



TRIBAL

Natural Hazard Mitigation Plan

Effective 2012-2017



Cow Creek Umpqua

Cow Creek Band of Umpqua Tribe of Indians

2012 Tribal Hazard Mitigation Plan

Prepared for

Cow Creek Band of Umpqua Tribe of Indians

“Cow Creek Tribe”

Funded by

Federal Emergency Management Agency

Prepared by

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Cover photo:

Cow Creek, looking north from Union Creek Bridge

June 20, 2011

Taken by Glenn B. Coil

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List of Acronyms

BCA	Benefit-Cost Analysis
BFE	Base Flood Elevation
BLM	Bureau of Land Management
CAR	Community at Risk
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CMZ	Channel Migration Zone
CWPP	Community Wildfire Protection Plan
D	Democrat
DFPA	Douglas Forest Protective Association
DMA	Disaster Mitigation Act of 2000
DOGAMI	Oregon Department of Geology and Mineral Industries
DRAC	Disaster Reconstruction Assistance Centers
EAP	Emergency Action Plan
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information Systems
HMGP	Hazard Mitigation Grant Program
HUD	US Department of Housing & Urban Development
M	Magnitude
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHMP	Natural Hazard Mitigation Plan
NIMS	National Incident Management System
NWS	National Weather Service
NWTEMC	Northwest Tribal Emergency Management Council
ODF	Oregon Department of Forestry
OEM	Oregon Emergency Management
PA	Public Assistance
PDM	Pre-Disaster Mitigation
PGA	Peak Ground Acceleration
R	Republican
SFHA	Special Flood Hazard Area
SHELDUS	Spatial Hazard Events and Losses Database for the United States
SLIDO	Statewide Landslide Information Database of Oregon

SRL	Severe Repetitive Loss
Tribe	Cow Creek Band of Umpqua Tribe of Indians; others terms used herein for the Tribe are: - Cow Creek Band of Umpqua, - Cow Creek Indian Tribe
UIDC	Umpqua Indian Development Cooperation
USC	United States Code
USDA	United States Department of Agriculture
USGS	United States Geological Survey
U & A	Usual and Accustomed Lands of the Tribe
WUI	Wildland-Urban Interface

1. Introduction

The Cow Creek Band of Umpqua Tribe of Indian's ("the Tribe") Tribal Natural Hazard Mitigation Plan (NHMP) has been prepared to guide current and future efforts to effectively and efficiently mitigate natural hazards on the Cow Creek Band of Umpqua Indian Reservation, trust and fee lands and other areas of Tribal interest including, but not limited to, its Usual and Accustomed Areas (U&A).

Hazard mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. Mitigation activities may be implemented prior to, during, or after an incident. However, hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

The mitigation planning process encourages coordination among tribal authorities and other governmental agencies, tribal members, local residents, businesses, academia, and non-profit groups and promotes their participation in the plan development and implementation process. This broad-based approach enables the development of mitigation actions that are supported by tribal members and other stakeholders and that reflect the needs of the Tribal government as a whole.

This Tribal Hazard Mitigation Plan establishes goals, lists objectives necessary to achieve the goals, and identifies policies, tools, and actions that will help meet the objectives. These short- and long-term actions will reduce the potential for losses to the Tribe due to natural hazards.

In short, this plan is intended to help create a disaster-resistant community by reducing the threat of natural hazards to life, property, emergency response capabilities, economic stability, and infrastructure, while encouraging the protection and restoration of natural and cultural resources.

The natural hazards that have affected the Cow Creek Band of Umpqua Tribe in the past and will affect the Tribe in the future include riverine flooding from the South Umpqua River and its tributaries, earthquakes, and severe winter storms including high winds. Landslides and wildfires are also potential hazards.

Goals & Objectives

The goals and objectives for the Natural Hazard Mitigation Plan (the "Plan") for the Cow Creek Band of Umpqua Tribe of Indians (the "Tribe") are identified below. These goals and objectives were developed to coordinate with the Tribe's Mission Statement which reads as follows:

“The mission of the Cow Creek Band of Umpqua Tribe of Indians is to uphold Tribal Government, protect and preserve Tribal history, culture and the general welfare of the Tribal membership, as well as to provide for the economic needs of the Tribe and its members through land acquisition and business development. To further fulfill its mission, the Tribe fosters a “good work ethic” and independence for the membership and strongly upholds the “government to government” relationship with local, State and Federal governments. The Tribe constantly develops strong cooperative relationships that benefit not only the Tribe, but the local community as well.”

The Tribe intends to stