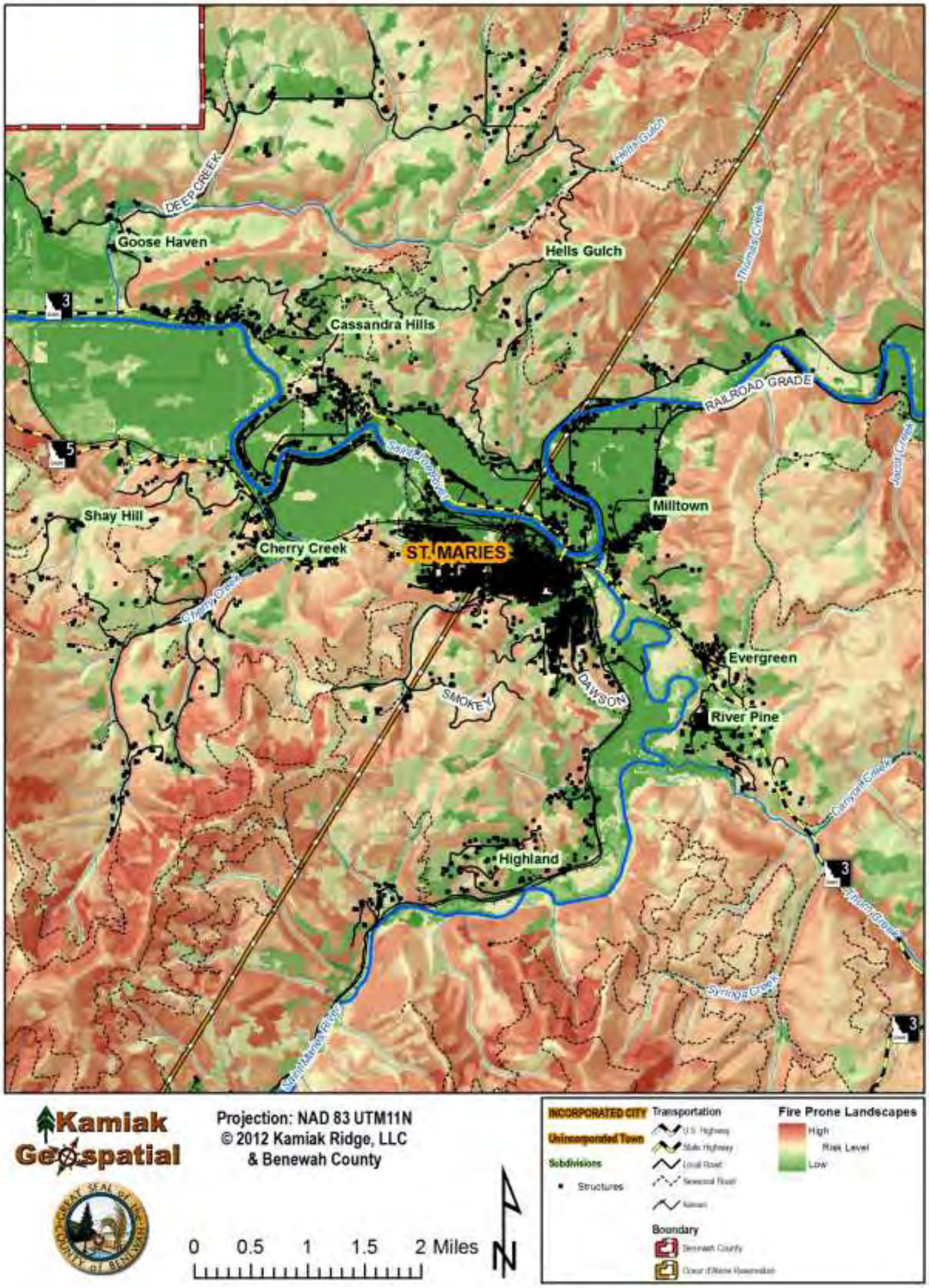


Figure 164. St. Maries Mean Fire Return Interval.

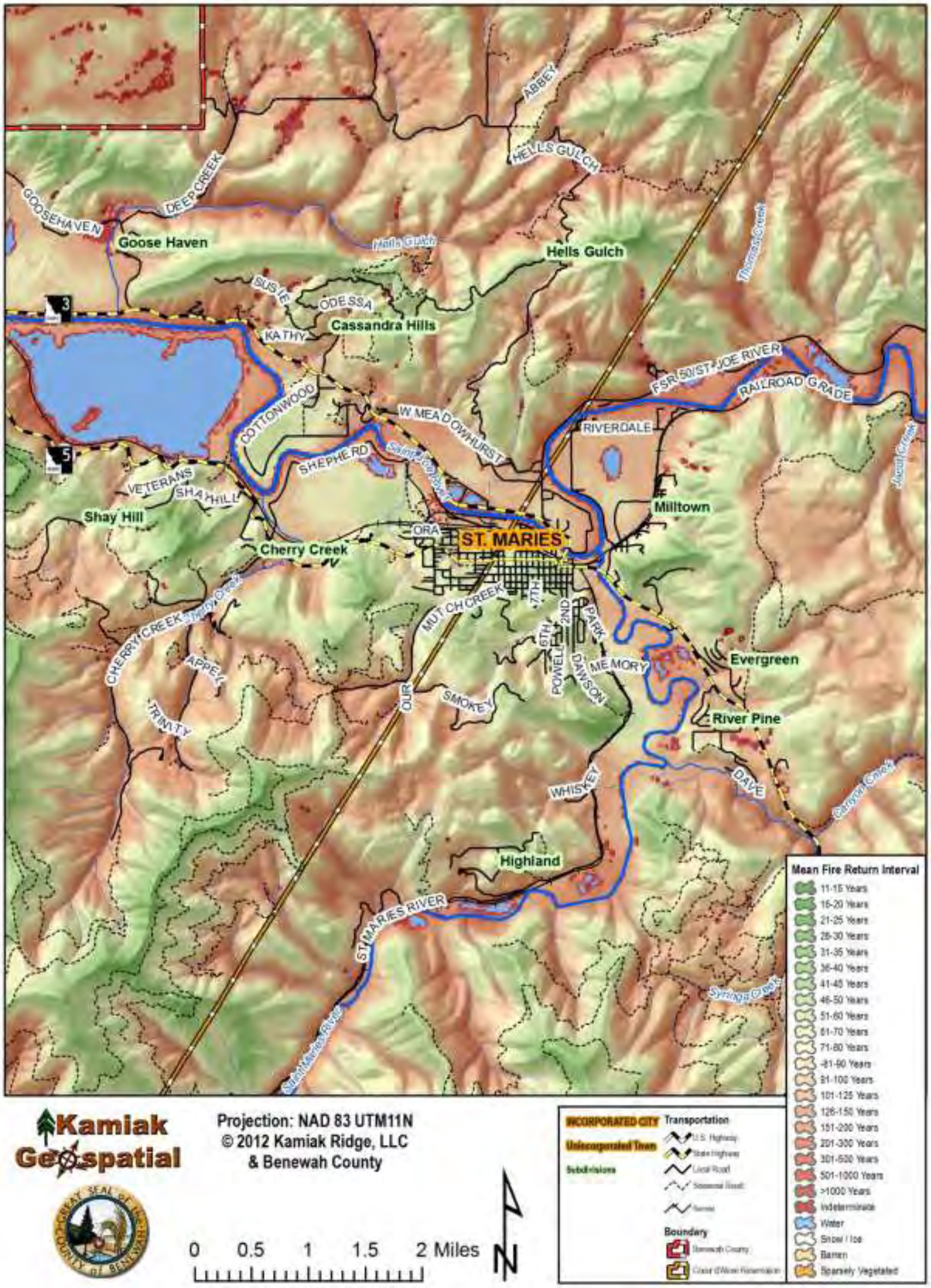


Figure 165. St. Maries Historic Fire Regime Groups.

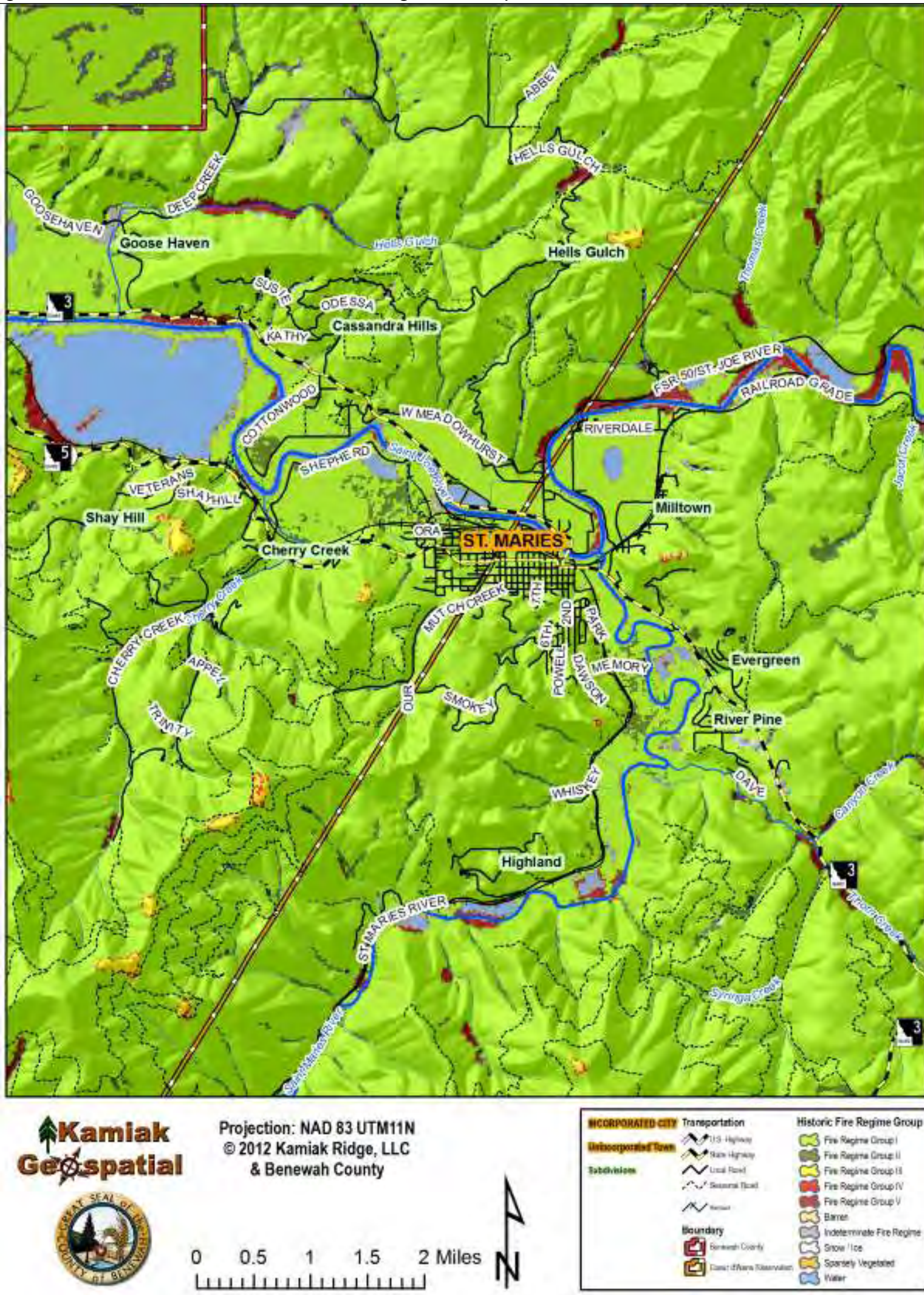


Figure 166. St. Maries Fire Regime Condition Class.

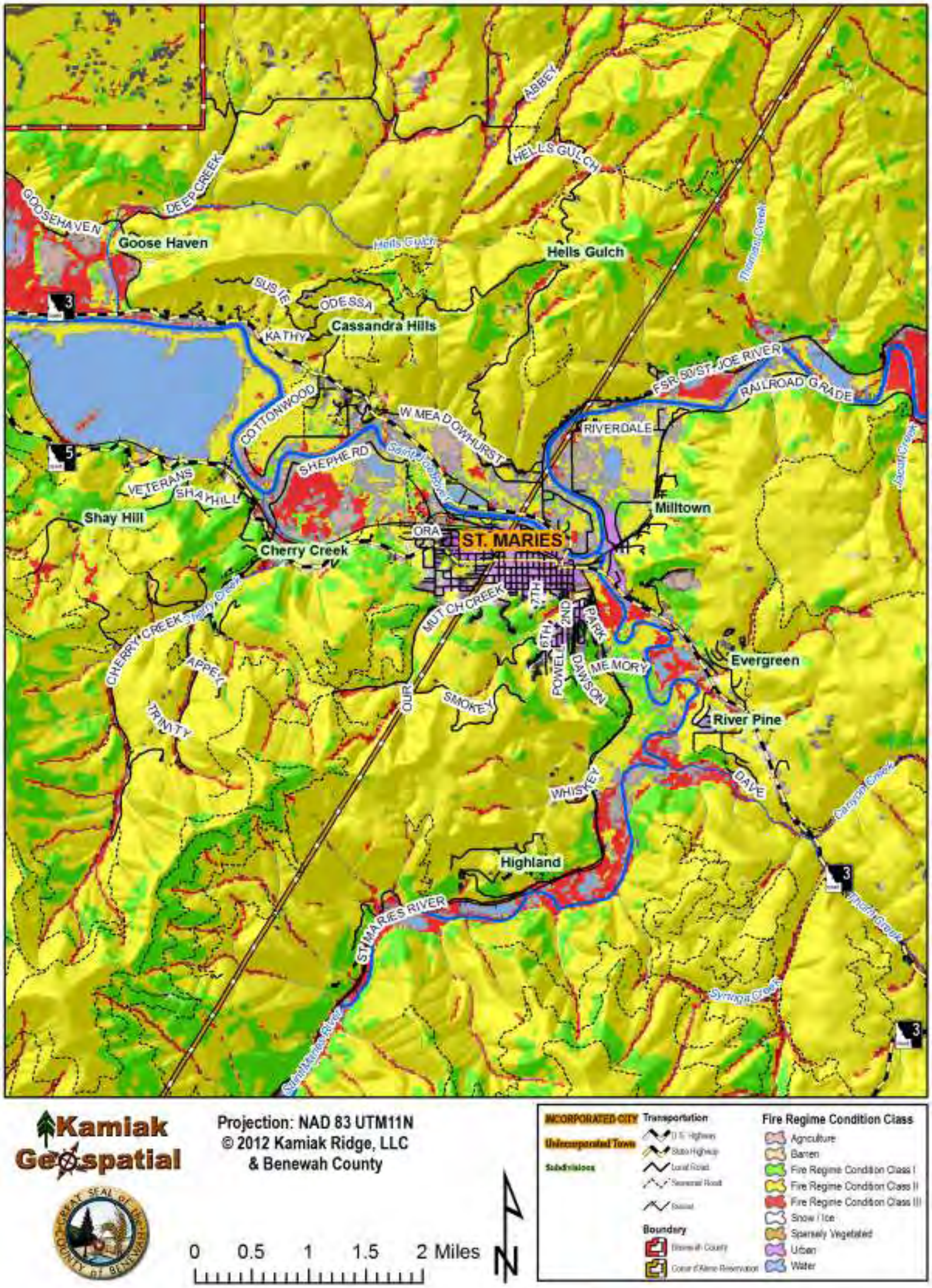


Figure 167. St. Maries Potential Soil Damage from Intense Fires.

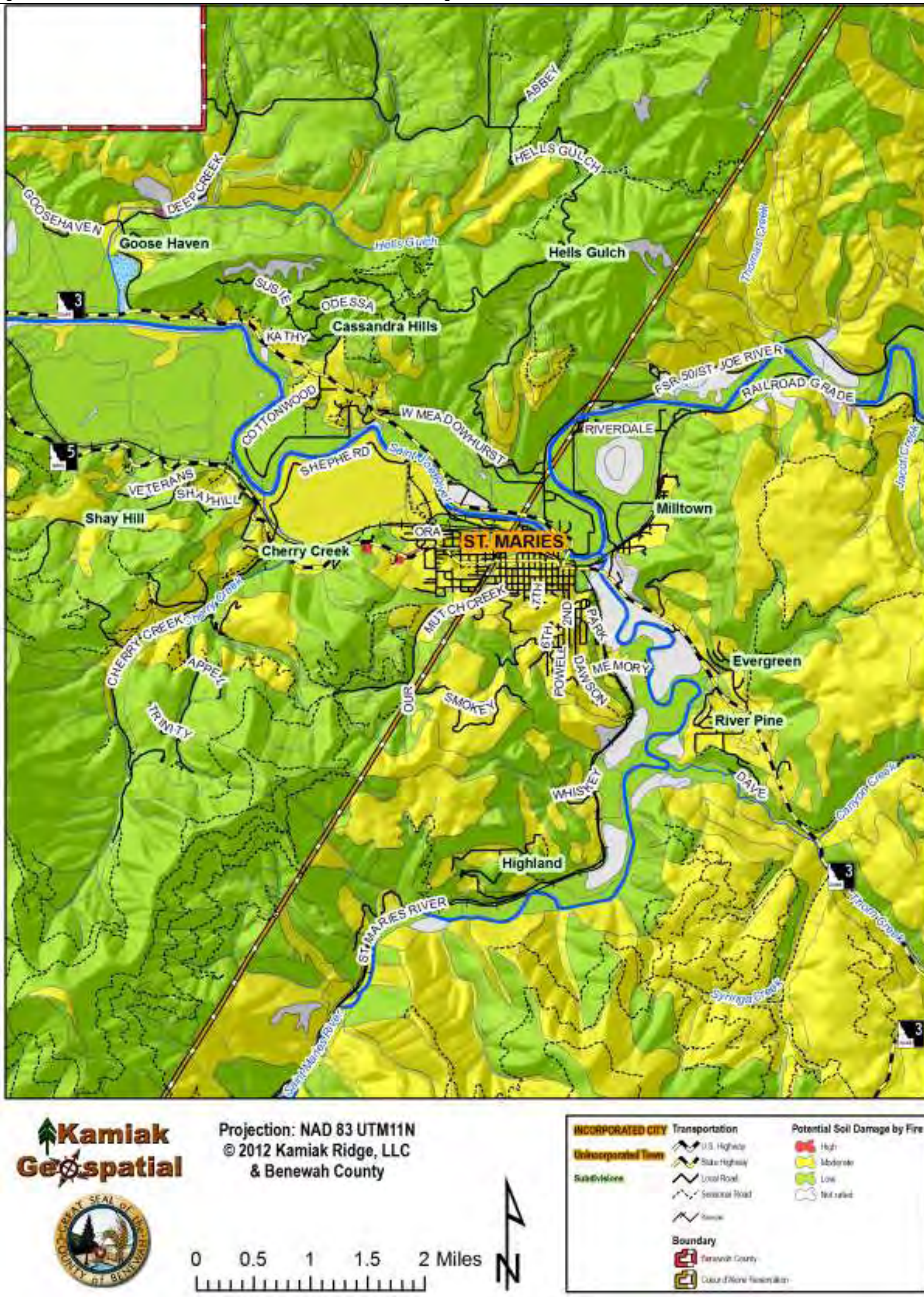


Figure 168.	Flat Creek NAIP Aerial Imagery.

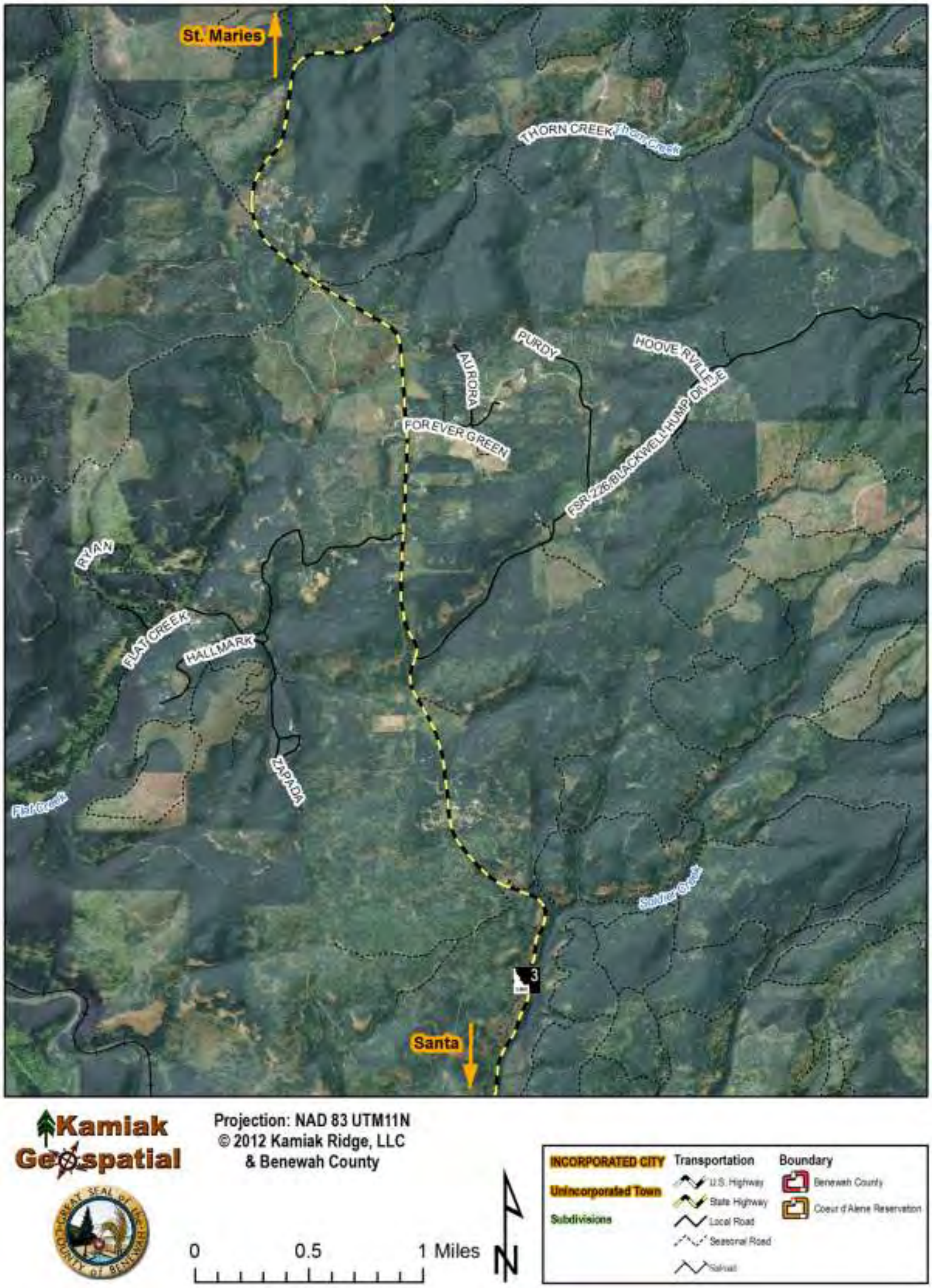


Figure 169. Flat Creek Topography.

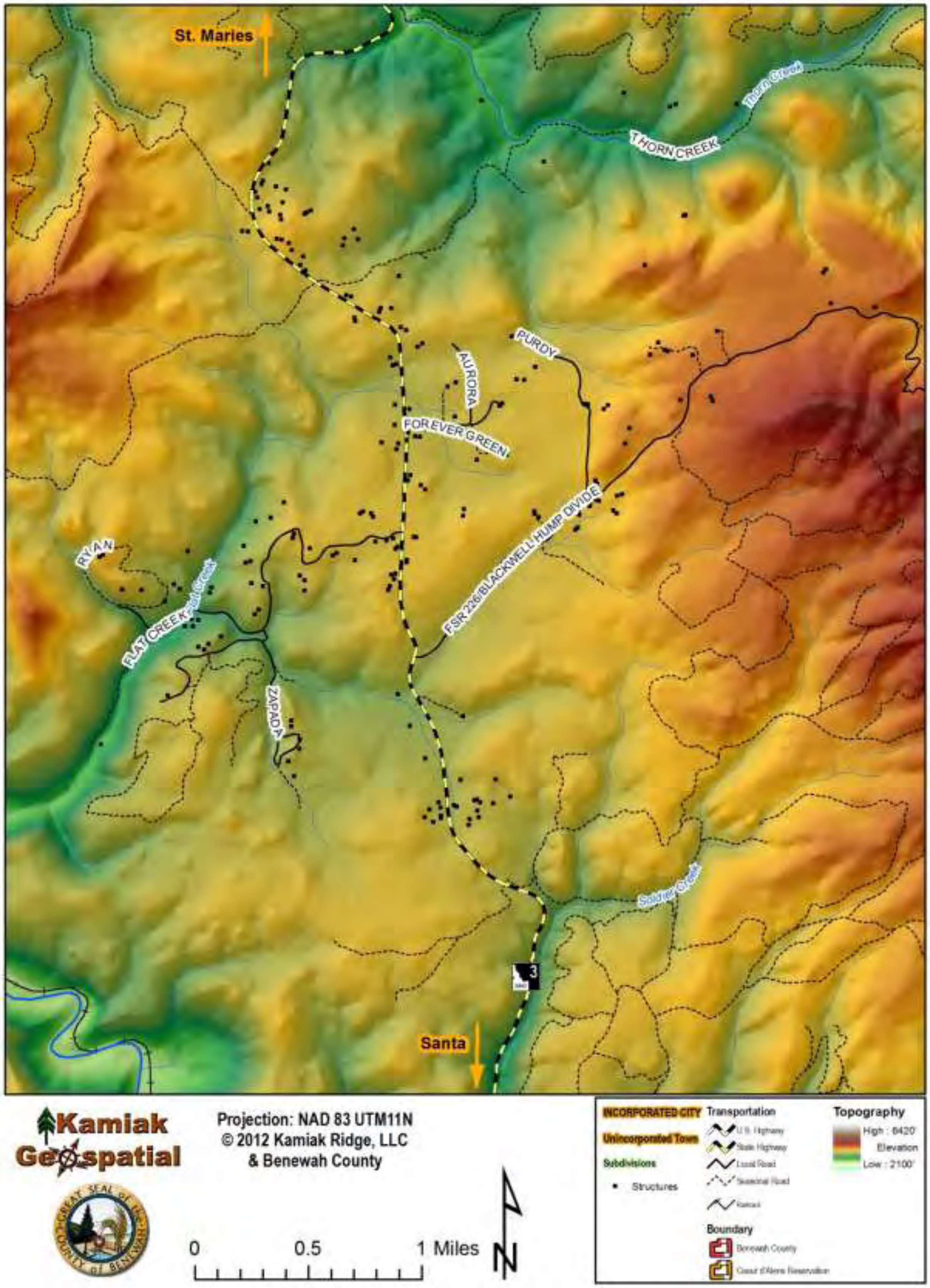


Figure 170.   Flat Creek Land Ownership.

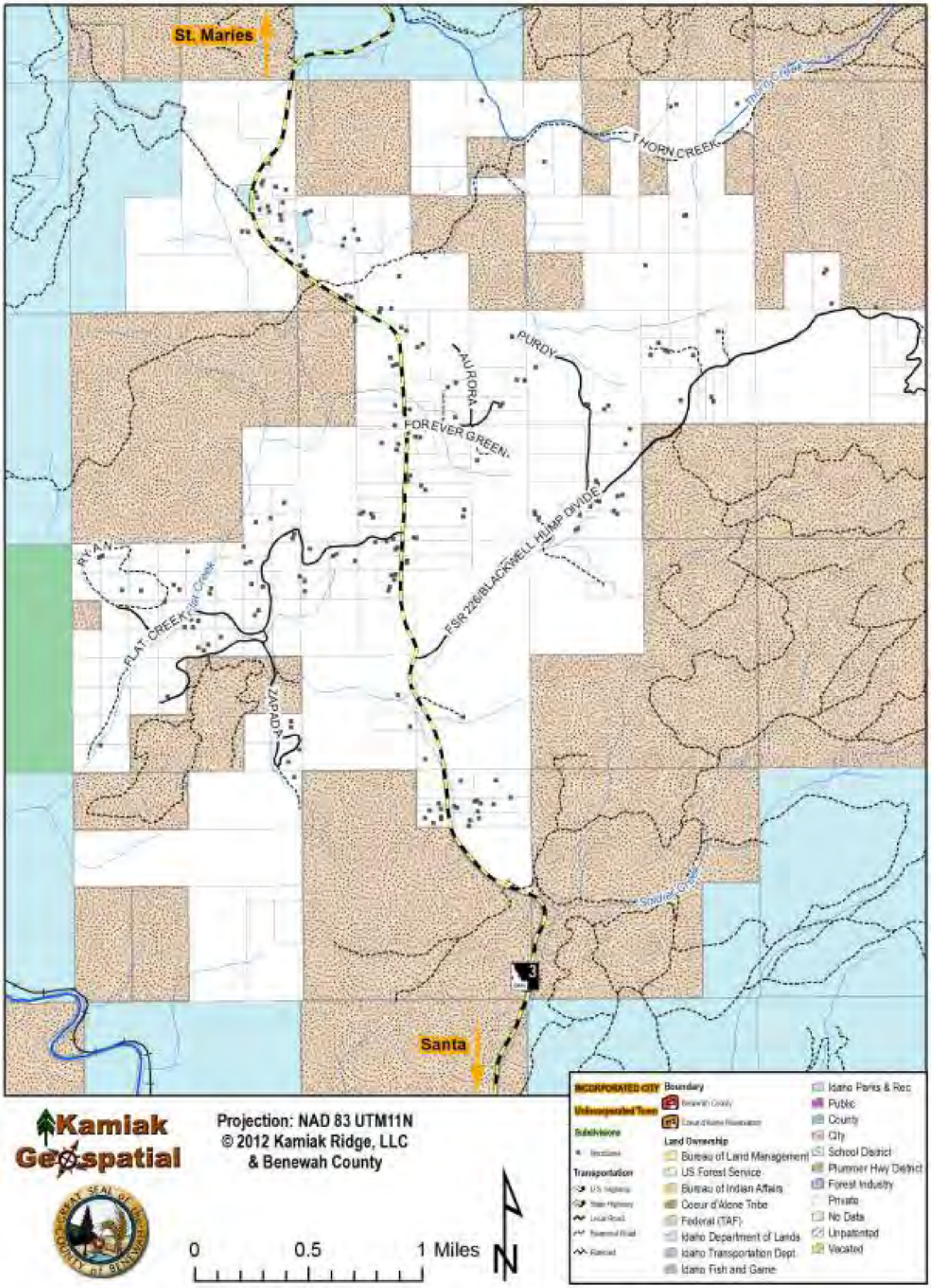


Figure 171. Flat Creek Wildland-Urban Interface Zones.

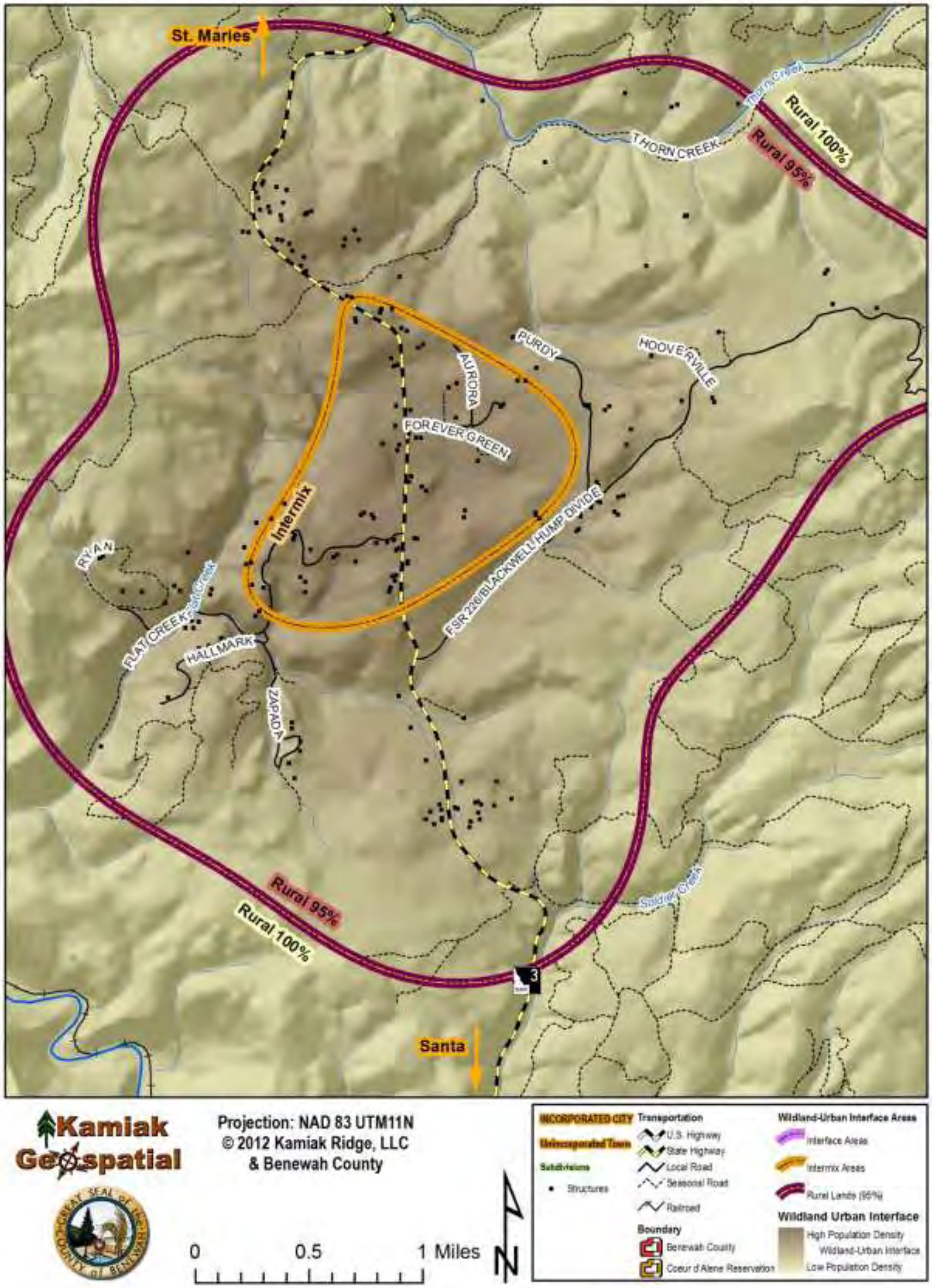


Figure 172. Flat Creek Fire Prone Landscapes.

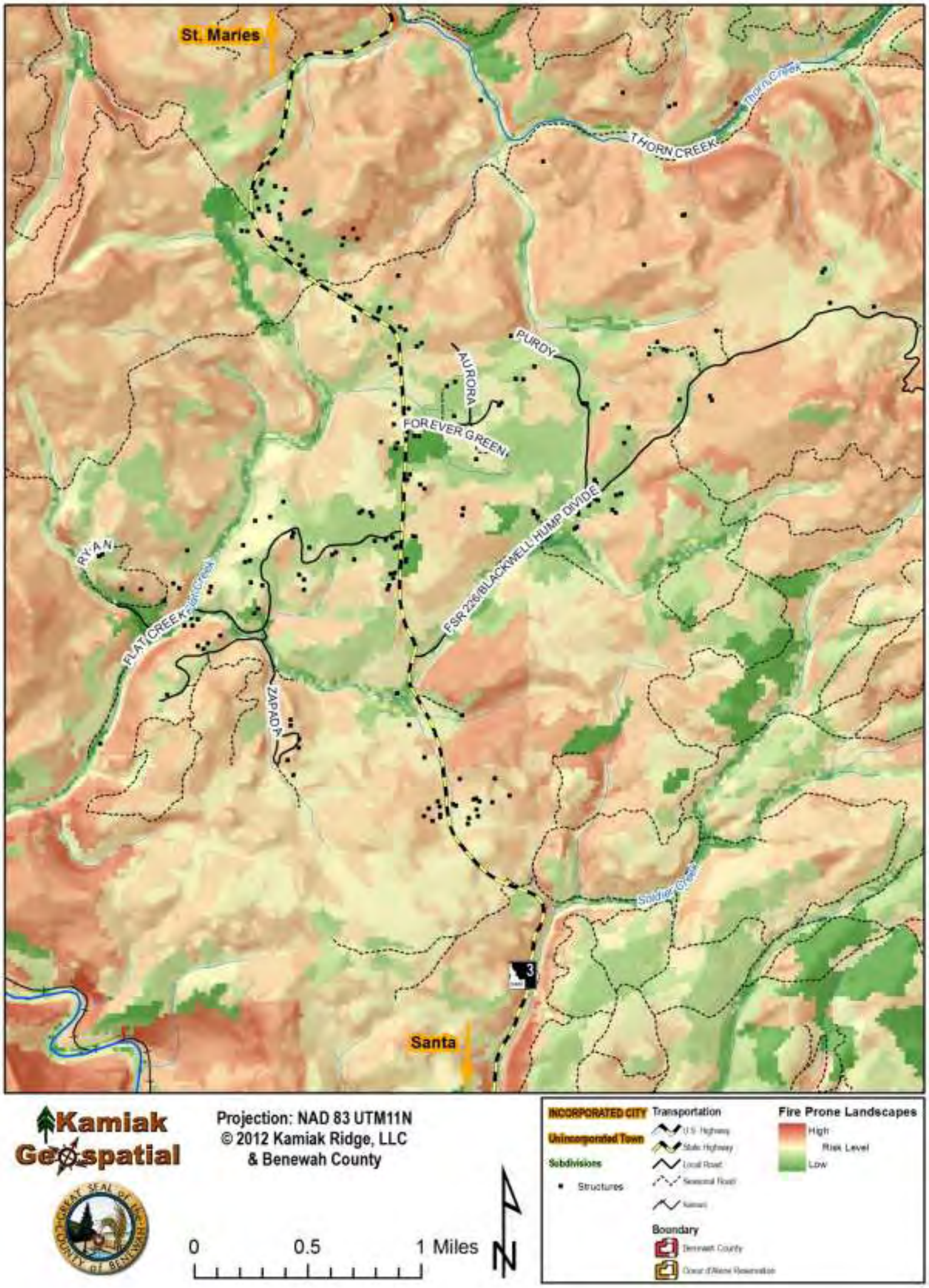


Figure 173. Flat Creek Mean Fire Return Interval.

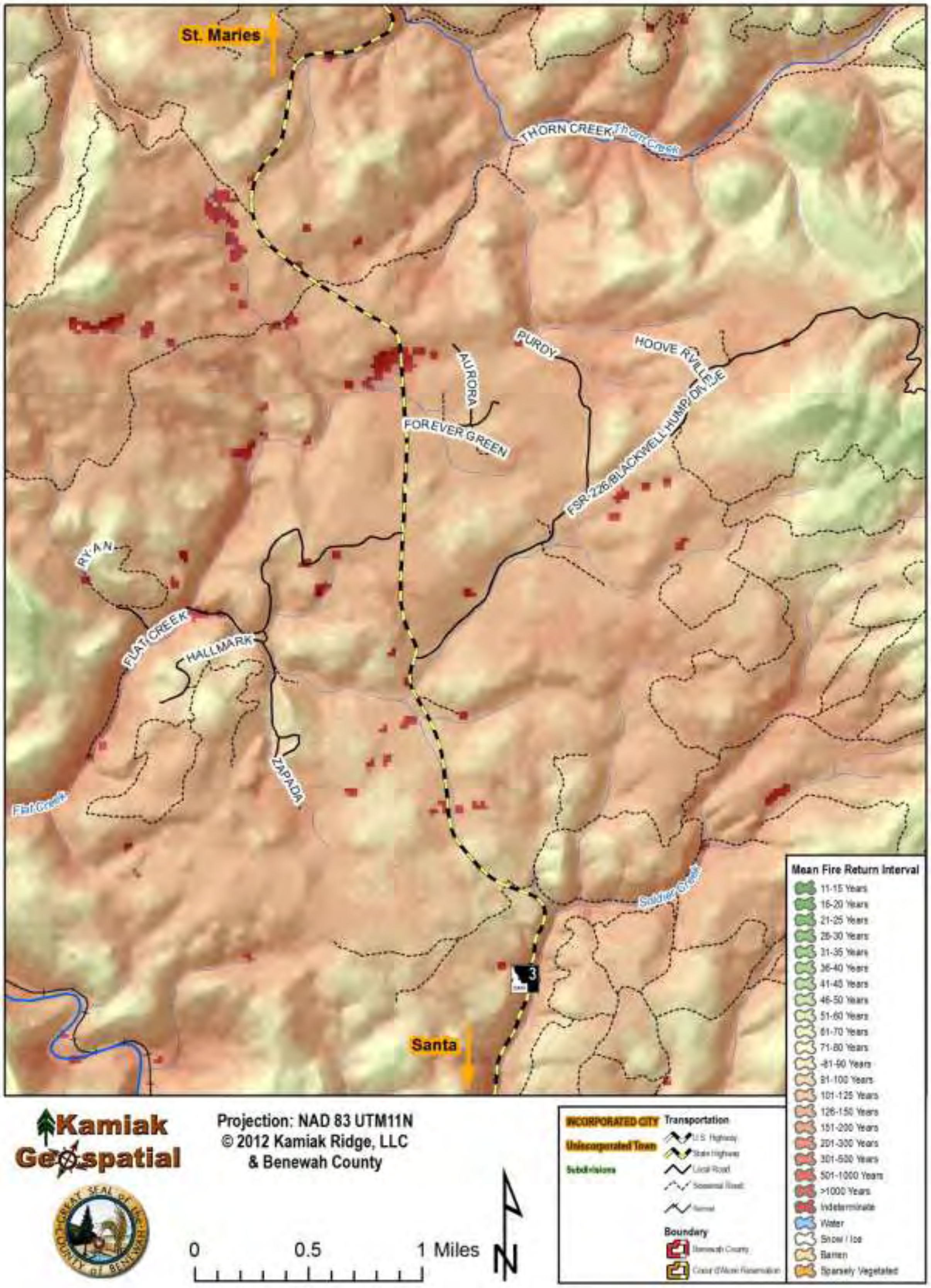


Figure 174. Flat Creek Historic Fire Regime Groups.

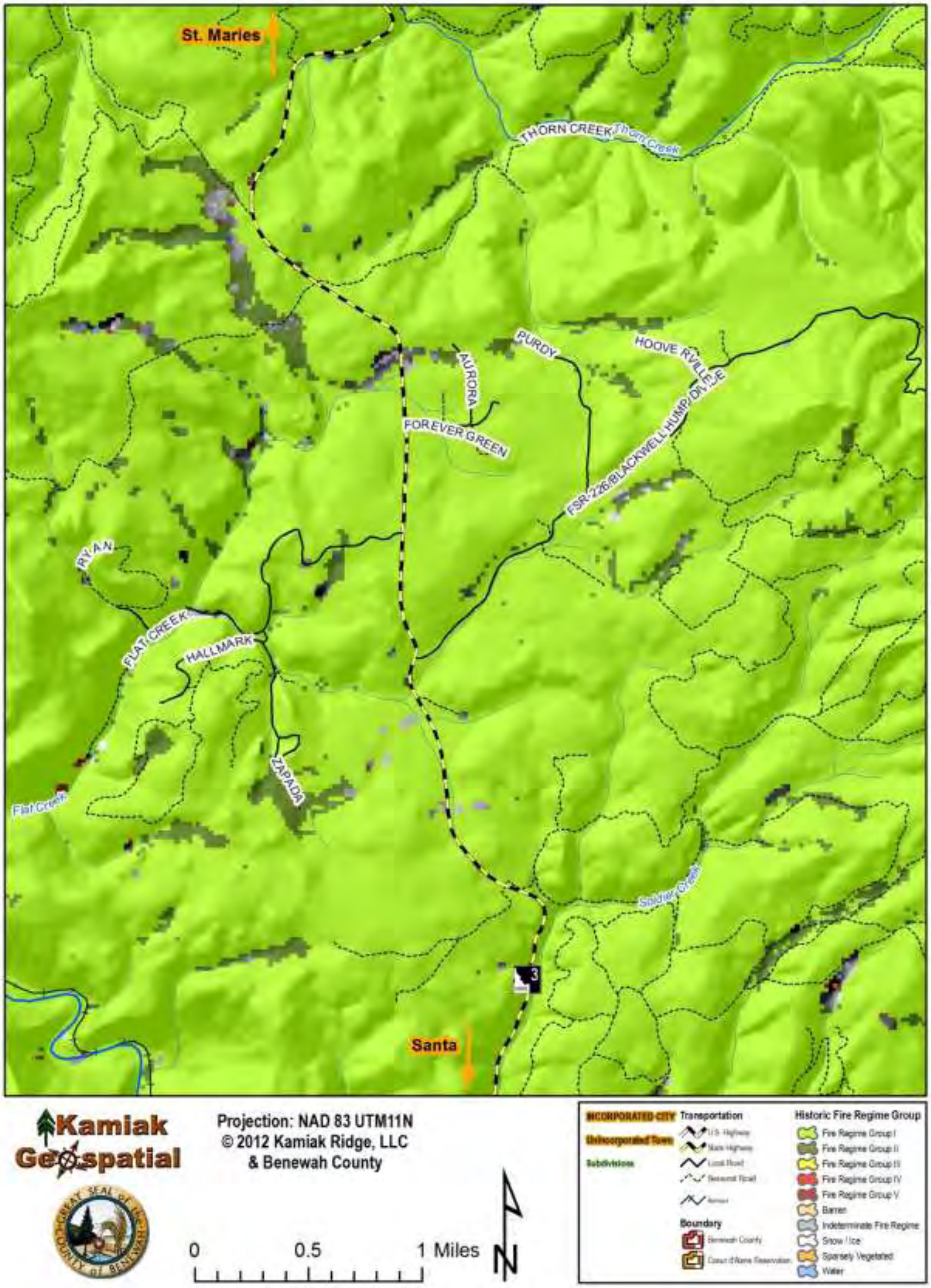


Figure 175. Flat Creek Fire Regime Condition Class.

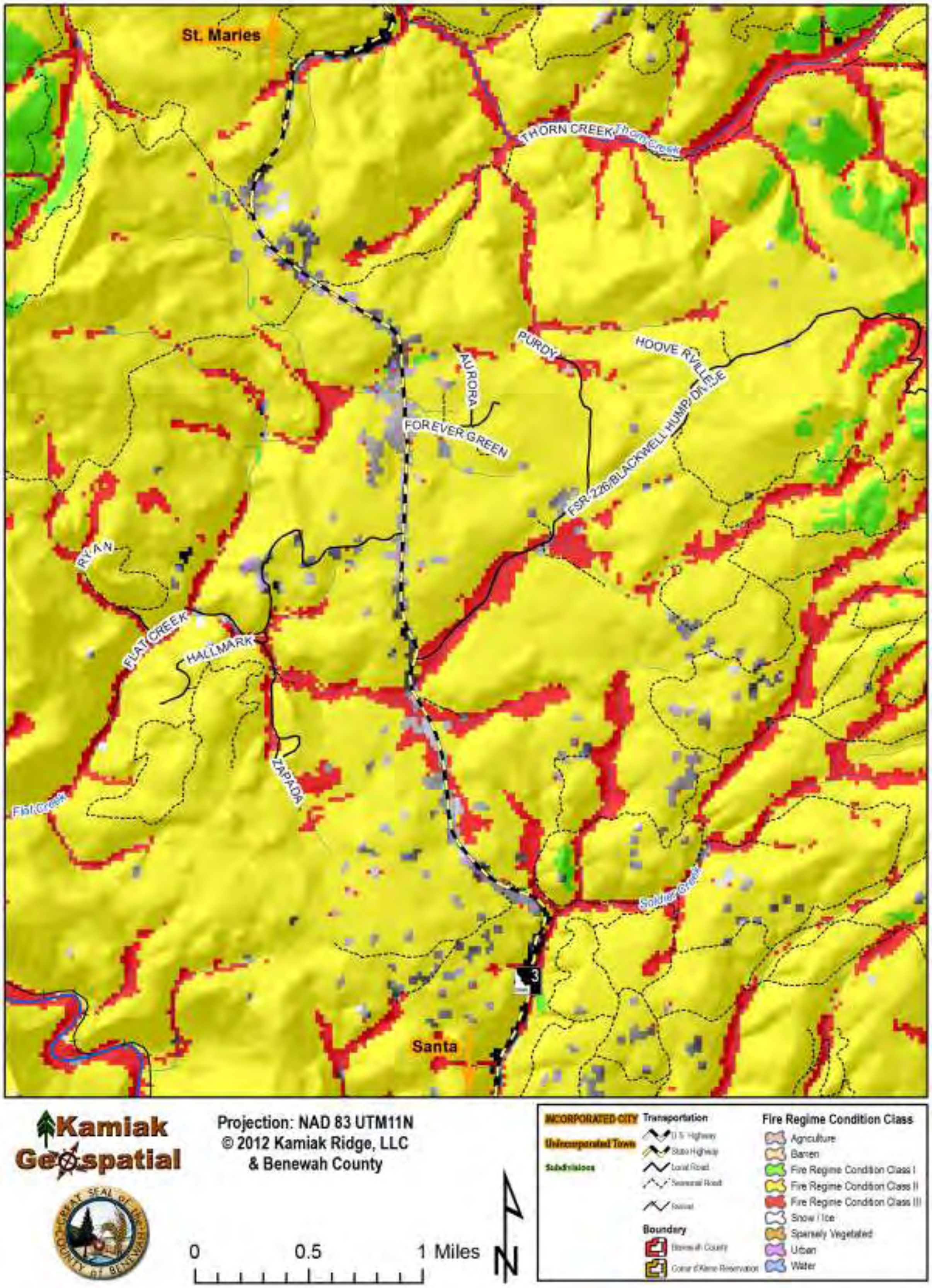
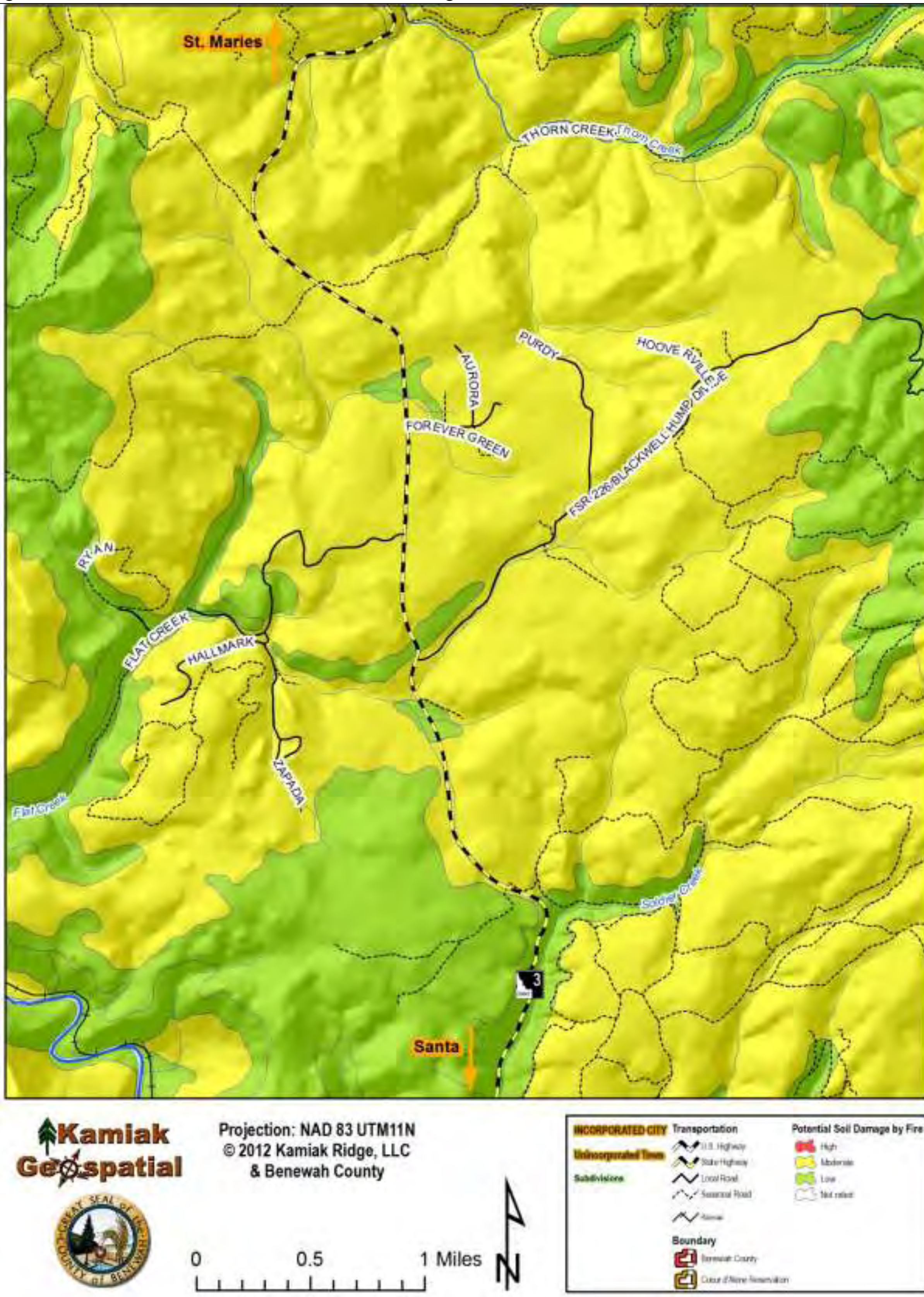


Figure 176. Flat Creek Potential Soil Damage from Intense Fires.



5.8. St. Joe City and Ferrell

5.8.1. Community Assessment

St. Joe and Ferrell, consisting of about 150 structures in total, are located along the St. Joe River, approximately 8-10 miles east of St. Maries. The primary risk to wildfire for these communities is located on the steep, heavily forested slopes, and from the up-canyon winds that are frequently present in the area during fire season. Although many of the structures located in these communities are immediately surrounded by valley grasses and agricultural lands along the St. Joe River, those homes located in the draws up Reeds Gulch, Ahrs Creek, and Phillips Draw face higher risks (Figure 177). Recreational activities and pass-through traffic increase the potential ignition sources that could threaten the communities.

Figure 177. Valley grasses meet steep heavily forested slopes.

There have been very few fuels projects completed in the area of St. Joe and Ferrell. One home defensibility project was completed in 2009 in the Rochat Creek drainage to remove excess fuels on a west facing slope. Other gulches in the area could benefit from similar projects in the future.

Many of the homes along Grand Avenue, south of the St. Joe River at St. Joe abut or mingle with heavy fuels (Figure 178). Additionally, some of these residences are located on dead end private drives. Although many of the homes along the river downstream of St. Joe are at low risk, the only road accessing this area is adjacent to continuous wildland fuels on its southern side.

Figure 178. Wildland fuels build-up adjacent to home with power line through trees.

The primary access into St. Joe is on the St. Joe City Road off the St. Joe River Road (Primary Forest Route 50). This road provides the only access across the St. Joe River for several miles. The bridge crossing the St. Joe River over the St. Joe City Road is restricted to one lane of travel. Additionally, the wooden bridge on the old railroad bed road, which provides the most direct access into town, is not only very narrow, it also lacks weight rating information and a railing or other protective guide on one whole side. Bond Creek Road, Sly Meadows Road, and the old railroad bed road, located along the south side of the river, offer additional escape routes to the south. All of these roads are located in areas at moderate to high fire risk due to the close proximity of continuous fuels along the roadway. In the event of a wildland fire, it is likely that one or more of the escape routes would be impassable.

Figure 179. St. Joe access road on South side of the St. Joe River; gravel with some areas of heavy fuels along roadside.

Many of the homes in the community have been built using wood siding, decking, and roofing, which is unfavorable for protection against wildfire. Also, some homeowners stack firewood under decks or against structures. Road names and house numbers are generally present throughout the area, yet bridges on many access roads lack adequate weight ratings signs. The power line corridors near the community have been cut and pruned; however, this area still maintains a very high risk of fire spread due to remaining surface fuels and nearby forest fuels. St. Joe and Ferrell are not incorporated into the St. Joe Valley Fire Protection District; therefore, there is no formal structural fire protection for these communities. The Idaho Department of Lands does, however, provide wildland fire protection to this area.

5.8.2. Potential Mitigation Activities

Those structures located on the north side of the St. Joe River, in draws and on south facing slopes are at a moderate risk of wildfire due to their location in heavily forested areas, winding access roads and gusting winds that occur within the St. Joe River Valley. Those structures located along the north facing slopes on the south side of the St. Joe River are at a lower risk of wildfire because of the lowered risk on north facing slopes as well as the defensible space and shorter access roads for firefighting equipment to safely protect homes located closer to the forest line.

Logging activities throughout the surrounding areas of St. Joe and Ferrell create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures.

Individual home site evaluations can increase homeowners' awareness and, when implemented, can improve the survivability of structures in the event of a wildfire. Home assessments can address the issue of escape routes and home defensibility characteristics. Creating a defensible space around structures can significantly reduce the potential loss of life and property (Figure 180). This can be accomplished by individual residents by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating wood piles, propane tanks, and other flammable objects away from the home. Efforts to thin fuels around the community would help lessen the probability of a wildland fire reaching the community. Creating and widening turnouts, thinning fuels, and repairing bridges along access routes would reduce the risk of residents becoming trapped and increase the responsiveness and safety of suppression vehicles and personnel. Educating homeowners in techniques for protecting their homes is critical in areas where heavy fuels are present.

Figure 180. Maintained yard, with some heavy fuels downslope of home.

In general, home clusters in this area should focus on small projects that will increase the safety of citizens and property in the event of a wildfire emergency. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, d) thinning and pruning trees around power lines, and e) thinning road-side brush and low-hanging branches along main travel routes. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the wildland-urban interface can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community. It is also important that people recognize and follow rules concerning campfires and trail restrictions in designated recreation areas along the shores of the St. Joe River.

5.8.3. Recommendations:

1. Perform individual home site evaluations (approximately 50-60) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 30 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges of secondary roads or one-way in, one-way out driveways that access homes identified as having risk; specifically Reeds Gulch, South Grand, and Riverside Roads.
4. Sign and provide weight rating information on all bridges on access roads.
5. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
6. Remove slash, regeneration, and other surface fuels from the understory in harvested areas.
7. Keep clear lines of communication open with the Idaho Department of Lands, Benewah County, USDA Forest Service.
8. Remove or prune trees away from power line corridors.
9. Identify all dead end roads and driveways and assess the ability of emergency vehicles to safely access residences.

10. Post clear regulations on fire use within recreational areas and provide escape proof fire rings and barbecue pits.
11. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.8.4. Community Maps

Community Maps of the St. Joe and Ferrell are provided to give the reader a better understanding of the area, and the concepts shared here (Figure 181 - Figure 189).

Figure 181. St. Joe City & Ferrell NAIP Aerial Imagery.

Figure 182. St. Joe City & Ferrell Topography.

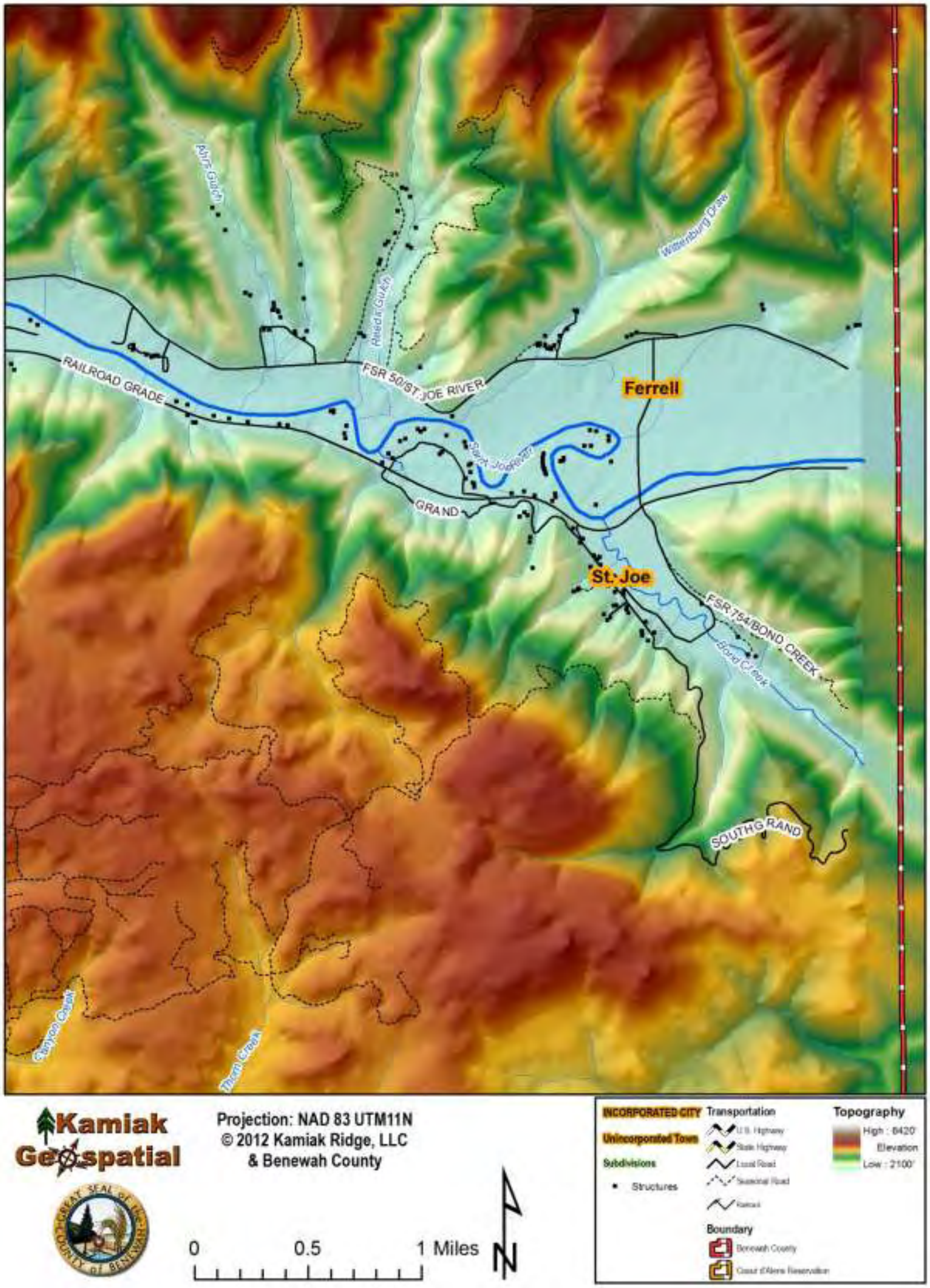


Figure 183. St. Joe City & Ferrell Land Ownership.

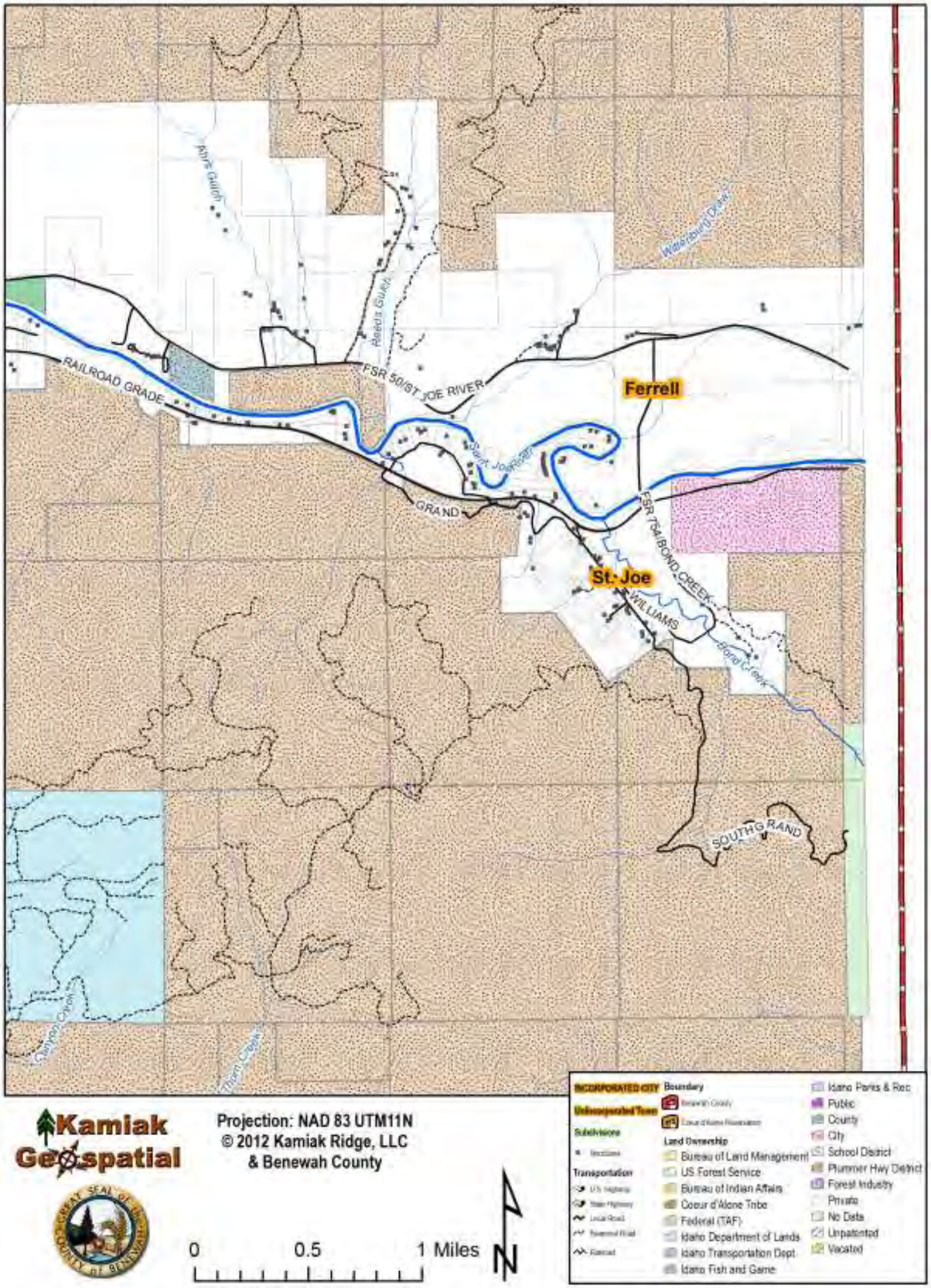


Figure 184. St. Joe City & Ferrell Wildland-Urban Interface Zones.

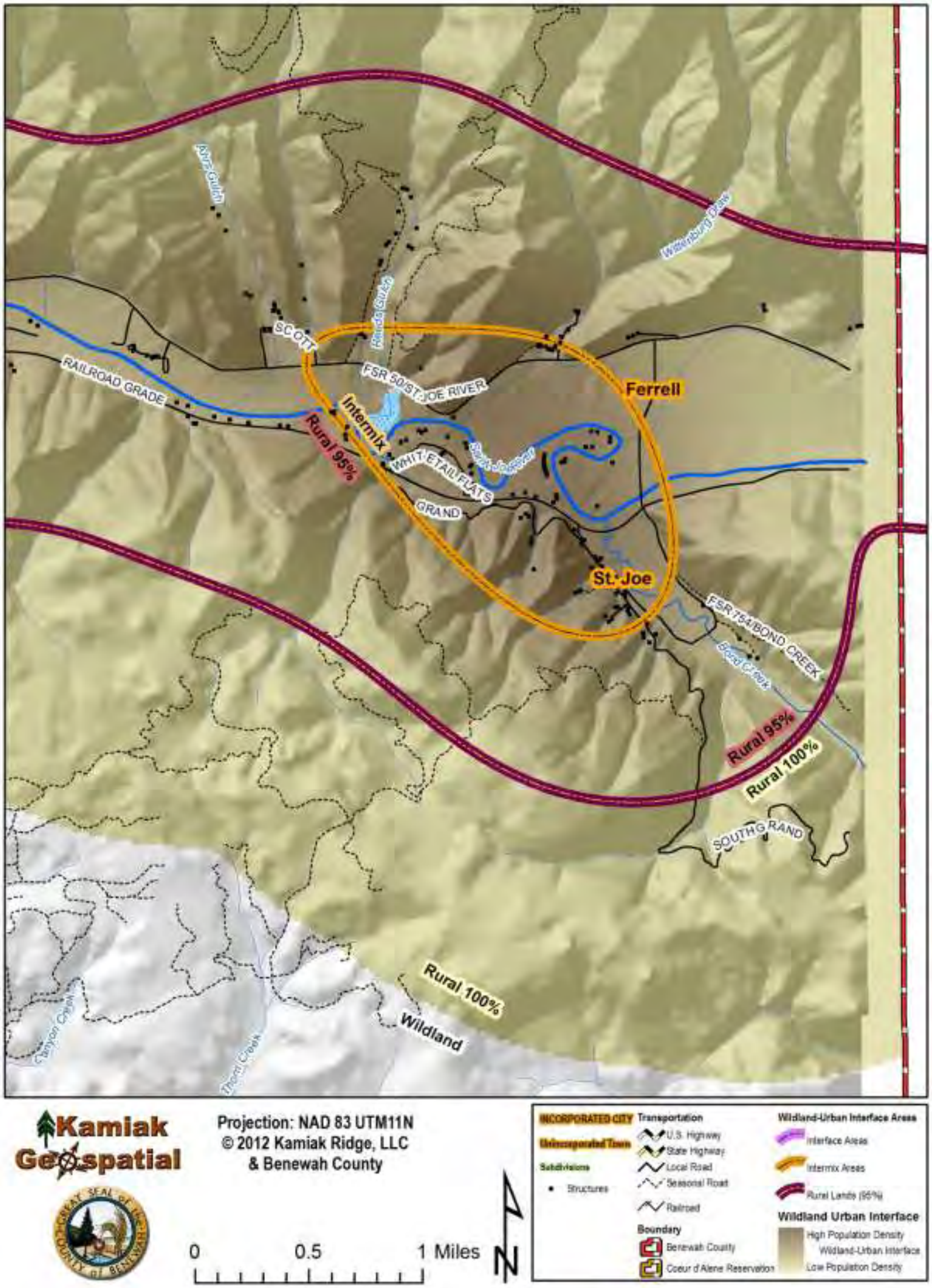


Figure 185. St. Joe City & Ferrell Fire Prone Landscapes.

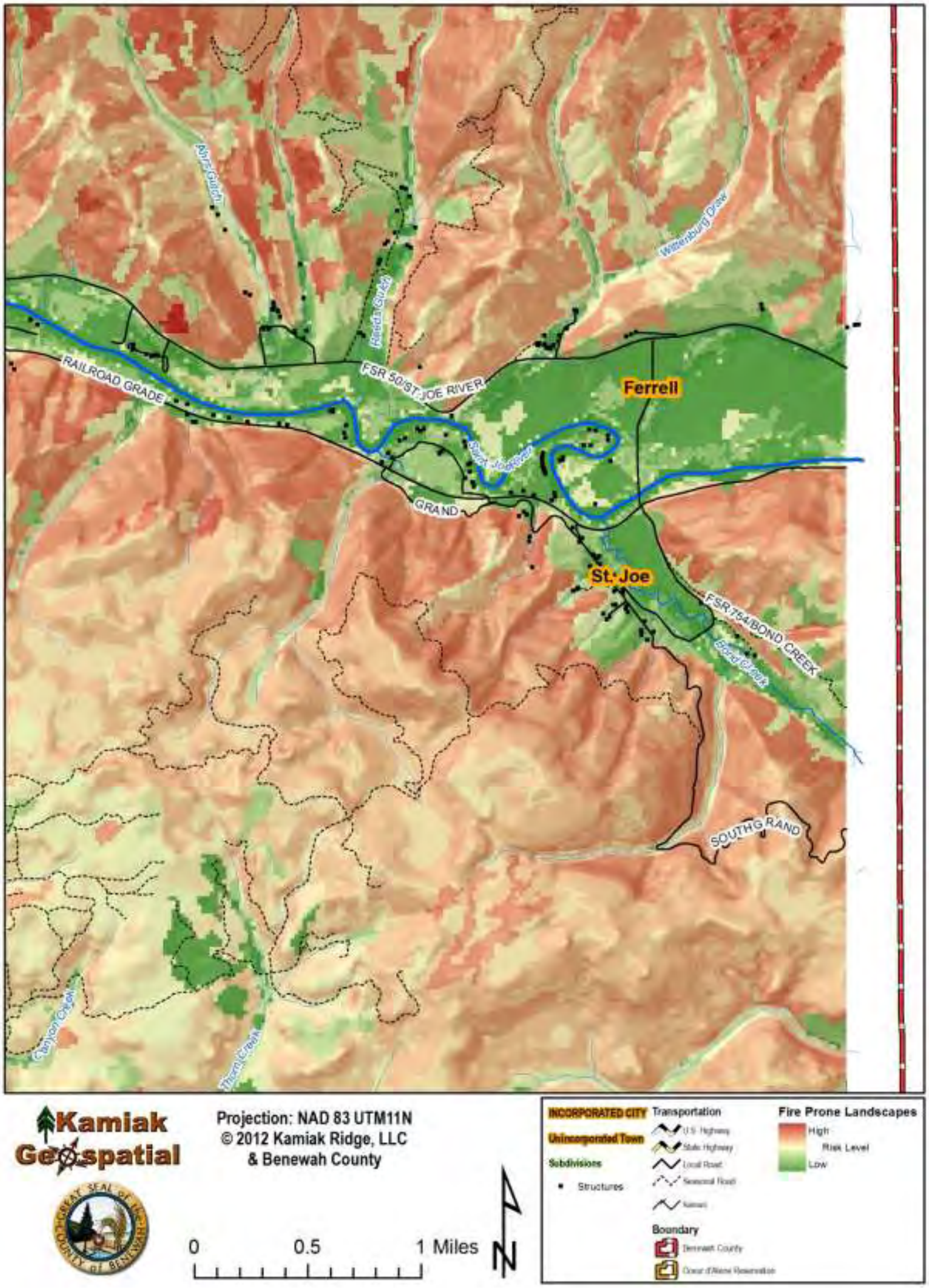


Figure 186. St. Joe City & Ferrell Mean Fire Return Interval.

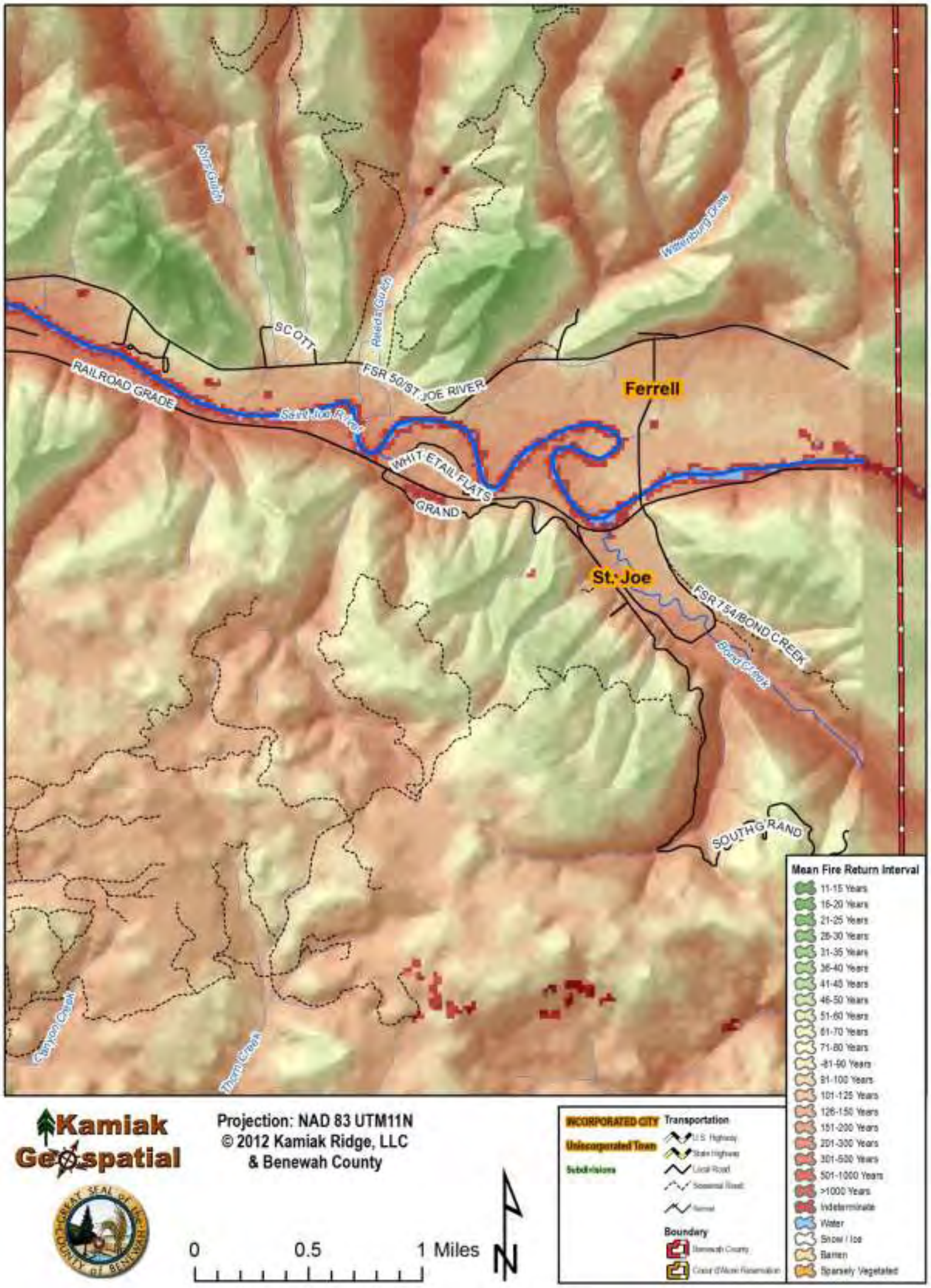


Figure 187. St. Joe City & Ferrell Historic Fire Regime Groups.

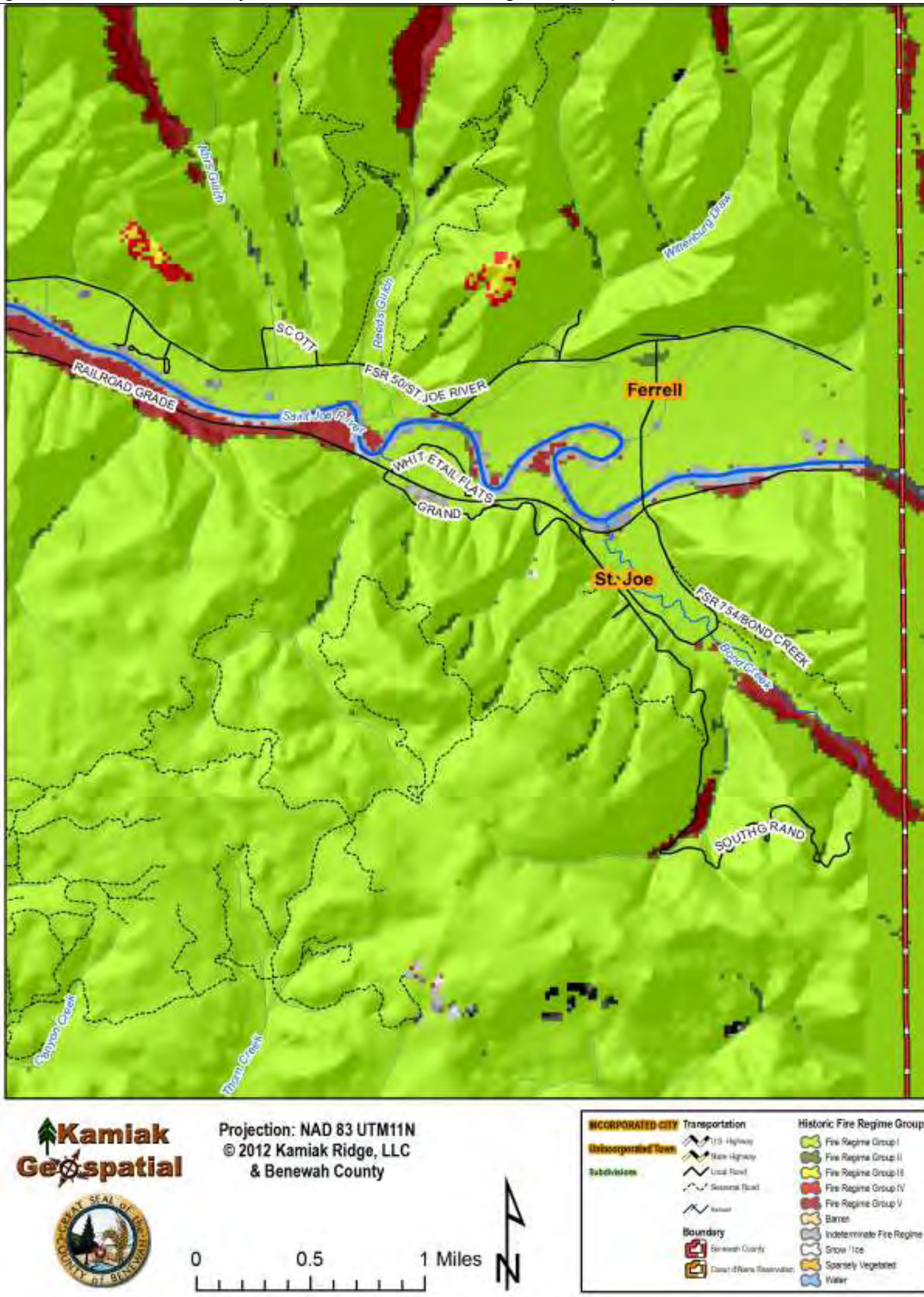


Figure 188. St. Joe City & Ferrell Fire Regime Condition Class.

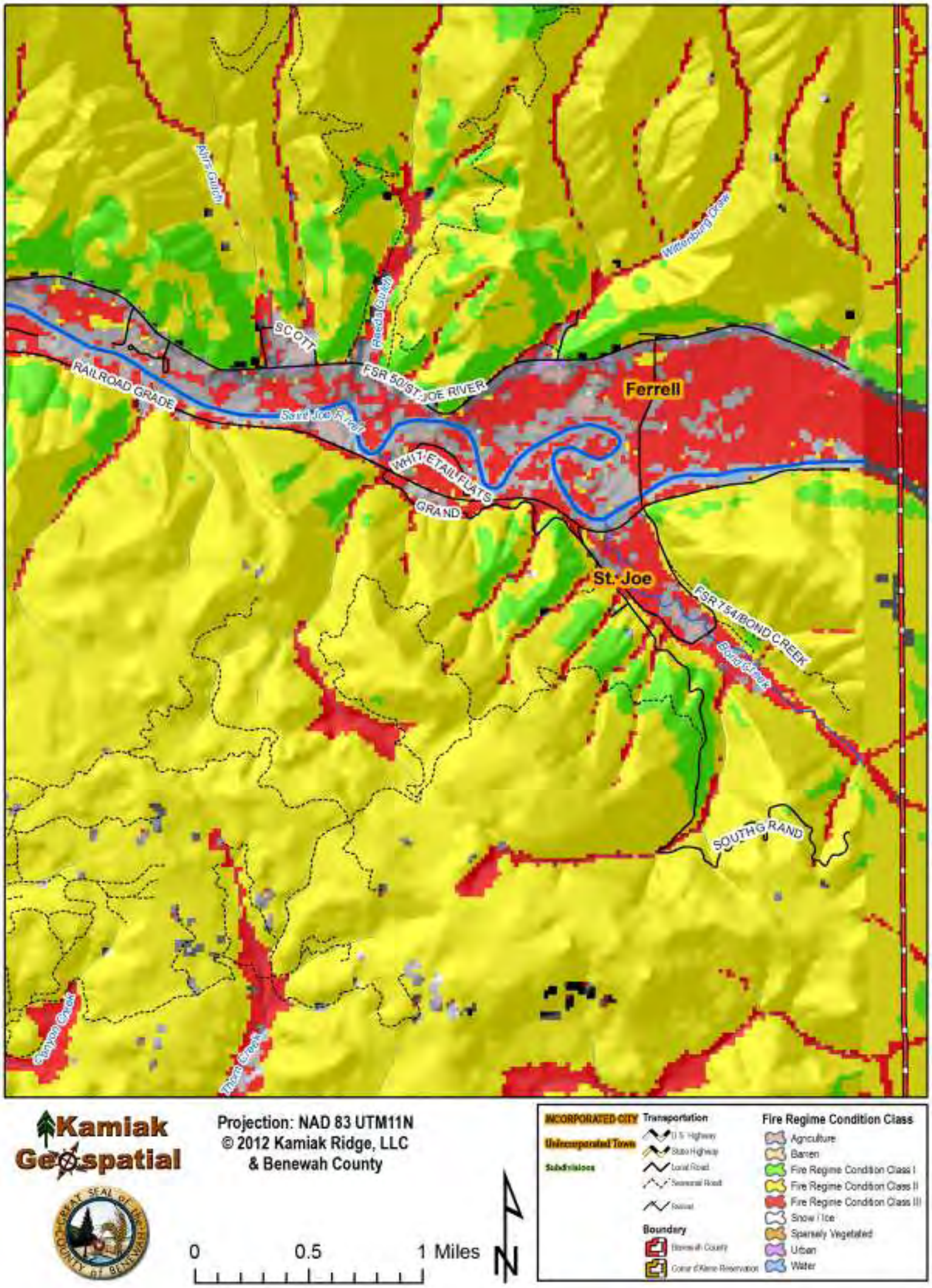
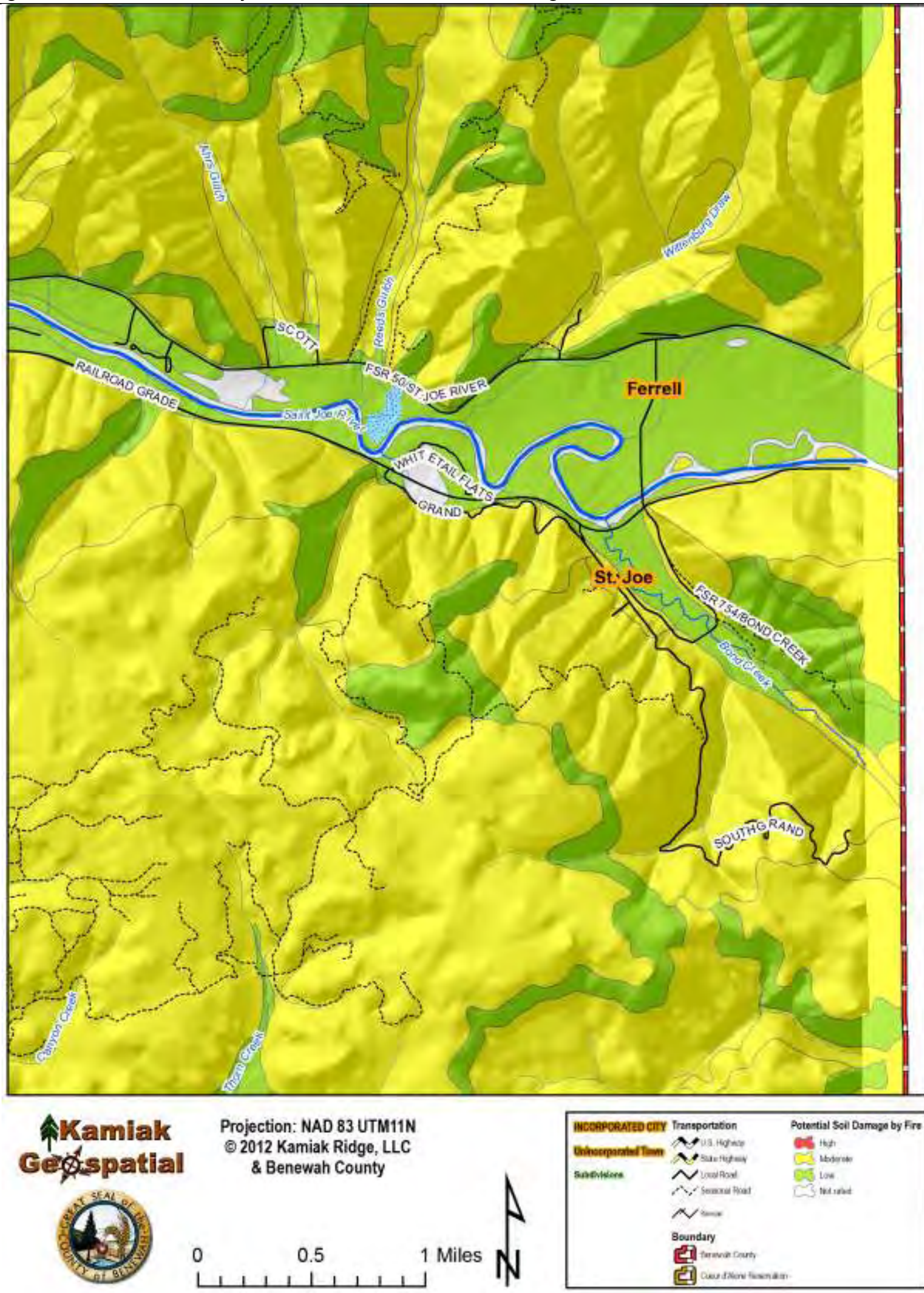


Figure 189. St. Joe City & Ferrell Potential Soil Damage from Intense Fires.



5.9. Tensed and Desmet

5.9.1. Community Risk Assessment

The City of Tensed and the community of Desmet face very low wildfire risks for the homes and structures located within the City and within the community because of the dominance of agriculture land surrounding them and the presence of a structure fire station capable of wildfire protection. The primary risk to wildfire in this area is to the homes located west of Desmet along the Desmet Road and along roads leading into the forested mountain sides to the west and southwest of these two communities (Figure 190). Many of these residences are constructed of wooden siding materials and include wooden decks and outbuildings. They are also generally accessible only by long one-way driveways, some with steep slopes leading up to the properties. The largest threat to these more secluded residences is the lack of defensible space protecting the structures from the spread of fire from the forest into the residence. These structures are at highest risk during annual field and brush pile burning activities which tend to occur close to forest lines.

Figure 190. Desmet Road needs a thinning mitigation project to better protect access to homes.

Fuels treatment activities have taken place in the communities of Tensed and Desmet, as well as within the surrounding hillsides to the southwest and northwest. The Coeur d'Alene Tribe has completed various projects from 2006 to present, including: brush pile burning, broadcast burning, grazing, thinning and chipping activities.

The immediate areas surrounding the towns of Tensed and Desmet are mostly used for agriculture, reducing the risk of a wildfire to carry from the forest and threaten the community centers. Within town, however, there are wildfire risks from brush fires or other flammable materials that may lead to catching adjacent structures on fire (Figure 191).

Figure 191. In-town homes with flammable materials against structure threaten other in-town structures.

Although the fire that ended with the complete destruction of the Sisters of Charity of Providence School in February 2011 was not ignited by a forest wildfire, the town of Desmet has taken steps in providing for defensible space around important cultural structures such as the Sacred Heart Mission, Tribal school, and Tribal Longhouse (Figure 192). Good care has been taken to ensure in-town fires will be less likely to spread to structures.

Figure 192. Desmet school.

The primary access into the area is from U.S. Highway 95, a paved two lane highway that extends to the north and south. This main access road is very well protected on both sides reducing the risk from wildfire spread to the road. It is critical that this road remains well maintained to ensure proper access by emergency services, and safe passage of homeowners out of town in the event of an evacuation. Old Tensed Road, Hangman Creek Road, and Old Sanders Road provide additional escape routes that lead away from these communities in all directions. Most of these secondary roads areas are located in areas at low fire risk. Those homes in outlying areas are generally located along higher risk one-way in, one-way out roads and driveways that could become threatened by wildland fire.

Road names and house numbers are present throughout the area, yet many of the bridges in the vicinity of Desmet and Tensed lack adequate weight rating signs. Most residences access water and power through personal wells or city water hook ups and above ground power lines. Tensed, Desmet, and rural homes in the surrounding areas are protected by the Tensed Fire Department.

5.9.2. Potential Mitigation Activities

The communities of Tensed and Desmet are at low risk of wildland fire due to the agricultural development within the valley. However, homes and other structures in outlying areas abutting wildland fuels have significantly higher risk. Long access roads and driveways should be maintained and vegetation along them thinned to ensure safe passage for firefighters and homeowners in the event of a wildfire (Figure 193). In addition, the high concentration of recreational use, such as camping and four-wheel vehicles, in these areas also increases the wildfire risk by contributing to potential ignition sources.

Figure 193. Long access road with decent protection, but thinning and pruning can be done.

Logging activities throughout the surrounding areas of Tensed and Desmet create a distinct wildland fire risk and reward. Areas following an active logging activity generally face about one fire season of increased risk from red needle debris on the forest floor, but it is mitigated during prescribed burning activities during that period, and the infrastructure put in place by the logging activity increases access for wildfire fighting equipment and personnel. Debris management following logging can be modified to continue the reduction of wildland surface fuel loading adjacent to homes and other structures.

Individual home assessments for those located within the forest lands surrounding these communities can provide more information about the level of risk these homes face. These assessments take a closer look at the amount of vegetation in the immediate area, the current defensible space of the structure(s), as well as the access to and away from the improved land. A reduction of risk can be accomplished by individual homeowners by removing or pruning trees nearby or overhanging the home, keeping the area clear of surface fuels, and locating wood piles, propane tanks, and their flammable objects away from the home. Creating and widening turnouts and thinning fuels along access routes reduce the risk of residents becoming trapped and increase the responsiveness and safety of suppression vehicles and personnel. Educating homeowners in techniques for protecting their homes is critical in areas where heavy fuels are present.

The protection of residents, property and culturally important structures should be the greatest focus for the communities. These projects could include a) providing street signs and weight rating information at all bridge crossings, b) identifying dead end roads, c) signs showing unrestricted escape routes, and d) thinning and pruning trees around power lines. Establishing a community wide program to keep vegetation around structures and along roadways green and clear of hazardous surface fuels would reduce the potential loss of life and property in the event of a wildfire. Livestock grazing on lands near the WUI can reduce fuel build ups; thus decreasing the likelihood of a wildfire reaching the community.

5.9.3. Recommendations:

1. Perform individual home site evaluations (approximately 100) to identify and prioritize high risk homes and help residents develop a plan that will effectively reduce their property's risk of ignition.
2. Create a defensible space around approximately 40-50 homes and structures identified as having risk, which may include thinning, pruning, mowing, etc.
3. Create a fire resistant buffer along both edges of secondary roads or one-way in, one-way out driveways that access homes identified as having risk; specifically south of Desmet Road and on Iron Mountain Road.
4. Maintain previously thinned and burned forest areas by periodically removing accumulated surface fuels and regeneration.
5. Sign and provide weight rating information on all bridges and cattle guards on access roads.
6. Create a system to inform residents of wildfires in the area and appropriate evacuation routes.
7. Post signs identifying unrestricted escape routes.
8. Post clear regulations on fire use within recreational areas and provide escape proof fire rings and barbecue pits.
9. Educate homeowners about maintaining defensible space and the risk of wildfire and precautions they can take to protect their families and property such as using fire-safe building materials and landscaping techniques and planning escape routes.

5.9.4. Community Maps

Community Maps of the City of Tensed and the community of Desmet are provided to give the reader a better understanding of the area, and the concepts shared here (Figure 194 - Figure 202).

Figure 194. Tensed & Desmet NAIP Aerial Imagery.

Figure 195. Tensed & Desmet Topography.

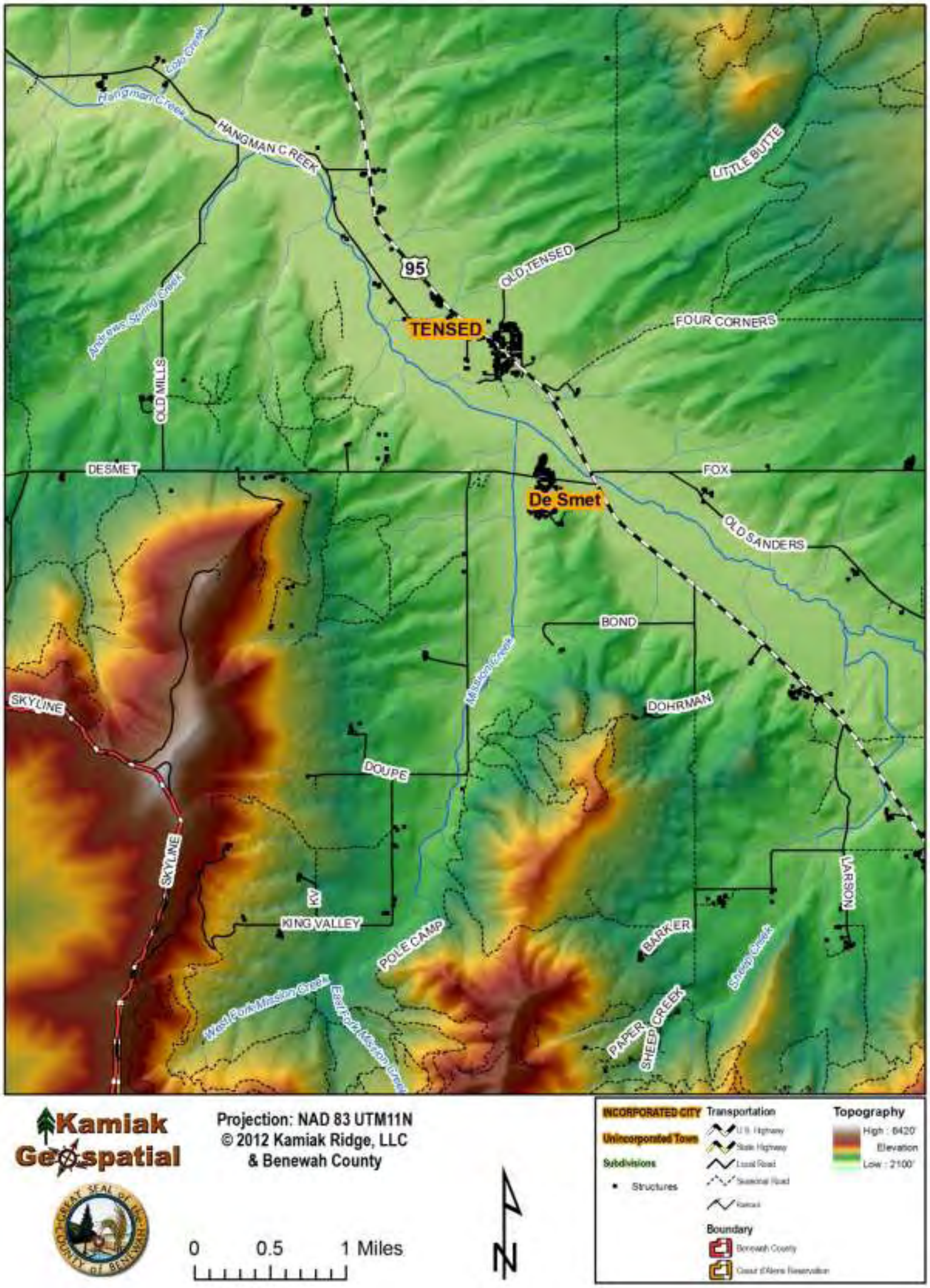


Figure 196. Tensed & Desmet Land Ownership.

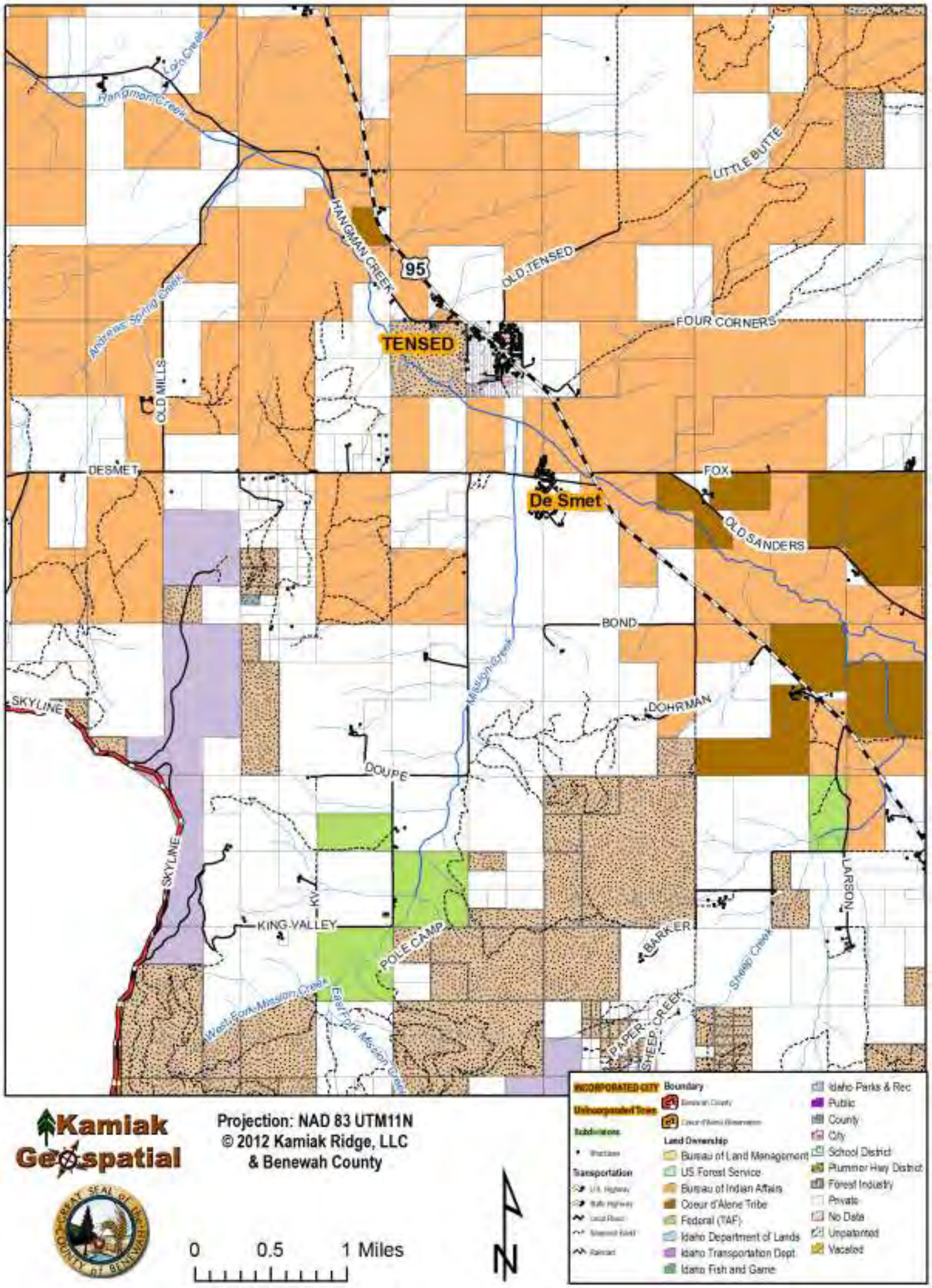


Figure 197. Tensed & Desmet Wildland-Urban Interface Zones.

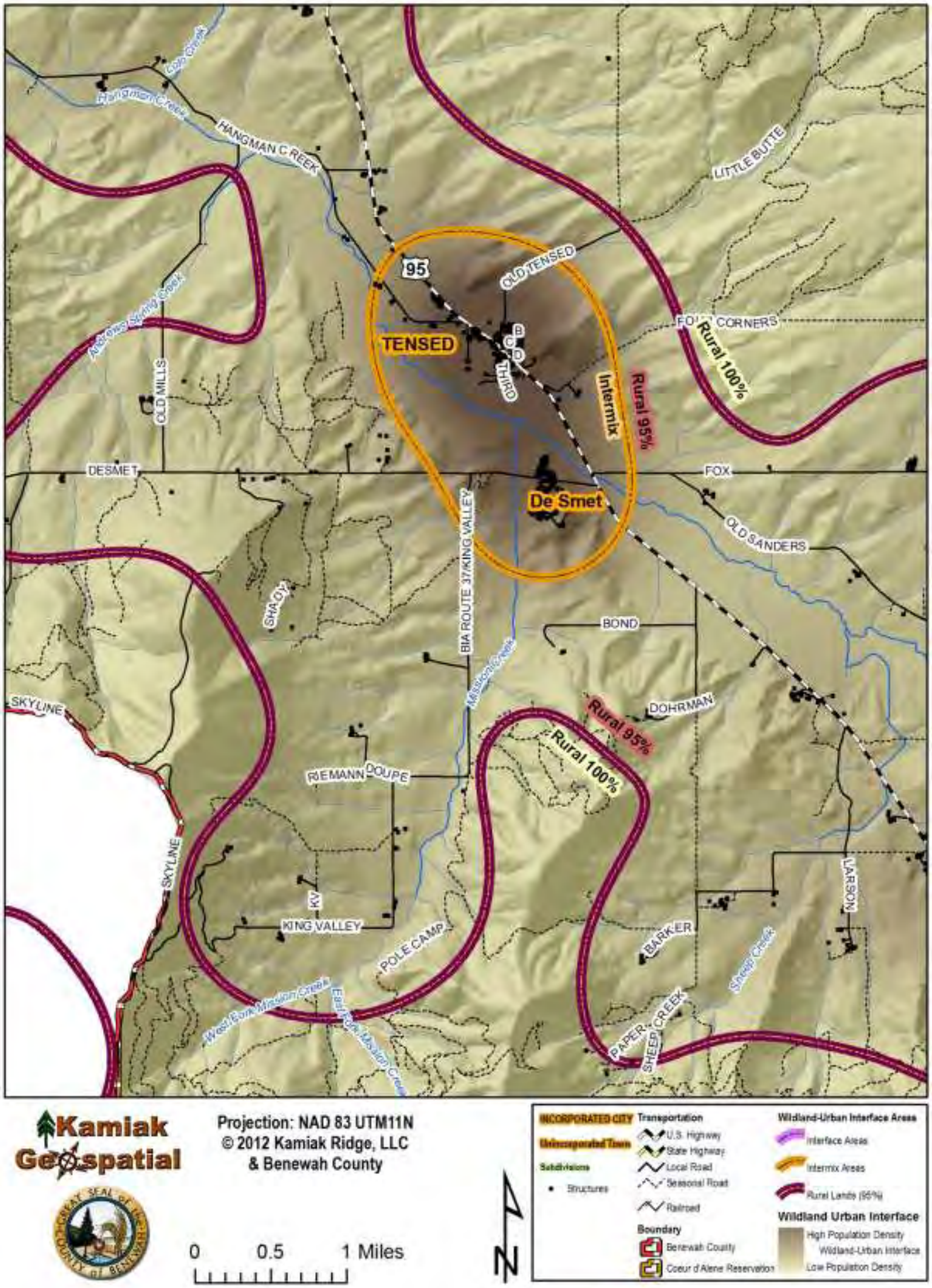


Figure 198. Tensed & Desmet Fire Prone Landscapes.

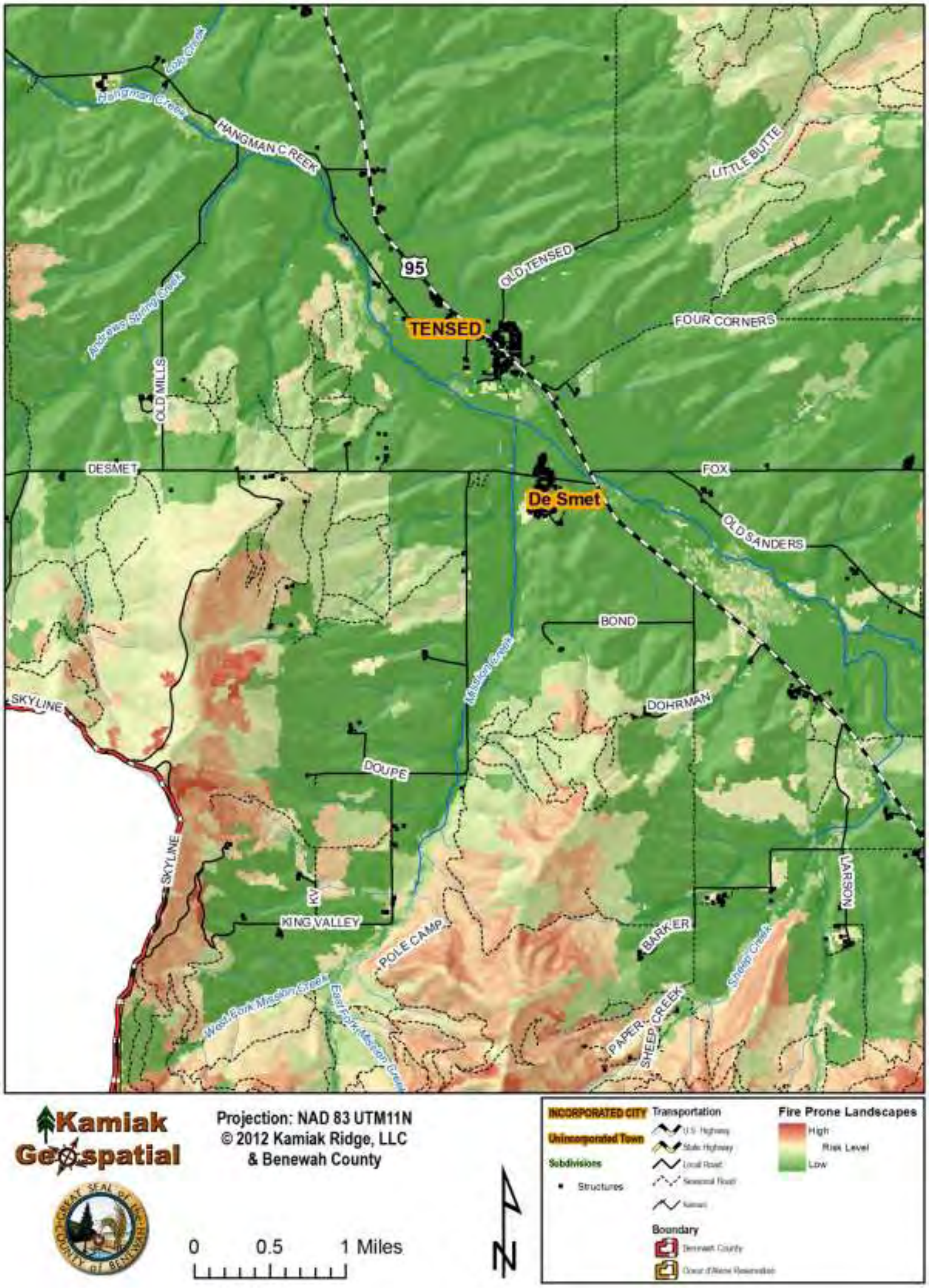


Figure 199. Tensed & Desmet Mean Fire Return Interval.

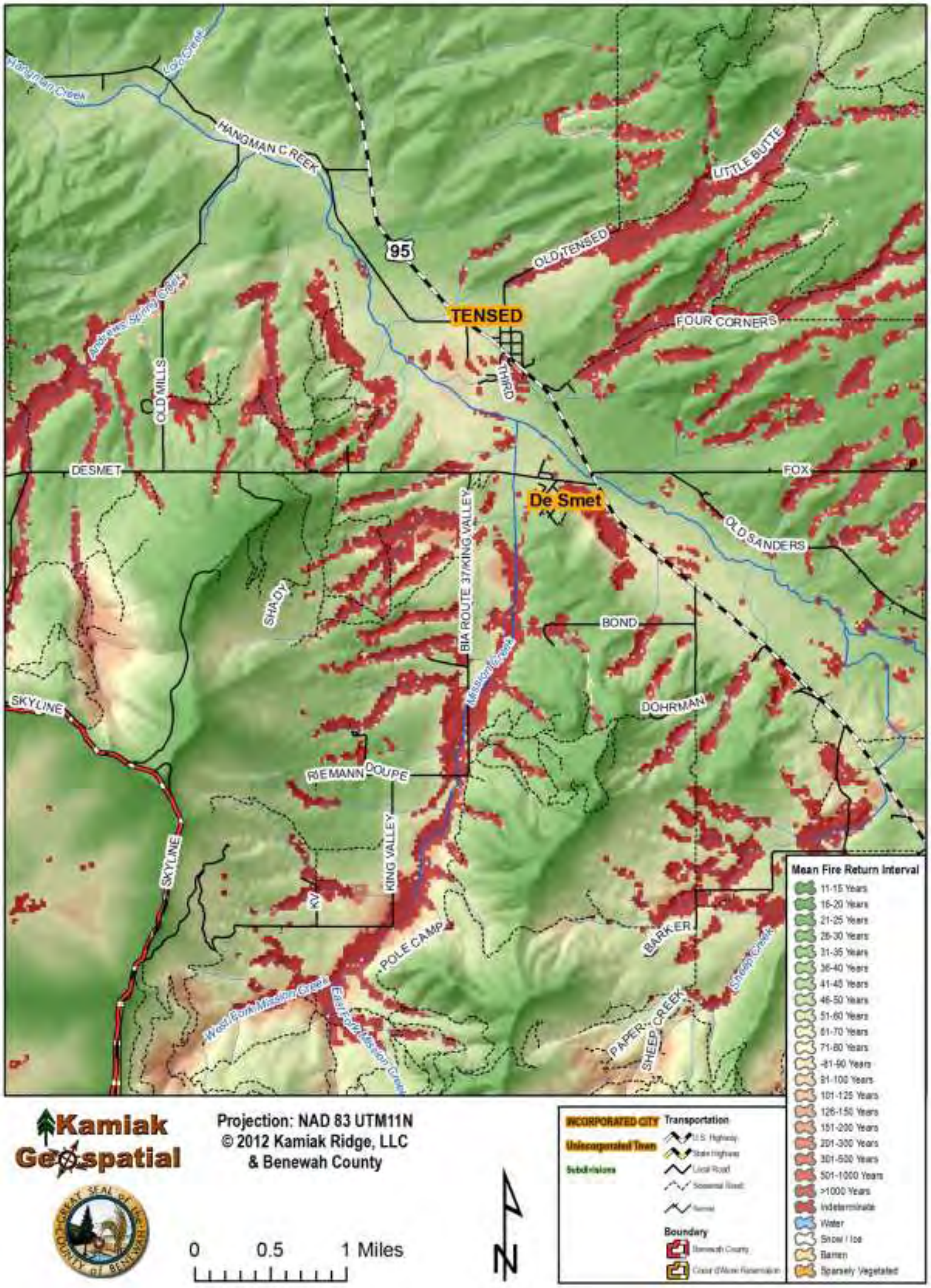


Figure 200. Tensed & Desmet Historic Fire Regime Groups.

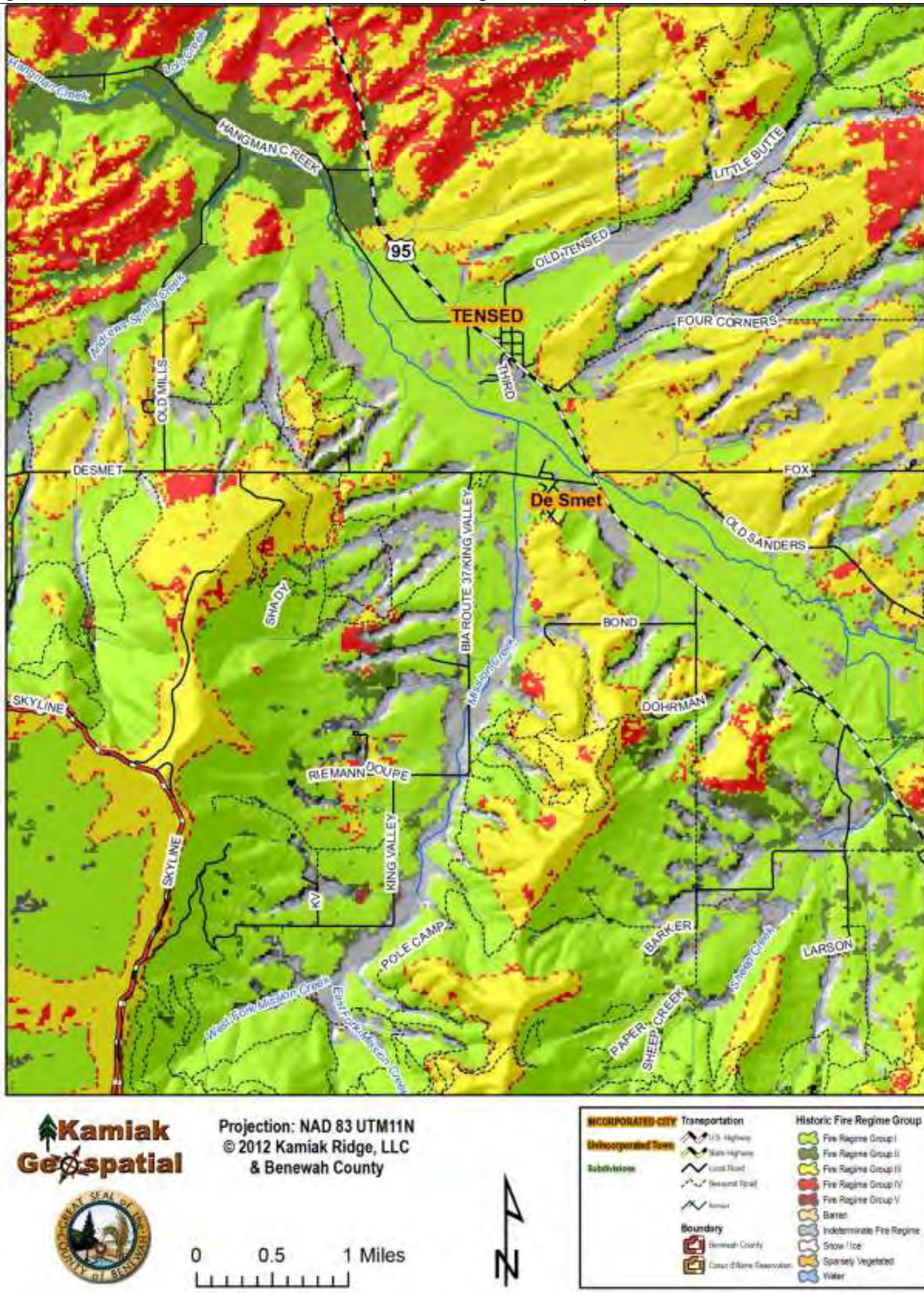


Figure 201. Tensed & Desmet Fire Regime Condition Class.

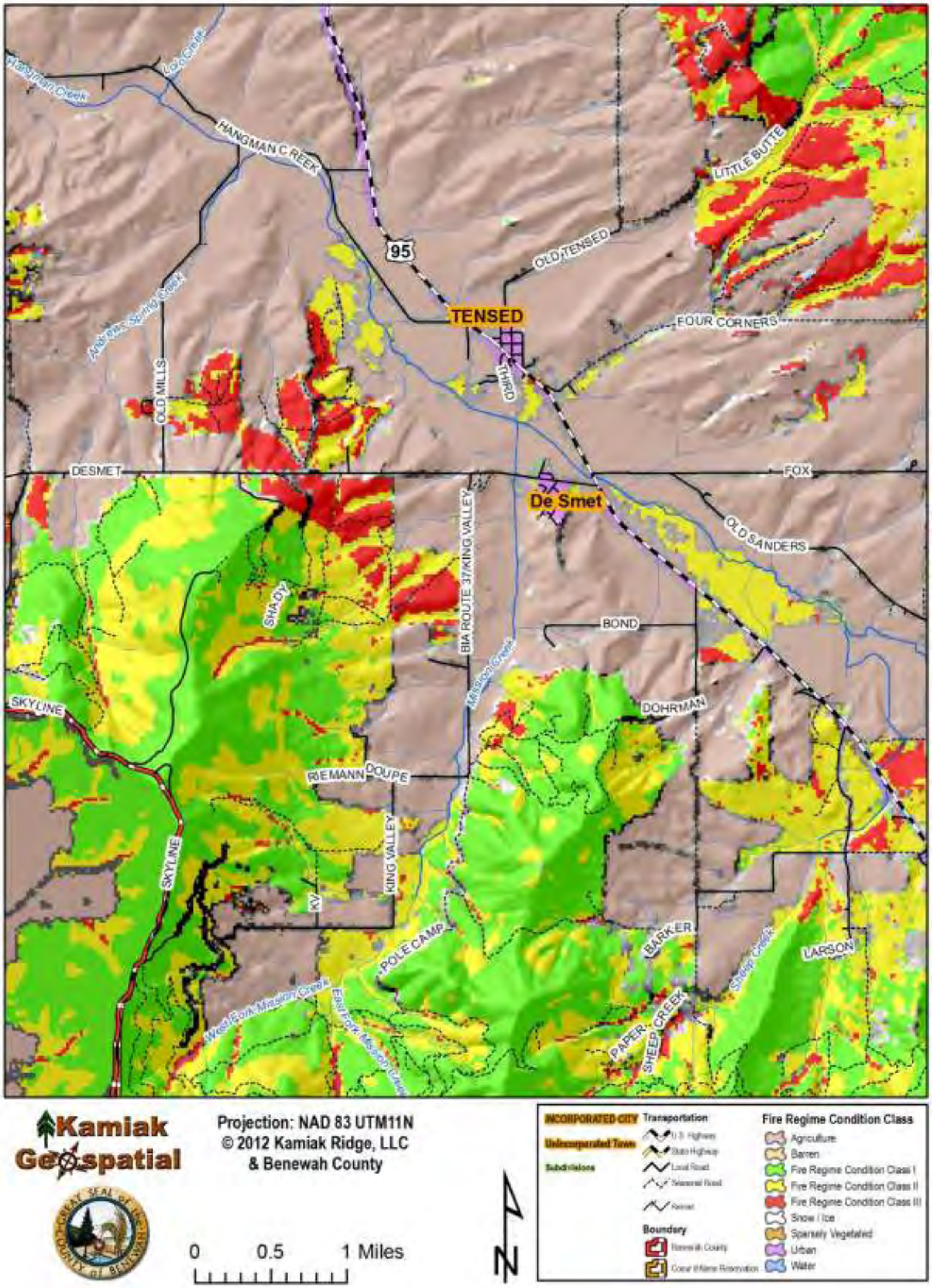
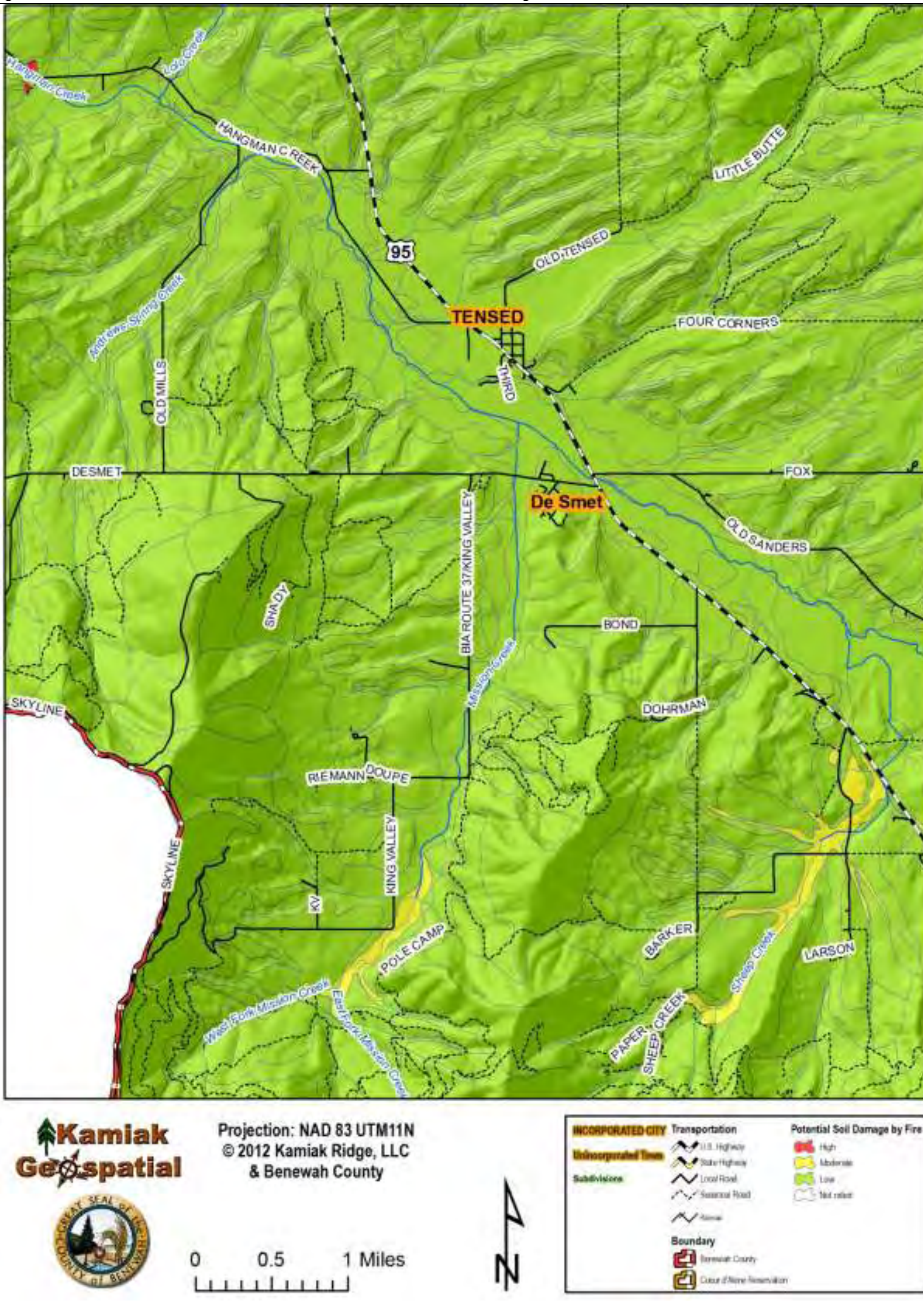


Figure 202. Tensed & Desmet Potential Soil Damage from Intense Fires.



Chapter 6. Wildfire Mitigation Activities: Past and Proposed

As population expansion throughout Benewah County has moved further and further into the rural areas of Benewah County over the past 40 years, efforts have been taken to help reduce the threat of human and infrastructure loss due to a catastrophic wildland fire. All federal agencies represented in the county have completed mitigation efforts to aid in this goal of reduced wildland fire fuels. This effort will continue into the future as agencies have been working to identify additional areas that will benefit from wildland fuels mitigation measures.

Completed projects have been gathered from all agencies with jurisdiction in the county including: Benewah County, the Coeur d'Alene Tribe, Idaho Department of Lands, US Bureau of Land Management, US Forest Service, and the privately owned company Inland Forest Management. Many of these efforts from the past 5 – 8 years are contained in GIS and made available for use in mapping. It is known, however, that some completed projects do not exist in a format available for representation on maps.

In the following community summaries and figures describing past and potential wildland fire fuels mitigation projects throughout Benewah County, some generalizations have been made to provide a clear indication of project areas. Benewah County has completed defensible space and fuel break projects that have been represented by points on the figures that follow (Figure 203); a distinction between the two has not been made in order to better represent the location of the mitigation project and the agency that completed that work. Potential mitigation projects have not been delineated to list the agency proposing the project because of project and agency overlap. It is also important to note the goal of this mapping effort is not to depict ownership and exact geographic location of these projects, but to propose locations that represent areas of Benewah County that can benefit from wildland fuels mitigation projects to reduce the risk of loss from a wildland fire event.

Figure 203. Past and present mitigation projects map symbology.

6.1. Benewah and Alder Creek

6.1.1. Past Mitigation Projects

Efforts to reduce the threat of a large wildland fire surrounding the communities of Benewah and Alder Creek have been completed by Benewah County and the Coeur d'Alene Tribe fuels mitigation crews. Benewah County has assisted in the development of defensible space in and around homes in the Alder Creek community. The Coeur d'Alene Tribe has completed over 650 acres of thinning, and lop and scatter projects in the hillsides to the northwest of the community of Benewah, as well as along Benewah Creek Road.

6.1.2. Potential Mitigation Projects

Future mitigation efforts to continue the reduction of wildland fuels around these communities have been planned by the Coeur d'Alene Tribe to the west and northwest of Benewah, and to the southeast of Alder Creek totaling approximately 700 acres. These projects are intended to reduce fuels along the heavily forested hillsides surrounding the communities. Additional efforts are proposed by this plan to focus ingress/egress protection throughout the Alder Creek community. Further efforts on defensible space projects will also aid in the reduction of wildland fire threat to these communities.

Figure 204. Communities of Benewah and Alder Creek past mitigation projects.

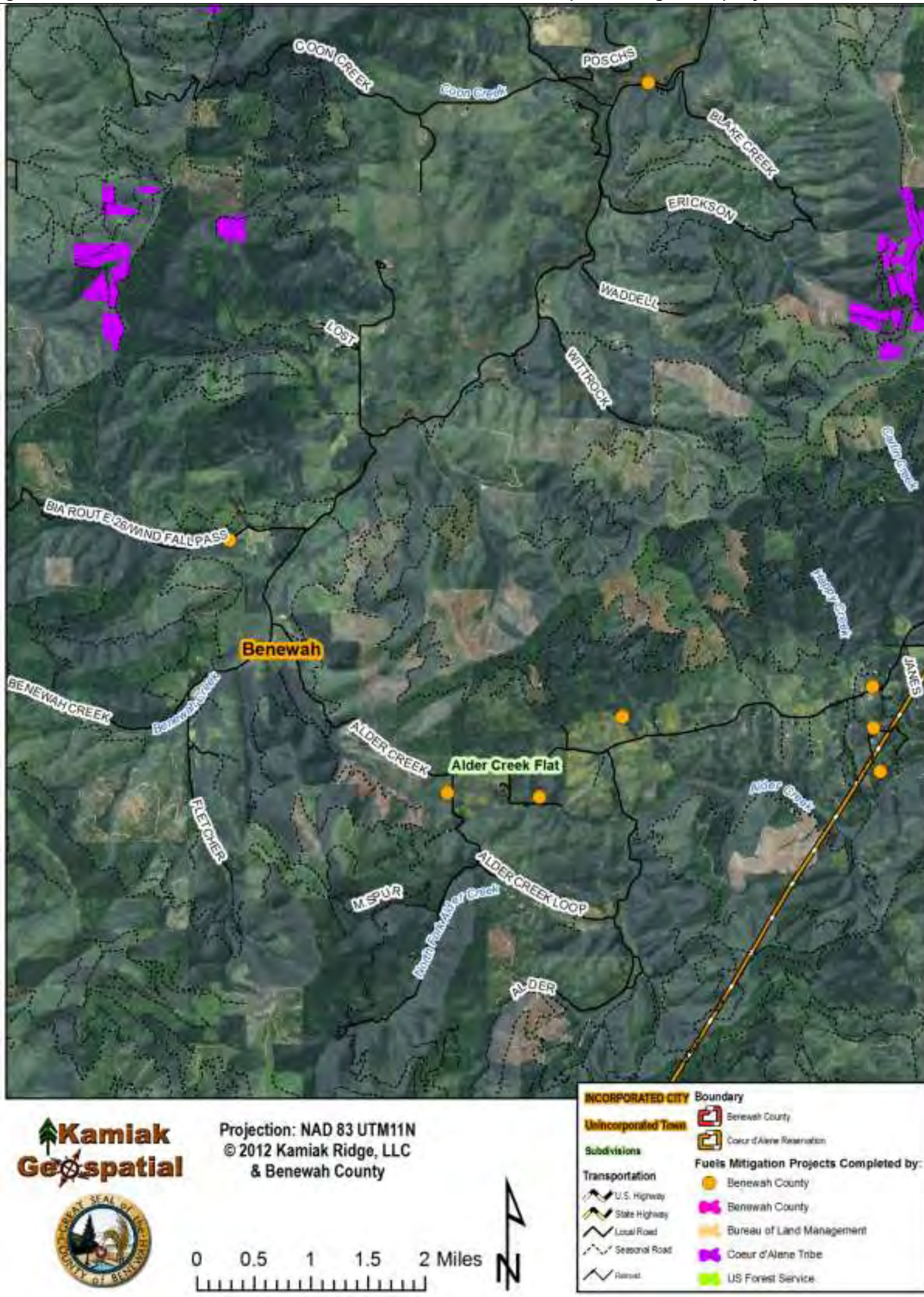


Figure 205. Communities of Benewah and Alder Creek potential mitigation projects.

6.2. Chatcolet and Heyburn State Park

6.2.1. Past Mitigation Projects

Efforts to reduce the wildland fuels throughout Heyburn State Park have focused on timber thinning and development of defensible space around the communities of Chatcolet and Rocky Point as well as around Heyburn State Park buildings and camp grounds. Although more projects have been completed within the State Park then are represented on the following figures, there have been some thinning around Chatcolet, but little has been completed near Rocky Point.

6.2.2. Potential Mitigation Projects

Further reduction of wildland fuels around the communities of Rocky Point and State Park headquarters represent the highest need of mitigation projects totaling around 50 acres. Rocky Point consists of approximately 50-60 structures, all with a need to develop defensible space to protect from wildfire spread. In addition, the steep and narrow access roads around these communities need mitigation projects to help ensure safe ingress/egress for fire equipment and evacuation of residents.

Figure 206. Heyburn State Park past mitigation projects.

Figure 207. Heyburn State Park potential mitigation projects.

6.3. Emida

6.3.1. Past Mitigation Projects

The majority of wildland fuels reduction projects have taken place in the forested hillsides to the south of the community of Emida. Over 1,500 acres of precommercial thinning and pile burning projects have been completed by the United States Forest Service around the greater area near Emida. In addition Benewah County fuels crews have completed over 25 acres of fuel breaks immediately to the north and south of town.

6.3.2. Potential Mitigation Projects

With over 1,400 acres proposed for future mitigation efforts by the United States Forest Service and Benewah County, there are plenty of areas around the community of Emida that will see wildland fuels reduction projects over the next 5+ years. These mitigation projects will continue to focus on precommercial thinning and lop and scatter efforts. Road protection closer to town will be the focus of Benewah County fuels crews to protect ingress/egress access to homes and safety zones.

Figure 208. Emida past mitigation projects.

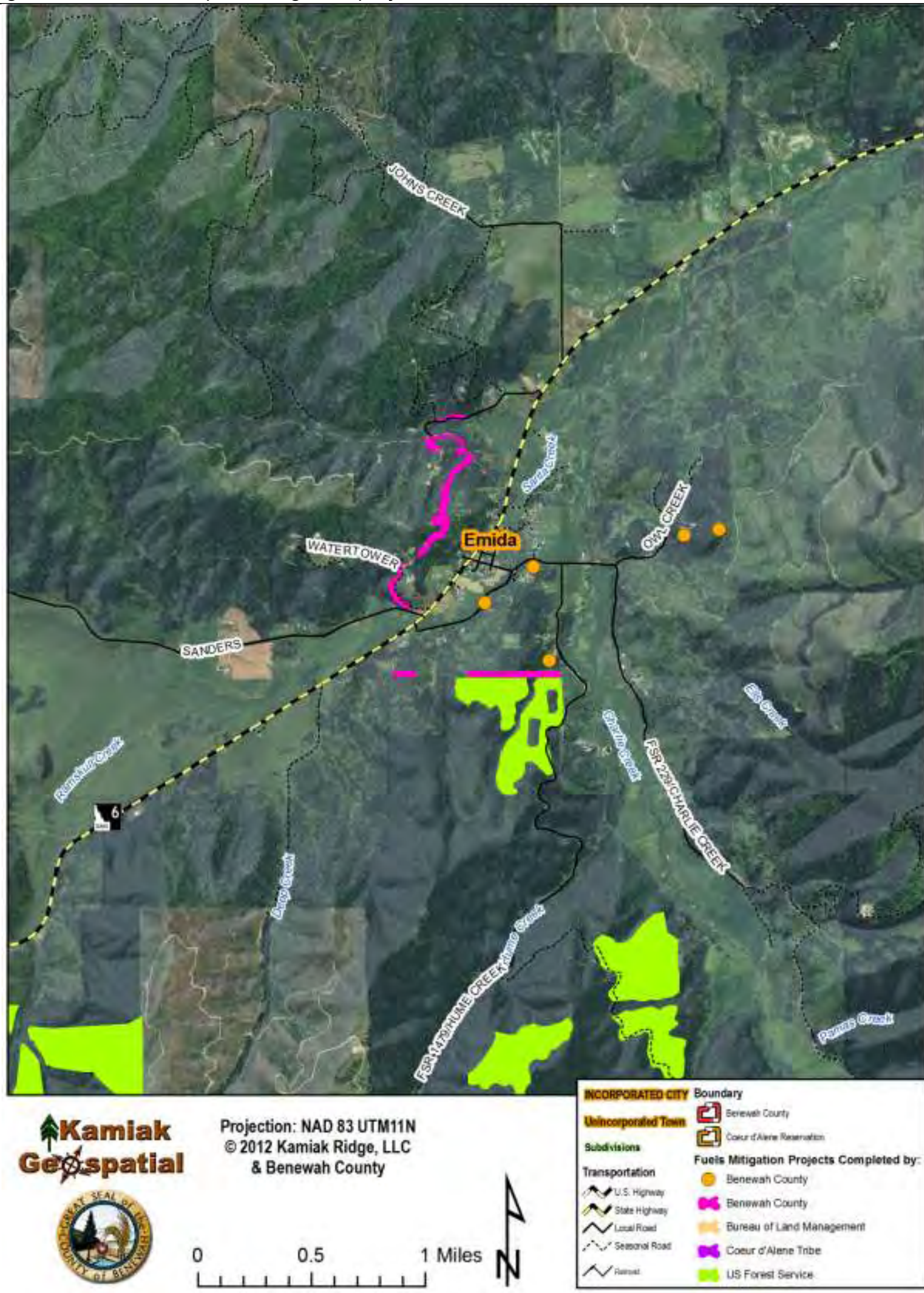
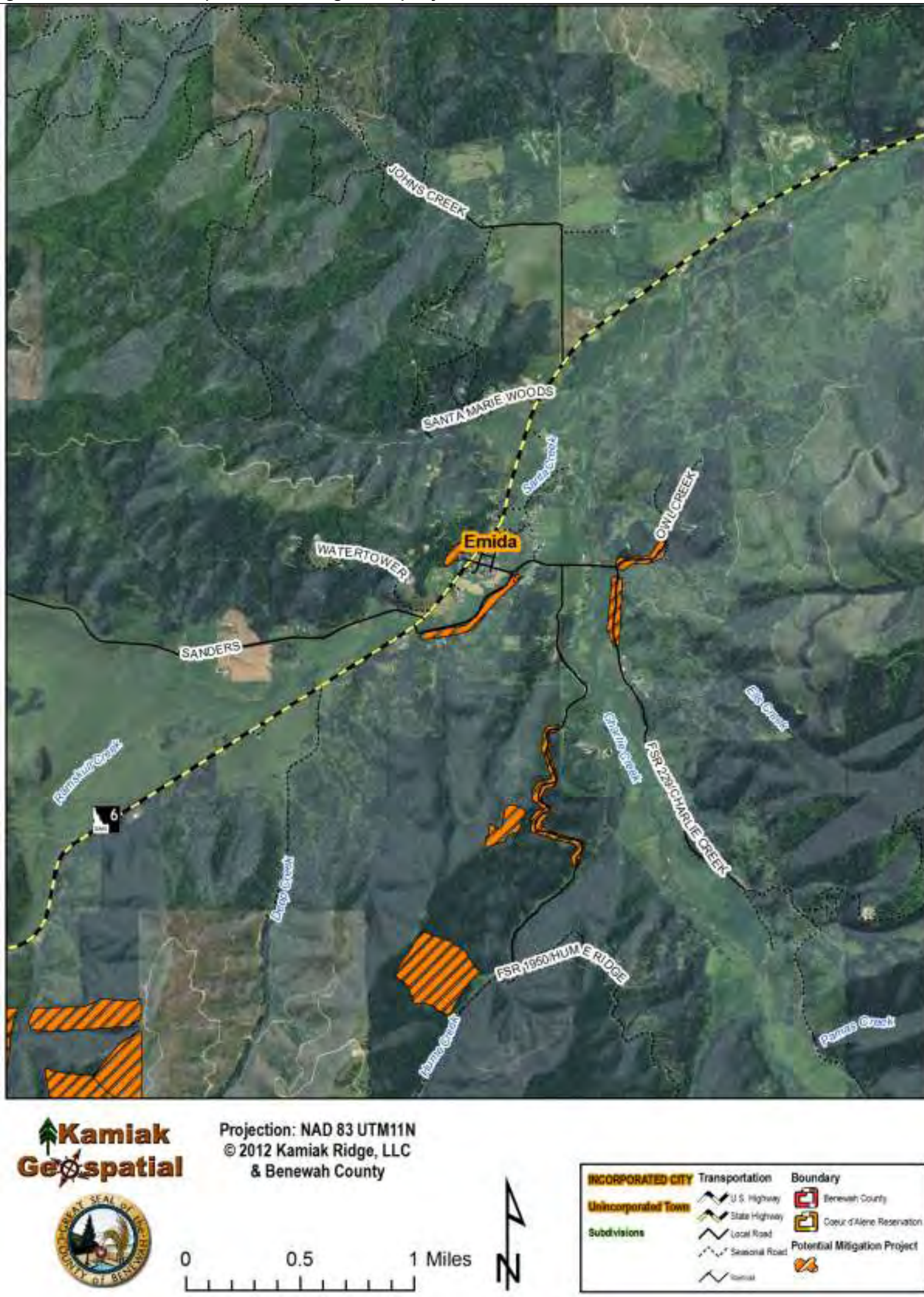


Figure 209. Emida potential mitigation projects.



6.4. Santa Creek

6.4.1. Past Mitigation Projects

Over 20 acres of mitigation projects have been completed by the Benewah County fuels crew in and around the small community of Santa Creek. These projects have focused on defensible space and fuel break installation.

6.4.2. Potential Mitigation Projects

An additional 25 acres of potential mitigation projects have been proposed to better protect the ingress/egress of access roads for firefighting efforts and evacuation. Further efforts to increase the amount of defensible space around homes in this small community will also go a long way to help protect the spread of wildland fire to structures.

Figure 210. Community of Santa Creek past mitigation projects.

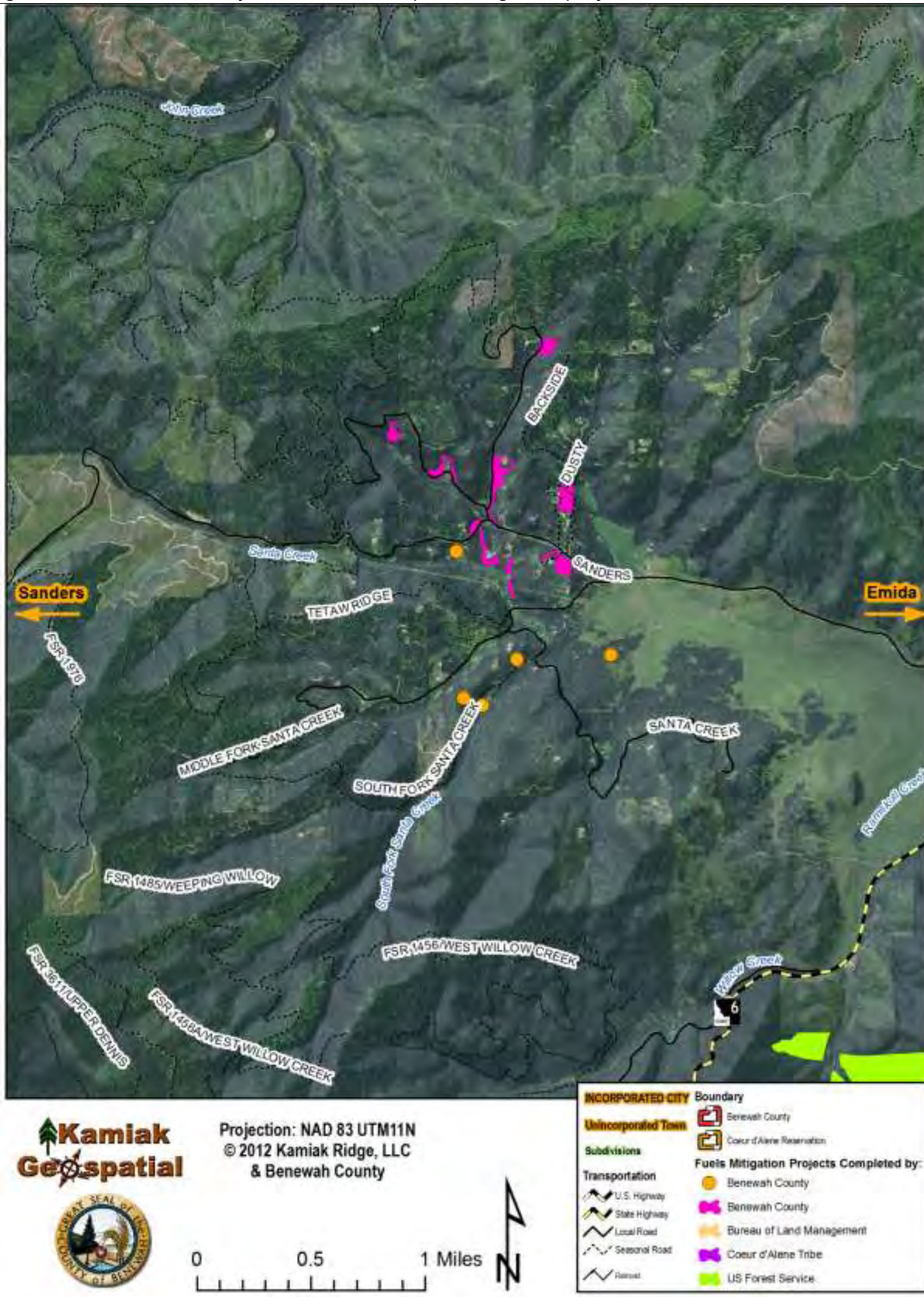


Figure 211. Community of Santa Creek potential mitigation projects.

6.5. Fernwood / Santa

6.5.1. Past Mitigation Projects

Wildland fuels reduction projects have been completed by the Benewah County fuels crew and the United States Forest Service around the two communities of Fernwood and Santa. Benewah County has focused on the installation of defensible space around over 20 structures and 30+ acres of fuel breaks and thinning projects along roads and forested hillsides. The USDA Forest Service has completed a commercial thinning project on federal land just north of Fernwood totaling approximately 26 acres.

6.5.2. Potential Mitigation Projects

Approximately 140 acres of wildland fuels mitigation projects have been proposed around the communities of Fernwood and Santa. These efforts focus generally on the protection of ingress/egress near access roads to the outer limits of the communities, including, Crystal Creek and Pokey Creek Roads.

Figure 212. Fernwood and Santa past mitigation projects.

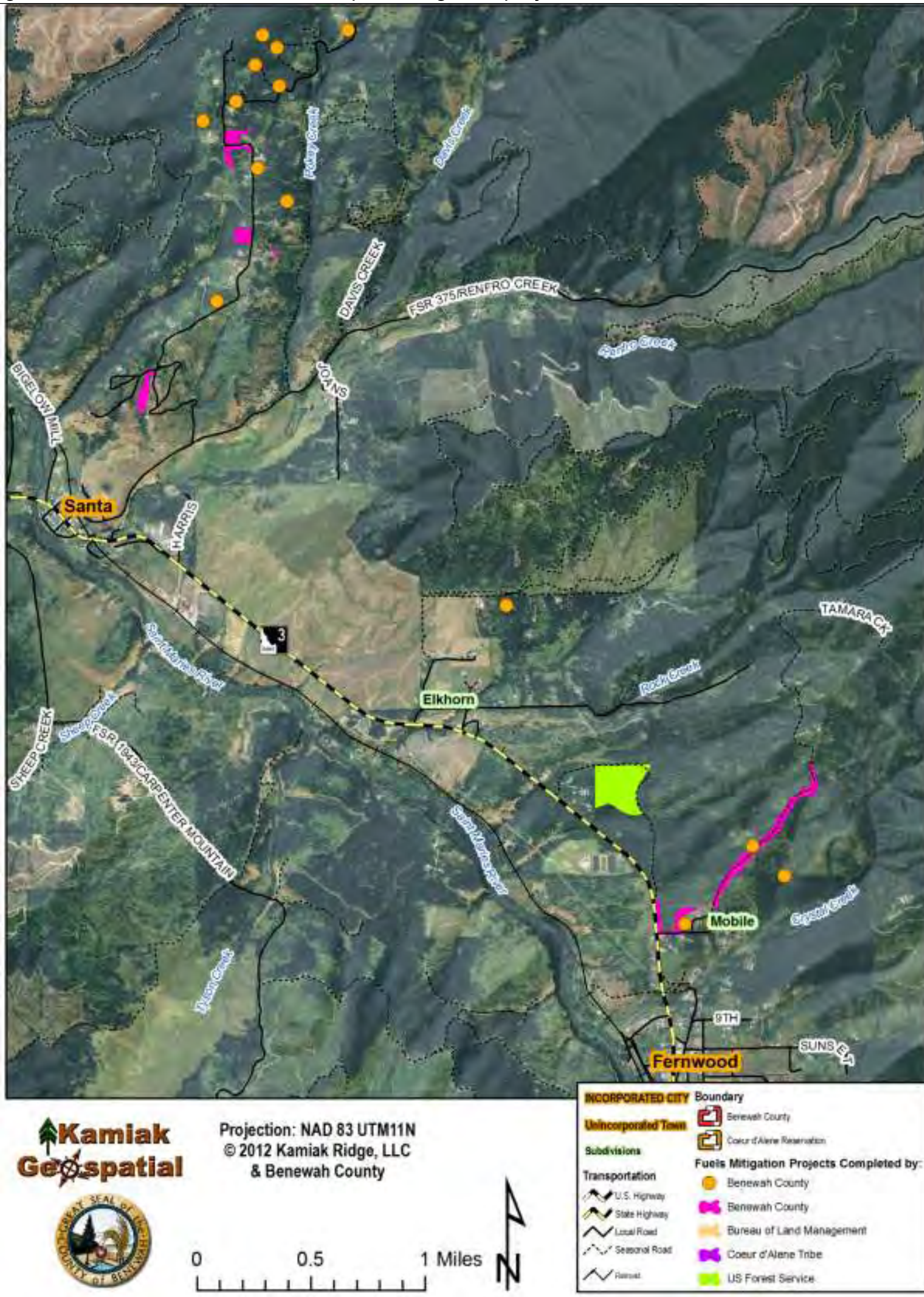


Figure 213. Fernwood and Santa potential mitigation projects.

6.6. Carpenter Creek

6.6.1. Past Mitigation Projects

Benewah County fuels crews have completed over 80 acres of fuels breaks and defensible space projects to reduce the wildland fire threat to homes in the Carpenter Creek community southwest of Fernwood. In addition, these projects have focused on access to the community via Carpenter Creek Road from State Highway 3.

6.6.2. Potential Mitigation Projects

In additional 35+ acres of projects have been proposed to further protect ingress/egress access to this community by firefighting efforts and evacuation of residents. Continued work is proposed along Carpenter Creek Road and for driveways and narrows access roads throughout the community.

Figure 214. Community of Carpenter Creek past mitigation projects.

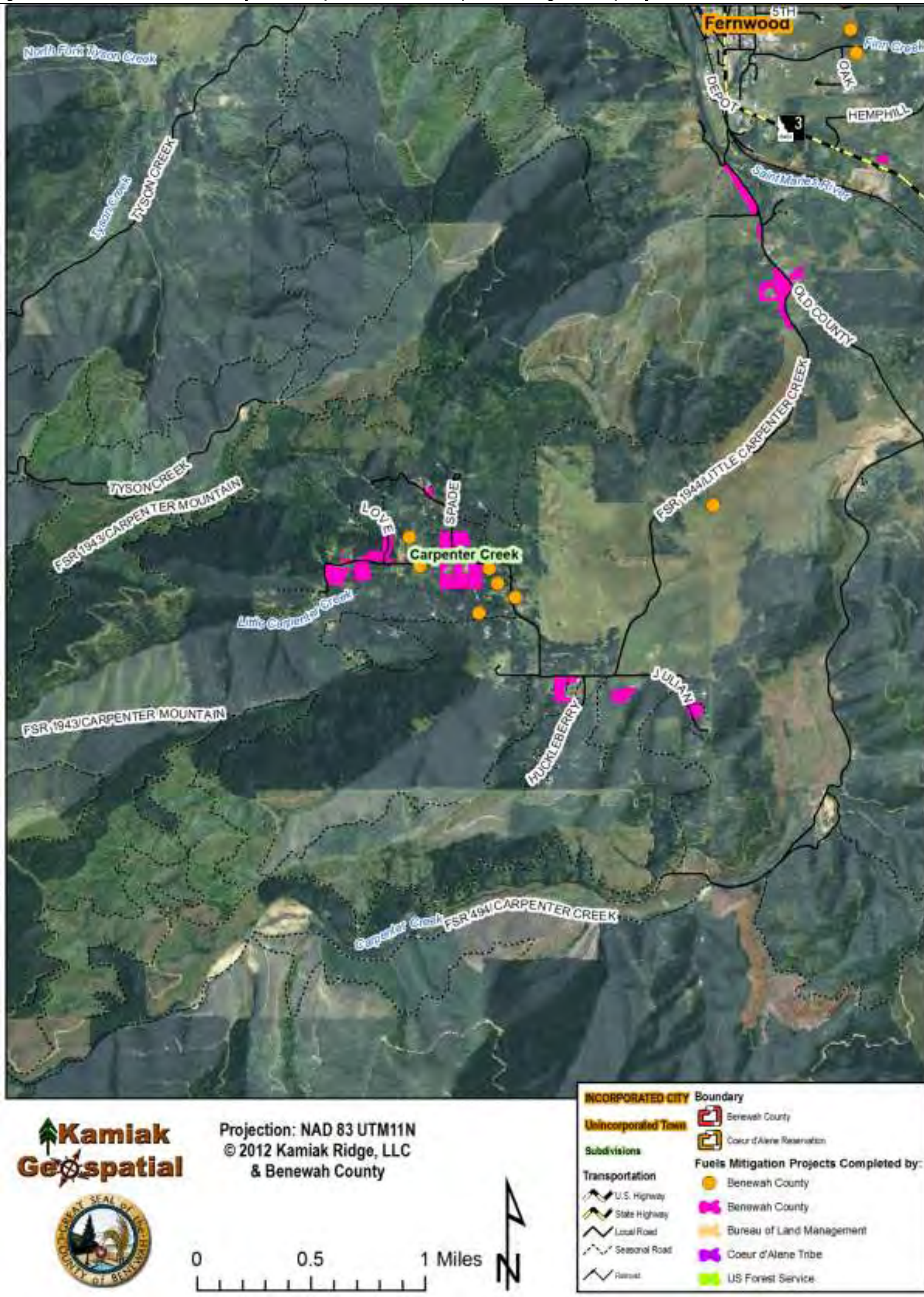


Figure 215. Community of Carpenter Creek potential mitigation projects.

6.7. Flat Creek

6.7.1. Past Mitigation Projects

Very few past mitigation efforts have been completed in the Flat Creek community. This area has been developing over the past 10+ years and has seen little wildland fuels reduction projects over that time. Benewah County fuels crews have developed over 3 acres of defensible space along Thorne Creek Road.

6.7.2. Potential Mitigation Projects

With the continued development of this community and increase in population over the past 10 years, mitigation projects have been proposed in this area for the protection of access to ingress/egress roads for firefighting efforts and the evacuation of residents. Currently, over 60 acres of projects along Thorne Creek Road, Flat Creek Road, and the Blackwell Hump Divide to ensure these access roads are passable in the event of a wildland fire.

Figure 216. Community of Flat Creek past mitigation projects.

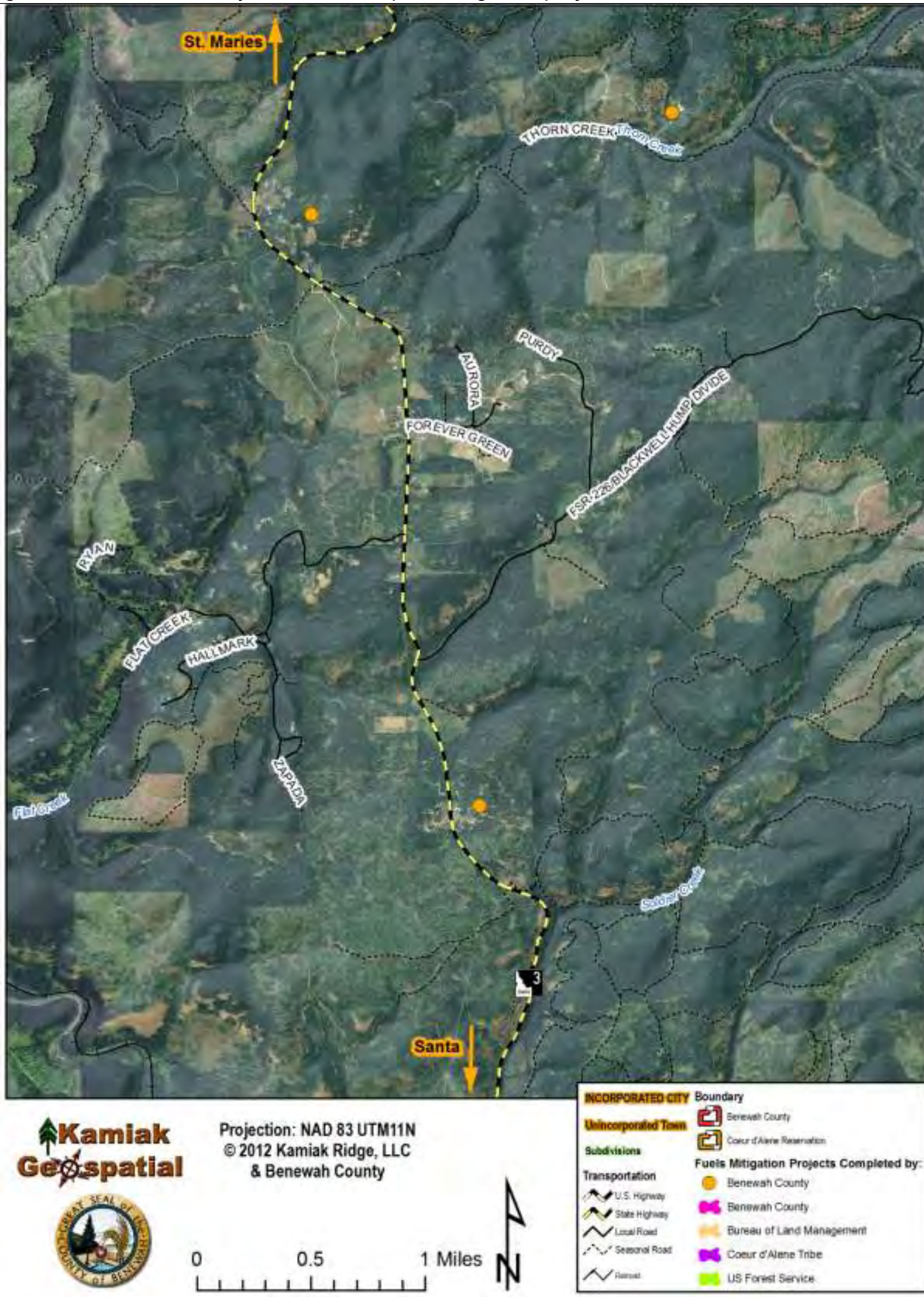
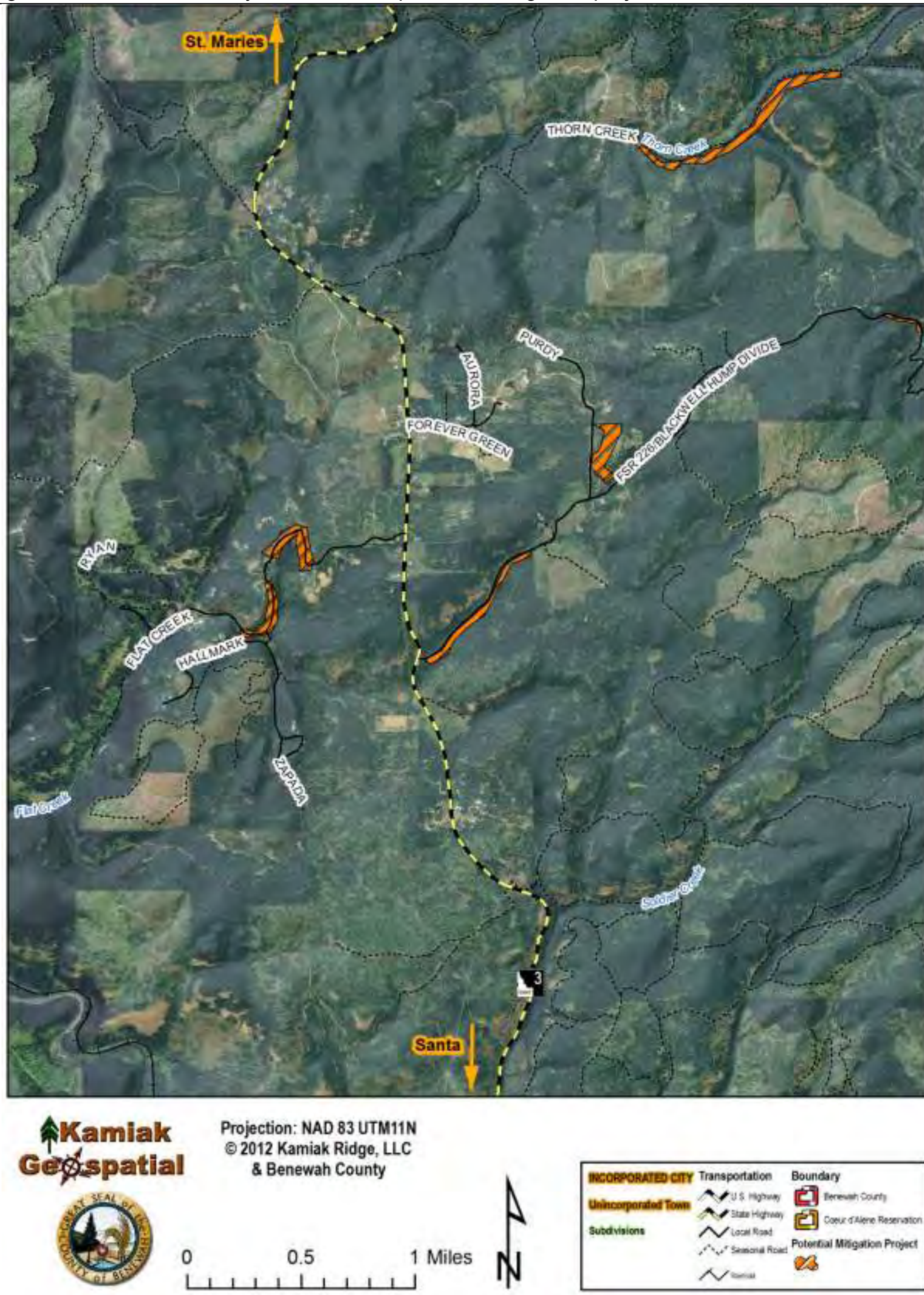


Figure 217. Community of Flat Creek potential mitigation projects.



6.8. Plummer

6.8.1. Past Mitigation Projects

The Coeur d'Alene Tribe has completed over 4,000 acres of mastication, thinning, lop and scatter, and pile burning projects around Plummer. The majority of these projects take place on parcels that receive yearly treatments to maintain the reduced fuel loading on these lands. These projects surround the town of Plummer and help to greatly reduce the risk of wildfire spread to the populous of the community.

6.8.1.1. Coeur d'Alene Tribe Headquarters

The Coeur d'Alene Tribe has completed over 1,200 acres of mastication, thinning, chipping, and mowing projects along Agency Road and in the area directly surrounding the tribal headquarters. Development of the agency headquarters and the construction of tribal housing in this area have increased the efforts of wildland fuels reduction to protect access roads and structures.

6.8.2. Potential Mitigation Projects

An additional 2,500 acres are scoped for continued mitigation projects to maintain many of the parcels that have already had some past mitigation efforts completed. These efforts are spread throughout the community of Plummer and the surrounding hillsides to the south and northeast. New projects are proposed along Fairfield Road and Haynes Road to protect ingress/egress for residence in that area.

6.8.2.1. Coeur d'Alene Tribe Headquarters

In additional 2,500+ acres have been targeted for further wildland fuels mitigation projects to further protect the development of the tribal headquarters. These projects focus on the maintenance of past mitigation efforts to ensure continued fuels reduction and accessible roads.

Figure 218. City of Plummer past mitigation projects.

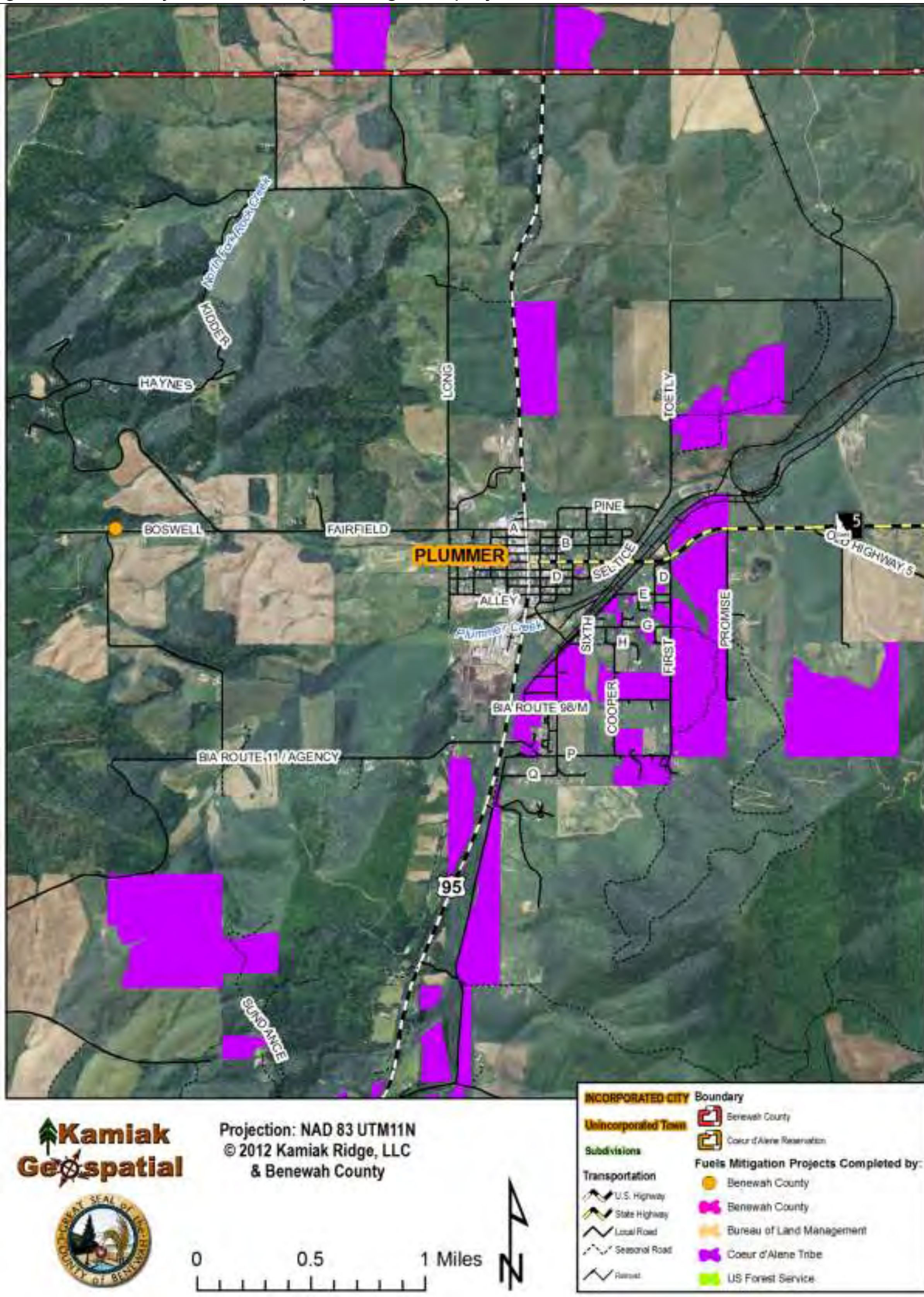


Figure 219. City of Plummer potential mitigation projects.

Figure 220. Coeur d'Alene Tribal Headquarters past mitigation projects.

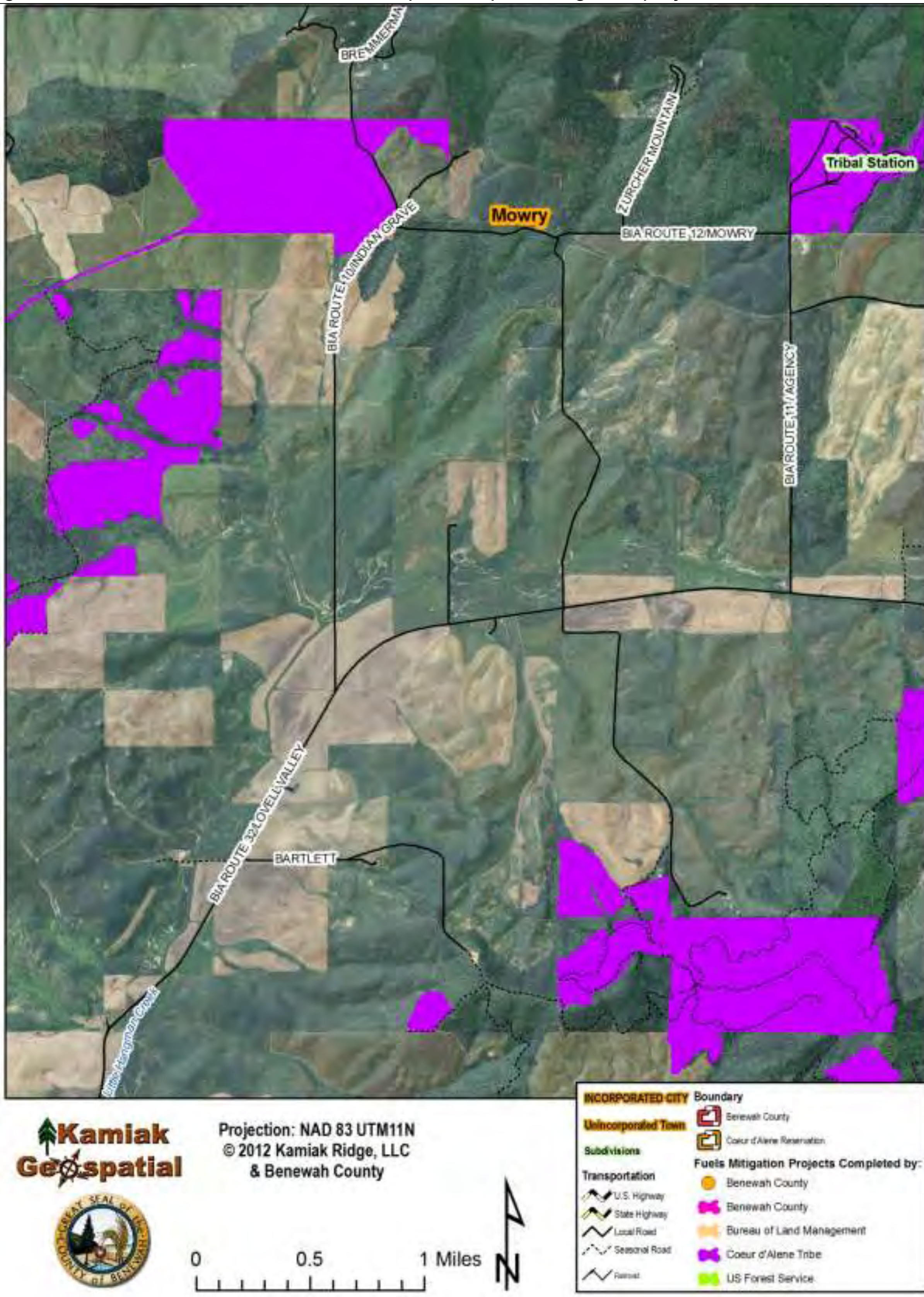
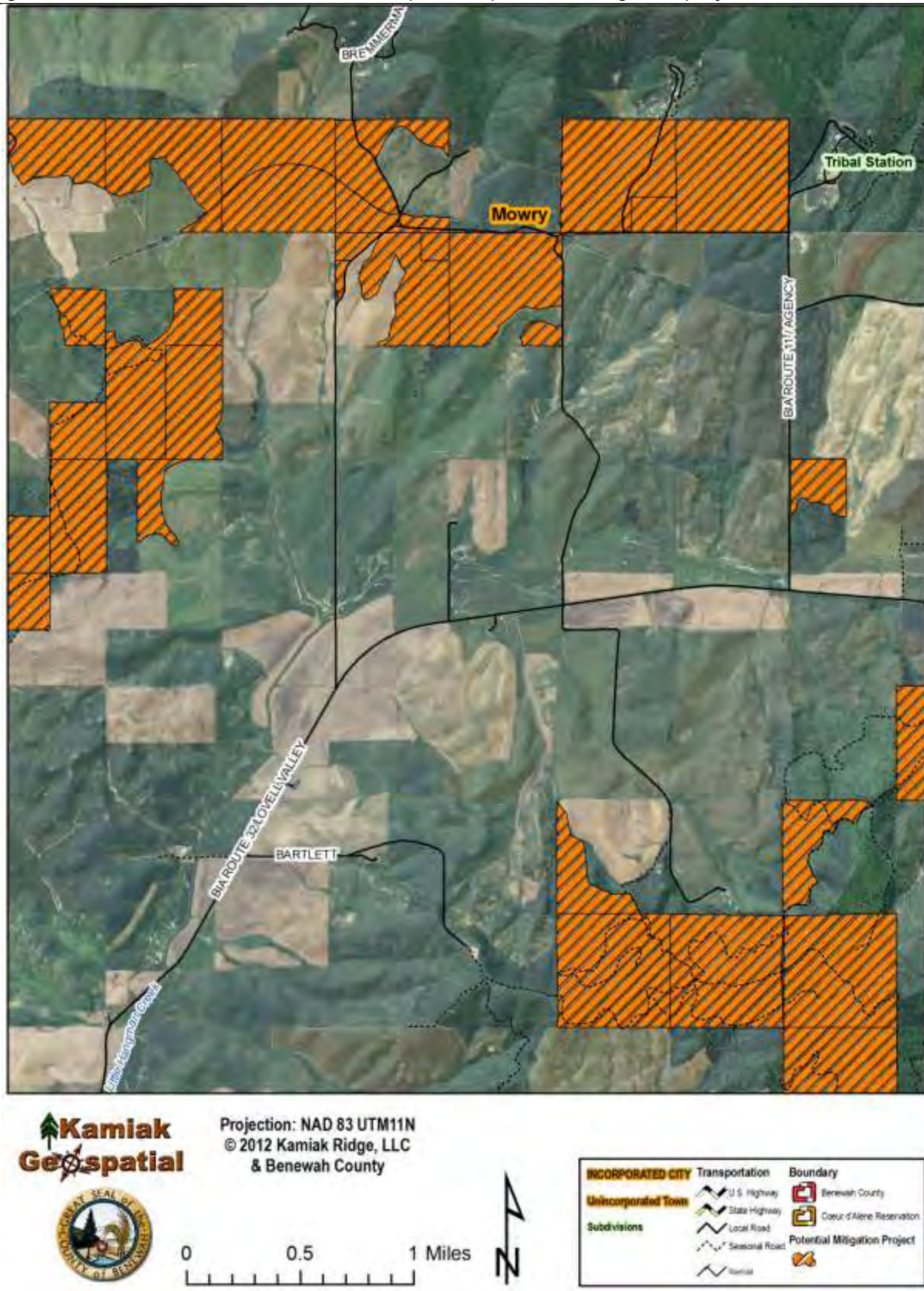


Figure 221. Coeur d'Alene Tribal Headquarters potential mitigation projects.



6.9. Sanders

6.9.1. Past Mitigation Projects

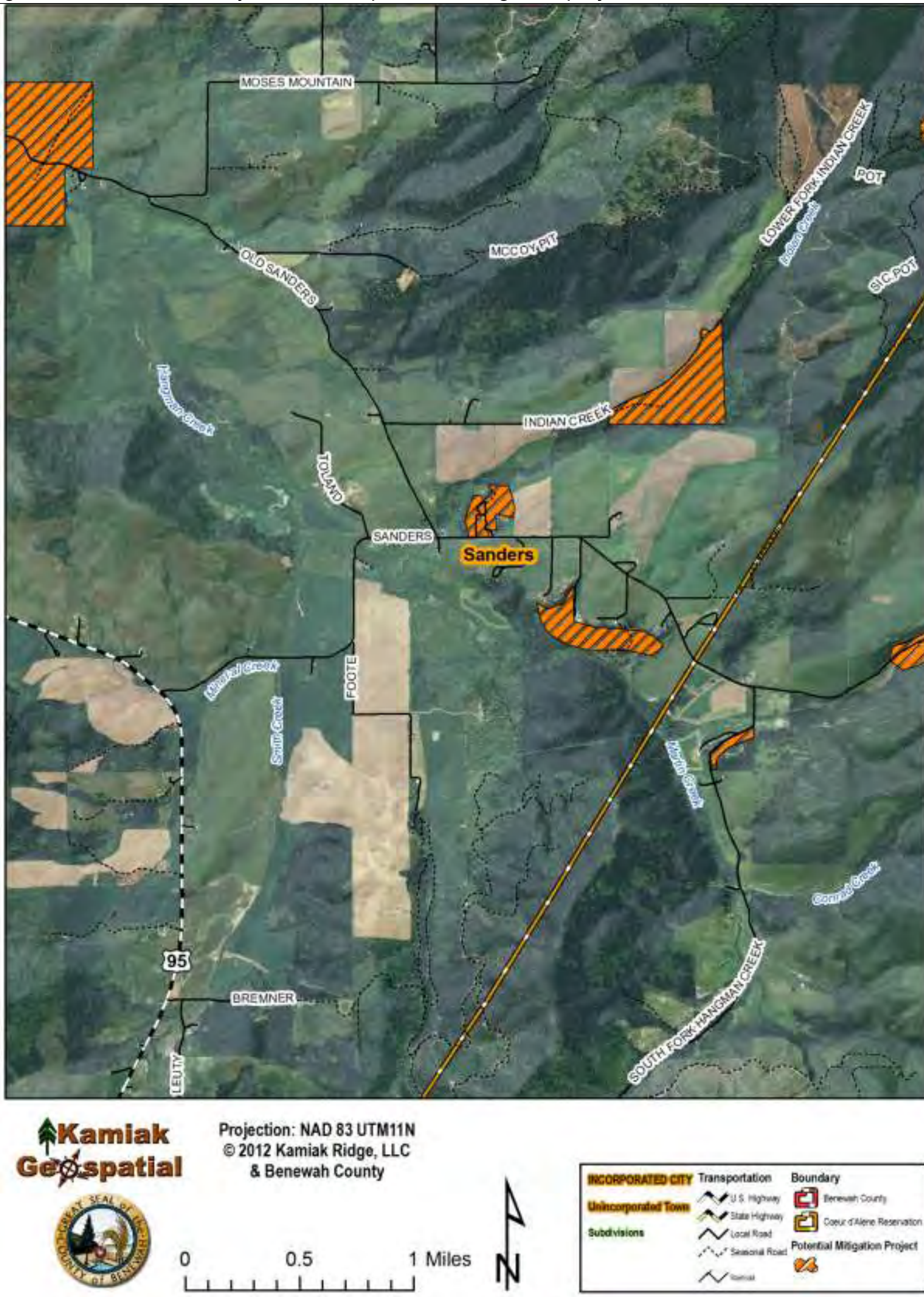
Although there is little evidence on the following figure of past mitigation projects, it is known that there have been some efforts in and around the Sanders Camp and community center to increase the defensible space in these areas. In addition, utilities companies have completed a well-protected power line corridor which has also helped create a fuel break for some areas of the community.

6.9.2. Potential Mitigation Projects

There are over 250 acres of mitigation projects proposed by this document for increasing the fuel breaks north of the community of Sanders, as well as for road protection along Sanders Road. The Coeur d'Alene Tribe has targeted a 70+ acre area along Indian Creek road for thinning and mastication that will help protect the community from the north, as well as residence living along that road. Projects are also proposed to protect Sanders Road between the communities of Sanders and Santa Creek.

Figure 222. Community of Sanders past mitigation projects.

Figure 223. Community of Sanders potential mitigation projects.



6.10. St. Maries

6.10.1. Past Mitigation Projects

Over 300 acres throughout the city of St. Maries have received wildland fuels mitigation projects in recent history. This includes approximately 25 acres completed by the Coeur d'Alene Tribe and over 275 acres by Benewah County fuels crews through development of defensible space and fuel breaks through thinning and pile burning. Efforts are spread throughout the communities that surround the city of St. Maries to protect from wildland fire spread.

6.10.1.1. Goose Haven

Wildland fuels mitigation efforts for the small community of Goose Haven has focused on developing defensible space around the homes and structures in the area.

6.10.1.2. Cassandra Hills

Over 65 acres of wildland fire mitigation work has been completed by the Benewah County fuels crew throughout the small community of Cassandra Hills. These projects focused on development of defensible space around homes and structures, as well as road protection to these homes along Cassandra Hills Road, Osdessa Road, and Susie Road.

6.10.1.3. Hells Gulch

Wildland fuels treatment around the area of Hells Gulch has focused on thinning and pile burning, and the development of defensible space. These treatments have added up to 25+ acres of completed mitigation projects by the Coeur d'Alene Tribe and Benewah County fuels crews.

6.10.1.4. Milltown

Although no past mitigation projects are mapped for the small area of Milltown, there is evidence of homeowner implemented improved defensible space along the northwest facing slope located behind the community.

6.10.1.5. Evergreen Terrace / River Pine Estates

Wildland fuels mitigation efforts for the small communities of Evergreen and River Pine Estates have focused on developing defensible space around the homes and structures in the area.

6.10.1.6. Highland Springs

In the community of Highland Springs and the smaller community to the south, Stony Ridge, there have been over 40 acres of fuels breaks and road protection projects completed by the Benewah County fuels crew. This area has been heavily developed over the past 20 years and wildland fuels mitigation projects have been completed to help protect ingress/egress access roads as well as the threat of a wildland fire spread from the forested hillsides to the community.

6.10.1.7. Cherry Creek / Shay Hill

There have been nearly 10 acres of road protection and defensible space projects completed by the Benewah County fuels crew in the area of Cherry Creek Road and Shay Hill. These projects have focused on Patches Road and areas closer to State Highway 5.

6.10.2. Potential Mitigation Projects

There are an additional 250+ acres of potential mitigation projects within the St. Maries city limits and spread throughout the surrounding communities. These projects generally target road protection and development near the communities seeing some growth over the past 10 years including: Cassandra Hills, Goose Haven, Hells Gulch and Highland Springs.

6.10.2.1. Goose Haven

Nearly 60 acres of road protection and fuel breaks have been proposed for the Goose Haven community along Goose Haven and Deep Creek Roads. These projects are intended to provide safe access to the community along the main access roads for ingress/egress in the event of a wildland fire.

6.10.2.2. Cassandra Hills

Additional wildland fuels mitigation work has been proposed for forested areas along Cassandra Hills Road. These projects include the development of defensible space for homes located along the steep slopes of the community.

6.10.2.3. Hells Gulch

Roads protection mitigation projects are the target for the Hells Gulch community area. Currently there are over 40 acres of proposed road protection efforts proposed along Hells Gulch Road and Bear Springs.

6.10.2.4. Milltown

The main wildland fuels project proposed for the area of Milltown is a 25 acre thinning and fuel break located to the southwest of Milltown homes just north of State Highway 3. This area is heavily forested and it is proposed for the reduced threat of spread from the hillside to this community.

6.10.2.5. Evergreen Terrace / River Pine Estates

Further development of defensible space in the Evergreen Terrace community and road protection along Meadow View Road and Dave Road south of the River Pine Estates are the target of wildland fuels reduction projects in these two communities.

6.10.2.6. Highland Spring

The protection of ingress/egress access roads and long driveways should continue to be the focus for the community of Highland Springs and to the south Stony Ridge. 30+ acres of road protection projects and fuel breaks throughout the community have been proposed for further protection of this area.

6.10.2.7. Cherry Creek / Shay Hill

The areas around Cherry Creek Road and Shay Hill are not heavily populated, and some mitigation efforts have already been in place to protect those homes in the area. Further road protection and fuels breaks have been suggested along Shay Hill Road, a section of heavily forested access road.

Figure 224.	St. Maries past mitigation projects.

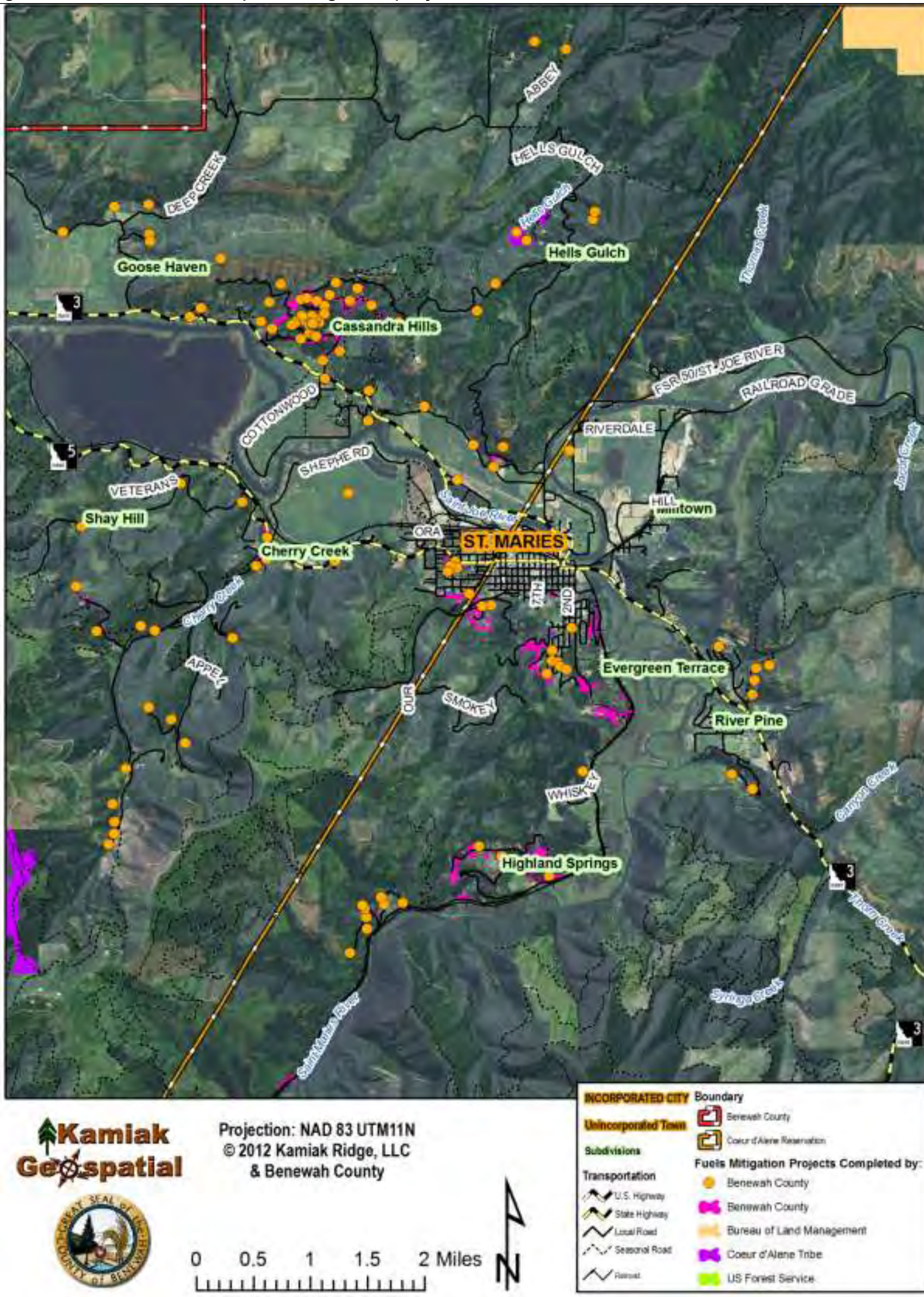


Figure 225. St. Maries potential mitigation projects.

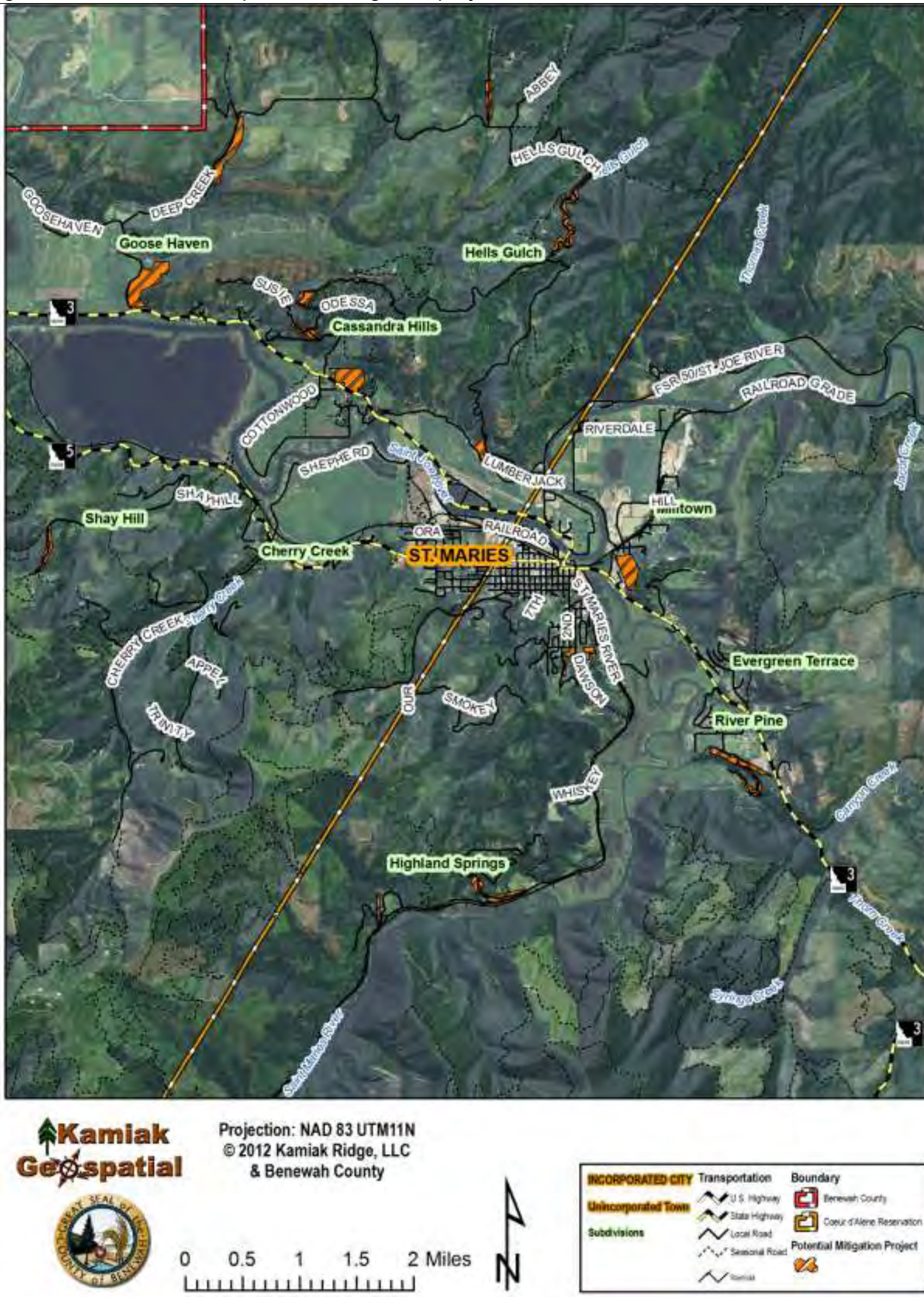


Figure 226. Community of Goose Haven past mitigation projects

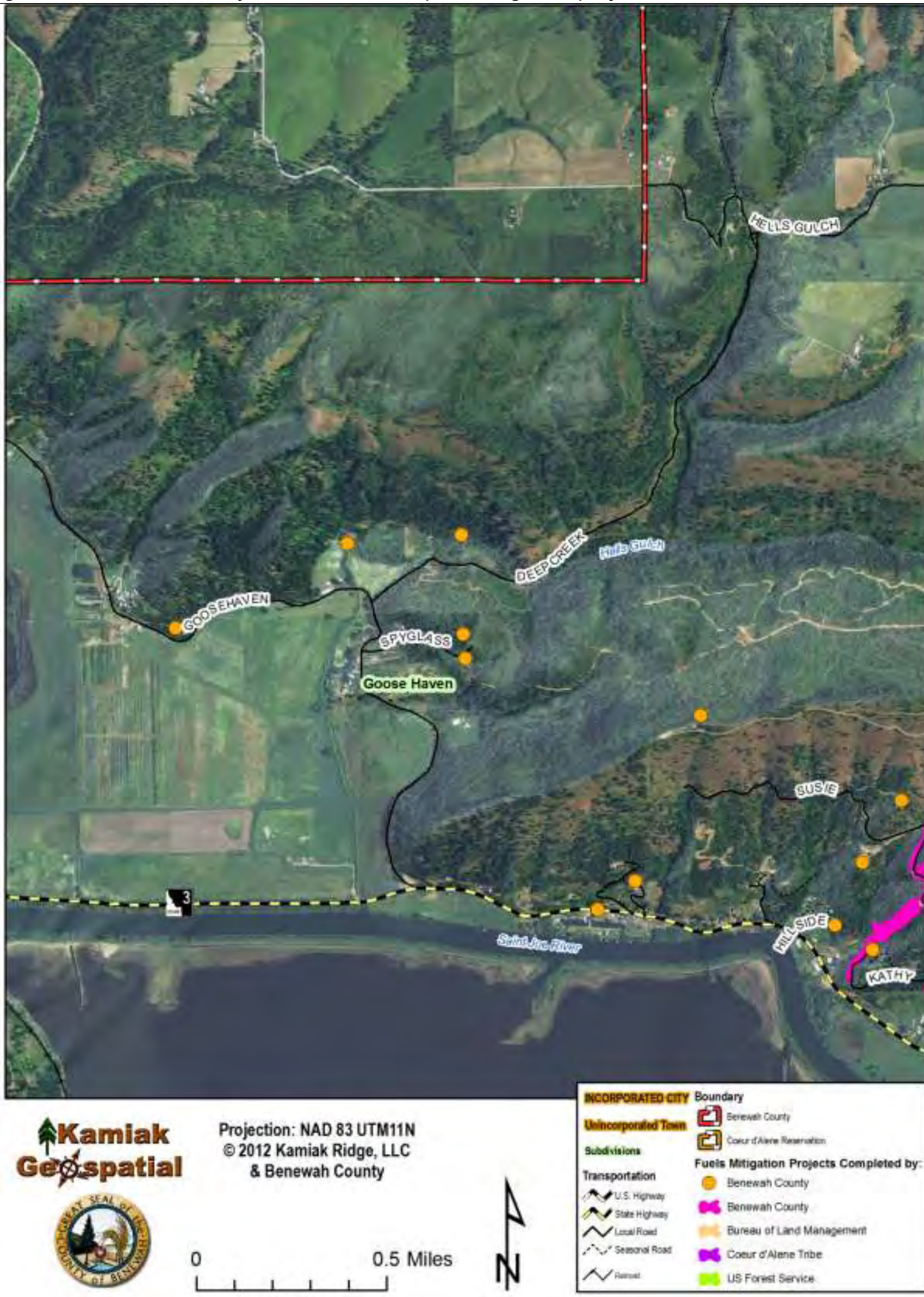


Figure 227. Community of Goose Haven potential mitigation projects

Figure 228. Community of Cassandra Hills past mitigation projects

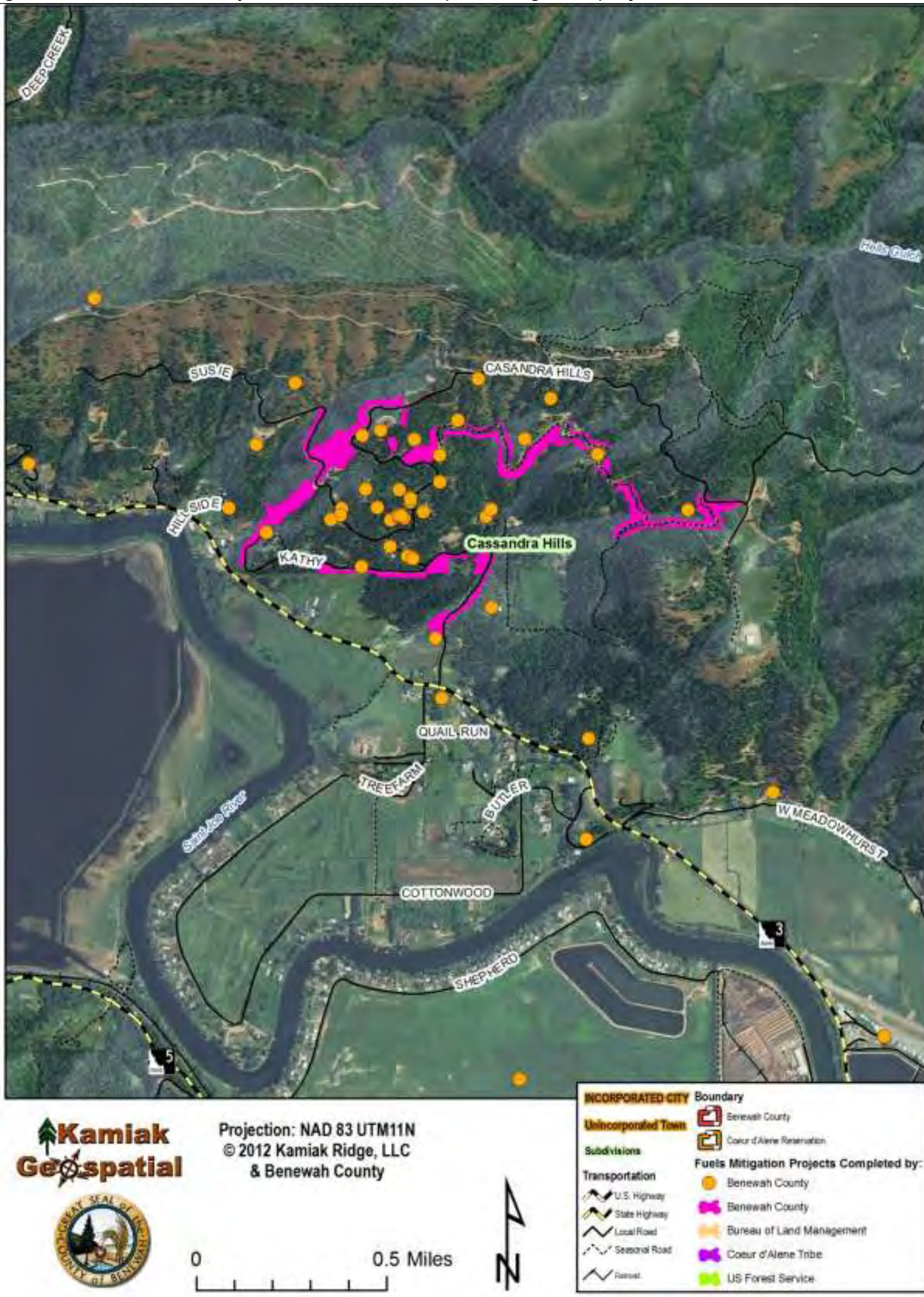


Figure 229. Community of Cassandra Hills potential mitigation projects

Figure 230. Community of Hells Gulch past mitigation projects

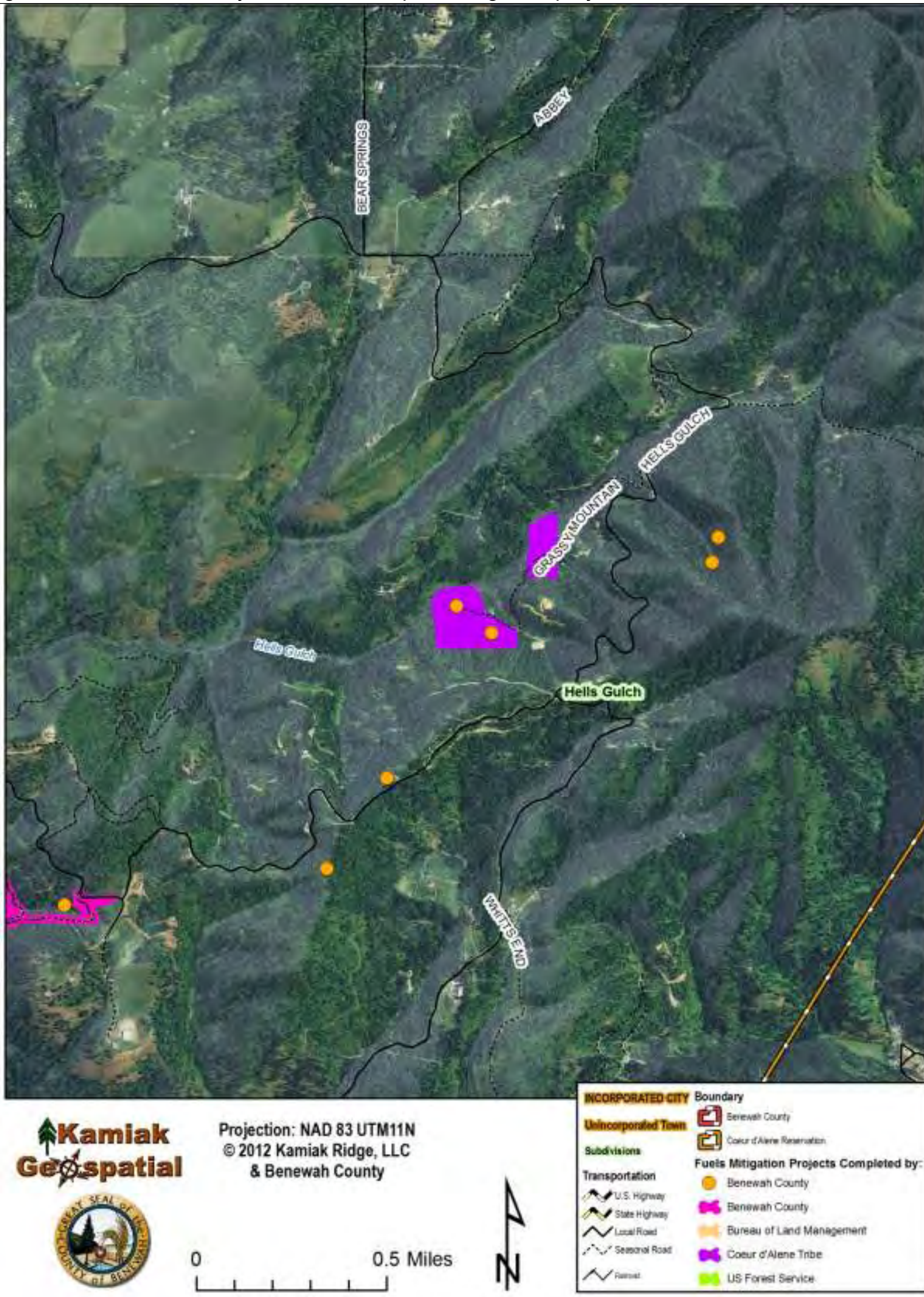


Figure 231. Community of Hells Gulch potential mitigation projects

Figure 232. Community of Milltown past mitigation projects

Figure 233. Community of Milltown potential mitigation projects

Figure 234. Evergreen Terrace and River Pine Estates past mitigation projects.

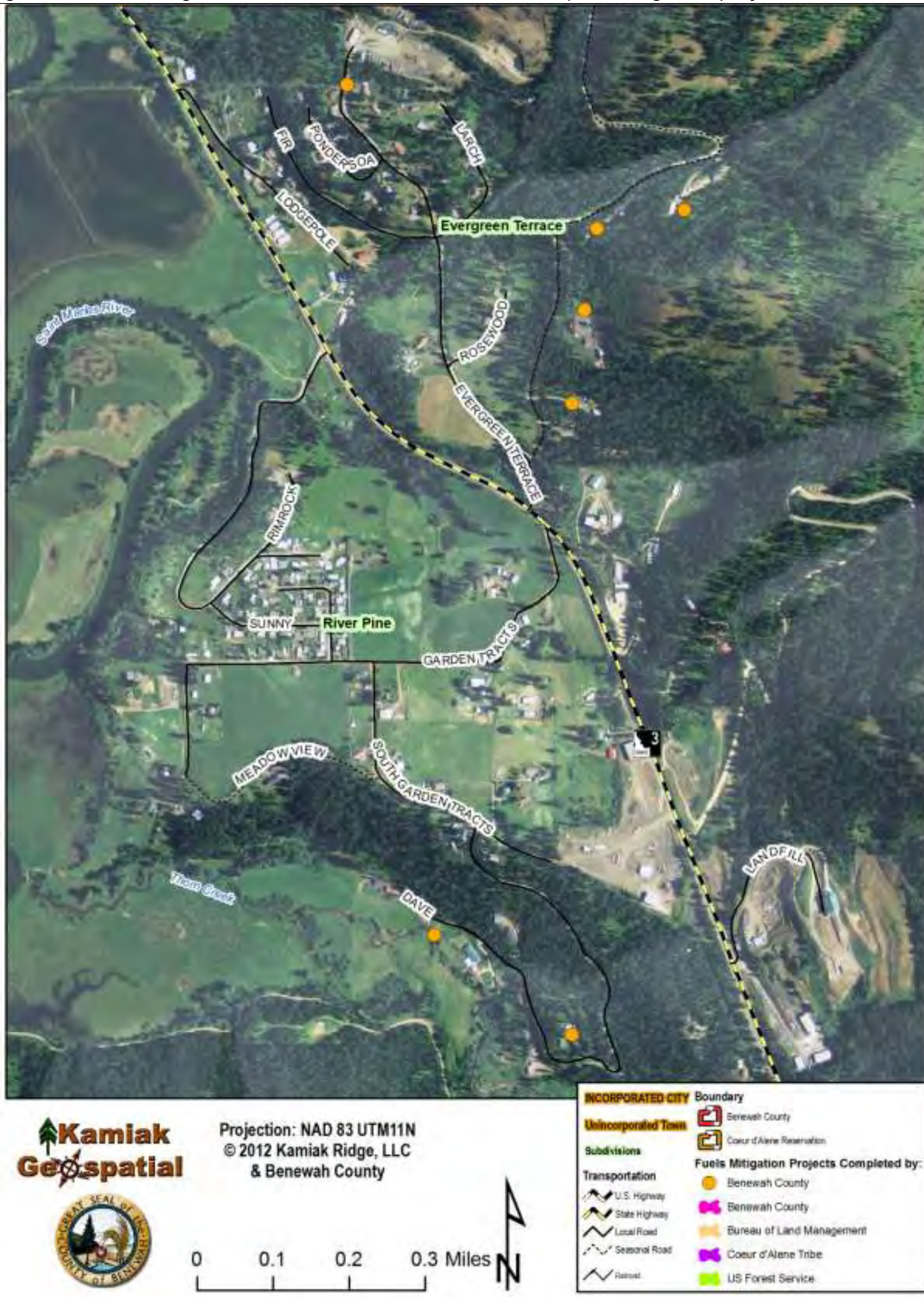


Figure 235. Evergreen Terrace and River Pine Estates potential mitigation projects.

Figure 236. Community of Highland Springs past mitigation projects

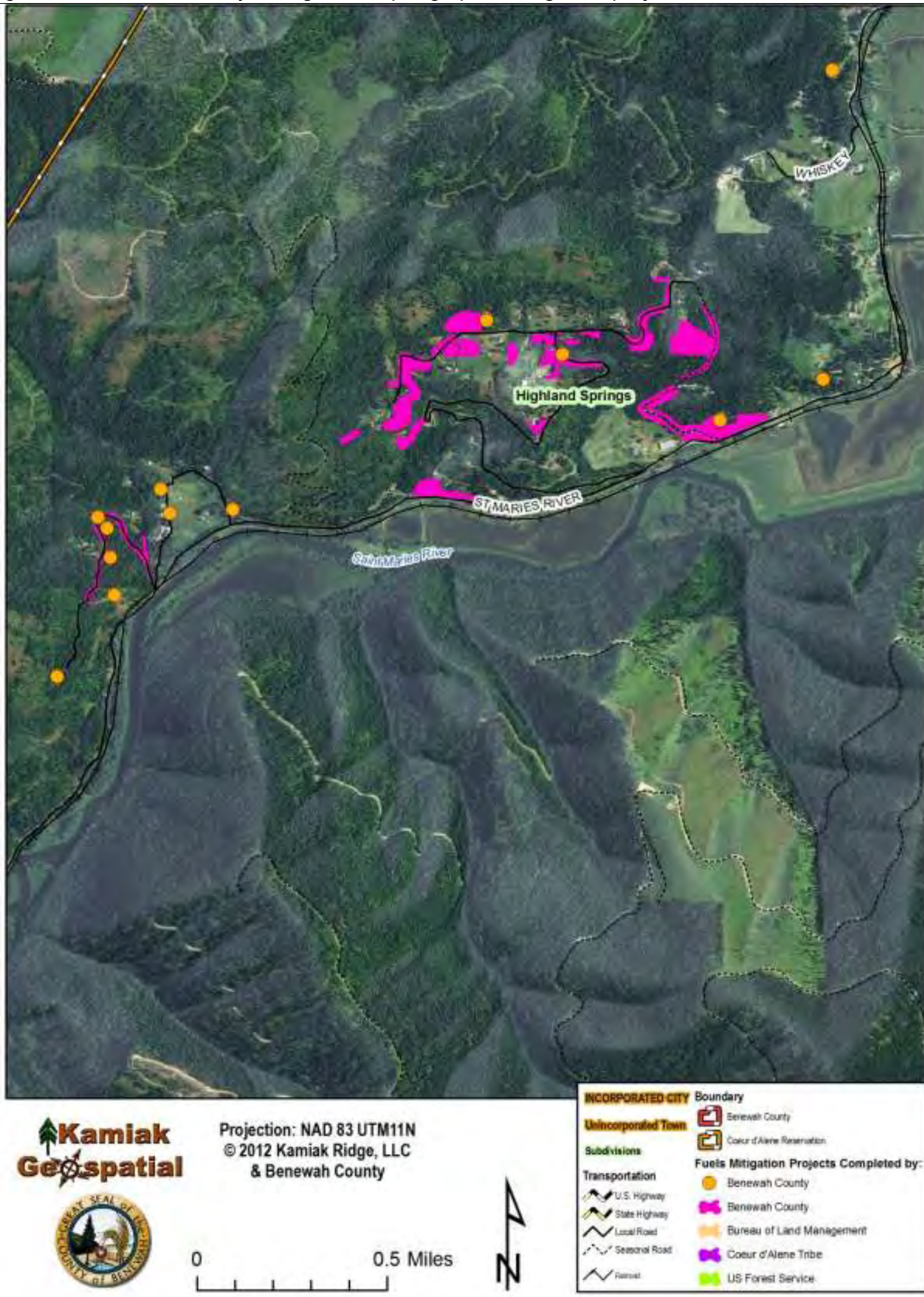


Figure 237. Community of Highland Springs potential mitigation projects

Figure 238. Community of Cherry Creek and Shay Hill past mitigation projects

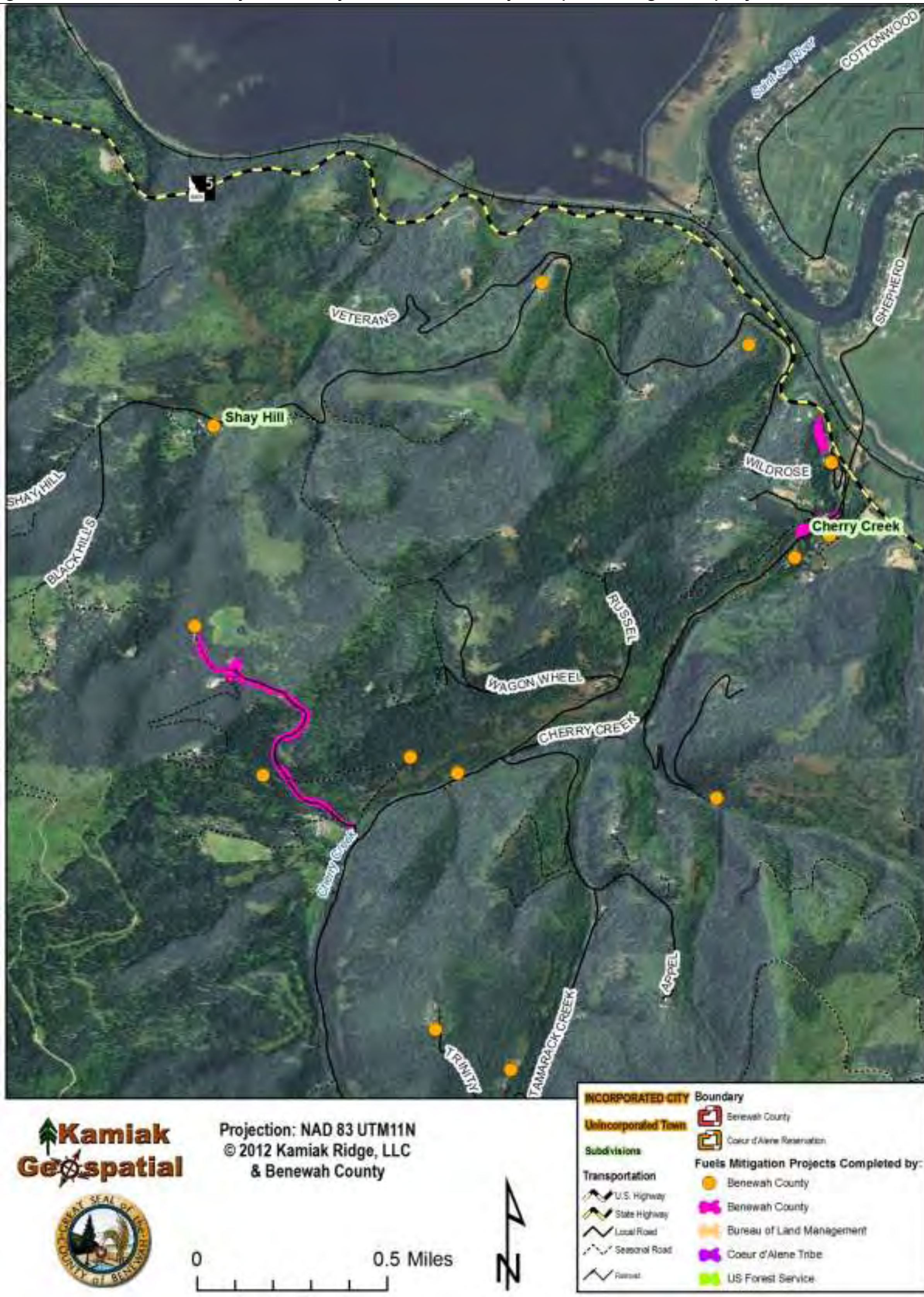


Figure 239. Community of Cherry Creek and Shay Hill potential mitigation projects

6.11. St. Joe / Ferrell

6.11.1. Past Mitigation Projects

Although there are no past mitigation projects mapped for St. Joe and Ferrell, there is evidence of home owner improved defensible space throughout St. Joe.

6.11.2. Potential Mitigation

The number one proposed wildland fuels mitigation project for the St. Joe area is a 22+ acres fuel break along the south side of the community to protect from wildland fire spread to these homes. In the Ferrell area, infrastructure protection along Reeds Gulch and Ahrs Gulch, which are both south facing, have been proposed to protect homes below these areas and along Scott Road.

Figure 240. St. Joe and Ferrell community's past mitigation projects.

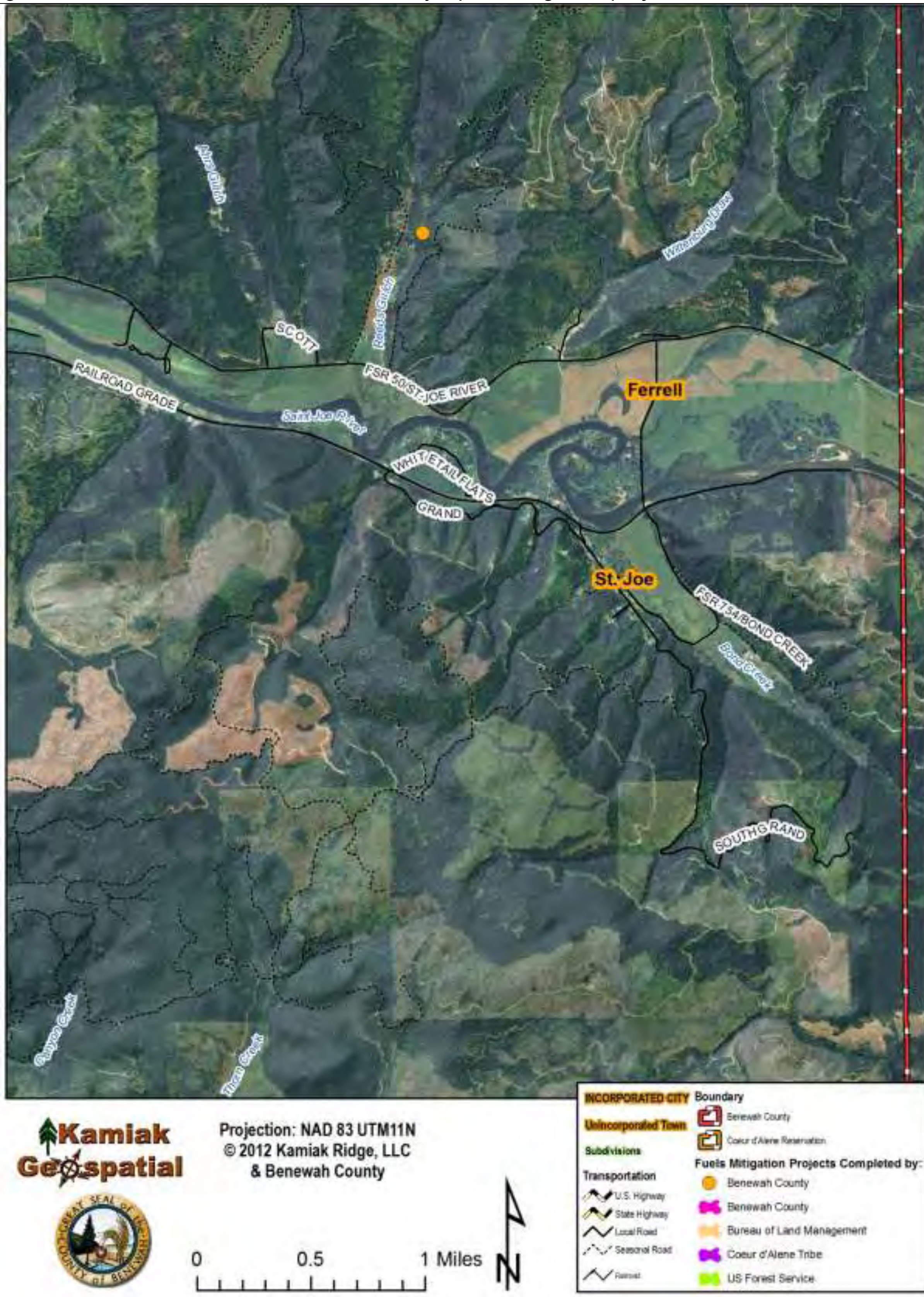
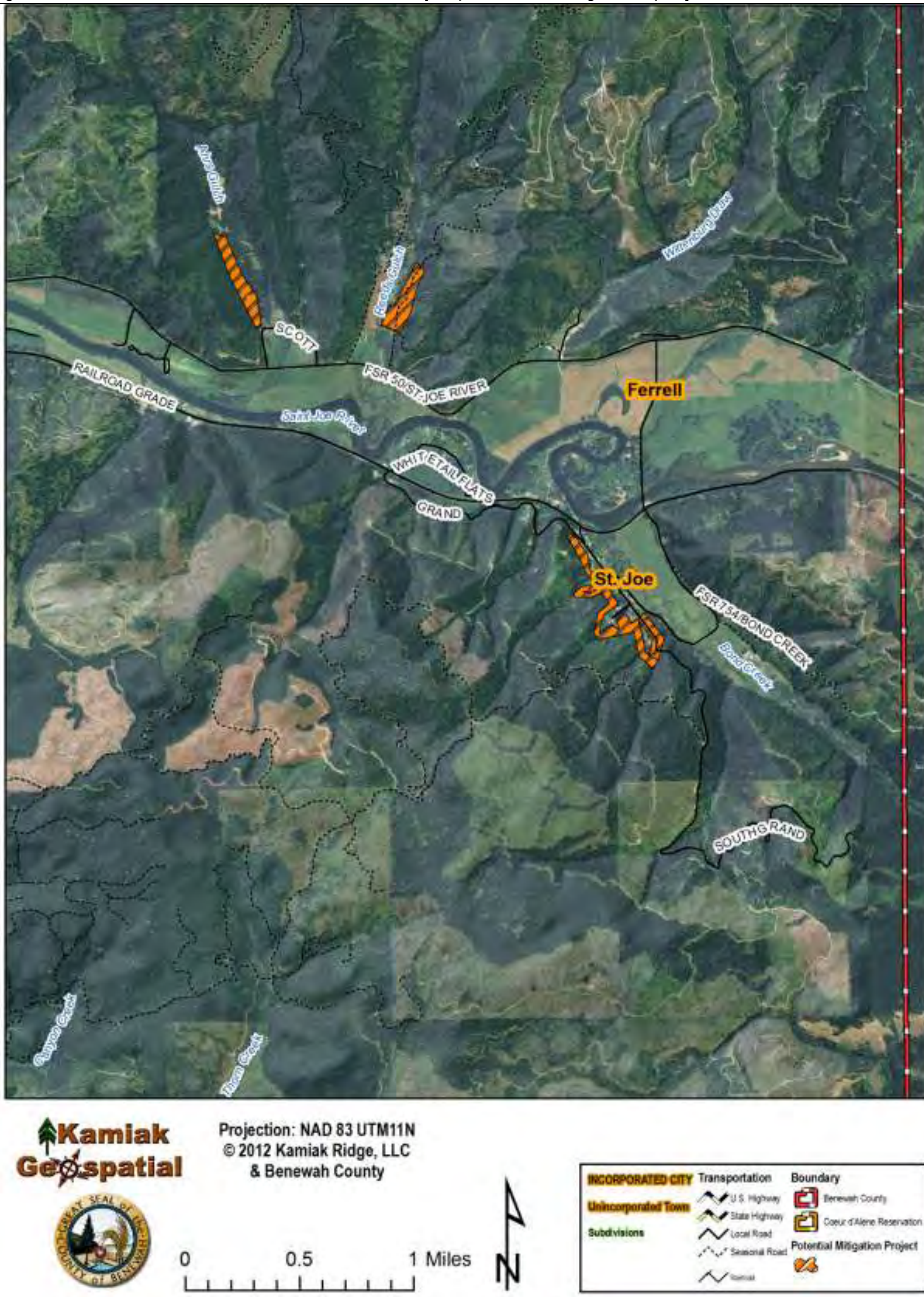


Figure 241. St. Joe and Ferrell community's potential mitigation projects.



6.12. Tensed / Desmet

6.12.1. Past Mitigation Projects

The Coeur d'Alene Tribe has completed over 4,000 acres of wildland fuels mitigation projects in near the city of Tensed and the community of Desmet. These projects have mainly consisted of thinning, mastication, pile burning, and lop and scatter projects in areas southwest and northeast of the main population areas. In addition, the Desmet housing areas have had mastication projects completed throughout the past 4 years.

6.12.2. Past Mitigation Projects

Over 2,400 acres are proposed for further wildland fuels mitigation projects, mostly by the Coeur d'Alene Tribe. These projects will focus on the continued maintenance of parcels and projects that have been completed in the past, as well as completing some new projects in the area along Iron Mountain Road and Shady Road.

Figure 242. Tensed and Desmet past mitigation projects.

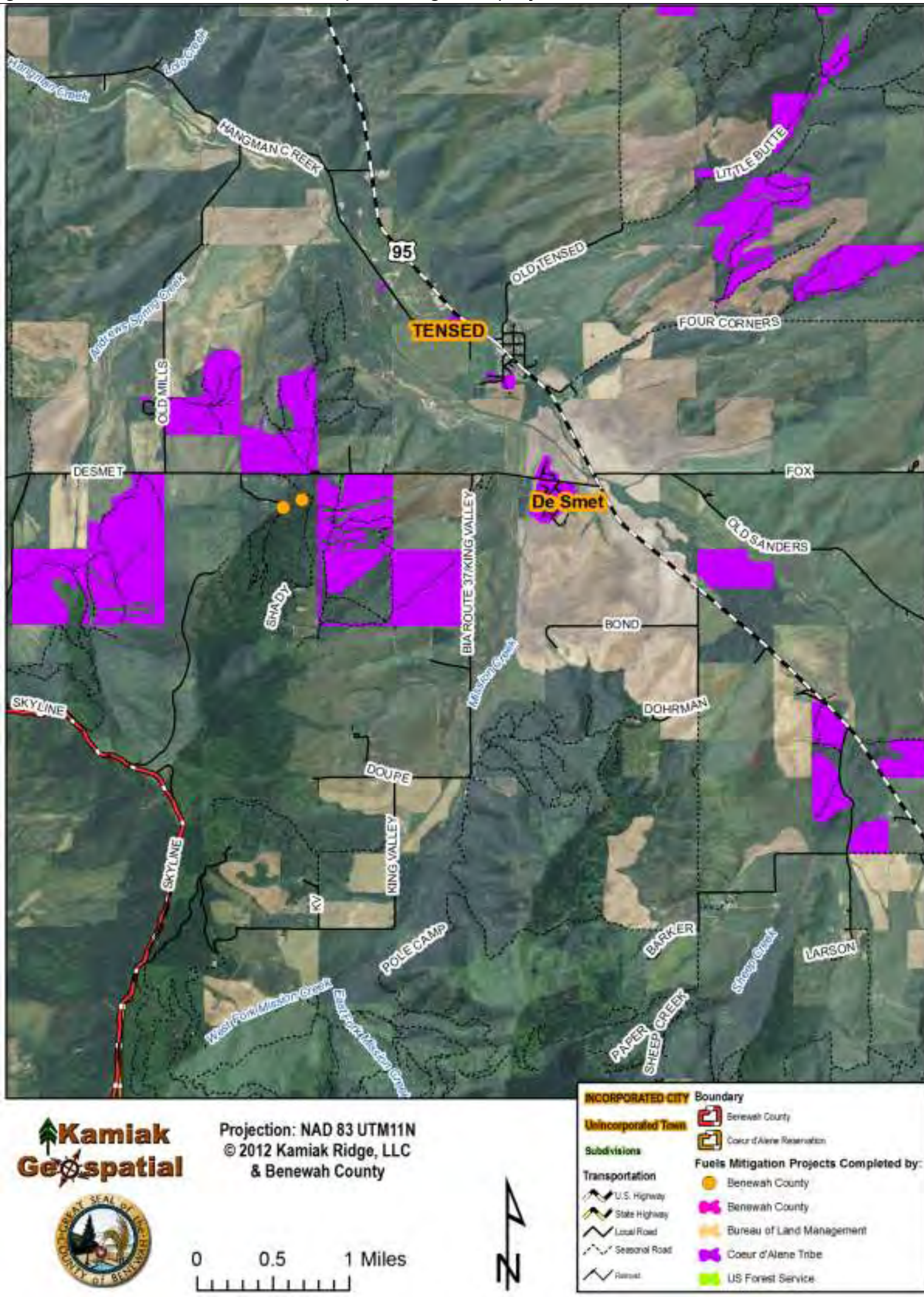
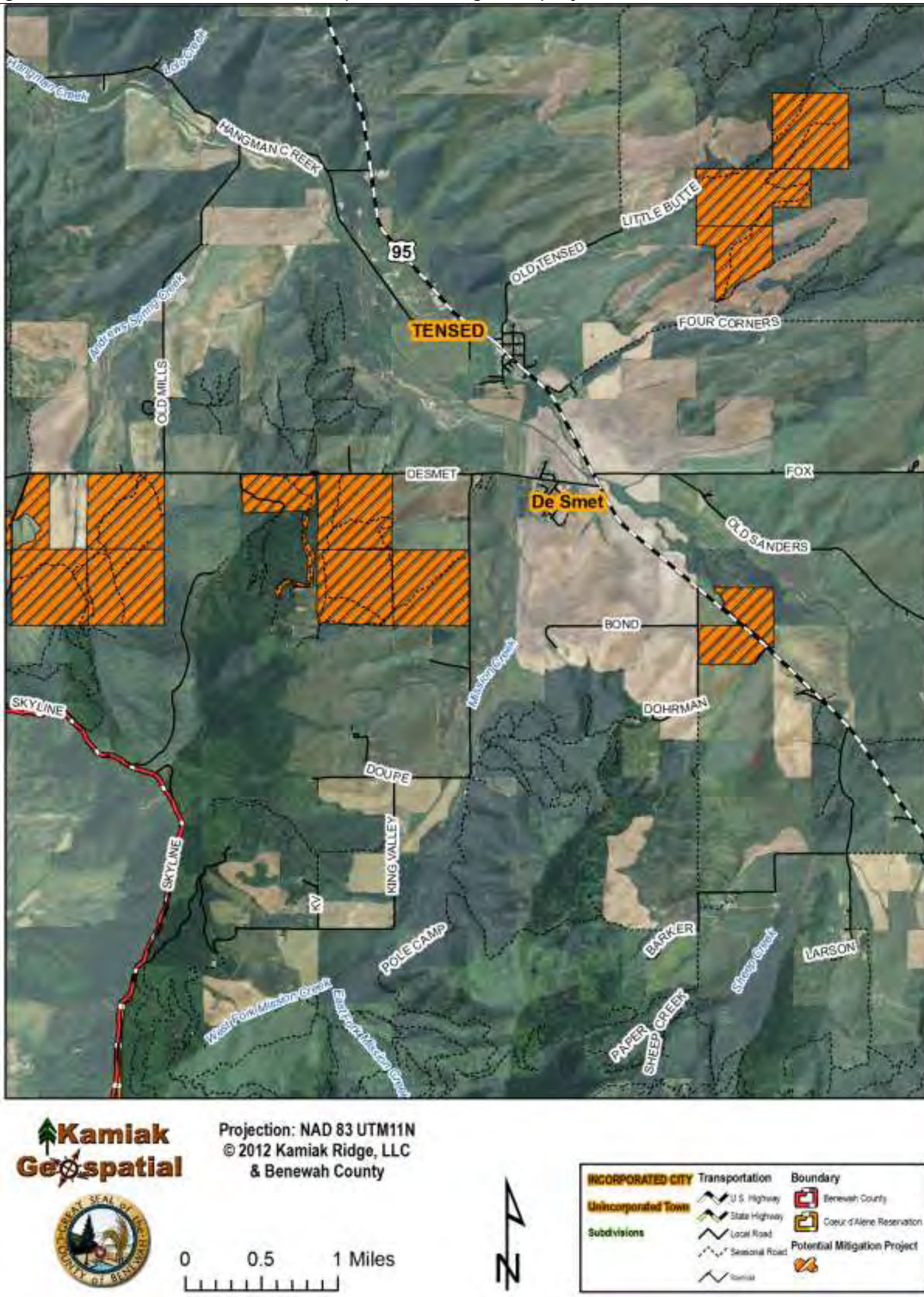


Figure 243. Tensed and Desmet potential mitigation projects.



Chapter 7. Resources, Capabilities, and Needs Assessment

The Resources, Capabilities, and Needs Summary was a survey given to all managers of emergency services, agencies, local governments, and others involved in the administration of hazard mitigation, preparedness, and protection during the execution of previous hazard mitigation plans completed in the county. These forms were intended to collect information to ascertain the status of protection responsibilities, resources available to respond to hazard prevention, mitigation, and response, and to collect current information about resources needed by each respondent's organization to better meet the needs of the citizenry of the respective organization.

7.1. Benewah County

The Emergency Manager for Benewah County completed Resource, Capabilities, and Needs assessments as part of the Benewah County Multi-Jurisdictional Hazards Mitigation Plan update in 2010 (Table 6.7). The Benewah County Sheriff's Office also completed this survey (Table 6.8). The analysis results of each respondent are presented here with only minor editing.

7.1.1. Benewah County Emergency Management

Table 6.7. Benewah County, Resources, Capabilities and Needs.

Organization Name	Benewah County
Name & Position of Person Preparing this Summary	Norm Suenkel Director of Emergency Management
Address & Telephone	701 W College Suite 3 208-245-4122
Service Area	Benewah County
Describe your services and organization goals in overview	Benewah County is proactive in mitigating potential hazards. Besides work that has been completed to reduce fuels in the WUI, the county has mitigated river ice to reduce the potential for flooding, worked on improving interoperable communications within the first responder community, and worked toward improving ingress and egress along the county road system. During emergencies, Benewah County will use its resources to help deal with the event.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	Benewah County has 6 ambulances, 14 dump trucks, 7 tractors, 5 sanders, two oil trucks, water trailers, belly dumps, culvert trailer, a mass causality incident trailer, graders, and front end loaders. The county also has four wheel vehicles. The County has worked with the Red Cross and the local school districts to develop emergency reception centers.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	Benewah county has nine people on the road crew, it has a staffed assessor, treasure and recorder offices, it has the sheriff department and a solid waste department.
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Benewah County has a 911 system though the sheriff's office. They have P-25 compliant radios. The county is continuing on working on improved interoperable communications. The Benewah Valley/Alder Creek area does not have an organized structural fire protection district. The St. Joe area is also out of an organized structural fire protection district.

Table 6.7. Benewah County, Resources, Capabilities and Needs.	
Organization Name	**Benewah County**
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Just about all the people in the fire districts are volunteers. Recruitment and retention of volunteers for these fire districts in a continuous challenge. Limited funds restrict the amount of personal the county can employ to be available to assist the citizens in the community.

7.1.2. Benewah County Sheriff

Table 6.8. Benewah County Sheriff's Office.

Organization Name	**Benewah County Sheriff**
Name & Position of Person Preparing this Summary	Sandra Anxo, Sgt. Dispatch
Address & Telephone	701 W. College Ave, Suite 301, St. Maries
Service Area	All of Benewah County including the cities of St. Maries, Plummer, Tensed, DeSmet, Emida, Santa, and Fernwood
Describe your services and organization goals in overview	We are an information center for the public as well as fielding calls and dispatching for response, law enforcement, medical, fire, search and rescue, road crews, wrecked cars, and other agencies (Idaho State Patrol, Coeur d'Alene Tribe).
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	Patrol vehicles, 2 boats, 2 snow-cats, 1 ATV, 1 snow machine, 1 air boat, command center, SWAT van, sled to pull behind snow-cats.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• Many staff
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Need an up to date command center with modern equipment and room for growth to effectively serve the public and the agencies we work with.

7.2. Coeur d'Alene Tribe

The Coeur d'Alene Tribe completed their Tribal Hazards Mitigation Plan (2011) and recorded this information. Those responses are included here to show the response capabilities associated with areas within Benewah County that are also within the Coeur d'Alene Reservation.

7.2.1. Forestry Fuels Program

Table 21. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Forestry Fuels Program.

Department Name	Natural Resources-Forestry Fuels Program
Name & Position of Person Preparing this Summary	Chuck Simpson, Fuels Specialist
Department Head	Alfred Nomee
Address & Telephone	402 Anne Antelope Avenue, Plummer, ID 83851 & (208)686-5030
Service Area	Coeur d'Alene Reservation

Table 21. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Forestry Fuels Program.

	Describe your services and organization goals in overview (100 words or less)	The Coeur d' Alene (CDA) Tribe's Fuels Program's primary goal is to reduce the wildfire potential in the Tribe's Wildland Urban Interface (WUI) within the boundaries of the Coeur d' Alene Indian Reservation. Tribal trust, individual allotments, and restricted Indian lands shall be considered the highest priority for treatments. The Fuels Program works cooperatively with local, state, and federal agencies to develop and implement hazardous fuels reduction treatments and prioritize them from high to low risk areas. Hazardous fuels reduction treatments include: thinning, pruning, mastication, chipping, piling, lop and scatter, biomass, and prescribed burning
Major Equipment Resources	List your currently available major equipment resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. vehicles, generators, equipment trailers, fire protection apparatus, snow plows, search & rescue trucks, etc.)	• 1 Dodge Pickup 2500 Single Cab GSA Vehicle • 1 Chevy Pickup 2500 Crew Cab GSA Vehicle • 1 Chevy Pickup 1500 Crew Cab GSA Vehicle • 1 Skid Steer Mastication Machine • 2010 Polaris Ranger • Yamaha Grizzly 4 Wheeler • 66 Gallon Fuel Tank & Pump • Briggs & Straton Air Compressor • 2, 50 Feet Air Hoses • Ford F550 • 3 Stihl 350 Brush Cutters • 2 Stihl 85 Brush Cutters • 8 Stihl Chainsaws • 2 DR Mowers • Titan Generator • PJ Tow Trailer • Ford F250
Major Equipment Resources	List your major equipment needs for responding to emergencies, or mitigating potential hazard conditions which are not currently in inventory.	Storage Building for Staff and Major Equipment Resources
Technological Resources	List your currently available technological resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. communications, emergency shelter/meals, etc.)	• 2 Garmin 60cx GPS Units • Trimble 2008 GEO XT GPS Device • 4 Computers/Laptop • 1 Projector • 2 Weather Stations
Technological Resources	List your organization's technological needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently in inventory, in your service area.	No Response

Table 21. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Forestry Fuels Program.

Human Resources	List your currently available human resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. detail staff by position and number, plus volunteers)	1. Charles Simpson – Fuels Specialist (FIRB qualified, Trainee - ENGB, RXB2, and FEMO) 2. Isaac Cawston – Supervisory Fuels Technician (FIRB qualified, Trainee - ENGB, CRWB, and RXB3) 3. Justin Hendrickx – Fuels Technician 2 (FFT1 qualified, Trainee - ENGB and Tech 3) 4. Miguel Arroyo – Fuels Technician 2 (Tech 2 and ENGB qualified) 5. James Beebe – Fuels Technician 1 (FFT2 qualified, Trainee - Tech 2 and FFT1) 6. Florencio Espana – Fuels Technician 1 (FFT2 qualified) 7. John Griffith – Fuels/Fire Equipment Operator (FFT2 qualified, Trainee - FFT1 and DOZR operator) 8. Willard Spottedblanket – Fuels Equipment Operator (FFT2 qualified, Trainee - DOZR operator) 9. John LaSarte – Fuels Technician 1 (FFT2 qualified) 10. Jeremy Howard – Fuels Technician 1 (Trainee - FFT2) 11. Chris Luke – Fuels Technician 1 (Summer Intern and FFT2 qualified) 12. Julianna Parker – Fuels/Fire Monitor (FFT2 qualified, Trainee - FEMO)
	List your organization's human resource needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	1. 1 Prescribed Burn Boss 2 (RXB2) 2. 1 Prescribed Burn Boss 3 (RXB3) 3. 4 Engine Boss (ENGB) 4. 2 Firefighter Type 1 (FFT1) 5. 4 Firefighter Type 2 (FFT2) 6. 2 Fire Effects Monitoring Observer (FEMO) 7. 1 Dozer Operator (DOZR)

7.2.2. Fire Management

Table 22. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Fire Management.

Department Name	Natural Resources-Fire Management Program
Name & Position of Person Preparing this Summary	Daniel Vassar, Training Specialist/Safety Officer
Department Head	Alfred Nomee
Address & Telephone	187 Agency Loop Road or P.O Box 408 Plummer Idaho 83851, Plummer Idaho 83851 208-686-7004
Service Area	Coeur d'Alene Reservation
Describe your services and organization goals in overview (100 words or less)	The Fire Management Program works cooperatively with local, state and federal agencies to protect tribal, allotted and fee lands against catastrophic wildfires. The Fire Management Program also prescribes burning to prepare planting sites, initiates underburning to increase forage and reduce fuel loading, and maintains a defensible space program to protect tribal homes from fire.

Table 22. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Fire Management.

	Department Name	Natural Resources-Fire Management Program
Major Equipment Resources	List your currently available major equipment resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. vehicles, generators, equipment trailers, fire protection apparatus, snow plows, search & rescue trucks, etc.)	• 2006 Ford F550 E5561 • 2003 Ford F550 E5562 • 1994 International 4700DT E5541 • 2000 International 4700DT E5551 • 1994 Ford F450 E5571 • 1995 Ford F700 Flat bed • 1984 Chevrolet military Truck (Snow plow) • 2006 Chevrolet Silverado Command truck • 1990 Ford F250 • Kubota (ATV) • 15 chain saws • 2 trailers • 2 welders • Wheel balancing machine • Tire changing machine • John Deere tractor (grapple, bucket, tiller, mower) • Water tender (In poor condition) • DR mower • 2 generators
	List your major equipment needs for responding to emergencies, or mitigating potential hazard conditions which are not currently in inventory.	• Replace water Tender • Replace command truck • Replace trailer • Replace type 4 engine • Kubota (ATV) • Passenger Van (transporting personnel) • Update fire cashe (Fire pants, fire shirts, hard hats, ect.) • Land tamer (UTV)
Technological Resources	List your currently available technological resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. communications, emergency shelter/meals, etc.)	• 1 Repeater in Tekoa Washington • 11 truck Radios • 19 hand held radios (Some radios do not work) • 2 cases of MRE's (Meals Ready to Eat) • 3 computers in office • 1 laptop
	List your organization's technological needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently in inventory, in your service area.	• Update older handheld radios (to digital) • Update older truck radios (to digital) • Replace 2 older computers • 1 laptop
Human Resources	List your currently available human resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. detail staff by position and number, plus volunteers)	1. Thomas Pakootas- Fire Management Officer (FMO) 2. Daniel Vassar- Training Specialist/Safety Officer 3. Donald Pakootas- Engine Boss 4. Michael Hendrickx-Engine Boss 5. Leonard Tomaskin- Firefighter Type 2

Table 22. Resources, Capabilities, and Needs: Coeur d'Alene Tribe Fire Management.

Department Name	Natural Resources-Fire Management Program
List your organization's human resource needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	1. 8 Firefighter type 2 2. 1 dozer operator with CDL (class A) driver's license. 3. 1 Diesel Mechanic

7.3. Municipality & Community Capabilities / Needs

Each incorporated city within Benewah County completed Resource, Capabilities, and Needs assessments during the Benewah County Multi-Jurisdictional Hazards Mitigation Plan update (2010). Their analysis results are presented here with only minor editing.

7.3.1. City of Plummer

Table 23. City of Plummer, Resources, Capabilities and Needs.

Name & Position of Person Preparing this Summary	
Address & Telephone	PO Box B Plummer, ID 83851
Service Area	City of Plummer
Describe your services and organization goals in overview	Government services, library, parks, cemetery, roads, public safety (police, animal control), utilities within the city (water, sewer, garbage collection, street lights). Electric distribution in Plummer and surrounding areas.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	Snow plows, graders, loader used for plowing, and a sander (generally we use all of our equipment to keep up with city streets. Assist other agencies as we can. Dump trucks, link truck, bobcat, backhoe, trash pump, jetter, water truck, roller, and other miscellaneous equipment and power tools. Vehicles include 2 police cars, police / animal control pickup, cell phones, 2 crews, 2 police officers, and city personnel.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	We have a small staff • 3 city maintenance workers • 2 law enforcement • 3 administrative personnel • 2 library staff
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Need emergency generators for at least one water service (well) to provide for emergency fire protection and potable water for residents in the city.
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	In the case of an emergency we may need to hire outside help depending on the situation.

7.3.2. City of St. Maries

Table 24. City of St. Maries, Resources, Capabilities and Needs.

Name & Position of Person Preparing this Summary	John W. Adams, Council Member
Address & Telephone	602 College Ave., St. Maries, ID
Service Area	City of St. Maries
Describe your services and organization goals in overview	City participates on the County LEPC, WUI committee, and delivers: • water & sewer • law enforcement • garbage services • street lights • public safety • library • cemetery • planning • building • ambulance • maintenance of federally approved levee system
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	The city maintains: • 3 ambulances • 5 patrol cars • 2 backhoes • 3 dump trucks • 1 loader • 2 sanders • 2 water trucks • 1 street sweeper • 1 line rodder • 5 mowers • 1 grader • 1 generator • Misc. power tools and equipment • 8 handheld radios with repeater
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• 6 police officers • 2 certified water operators • 2 certified wastewater operators • 8 maintenance workers • 12 volunteer EMTs • 2 grounds keepers • 1 cemetery sexton • 2 library staff • 4 administrative personnel
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	• Security system for City's main water source at Rochat Creek • Pumping system for secondary water source at St. Joe River • Storm sewer pumping system • City Hall backup generator

7.3.3. City of Tensed

Table 25. City of Tensed, Resources, Capabilities and Needs.

Name & Position of Person Preparing this Summary	Mayor Faith Harvey
Address & Telephone	PO Box 126, Tensed, ID
Service Area	City of Tensed
Describe your services and organization goals in overview	The City of Tensed is on Hwy 95 half way between Moscow and Coeur d'Alene. We have a floodplain we are addressing with FEMA, to establish a BFE for our town's development. Our current issues include working with Idaho DEQ on water supply for the City.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• Tensed Fire District • Tensed Ambulance • 1-ton snow plow
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	Fire and Ambulance 911 Services
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	• 10 fire hydrants to be located within the city • Radio communications needs • Improved access to the sewer lagoons and increased protection from flood waters

7.4. Emergency Services Capabilities and Needs

Resource, Capabilities, and Needs forms were completed by each of the fire protection organizations in Benewah County and are presented in this section with only minor editing.

7.4.1. St. Maries Fire Protection District

Table 26. St. Maries Fire Protection, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Chief Larry Naccarato
Address & Telephone	308 West Jefferson Ave. 1-208-245-5253- Office
Service Area	Kootenai Harrison and Benewah County St. Maries a total of 80 Square miles. The technical rescue area is over 2,350 square miles.
Describe your services and organization goals in overview	Provide Structure protection Wildland fire protection, and vehicle fire protection. We also provide extrication, and technical rescue.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	4-Type 1 Structure Eng. 2-Type 1 Water Tenders 1- Type 3 Rescue Truck 2-Type 6 Brush Trucks 1 Mobile Support Truck- With portable air system 2- Support vehicles 1- Trailer mounted 750 GPM pump 1- Command vehicle

Table 26. St. Maries Fire Protection, Resources, Capabilities, and Needs.

List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	901- Fire Chief 902-A Chief Training Officer EMT-A 903- A Chief of Operations EMT-B 913 Sta. 1 Capt EMT-B 906- Sta. 2 Captain 908-Sta. 3 Capt. 911 Lt. Sta. 1 EMT_B 914,915 Lt. Sta 3 Sta 1, Volunteer FF 20 Sta 2, Volunteers FF 8 Sta 3, Volunteers FF 5
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	1- 1-Mountain top repeater- p-25 2- 3- fixed base stations with page capable/ Communications P-25 3- 40 Handheld radio units/ P-25 4- 1- Water tender 5- 3- F-550 Wildland units 6- 8000 of Structure hose, 11/2, 21/2, LDH 7- New ropes and hardware for technical rescue 8- Need Fire Fighters Personal Protective Equipment (Turnouts)
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	1. More Volunteers 2. Money for sending FF to Specialty training.

7.4.2. Tensed Ambulance Department

Table 27. Tensed Ambulance, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Paul E. Damon, President
Address & Telephone	PO Box 6, Tensed, ID
Service Area	Southwestern portions of Benewah County.
Describe your services and organization goals in overview	Our goal is to provide excellent emergency medical services at the EMT Basic level along with rapid ambulance transport for people of the greater Tensed community.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	Tensed Ambulance has one 4x4 Ambulance equipped as per the State of Idaho for EMT Basic service.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	We have 8 certified EMT Basics and 2 non-certified drivers for a total of 10 staff.

Table 27. Tensed Ambulance, Resources, Capabilities, and Needs.

List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	We currently need radios that are P25 capable. In the next five years we will need to update our ambulance.
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	We need additional EMTs and Basic Training.

7.4.3. Gateway Fire Protection District

Table 28. Gateway Fire Protection District, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Mike Meagher, Fire Chief	
Address & Telephone	PO Box 328, Plummer ID	
Service Area	Gateway Fire Protection District	
Describe your services and organization goals in overview	Provide fire protection and suppression to approximately 129 square miles. Provide extraction and BLS response to approximately 275 square miles.	
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• 4500 gal water tender • 1250 gpm engine • 1000 gpm engine • Extraction / rescue / EMS truck • 1 ton brush truck 1986 • 1 ton brush truck 1987	
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• 1701 – Fire Chief / EMT B • 1703 – Captain / EMT B • 1704 – Captain / EMT B • 1705 – Lieutenant / EMT B • 1707 – Firefighter • 1708 – Engineer • 1709 – Firefighter / EMT A • 1710 – Firefighter	• 1711 – Lieutenant / EMT B • 1712 – Firefighter / EMT B • 1713 – Firefighter / EMT B • 1714 – Firefighter • 1715 – Firefighter • 1716 – Firefighter / EMT B • 1717 – Engineer • 1718 - Firefighter
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	• Water Tenders • Radio Communications compliant with P25 System • Laptop computers for trucks • Fire Hose • Construct turnouts on access routes • Extraction equipment • Gas detectors	
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	• More volunteers • Training locally for the volunteers in the organization.	

7.4.4. Fernwood Fire Protection

Table 29. Fernwood Fire Department, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Mike McQueen, Fire Chief
Address & Telephone	PO Box 301 Fernwood, ID 83830
Service Area	Fernwood and Santa
Describe your services and organization goals in overview	We provide fire protection services for the Fernwood Fire District.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• 1 fire engine 750 gal with full equipment • 1 Extraction, wildland truck • 1 fire tender 4300 gal
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• Fire Chief • Assistant Fire Chief • Captain • 7 Firefighters
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	• We need better communications that work within the mountain tops and valley bottoms. This can be accomplished with the placement of repeater towers and compliant radios. • We need water supplies for firefighting activities • We need a wildland tender • Installation of dry-hydrants in outlying areas
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	We need 10 or more volunteer firefighters, wildland fire fighting training, propane training, and railroad training for our staff.

7.4.5. Emida Fire Protection

Table 30. Emida Fire Department, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Jim Minser, Public Information Officer, EFPD
Address & Telephone	29105 Highway 6, St. Maries, Idaho 83861. 208-245-1971
Service Area	Emida Fire District
Describe your services and organization goals in overview	Fire protection in the newly formed district of Emida including structural, wildland, and vehicle fires.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	One older Type 1 Structure Engine, one brush truck, one older Tender w/pump and hoses, one 4WD Suburban.

Table 30. Emida Fire Department, Resources, Capabilities, and Needs.

List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	14 trained volunteer firefighters	
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Apparatus Needs: • Additional Type 1 Structure Engine, • 1500 ft. of 2 ½ inch hose • Newer Tender	Structure Firefighting Gear Needs: • ventilation fans, • chimney nozzle, • monitor
	Wildland firefighting needs: • portable volume pump, • portable pressure pump, • mop-up wands, • 1500 ft. of 2 ½ inch hose	Brush Gear: • Wildland nozzles, • fire shelters, • Pulaskis
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Need volunteers for training and response.	

7.4.6. St. Joe Valley Search & Rescue

Table 31. St. Joe Valley Search & Rescue, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Yvonne Cornell, Board Member (& Jeanne White)
Address & Telephone	PO Box 41, St. Maries, ID
Service Area	Benewah & Shoshone Counties
Describe your services and organization goals in overview	Search and Rescue, consists of 54 individuals who volunteer their time to help with calls by either Sheriff's office.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	2 mobile command units 1 Bus to be used as kitchen or command unit Radio Repeater 10-15 Radios Thiokol (snow machine) 4-6 peepers (avalanche) 4-6 shovels/probes (avalanche) 4 search dogs – human/cadaver
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	Volunteers: 54 members

Table 31. St. Joe Valley Search & Rescue, Resources, Capabilities, and Needs.

List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	6 GPS units 6 shovels and probes for avalanche rescue Building to house 5 vehicles and meeting area for group 2 ATV's with trailer
List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	6 new volunteers and search and rescue training for them

7.5. Organization and Agency Capabilities / Needs

7.5.1. Idaho Department of Lands

Table 32. Resources, Capabilities, and Needs: Idaho Department of Lands.

Department/Organization Name		Idaho Department of Lands
Name & Position of Person Preparing this Summary		Cory Flesher, Assistant Fire Warden
Address & Telephone		Idaho Dept. of Lands 1806 Main Ave. St. Maries, ID. 83861 208-245-4551
Service Area		Pts. Benewah, Kootenai and Shoshone Co. West St. Joe Fire Protection District
Describe your services and organization goals in overview (100 words or less)		Wildland Fire Suppression and Hazardous Fuels Management
Technological Resources	List your currently available technological resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. communications, emergency shelter/meals, etc.)	Engines – Wildland: Type 4, 4X2, 750 gal. (30F11) Type 6, 4X4, 300 gal. (30F10) Type 6, 4X4, 300 gal. (30F27) Water Tender – Type 3, 1,100 gal. (30F13) Dozer, Tractor & Lowboy – Type 3, Cat D4H, (30f16, 30F14 & 43F19) Pickups – 4X4, ½ & ¾ T – 20 Personnel: ICS Qualified Overhead - 10-15 Firefighters (FFT1 or FFT2) - 10-15
	List your organization's technological needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently in inventory, in your service area.	None
Human Resources	List your currently available human resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. detail staff by position and number, plus volunteers)	15-30 personnel trained in the Incident Command System, with various wildland fire qualifications.

Table 32. Resources, Capabilities, and Needs: Idaho Department of Lands.

List your organization's human resource needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Additional permanent, qualified and trained wildland fire personnel

7.5.2. Heyburn State Park

Table 33. Heyburn State Park, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Ron Hise
Address & Telephone	1291 Chatcolet Rd
Service Area	Western Benewah County
Describe your services and organization goals in overview	Heyburn State Park consists of 5,700 acres of land and 2,300 acres of water and is situated on the southern end of Lake Coeur d'Alene. Services and amenities include three campgrounds, five day use areas, two marinas, three boat launches, three rental cottages, 16 miles of non-motorized trails, and a visitor information center. The park is also home to 166 privately leased cottages and 20 historic structures. Our goal is to provide for quality recreational opportunities and resource stewardship.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	**Resources available:** 1 John Deere 450 bulldozer, 1 case backhoe/loader, 1 75 gallon slip in fire pumper, 1 150 gallon slip in fire pumper, 1 17' aluminum work boat w/90hp outboard, 1 one ton 4x4 with 8 ½' snow plow, 1 Yamaha ATV, 1 Kawasaki Mule UTV.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	**Human resources available:** 5.75 full time employees made up of one manager, one assistant manager, three park rangers, and one part time office staff. From June 1st – August 31st there are an additional 6-10 seasonal employees of various backgrounds and skill levels available.

7.5.3. Bureau of Land Management

Table 34. Resources, Capabilities, and Needs, Bureau of Land Management.

Department/Organization Name	U.S. Dept. of Interior, Bureau of Land Management (BLM)
Name & Position of Person Preparing this Summary	Kurt Pavlat, Field Manager, Coeur d'Alene Field Office
Address & Telephone	3815 Schreiber Way, Coeur d'Alene, ID 83815 (208) 769-5038
Service Area	Boundary, Bonner, Kootenai, Benewah and Shoshone Counties

Table 34. Resources, Capabilities, and Needs, Bureau of Land Management.

Describe your services and organization goals in overview (100 words or less)		Multiple use and sustained yield management of federal public lands and resources located in the five northern counties of Idaho. BLM resource specialists located in Coeur d'Alene specialize in forest management, hazardous fuels management, botany, cultural resource mgmt., wildlife/fisheries management, lands/realty, noxious/invasive species management, hydrology, geology/mine engineering, GIS, IT, environmental engineering, outdoor recreation management, environmental planning, law enforcement, cadastral survey, public affairs, financial management and abandoned mine land/HAZMAT management.
Major Equipment Resources	List your currently available major equipment resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. vehicles, generators, equipment trailers, fire protection apparatus, snow plows, search & rescue trucks, etc.)	The BLM has a type 6 fire engine located in Coeur d'Alene. The BLM also has various pickup trucks/SUVs and one 1 ton stake truck available for transporting people and hauling equipment and supplies.
	List your major equipment needs for responding to emergencies, or mitigating potential hazard conditions which are not currently in inventory.	None
Technological Resources	List your currently available technological resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. communications, emergency shelter/meals, etc.)	Hand-held broad-band programmable radios, hand-held GPS units, fire shelters, satellite telephones and various GIS mapping software.
	List your organization's technological needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently in inventory, in your service area.	None
Human Resources	List your currently available human resources for use in responding to emergencies, or mitigating potential hazard conditions in your service area (e.g. detail staff by position and number, plus volunteers)	The BLM has three Foresters, one Fire Ecologist , one Law Enforcement Officer (LEO), various ICS qualified personnel (fire), one hydrologist, one mining engineer, one budget analyst, one public affairs officer, one IT specialist and three administrative assistants located in Coeur d'Alene.
	List your organization's human resource needs for responding to hazard emergencies, or mitigating potential hazard conditions, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	None

7.5.4. US Forest Service

Table 35. USFS, St. Joe Ranger District, Resources, Capabilities, and Needs.

Name & Position of Person Preparing this Summary	Lisa Spinelli, Fuels AFMO St. Joe RD, Idaho Panhandle NF
Address & Telephone	222 S. 7th Street, Suite 1, St. Maries 208-245-6025
Service Area	Benewah, Shoshone, Clearwater, Latah Counties

Table 35. USFS, St. Joe Ranger District, Resources, Capabilities, and Needs.

Describe your services and organization goals in overview	Caring for the land, resources and serving people is our motto. Forest Service responds under certain Memoranda of Understanding (MOU) with counties. Each MOU is different and relates specifically to what the Forest Service can and cannot do.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	In Avery, 1-Type 6 wildland engine, 300 gal., 2-Type 4 wildland engines, 750 gal. each. In Clarkia, 1-Type 6 wildland engine, 300 gal. Other Fleet: Includes 4 crew cab pickups, stake side flatbed, terra-torch, helitorch trailer and several extended cab pickups designated for fire personnel use.
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	Seasonal workforce, May 15- September 30; 18 production firefighters stationed in Avery and 6 production firefighters stationed in Clarkia. Qualified ICS overhead on the District include 3 Type III Incident Commanders, 7 Type IV ICs, and 9 Type V ICs. Radios: All vehicles equipped with field-programmable 15-group, 16-channel digital Bendix King mobile radios. Over 30 handheld radios with same narrowband capabilities as mobile truck radios. Radio repeater facilities at St. Joe Baldy, Huckleberry Mountain, and Mark's Butte provide good radio coverage for lands within Benewah County

7.6. Local Businesses and Organizations

7.6.1. Avista Utilities

Table 36. Avista Utilities in Benewah County.

Name & Position of Person Preparing this Summary	Larry Hager, Saint Maries District Manager
Address & Telephone	Address: 528 College Avenue, St. Maries ID 83861 Telephone: St. Maries 208.245.6671
Service Area	St. Maries Service Area: St. Maries and Benewah area up to Carlin Bay and to Avery. Kellogg Service Area: The Silver Valley, from the Montana Border to the 4th of July Pass and up the North Fork to Shoshone Camp and Murray ID.
Describe your services and organization goals in overview	We are an electric and gas provider. We generate and distribute these commodities across our distribution system which includes transmission and generation facilities.
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• 5 areal bucket trucks up to 60' in reach • 2 line trucks with augers and limited lifting capabilities • 2 snow cat vehicles with man cabs, one bladed • Misc. small trucks and pick-ups
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• 8 field personnel (Silver Valley) • 3 administration • 5 field personnel (St. Maries area)
List your organization's technological needs for responding to hazard emergencies, which are not currently in inventory, in your service area (e.g., fire trucks or water tenders, fire hydrant network, radio communications network, etc.)	Our expertise lies in Electrical and Gas emergencies and we are all trained in CPR and Basic First Aid. Avista Corp would assist in every way possible to protect and or support our electric and gas facilities. Our other offices would provide the same type of support as our local office only with more man-power.

List your organization's human resource needs for responding to hazard emergencies, which are not currently utilized, in your service area (e.g., additional number of paid staff, more volunteers, training for volunteers and staff, etc.)	Avista Corp would assist in every way possible to protect and or support our electric and gas facilities. Our other offices would provide the same type of support as our local office only with more man-power.

7.6.2. Clearwater Power Company

Table 37. Clearwater Power Company in Benewah County.

Name & Position of Person Preparing this Summary	Stan Vannoy Manager of Operations
Address & Telephone	PO Box 997 Lewiston, ID 83501
Service Area	Idaho, Washington, Oregon
Describe your services and organization goals in overview	Provide power to customers
List your currently available technological resources for use in responding to emergencies in your service area (e.g., list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• Cell phones • Radio communications • Clearwater Power Emergency Restoration Plan
List your currently available human resources for use in responding to emergencies in your service area (e.g., detail staff by position and number, plus volunteers)	• Stan Vannoy, Operations Manager – on-call Dispatcher

7.6.3. St. Maries Railroad

Table 38. St. Maries Railroad in Benewah County.

Name & Position of Person Preparing this Summary	William L. Barnholt, Jr. Manager
Address & Telephone	318 N. 10th St. St. Maries ID 83861
Service Area	Plummer to St. Maries to Clarkia
Describe your services and organization goals in overview	Fire suppression and rail access to remote areas
List your currently available technological resources for use in responding to emergencies in your service area (e.g. list of fire protection apparatus, snow plows, search and rescue trucks, etc.)	• 10,000 gal water tank • Railroad snow plow • Locomotives & railcars • Hi-Rail trucks • Radio communications on railroad frequency
List your currently available human resources for use in responding to emergencies in your service area (e.g. detail staff by position and number, plus volunteers)	• 16 Railroad employees

Chapter 8. WUI Proposed Site Treatments

This planning effort has identified 378 WUI treatments within Benewah County (Table 39). The proposals were made by the 2012 WUI Planning Team, the US Forest Service, The Coeur d'Alene Tribe, and by citizens of the County at outreach opportunities. These treatment areas were defined with the goal of reducing the potential loss of life, destruction of homes, and costs of suppression in the event of wildfire within the jurisdiction. These efforts are not prescribed to eliminate wildfires in the County, but to reduce the costs of future suppression while protecting people and assets.

Readers of this planning document can identify these "Treatment Numbers" shown here through the interactive WUI internet website (http://Resource-Analysis.com/WUI3B/) to see these attributes and by viewing the GIS data accompanying this planning document.

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
Alder Creek Intermix	Intermix	6.13	Thinning	2012 WUI Committee Planned	4229
Alder Creek Intermix	Intermix	5.24	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4299
Alder Creek Rural	Rural 95%	4.49	Grazing	2012 WUI Committee Planned	4230
Alder Creek Rural	Rural 95%	3.97	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4299
Bear Springs	Intermix	8.32	Infrastructure Protection	2012 WUI Committee Planned	4240
Blackwell Divide	Rural 95%	9.57	Infrastructure Protection	2012 WUI Committee Planned	4225
Blackwell Divide	Rural 95%	1.46	Infrastructure Protection	2012 WUI Committee Planned	4249
Blackwell Divide	Rural 95%	10.99	Infrastructure Protection	2012 WUI Committee Planned	4250
Blackwell Divide	Rural 95%	13.41	Infrastructure Protection	2012 WUI Committee Planned	4253
Blackwell Divide	Rural 95%	4.84	Infrastructure Protection	2012 WUI Committee Planned	4284
Carpenter Creek	Intermix	9.39	Infrastructure Protection	2012 WUI Committee Planned	4221
Carpenter Creek	Intermix	2.35	Infrastructure Protection	2012 WUI Committee Planned	4222
Carpenter Creek	Intermix	4.99	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4288
Carpenter Creek	Intermix	3.52	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4289
Chief MOC-TEL-ME	Rural 95%	51.14	RX HFR	Coeur d'Alene Tribe Planned	4142
Chief MOC-TEL-ME	Rural 95%	57.79	RX HFR	Coeur d'Alene Tribe Planned	4143
Chief MOC-TEL-ME	Rural 95%	152.07	RX HFR	Coeur d'Alene Tribe Planned	4171
Chief MOC-TEL-ME	Rural 95%	80.63	RX HFR	Coeur d'Alene Tribe Planned	4172
Chief MOC-TEL-ME	Rural 95%	26.14	RX HFR	Coeur d'Alene Tribe Planned	4173
County Wide Low Density Rural Expanse	Rural 100%	36.63	Rel/weed	Forest Service Planned	4000
County Wide Low Density Rural Expanse	Rural 100%	48.53	Precommercial Thinning	Forest Service Planned	4003

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
County Wide Low Density Rural Expanse	Rural 100%	48.53	Pruning	Forest Service Planned	4004
County Wide Low Density Rural Expanse	Rural 100%	68.73	Precommercial Thinning	Forest Service Planned	4005
County Wide Low Density Rural Expanse	Rural 100%	68.73	Pruning	Forest Service Planned	4006
County Wide Low Density Rural Expanse	Rural 100%	30.12	Pruning	Forest Service Planned	4008
County Wide Low Density Rural Expanse	Rural 100%	38.42	Precommercial Thinning	Forest Service Planned	4009
County Wide Low Density Rural Expanse	Rural 100%	38.42	Pruning	Forest Service Planned	4010
County Wide Low Density Rural Expanse	Rural 100%	13.31	Pruning	Forest Service Planned	4011
County Wide Low Density Rural Expanse	Rural 100%	37.20	Precommercial Thinning	Forest Service Planned	4012
County Wide Low Density Rural Expanse	Rural 100%	37.20	Pruning	Forest Service Planned	4013
County Wide Low Density Rural Expanse	Rural 100%	45.19	Precommercial Thinning	Forest Service Planned	4014
County Wide Low Density Rural Expanse	Rural 100%	45.19	Pruning	Forest Service Planned	4015
County Wide Low Density Rural Expanse	Rural 100%	21.10	Precommercial Thinning	Forest Service Planned	4016
County Wide Low Density Rural Expanse	Rural 100%	21.10	Pruning	Forest Service Planned	4017
County Wide Low Density Rural Expanse	Rural 100%	19.05	Precommercial Thinning	Forest Service Planned	4018
County Wide Low Density Rural Expanse	Rural 100%	19.05	Pruning	Forest Service Planned	4019
County Wide Low Density Rural Expanse	Rural 100%	33.23	Precommercial Thinning	Forest Service Planned	4020
County Wide Low Density Rural Expanse	Rural 100%	33.23	Pruning	Forest Service Planned	4021
County Wide Low Density Rural Expanse	Rural 100%	37.89	Precommercial Thinning	Forest Service Planned	4022
County Wide Low Density Rural Expanse	Rural 100%	37.89	Pruning	Forest Service Planned	4023
County Wide Low Density Rural Expanse	Rural 100%	59.22	Precommercial Thinning	Forest Service Planned	4024
County Wide Low Density Rural Expanse	Rural 100%	59.22	Pruning	Forest Service Planned	4025
County Wide Low Density Rural Expanse	Rural 100%	40.57	Precommercial Thinning	Forest Service Planned	4026
County Wide Low Density Rural Expanse	Rural 100%	40.57	Pruning	Forest Service Planned	4027
County Wide Low Density Rural Expanse	Rural 100%	31.59	Precommercial Thinning	Forest Service Planned	4028
County Wide Low Density Rural Expanse	Rural 100%	31.59	Pruning	Forest Service Planned	4029
County Wide Low Density Rural Expanse	Rural 100%	29.81	Precommercial Thinning	Forest Service Planned	4030
County Wide Low Density Rural Expanse	Rural 100%	29.81	Pruning	Forest Service Planned	4031
County Wide Low Density Rural Expanse	Rural 100%	30.86	Precommercial Thinning	Forest Service Planned	4032
County Wide Low Density Rural Expanse	Rural 100%	30.86	Pruning	Forest Service Planned	4033
County Wide Low Density Rural Expanse	Rural 100%	42.67	Infrastructure Protection	Forest Service Planned	4034
County Wide Low Density Rural Expanse	Rural 100%	42.67	Precommercial Thinning	Forest Service Planned	4035
County Wide Low Density Rural Expanse	Rural 100%	42.67	Pruning	Forest Service Planned	4036

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
County Wide Low Density Rural Expanse	Rural 100%	21.93	Pruning	Forest Service Planned	4037
County Wide Low Density Rural Expanse	Rural 100%	33.13	Precommercial Thinning	Forest Service Planned	4038
County Wide Low Density Rural Expanse	Rural 100%	19.44	Precommercial Thinning	Forest Service Planned	4039
County Wide Low Density Rural Expanse	Rural 100%	62.86	Precommercial Thinning	Forest Service Planned	4040
County Wide Low Density Rural Expanse	Rural 100%	62.86	Pruning	Forest Service Planned	4041
County Wide Low Density Rural Expanse	Rural 100%	48.48	Precommercial Thinning	Forest Service Planned	4042
County Wide Low Density Rural Expanse	Rural 100%	48.48	Pruning	Forest Service Planned	4043
County Wide Low Density Rural Expanse	Rural 100%	45.11	Pruning	Forest Service Planned	4044
County Wide Low Density Rural Expanse	Rural 100%	0.21	Precommercial Thinning	Forest Service Planned	4045
County Wide Low Density Rural Expanse	Rural 100%	50.82	Precommercial Thinning	Forest Service Planned	4046
County Wide Low Density Rural Expanse	Rural 100%	6.35	Pruning	Forest Service Planned	4047
County Wide Low Density Rural Expanse	Rural 100%	0.35	Thinning	Coeur d'Alene Tribe Planned	4048
County Wide Low Density Rural Expanse	Rural 100%	0.35	Masticate	Coeur d'Alene Tribe Planned	4049
County Wide Low Density Rural Expanse	Rural 100%	31.94	Thinning	Coeur d'Alene Tribe Planned	4050
County Wide Low Density Rural Expanse	Rural 100%	31.94	Masticate	Coeur d'Alene Tribe Planned	4051
County Wide Low Density Rural Expanse	Rural 100%	29.45	Thinning	Coeur d'Alene Tribe Planned	4052
County Wide Low Density Rural Expanse	Rural 100%	29.45	Masticate	Coeur d'Alene Tribe Planned	4053
County Wide Low Density Rural Expanse	Rural 100%	0.25	Thinning	Coeur d'Alene Tribe Planned	4054
County Wide Low Density Rural Expanse	Rural 100%	0.25	Masticate	Coeur d'Alene Tribe Planned	4055
County Wide Low Density Rural Expanse	Rural 100%	8.03	Thinning	Coeur d'Alene Tribe Planned	4056
County Wide Low Density Rural Expanse	Rural 100%	8.03	Masticate	Coeur d'Alene Tribe Planned	4057
County Wide Low Density Rural Expanse	Rural 100%	123.91	Thinning	Coeur d'Alene Tribe Planned	4058
County Wide Low Density Rural Expanse	Rural 100%	123.91	Masticate	Coeur d'Alene Tribe Planned	4059
County Wide Low Density Rural Expanse	Rural 100%	79.17	Thinning	Coeur d'Alene Tribe Planned	4060
County Wide Low Density Rural Expanse	Rural 100%	79.17	Masticate	Coeur d'Alene Tribe Planned	4061
County Wide Low Density Rural Expanse	Rural 100%	27.92	Thinning	Coeur d'Alene Tribe Planned	4062
County Wide Low Density Rural Expanse	Rural 100%	27.92	Masticate	Coeur d'Alene Tribe Planned	4063
County Wide Low Density Rural Expanse	Rural 100%	26.73	Thinning	Coeur d'Alene Tribe Planned	4064
County Wide Low Density Rural Expanse	Rural 100%	26.73	Masticate	Coeur d'Alene Tribe Planned	4065
County Wide Low Density Rural Expanse	Rural 100%	79.93	Thinning	Coeur d'Alene Tribe Planned	4066
County Wide Low Density Rural Expanse	Rural 100%	79.93	Masticate	Coeur d'Alene Tribe Planned	4067
County Wide Low Density Rural Expanse	Rural 100%	40.01	Thinning	Coeur d'Alene Tribe Planned	4068

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
County Wide Low Density Rural Expanse	Rural 100%	40.01	Masticate	Coeur d'Alene Tribe Planned	4069
County Wide Low Density Rural Expanse	Rural 100%	129.26	Thinning	Coeur d'Alene Tribe Planned	4070
County Wide Low Density Rural Expanse	Rural 100%	129.26	Masticate	Coeur d'Alene Tribe Planned	4071
County Wide Low Density Rural Expanse	Rural 100%	44.38	Thinning	Coeur d'Alene Tribe Planned	4072
County Wide Low Density Rural Expanse	Rural 100%	44.38	Masticate	Coeur d'Alene Tribe Planned	4073
County Wide Low Density Rural Expanse	Rural 100%	37.67	Thinning	Coeur d'Alene Tribe Planned	4074
County Wide Low Density Rural Expanse	Rural 100%	37.67	Masticate	Coeur d'Alene Tribe Planned	4075
County Wide Low Density Rural Expanse	Rural 100%	15.93	TSI	Coeur d'Alene Tribe Planned	4079
County Wide Low Density Rural Expanse	Rural 100%	15.93	Slash T	Coeur d'Alene Tribe Planned	4080
County Wide Low Density Rural Expanse	Rural 100%	13.52	TSI	Coeur d'Alene Tribe Planned	4081
County Wide Low Density Rural Expanse	Rural 100%	13.52	Slash T	Coeur d'Alene Tribe Planned	4082
County Wide Low Density Rural Expanse	Rural 100%	29.06	TSI	Coeur d'Alene Tribe Planned	4083
County Wide Low Density Rural Expanse	Rural 100%	29.06	Slash T	Coeur d'Alene Tribe Planned	4084
County Wide Low Density Rural Expanse	Rural 100%	7.44	TSI	Coeur d'Alene Tribe Planned	4085
County Wide Low Density Rural Expanse	Rural 100%	7.44	Slash T	Coeur d'Alene Tribe Planned	4086
County Wide Low Density Rural Expanse	Rural 100%	58.23	TSI	Coeur d'Alene Tribe Planned	4087
County Wide Low Density Rural Expanse	Rural 100%	58.23	Slash T	Coeur d'Alene Tribe Planned	4088
County Wide Low Density Rural Expanse	Rural 100%	129.06	Thinning	Coeur d'Alene Tribe Planned	4091
County Wide Low Density Rural Expanse	Rural 100%	129.06	Masticate	Coeur d'Alene Tribe Planned	4092
County Wide Low Density Rural Expanse	Rural 100%	10.96	Thinning	Coeur d'Alene Tribe Planned	4093
County Wide Low Density Rural Expanse	Rural 100%	10.96	Masticate	Coeur d'Alene Tribe Planned	4094
County Wide Low Density Rural Expanse	Rural 100%	10.00	Thinning	Coeur d'Alene Tribe Planned	4095
County Wide Low Density Rural Expanse	Rural 100%	10.00	Masticate	Coeur d'Alene Tribe Planned	4096
County Wide Low Density Rural Expanse	Rural 100%	94.06	Thinning	Coeur d'Alene Tribe Planned	4097
County Wide Low Density Rural Expanse	Rural 100%	94.06	Masticate	Coeur d'Alene Tribe Planned	4098
County Wide Low Density Rural Expanse	Rural 100%	4.80	Thinning	Coeur d'Alene Tribe Planned	4099
County Wide Low Density Rural Expanse	Rural 100%	4.80	Masticate	Coeur d'Alene Tribe Planned	4100
County Wide Low Density Rural Expanse	Rural 100%	10.17	Thinning	Coeur d'Alene Tribe Planned	4101
County Wide Low Density Rural Expanse	Rural 100%	10.17	Masticate	Coeur d'Alene Tribe Planned	4102
County Wide Low Density Rural Expanse	Rural 100%	0.35	Thinning	Coeur d'Alene Tribe Planned	4107
County Wide Low Density Rural Expanse	Rural 100%	0.35	Masticate	Coeur d'Alene Tribe Planned	4108
County Wide Low Density Rural Expanse	Rural 100%	100.14	HFR.RX	Coeur d'Alene Tribe Planned	4109

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
County Wide Low Density Rural Expanse	Rural 100%	160.11	HFR.RX	Coeur d'Alene Tribe Planned	4110
County Wide Low Density Rural Expanse	Rural 100%	160.89	HFR.RX	Coeur d'Alene Tribe Planned	4111
County Wide Low Density Rural Expanse	Rural 100%	79.87	HFR.RX	Coeur d'Alene Tribe Planned	4112
County Wide Low Density Rural Expanse	Rural 100%	79.71	HFR.RX	Coeur d'Alene Tribe Planned	4113
County Wide Low Density Rural Expanse	Rural 100%	158.44	HFR.RX	Coeur d'Alene Tribe Planned	4117
County Wide Low Density Rural Expanse	Rural 100%	0.72	Prune / Thinning	Coeur d'Alene Tribe Planned	4118
County Wide Low Density Rural Expanse	Rural 100%	0.72	Lop and Scatter	Coeur d'Alene Tribe Planned	4121
County Wide Low Density Rural Expanse	Rural 100%	1.05	Lop and Scatter	Coeur d'Alene Tribe Planned	4122
County Wide Low Density Rural Expanse	Rural 100%	1.05	Prune / Thinning	Coeur d'Alene Tribe Planned	4123
County Wide Low Density Rural Expanse	Rural 100%	37.34	Lop and Scatter	Coeur d'Alene Tribe Planned	4124
County Wide Low Density Rural Expanse	Rural 100%	37.34	Prune / Thinning	Coeur d'Alene Tribe Planned	4125
County Wide Low Density Rural Expanse	Rural 100%	9.42	Thinning	Coeur d'Alene Tribe Planned	4130
County Wide Low Density Rural Expanse	Rural 100%	9.42	Masticate	Coeur d'Alene Tribe Planned	4131
County Wide Low Density Rural Expanse	Rural 100%	33.12	Thinning	Coeur d'Alene Tribe Planned	4134
County Wide Low Density Rural Expanse	Rural 100%	33.12	Masticate	Coeur d'Alene Tribe Planned	4135
County Wide Low Density Rural Expanse	Rural 100%	5.19	RX HFR	Coeur d'Alene Tribe Planned	4142
County Wide Low Density Rural Expanse	Rural 100%	100.28	RX HFR	Coeur d'Alene Tribe Planned	4143
County Wide Low Density Rural Expanse	Rural 100%	159.88	RX HFR	Coeur d'Alene Tribe Planned	4144
County Wide Low Density Rural Expanse	Rural 100%	20.01	Prune / Thinning	Coeur d'Alene Tribe Planned	4148
County Wide Low Density Rural Expanse	Rural 100%	20.01	Lop and Scatter	Coeur d'Alene Tribe Planned	4149
County Wide Low Density Rural Expanse	Rural 100%	49.93	Prune / Thinning	Coeur d'Alene Tribe Planned	4150
County Wide Low Density Rural Expanse	Rural 100%	49.93	Lop and Scatter	Coeur d'Alene Tribe Planned	4151
County Wide Low Density Rural Expanse	Rural 100%	18.50	Lop and Scatter	Coeur d'Alene Tribe Planned	4152
County Wide Low Density Rural Expanse	Rural 100%	18.50	Prune / Thinning	Coeur d'Alene Tribe Planned	4153
County Wide Low Density Rural Expanse	Rural 100%	24.29	Lop and Scatter	Coeur d'Alene Tribe Planned	4154
County Wide Low Density Rural Expanse	Rural 100%	24.29	Prune / Thinning	Coeur d'Alene Tribe Planned	4155
County Wide Low Density Rural Expanse	Rural 100%	22.40	Prune / Thinning	Coeur d'Alene Tribe Planned	4156
County Wide Low Density Rural Expanse	Rural 100%	22.40	Lop and Scatter	Coeur d'Alene Tribe Planned	4157
County Wide Low Density Rural Expanse	Rural 100%	0.15	Prune / Thinning	Coeur d'Alene Tribe Planned	4166
County Wide Low Density Rural Expanse	Rural 100%	0.15	Masticate	Coeur d'Alene Tribe Planned	4167
County Wide Low Density Rural Expanse	Rural 100%	149.38	RX HFR	Coeur d'Alene Tribe Planned	4169
County Wide Low Density Rural Expanse	Rural 100%	141.43	RX HFR	Coeur d'Alene Tribe Planned	4170

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
County Wide Low Density Rural Expanse	Rural 100%	5.10	RX HFR	Coeur d'Alene Tribe Planned	4171
County Wide Low Density Rural Expanse	Rural 100%	78.70	RX HFR	Coeur d'Alene Tribe Planned	4172
County Wide Low Density Rural Expanse	Rural 100%	19.99	RX HFR	Coeur d'Alene Tribe Planned	4173
County Wide Low Density Rural Expanse	Rural 100%	158.43	Prune / Thinning	Coeur d'Alene Tribe Planned	4180
County Wide Low Density Rural Expanse	Rural 100%	158.43	Masticate	Coeur d'Alene Tribe Planned	4181
County Wide Low Density Rural Expanse	Rural 100%	80.57	Prune / Thinning	Coeur d'Alene Tribe Planned	4182
County Wide Low Density Rural Expanse	Rural 100%	80.57	Masticate	Coeur d'Alene Tribe Planned	4183
County Wide Low Density Rural Expanse	Rural 100%	41.07	Prune / Thinning	Coeur d'Alene Tribe Planned	4184
County Wide Low Density Rural Expanse	Rural 100%	41.07	Masticate	Coeur d'Alene Tribe Planned	4185
County Wide Low Density Rural Expanse	Rural 100%	25.03	Prune / Thinning	Coeur d'Alene Tribe Planned	4186
County Wide Low Density Rural Expanse	Rural 100%	25.03	Masticate	Coeur d'Alene Tribe Planned	4187
County Wide Low Density Rural Expanse	Rural 100%	33.04	Prune / Thinning	Coeur d'Alene Tribe Planned	4188
County Wide Low Density Rural Expanse	Rural 100%	33.04	Masticate	Coeur d'Alene Tribe Planned	4189
County Wide Low Density Rural Expanse	Rural 100%	32.65	Prune / Thinning	Coeur d'Alene Tribe Planned	4190
County Wide Low Density Rural Expanse	Rural 100%	32.65	Masticate	Coeur d'Alene Tribe Planned	4191
County Wide Low Density Rural Expanse	Rural 100%	0.23	Prune / Thinning	Coeur d'Alene Tribe Planned	4192
County Wide Low Density Rural Expanse	Rural 100%	0.23	Masticate	Coeur d'Alene Tribe Planned	4193
County Wide Low Density Rural Expanse	Rural 100%	102.24	Prune / Thinning	Coeur d'Alene Tribe Planned	4196
County Wide Low Density Rural Expanse	Rural 100%	102.24	Lop and Scatter	Coeur d'Alene Tribe Planned	4197
County Wide Low Density Rural Expanse	Rural 100%	31.27	Prune / Thinning	Coeur d'Alene Tribe Planned	4198
County Wide Low Density Rural Expanse	Rural 100%	31.27	Lop and Scatter	Coeur d'Alene Tribe Planned	4199
County Wide Low Density Rural Expanse	Rural 100%	25.42	Prune / Thinning	Coeur d'Alene Tribe Planned	4200
County Wide Low Density Rural Expanse	Rural 100%	25.42	Lop and Scatter	Coeur d'Alene Tribe Planned	4201
County Wide Low Density Rural Expanse	Rural 100%	17.38	Infrastructure Protection	2012 WUI Committee Planned	4212
County Wide Low Density Rural Expanse	Rural 100%	9.69	Infrastructure Protection	2012 WUI Committee Planned	4253
County Wide Low Density Rural Expanse	Rural 100%	4.94	Fuel Break	2012 WUI Committee Planned	4301
Emida	Intermix	3.39	Thinning	2012 WUI Committee Planned	4213
Emida	Intermix	5.00	Infrastructure Protection	2012 WUI Committee Planned	4214
Emida	Intermix	1.52	Infrastructure Protection	2012 WUI Committee Planned	4215
Emida	Intermix	10.39	Infrastructure Protection	2012 WUI Committee Planned	4216
Fernwood	Intermix	5.02	Infrastructure Protection	2012 WUI Committee Planned	4218
Fernwood	Intermix	3.96	Infrastructure Protection	2012 WUI Committee Planned	4219

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
Fernwood	Intermix	7.61	Thinning	2012 WUI Committee Planned	4220
Fernwood	Intermix	0.41	Infrastructure Protection	2012 WUI Committee Planned	4281
Forever Green	Intermix	12.41	Infrastructure Protection	2012 WUI Committee Planned	4224
Forever Green	Intermix	3.76	Infrastructure Protection	2012 WUI Committee Planned	4284
North Central Rural Expansion	Rural 95%	74.45	Thinning	Coeur d'Alene Tribe Planned	4048
North Central Rural Expansion	Rural 95%	74.45	Masticate	Coeur d'Alene Tribe Planned	4049
North Central Rural Expansion	Rural 95%	52.77	Thinning	Coeur d'Alene Tribe Planned	4050
North Central Rural Expansion	Rural 95%	52.77	Masticate	Coeur d'Alene Tribe Planned	4051
North Central Rural Expansion	Rural 95%	77.18	Thinning	Coeur d'Alene Tribe Planned	4052
North Central Rural Expansion	Rural 95%	77.18	Masticate	Coeur d'Alene Tribe Planned	4053
North Central Rural Expansion	Rural 95%	83.00	Thinning	Coeur d'Alene Tribe Planned	4054
North Central Rural Expansion	Rural 95%	83.00	Masticate	Coeur d'Alene Tribe Planned	4055
North Central Rural Expansion	Rural 95%	24.78	Thinning	Coeur d'Alene Tribe Planned	4056
North Central Rural Expansion	Rural 95%	24.78	Masticate	Coeur d'Alene Tribe Planned	4057
North Central Rural Expansion	Rural 95%	13.21	Thinning	Coeur d'Alene Tribe Planned	4064
North Central Rural Expansion	Rural 95%	13.21	Masticate	Coeur d'Alene Tribe Planned	4065
North Central Rural Expansion	Rural 95%	0.06	Thinning	Coeur d'Alene Tribe Planned	4066
North Central Rural Expansion	Rural 95%	0.06	Masticate	Coeur d'Alene Tribe Planned	4067
North Central Rural Expansion	Rural 95%	0.06	Thinning	Coeur d'Alene Tribe Planned	4068
North Central Rural Expansion	Rural 95%	0.06	Masticate	Coeur d'Alene Tribe Planned	4069
North Central Rural Expansion	Rural 95%	159.43	RX Burn	Coeur d'Alene Tribe Planned	4076
North Central Rural Expansion	Rural 95%	19.98	RX Burn	Coeur d'Alene Tribe Planned	4077
North Central Rural Expansion	Rural 95%	139.96	RX Burn	Coeur d'Alene Tribe Planned	4078
North Central Rural Expansion	Rural 95%	139.96	Thinning	Coeur d'Alene Tribe Planned	4089
North Central Rural Expansion	Rural 95%	139.96	Masticate	Coeur d'Alene Tribe Planned	4090
North Central Rural Expansion	Rural 95%	0.99	Thinning	Coeur d'Alene Tribe Planned	4091
North Central Rural Expansion	Rural 95%	0.99	Masticate	Coeur d'Alene Tribe Planned	4092
North Central Rural Expansion	Rural 95%	25.88	Thinning	Coeur d'Alene Tribe Planned	4101
North Central Rural Expansion	Rural 95%	25.88	Masticate	Coeur d'Alene Tribe Planned	4102
North Central Rural Expansion	Rural 95%	25.98	Thinning	Coeur d'Alene Tribe Planned	4103
North Central Rural Expansion	Rural 95%	25.98	Masticate	Coeur d'Alene Tribe Planned	4104
North Central Rural Expansion	Rural 95%	37.65	Thinning	Coeur d'Alene Tribe Planned	4105

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
North Central Rural Expansion	Rural 95%	37.65	Masticate	Coeur d'Alene Tribe Planned	4106
North Central Rural Expansion	Rural 95%	74.70	Thinning	Coeur d'Alene Tribe Planned	4107
North Central Rural Expansion	Rural 95%	74.70	Masticate	Coeur d'Alene Tribe Planned	4108
North Central Rural Expansion	Rural 95%	49.39	HFR.RX	Coeur d'Alene Tribe Planned	4114
North Central Rural Expansion	Rural 95%	34.86	HFR.RX	Coeur d'Alene Tribe Planned	4115
North Central Rural Expansion	Rural 95%	39.14	HFR.RX	Coeur d'Alene Tribe Planned	4116
North Central Rural Expansion	Rural 95%	158.65	Thinning	Coeur d'Alene Tribe Planned	4136
North Central Rural Expansion	Rural 95%	158.65	Masticate	Coeur d'Alene Tribe Planned	4137
North Central Rural Expansion	Rural 95%	19.98	Thinning	Coeur d'Alene Tribe Planned	4138
North Central Rural Expansion	Rural 95%	19.98	Masticate	Coeur d'Alene Tribe Planned	4139
North Central Rural Expansion	Rural 95%	142.52	Thinning	Coeur d'Alene Tribe Planned	4140
North Central Rural Expansion	Rural 95%	142.52	Masticate	Coeur d'Alene Tribe Planned	4141
North Central Rural Expansion	Rural 95%	49.39	Prune / Thinning	Coeur d'Alene Tribe Planned	4174
North Central Rural Expansion	Rural 95%	49.39	Masticate	Coeur d'Alene Tribe Planned	4175
North Central Rural Expansion	Rural 95%	34.86	Prune / Thinning	Coeur d'Alene Tribe Planned	4176
North Central Rural Expansion	Rural 95%	34.86	Masticate	Coeur d'Alene Tribe Planned	4177
North Central Rural Expansion	Rural 95%	39.11	Prune / Thinning	Coeur d'Alene Tribe Planned	4178
North Central Rural Expansion	Rural 95%	39.11	Masticate	Coeur d'Alene Tribe Planned	4179
North Central Rural Expansion	Rural 95%	128.04	Prune / Thinning	Coeur d'Alene Tribe Planned	4190
North Central Rural Expansion	Rural 95%	128.04	Masticate	Coeur d'Alene Tribe Planned	4191
North Central Rural Expansion	Rural 95%	156.85	Prune / Thinning	Coeur d'Alene Tribe Planned	4192
North Central Rural Expansion	Rural 95%	156.85	Masticate	Coeur d'Alene Tribe Planned	4193
North Central Rural Expansion	Rural 95%	156.78	Prune / Thinning	Coeur d'Alene Tribe Planned	4194
North Central Rural Expansion	Rural 95%	156.78	Masticate	Coeur d'Alene Tribe Planned	4195
North Central Rural Expansion	Rural 95%	8.21	Infrastructure Protection	2012 WUI Committee Planned	4204
North Central Rural Expansion	Rural 95%	4.54	Infrastructure Protection	2012 WUI Committee Planned	4205
North Central Rural Expansion	Rural 95%	16.39	Infrastructure Protection	2012 WUI Committee Planned	4206
North Central Rural Expansion	Rural 95%	32.51	Infrastructure Protection	2012 WUI Committee Planned	4207
North Central Rural Expansion	Rural 95%	1.66	Thinning	2012 WUI Committee Planned	4228
North Central Rural Expansion	Rural 95%	24.93	Grazing	2012 WUI Committee Planned	4231
North Central Rural Expansion	Rural 95%	29.28	Grazing	2012 WUI Committee Planned	4232
North Central Rural Expansion	Rural 95%	10.39	Infrastructure Protection	2012 WUI Committee Planned	4233

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
North Central Rural Expansion	Rural 95%	3.03	Infrastructure Protection	2012 WUI Committee Planned	4234
North Central Rural Expansion	Rural 95%	7.64	Infrastructure Protection	2012 WUI Committee Planned	4235
North Central Rural Expansion	Rural 95%	20.51	Thinning	2012 WUI Committee Planned	4237
North Central Rural Expansion	Rural 95%	8.70	Infrastructure Protection	2012 WUI Committee Planned	4238
North Central Rural Expansion	Rural 95%	25.36	Infrastructure Protection	2012 WUI Committee Planned	4239
North Central Rural Expansion	Rural 95%	2.07	Infrastructure Protection	2012 WUI Committee Planned	4240
North Central Rural Expansion	Rural 95%	32.71	Infrastructure Protection	2012 WUI Committee Planned	4241
North Central Rural Expansion	Rural 95%	4.98	Infrastructure Protection	2012 WUI Committee Planned	4246
North Central Rural Expansion	Rural 95%	14.08	Infrastructure Protection	2012 WUI Committee Planned	4247
North Central Rural Expansion	Rural 95%	12.98	Thinning	2012 WUI Committee Planned	4248
North Central Rural Expansion	Rural 95%	1.25	Infrastructure Protection	2012 WUI Committee Planned	4251
North Central Rural Expansion	Rural 95%	0.96	Infrastructure Protection	2012 WUI Committee Planned	4272
North Central Rural Expansion	Rural 95%	4.76	Fuel Break	2012 WUI Committee Planned	4285
North Central Rural Expansion	Rural 95%	10.27	Infrastructure Protection	2012 WUI Committee Planned	4286
North Central Rural Expansion	Rural 95%	2.92	Fuel Break	2012 WUI Committee Planned	4298
North Central Rural Expansion	Rural 95%	12.23	Infrastructure Protection	2012 WUI Committee Planned	4300
North Central Rural Expansion	Rural 95%	6.04	Fuel Break	2012 WUI Committee Planned	4301
North Central Rural Expansion	Rural 95%	24.63	Fuel Break	2012 WUI Committee Planned	4302
North Central Rural Expansion	Rural 95%	6.43	Infrastructure Protection	Citizen Provided Project	4306
North Central Rural Expansion	Rural 95%	0.38	Defensible Space	Citizen Provided Project	4310
Plummer Intermix	Intermix	0.79	Infrastructure Protection	2012 WUI Committee Planned	4204
Rocky Point	Intermix	28.32	Thinning	2012 WUI Committee Planned	4236
Rural Santa	Rural 95%	5.87	Infrastructure Protection	2012 WUI Committee Planned	4212
Rural Santa	Rural 95%	1.63	Infrastructure Protection	2012 WUI Committee Planned	4260
Rural Santa	Rural 95%	1.30	Infrastructure Protection	2012 WUI Committee Planned	4262
Rural Santa	Rural 95%	1.43	Infrastructure Protection	2012 WUI Committee Planned	4263
Sanders	Intermix	19.77	Defensible Space	2012 WUI Committee Planned	4203
Santa	Intermix	1.89	Thinning	2012 WUI Committee Planned	4217
Santa	Intermix	0.52	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4282
Santa	Intermix	12.51	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4283
Santa	Intermix	9.22	Defensible Space	2012 WUI Committee Planned	4290
Santa	Intermix	8.29	Defensible Space	2012 WUI Committee Planned	4291

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
Santa	Intermix	12.73	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4292
Santa	Intermix	3.00	Infrastructure Protection	2012 WUI Committee Planned	4293
Santa	Intermix	6.88	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4294
Santa	Intermix	2.41	Defensible Space	2012 WUI Committee Planned	4295
Santa Creek	Intermix	0.86	Infrastructure Protection	2012 WUI Committee Planned	4256
Santa Creek	Intermix	1.16	Infrastructure Protection	2012 WUI Committee Planned	4257
Santa Creek	Intermix	1.00	Infrastructure Protection	2012 WUI Committee Planned	4258
Santa Creek	Intermix	1.37	Infrastructure Protection	2012 WUI Committee Planned	4259
Santa Creek	Intermix	0.06	Infrastructure Protection	2012 WUI Committee Planned	4260
Santa Creek	Intermix	1.39	Infrastructure Protection	2012 WUI Committee Planned	4261
Santa Creek	Intermix	1.28	Infrastructure Protection	2012 WUI Committee Planned	4264
Santa Creek	Intermix	0.53	Infrastructure Protection	2012 WUI Committee Planned	4265
Santa Creek	Intermix	0.22	Infrastructure Protection	2012 WUI Committee Planned	4266
Santa Creek	Intermix	7.14	Infrastructure Protection	2012 WUI Committee Planned	4267
Santa Creek	Intermix	8.18	Thinning	2012 WUI Committee Planned	4277
South Eastern	Wildland	8.21	Precommercial Thinning	Forest Service Planned	4001
South Eastern	Wildland	5.86	Precommercial Thinning	Forest Service Planned	4002
South Eastern	Wildland	41.98	Pruning	Forest Service Planned	4007
South Eastern Rural Expansion	Rural 95%	9.84	Precommercial Thinning	Forest Service Planned	4045
South Eastern Rural Expansion	Rural 95%	4.34	Infrastructure Protection	2012 WUI Committee Planned	4214
South Eastern Rural Expansion	Rural 95%	4.77	Infrastructure Protection	2012 WUI Committee Planned	4215
South Eastern Rural Expansion	Rural 95%	5.69	Infrastructure Protection	2012 WUI Committee Planned	4222
South Eastern Rural Expansion	Rural 95%	5.40	Infrastructure Protection	2012 WUI Committee Planned	4223
South Eastern Rural Expansion	Rural 95%	17.81	Infrastructure Protection	2012 WUI Committee Planned	4252
South Eastern Rural Expansion	Rural 95%	43.48	Infrastructure Protection	2012 WUI Committee Planned	4280
South Eastern Rural Expansion	Rural 95%	8.66	Infrastructure Protection	2012 WUI Committee Planned	4281
South Eastern Rural Expansion	Rural 95%	7.44	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4282
South Eastern Rural Expansion	Rural 95%	0.37	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4283
South Eastern Rural Expansion	Rural 95%	5.05	Infrastructure Protection	2012 WUI Committee Planned	4287
South Eastern Rural Expansion	Rural 95%	111.38	Defensible Space	Citizen Provided Project	4305
Southwestern Rural Zone	Rural 95%	6.82	Thinning	Coeur d'Alene Tribe Planned	4074
Southwestern Rural Zone	Rural 95%	6.82	Masticate	Coeur d'Alene Tribe Planned	4075

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
Southwestern Rural Zone	Rural 95%	9.14	Prune / Thinning	Coeur d'Alene Tribe Planned	4118
Southwestern Rural Zone	Rural 95%	10.01	Prune / Thinning	Coeur d'Alene Tribe Planned	4119
Southwestern Rural Zone	Rural 95%	10.01	Lop and Scatter	Coeur d'Alene Tribe Planned	4120
Southwestern Rural Zone	Rural 95%	9.14	Lop and Scatter	Coeur d'Alene Tribe Planned	4121
Southwestern Rural Zone	Rural 95%	14.29	Lop and Scatter	Coeur d'Alene Tribe Planned	4122
Southwestern Rural Zone	Rural 95%	14.29	Prune / Thinning	Coeur d'Alene Tribe Planned	4123
Southwestern Rural Zone	Rural 95%	57.13	Thinning	Coeur d'Alene Tribe Planned	4126
Southwestern Rural Zone	Rural 95%	57.13	Lop and Scatter	Coeur d'Alene Tribe Planned	4127
Southwestern Rural Zone	Rural 95%	63.42	Thinning	Coeur d'Alene Tribe Planned	4128
Southwestern Rural Zone	Rural 95%	63.42	Masticate	Coeur d'Alene Tribe Planned	4129
Southwestern Rural Zone	Rural 95%	70.68	Thinning	Coeur d'Alene Tribe Planned	4130
Southwestern Rural Zone	Rural 95%	70.68	Masticate	Coeur d'Alene Tribe Planned	4131
Southwestern Rural Zone	Rural 95%	48.57	Thinning	Coeur d'Alene Tribe Planned	4132
Southwestern Rural Zone	Rural 95%	48.57	Masticate	Coeur d'Alene Tribe Planned	4133
Southwestern Rural Zone	Rural 95%	153.97	RX HFR	Coeur d'Alene Tribe Planned	4145
Southwestern Rural Zone	Rural 95%	156.74	RX HFR	Coeur d'Alene Tribe Planned	4146
Southwestern Rural Zone	Rural 95%	160.41	RX HFR	Coeur d'Alene Tribe Planned	4147
Southwestern Rural Zone	Rural 95%	128.07	Masticate	Coeur d'Alene Tribe Planned	4158
Southwestern Rural Zone	Rural 95%	33.40	Masticate	Coeur d'Alene Tribe Planned	4159
Southwestern Rural Zone	Rural 95%	87.24	Masticate	Coeur d'Alene Tribe Planned	4160
Southwestern Rural Zone	Rural 95%	128.07	Prune / Thinning	Coeur d'Alene Tribe Planned	4161
Southwestern Rural Zone	Rural 95%	33.40	Prune / Thinning	Coeur d'Alene Tribe Planned	4162
Southwestern Rural Zone	Rural 95%	87.24	Prune / Thinning	Coeur d'Alene Tribe Planned	4163
Southwestern Rural Zone	Rural 95%	180.45	Prune / Thinning	Coeur d'Alene Tribe Planned	4164
Southwestern Rural Zone	Rural 95%	180.45	Masticate	Coeur d'Alene Tribe Planned	4165
Southwestern Rural Zone	Rural 95%	71.99	Prune / Thinning	Coeur d'Alene Tribe Planned	4166
Southwestern Rural Zone	Rural 95%	71.99	Masticate	Coeur d'Alene Tribe Planned	4167
Southwestern Rural Zone	Rural 95%	161.87	RX HFR	Coeur d'Alene Tribe Planned	4168
Southwestern Rural Zone	Rural 95%	9.59	RX HFR	Coeur d'Alene Tribe Planned	4169
Southwestern Rural Zone	Rural 95%	18.02	RX HFR	Coeur d'Alene Tribe Planned	4170
Southwestern Rural Zone	Rural 95%	37.34	Thinning	2012 WUI Committee Planned	4202
Southwestern Rural Zone	Rural 95%	75.69	Infrastructure Protection	2012 WUI Committee Planned	4208

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
Southwestern Rural Zone	Rural 95%	17.72	Infrastructure Protection	2012 WUI Committee Planned	4209
Southwestern Rural Zone	Rural 95%	5.60	Infrastructure Protection	2012 WUI Committee Planned	4210
Southwestern Rural Zone	Rural 95%	14.38	Infrastructure Protection	2012 WUI Committee Planned	4211
Southwestern Rural Zone	Rural 95%	10.72	Infrastructure Protection	2012 WUI Committee Planned	4254
Southwestern Rural Zone	Rural 95%	90.79	Infrastructure Protection	2012 WUI Committee Planned	4255
Southwestern Rural Zone	Rural 95%	16.98	Infrastructure Protection	2012 WUI Committee Planned	4268
St. Joe	Intermix	0.76	Infrastructure Protection	2012 WUI Committee Planned	4246
St. Joe	Intermix	0.30	Thinning	2012 WUI Committee Planned	4248
St. Joe	Intermix	17.71	Fuel Break	2012 WUI Committee Planned	4285
St. Maries Intermix	Intermix	13.94	Thinning	2012 WUI Committee Planned	4226
St. Maries Intermix	Intermix	10.19	Thinning	2012 WUI Committee Planned	4227
St. Maries Intermix	Intermix	24.61	Thinning	2012 WUI Committee Planned	4242
St. Maries Intermix	Intermix	6.97	Thinning	2012 WUI Committee Planned	4243
St. Maries Intermix	Intermix	26.08	Thinning	2012 WUI Committee Planned	4244
St. Maries Intermix	Intermix	42.27	Grazing	2012 WUI Committee Planned	4245
St. Maries Intermix	Intermix	1.10	Fuel Break	2012 WUI Committee Planned	4269
St. Maries Intermix	Intermix	1.31	Fuel Break	2012 WUI Committee Planned	4270
St. Maries Intermix	Intermix	1.09	Infrastructure Protection	2012 WUI Committee Planned	4271
St. Maries Intermix	Intermix	1.16	Infrastructure Protection	2012 WUI Committee Planned	4272
St. Maries Intermix	Intermix	0.04	Fuel Break	2012 WUI Committee Planned	4273
St. Maries Intermix	Intermix	2.73	Fuel Break	2012 WUI Committee Planned	4273
St. Maries Intermix	Intermix	2.71	Fuel Break	2012 WUI Committee Planned	4274
St. Maries Intermix	Intermix	0.29	Fuel Break	2012 WUI Committee Planned	4274
St. Maries Intermix	Intermix	1.86	Fuel Break	2012 WUI Committee Planned	4275
St. Maries Intermix	Intermix	0.09	Fuel Break	2012 WUI Committee Planned	4275
St. Maries Intermix	Intermix	1.40	Fuel Break	2012 WUI Committee Planned	4276
St. Maries Intermix	Intermix	14.28	Infrastructure Protection	2012 WUI Committee Planned	4296
St. Maries Intermix	Intermix	7.79	Infrastructure Protection	2012 WUI Committee Planned	4297
St. Maries Intermix	Intermix	11.37	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4303
St. Maries Intermix	Intermix	8.82	Fuel Break / Infrastructure Protection	2012 WUI Committee Planned	4304
St. Maries Intermix	Intermix	32.97	Infrastructure Protection	Citizen Provided Project	4306
St. Maries Intermix	Intermix	7.55	Defensible Space	Citizen Provided Project	4307

Table 39. Individual Proposed WUI Treatment areas within Benewah County showing WUI Named Place, WUI Condition, and Acres.

WUI Named Place	WUI Condition Class	Acres	Treatment Type	Agency	Treatment No.
St. Maries Intermix	Intermix	1.43	Defensible Space	Citizen Provided Project	4308
St. Maries Intermix	Intermix	0.70	Defensible Space	Citizen Provided Project	4309
St. Maries Intermix	Intermix	3.23	Defensible Space	Citizen Provided Project	4310
Windfall / Lolo Pass	Rural 95%	0.60	Infrastructure Protection	2012 WUI Committee Planned	4278
Windfall / Lolo Pass	Rural 95%	1.08	Infrastructure Protection	2012 WUI Committee Planned	4279

Within these 378 potential mitigation areas, some of the discrete places have multiple treatments identified on the same site. These overlapping treatments may include treatments such as precommercial thinning as one effort, and pruning as another. Treatments may be scheduled for the same year in the future, or in different years. It is not uncommon for a single site to receive multiple treatments in the same year, or over several years.

When treatments are considered for the named places of the county and the matching WUI Condition, the treatments show some areas with only one or two proposed projects, while others have as many as 156 proposed treatments (Table 40). If considered for only the WUI Conditions of the County, then the treatments show the majority of treatment areas to be focused on Rural 95% and Rural 100% lands with about 69 discrete project areas within the Intermix zones on about 468 acres (Table 41).

These tables can be used for a variety of purposes including calculating the cost component of treatments within Benewah County. For instance, the implementation of the 4 identified projects in the Carpenter Creek community, will be implemented on 20.2 acres (Table 40). Costs can be estimated from the combination of the data in Table 39 and Table 40. The benefits can be derived from Table 2 to articulate the number of homes and the value of improvements, in the community.

Table 40. Summary of proposed WUI treatments by Named Place and WUI Condition.

WUI Named Place	WUI Condition	Project Count	Acres
Alder Creek Intermix	Intermix	2	11.4
Alder Creek Rural	Rural 95%	2	8.5
Bear Springs	Intermix	1	8.3
Blackwell Divide	Rural 95%	5	40.3
Carpenter Creek	Intermix	4	20.2
Chief MOC-TEL-ME	Rural 95%	5	367.8
County Wide Low Density Rural Expanse	Rural 100%	156	6,700.5
Emida	Intermix	4	20.3

Table 40. Summary of proposed WUI treatments by Named Place and WUI Condition.

WUI Named Place	WUI Condition	Project Count	Acres
Fernwood	Intermix	4	17.0
Forever Green	Intermix	2	16.2
North Central Rural Expansion	Rural 95%	80	3,806.3
Plummer Intermix	Intermix	1	0.8
Rocky Point	Intermix	1	28.3
Rural Santa	Rural 95%	4	10.2
Sanders	Intermix	1	19.8
Santa	Intermix	9	57.5
Santa Creek	Intermix	11	23.2
South Eastern	Wildland	3	56.1
South Eastern Rural Expansion	Rural 95%	12	224.2
Southwestern Rural Zone	Rural 95%	40	2,492.3
St. Joe	Intermix	3	18.8
St. Maries Intermix	Intermix	26	226.0
Windfall / Lolo Pass	Rural 95%	2	1.7
	Total	**378**	**14,175.4**

Table 41. WUI Condition sand Proposed Mitigation Measures.

WUI Condition	Project Count	Acres
Interface	0	-
Intermix	69	467.7
Rural 95%	150	6,951.2
Rural 100%	156	6,700.5
Wildland	3	56.1
Total	**378**	**14,175.4**

Chapter 9. Works Cited

Agee, J.K. *Fire ecology of the Pacific Northwest Forests.* Washington: Island Press, 1993.

Agee, J.K. "The Landscape Ecology of Western Forest Fire Regimes." *Northwest Science, Vol. 72, Special Issue 1998*, 1998.

Barrett, J.W. *Silviculture of ponderosa pine in the Pacific Northwest: the state of our knowledge.* Portland, OR: USDA Forest Service, General Technical Report PNW-97. Pacific Northwest Forest and Range Experiment Station, 1979, 106.

BCEMD. *Benewah County Emergency Management Department.* St. Maries: Benewah County Emergency Management Department, 2009.

BHS, Idaho. *STATE OF IDAHO HAZARD MITIGATION PLAN.* Boise: Idaho Bureau of Homeland Security, 2010.

BLM. *Bureau of Land Management, Cadastral Survey.* May 12, 2011. http://www.blm.gov/wo/st/en/prog/more/cadastralsurvey.html (accessed June 10, 2011).

Brookhouse, P. "Lightning detection and operations systems in North America." *Australian Brushfire Conference, July 1999.* Albury, 1999.

Brown, J.K. "Fire regimes and their relevance to ecosystem management." *Proceedings of Society of American Foresters National Convention, Sept. 18-22, 1994.* Anchorage, AK: Society of American Foresters, Wash. DC., 1995. 171-178.

Carree, Y., C. Schnepf, and W.M. Colt. *Landscaping for Wildfire Prevention; Protecting Homes on the Wildland-Urban Interface. .* Station Bulletin 67, Moscow, Idaho: Idaho Forest, Wildlife and Range Experiment Station., 1998.

Castillo, E. *Extreme value theory in engineering.* New York: Academic Press, Inc., 1988.

CDAT. "Statements from the Coeur d'Alene Tribe's Internet web site." *Coeur d'Alene Tribe internet porthole.* 2008. http://www.cadtribe.com (accessed June 26, 2010).

CSUE. "Douglas-fir Tussock Moths." *Colorado State University Extension.* February 2009. http://www.ext.colostate.edu/pubs/insect/05542.html (accessed July 19, 2012).

Dillman, D.A. *Mail and Telephone Surveys: The Total Design Method.* Hoboken: John Wiley & Sons, Incorporated., 1978.

FEMA. *Federal Emergency Management Agency Internet website repository of information.* USG. July 1, 2012. http://www.fema.gov/ (accessed July 1, 2012).

Frey, R. *Stories that Make the World: Oral Literature of the Indian Peoples of the Inland Northwest as told by Lawrence Aripa, Tom Yellowtail and other Elders.* Norman and London: University of Oklahoma Press., 1995.

Hann, W., et al. "Interagency Fire Regime Condition Class Guidebook." *Interagency and The Nature Conservancy fire regime condition class website, USDA Forest Service, U.S. Department of the Interior, The Nature Conservancy, and Systems for Environmental Management.* 2004. www.frcc.gov (accessed December 20, 2010).

Hann, W.J., and D.L. Bunnell. "Fire and land management planning and implementation across multiple scales." *Int. J. Wildland Fire*, 2001: 10:389-403.

Hardy, C.C., K.M. Schmidt, J.M. Menakis, and N.R. Samson. "Spatial data for national fire planning and fuel management." *International Journal of Wildland Fire*, 2001: 10:353-372.

IBHS. "Idaho Disasters." *Idaho Bureau of Homeland Security.* November 2007. http://www.bhs.idaho.gov/Resources/ (accessed September 12, 2009).

Idaho BHS. "State of Idaho Bureau of Homeland Security." *Idaho Bureau of Hhomeland Security.* November 2010. http://www.bhs.idaho.gov/Pages/Plans/Mitigation/SHMP.aspx (accessed August 8, 2011).

IDL. "Douglas-fir Tussock Moth Information Leaflet." *Idaho Department of Lands.* January 1981. http://www.idl.idaho.gov/bureau/ForestAssist/forest_health/dftm2011/FIDL-86-Douglas-fir-tussock-moth.pdf (accessed July 20, 2012).

—. "Forest Health Alert." *Idaho Department of Lands.* 2012. http://www.idl.idaho.gov/bureau/ForestAssist/forest_health/dftm2012/DFTM_PestAlert_Revised_2_3_2012_with_Hyperlink.pdf (accessed July 20, 2012).

—. "Idaho Department of Lands." *Douglas-fir Tussock Moth Public Meetings.* April 2012. http://www.idl.idaho.gov/media/press_releases/2012/032812-FLIER-Tussock-moth-public-meetings-April-2012.pdf (accessed July 20, 2012).

IFPC. "Trees of Idaho’s Forests – Western White Pine." *Idaho Forest Products Commission.* 2005. http://www.idahoforests.org/whitpine.htm (accessed November 2, 2008).

IPNF. "Wildfire Histories." *Idaho Panhandle National Forest.* October 11, 2009. http://www.fs.fed.us/ipnf/eco/yourforest/gis/index.html (accessed oCTOBER 11, 2009).

Johnson, C.G., R.R. Clausnitzer, P.J. Mehringer, and C.D. Oliver. "Biotic and Abiotic Processes of Eastside Ecosytems: the Effects of Management on Plant and Community Ecology, and on Stand and Landscape Vegetation Dynamics." Gen. Tech. Report PNW-GTR-322, PNW Research Station, USDA-Forest Service, Portland, Oregon, 1994, 722.

Johnson, V.W. *Land problems and policies.* Raleigh: Ayer Publishing, 1979.

Keane, R. E., R. Parsons, and P. Hessburg. "Estimating historical range and variation of landscape patch dynamics: limitations of the simulation approach." *Ecological Modeling*, 2002: 151:29-49.

Keane, R.E., L. M. Holsinger, and S.D. Pratt. *Simulating historical landscape dynamics using the landscape fire succession model LANDSUM.* version 4.0 Gen. Tech. Rep. RMRS-GTR-171CD, Fort Collins, Colorado: US Forest Service, Rocky Mountain Research Station, 2006, 73.

Kevis, M.S. *Saga of the Coeur d‘Alene Indians: an account of Chief Joseph Seltice written by his granddaughter, and the daughter of Chief Joseph Timothy Seltice, Marceline Seltice Kevis.* Fairfield, WA: Ye Galleon Press, Second edition. Pp 372, 1999.

LANDFIRE HFRG. "Historical Fire Regime Groups." *LANDFIRE.* May 2012. http://gisdata.usgs.net/website/landfire/ (accessed June 10, 2012).

LANDFIRE. "Homepage of the LANDFIRE Project." *LANDFIRE.* Forest Service U.S. Department of Agriculture and U.S. Department of Interior. January 2012. http://www.landfire.gov/index.php (accessed May 12, 2012).

LANDFIRE MFRI. "Mean Fire Return Interval." *U.S. Department of Interior, Geological Survey.* September 2011. http://gisdata.usgs.net/website/landfire/ (accessed June 11, 2012).

Mass, C. *The Weather of the Pacific Northwest.* Seattle: University of Washington Press, 2008.

NFPCST. *Northern Fire Plan Cohesive Strategy Team.* GIS Data Distribution, Kalispell, MT 59901: Flathead National Forest, 1935 3rd Ave., 2005.

NOAA. "National Weather Service Forecast Office." *Elko, Nevada.* 2011. http://www.wrh.noaa.gov/lkn/photogal.php (accessed May 14, 2011).

NRCS. *National Cooperative Soil Survey Soil Characterization Data.* 2011. http://soildatamart.nrcs.usda.gov/ (accessed December 26, 2011).

NRCS Soil Survey Staff. *Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition.* U.S. Department of Agriculture Handbook, Natural Resources Conservation Service, 1999, 436.

NWCG. "National Wildfire Coordinating Group." 1998, 117.

Pratt, S.D., L. Holsinger, and R.E. Keane. "Using simulation modeling to assess historical Reference conditions for vegetation and fire Regimes for the landfire prototype project." Edited by M.G. and C.K. Frame Rollins. *The LANDFIRE Prototype Project: nationally consistent and locally relevant geospatial data for wildland fire management.* Fort Collins, Colorado: U.S. Forest Service, Rocky Mountain Research Station, 2006. 277-315.

PRISM Climate Group. *PRISM Climate Group.* Edited by Dr. Christopher Daly. Oregon State University. June 10, 2012. http://prism.oregonstate.edu (accessed July 1, 2012).

Red Zone Software. *Red Zone Software.* 2009. http://www.redzonesoftware.com/ (accessed September 30, 2009).

Schlosser, W.E. *Benewah County Hazard Mitigation Plan.* St. Maries, Idaho: Northwest Management, Inc., 2005.

Schlosser, W.E. *Benewah County Multi-Jurisdictional Hazard Mitigation Plan.* St. Maries, Idaho: TerraGraphics Environmental Engineering, Inc., 2010.

Schlosser, W.E. *Benewah County Wildland-Urban Interface Wildfire Mitigation Plan.* St. Maries, Idaho: Northwest Management, Inc., 2004.

Schlosser, W.E. *Coeur d'Alene Reservation Tribal Hazards Mitigation Plan.* Plummer, Idaho: Kamiak Ridge, LLC, 2011.

Schlosser, W.E. *Coeur d'Alene Reservation Tribal Hazards Mitigation Plan.* Plummer, Idaho: Kamiak Ridge, LLC, 2011.

—. "Defining the Wildland-Urban Interface; A Logic-Graphical Interpretation of Population Density. Previously published in Western Forester, Journal of forestry, and other outlets, and updated in January 2010." *Kamiak Ridge, LLC.* June 15, 2012. http://www.Resource-Analysis.com (accessed July 1, 2012).

Schmidt, K.M., J.P. Menakis, C.C. Hardy, W.J. Hann, and D.L. Bunnell. *Development of coarse-scale spatial data for wildland fire and fuel management.* General Technical Report, RMRS-GTR-87, Fort Collins, CO.: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 2002.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Soil Survey Geographic (SSURGO) Database for Benewah County, Idaho.* USDA. 2012. http://soildatamart.nrcs.usda.gov (accessed July 1, 2012).

US Census. "Census 2000 TIGER/Line Data: Roads." *Topologically Integrated Geographic Encoding and Referencing system.* US Census. November 30, 2010. http://www.census.gov/geo/www/tiger/ (accessed 20 2011, March).

Worrall, J. "Forest Pathology: White Pine Blister Rust." *A lecture series hosted on the Internet.* May 27, 2007. http://www.forestpathology.org/dis_wpbr.html (accessed March 3, 2008).

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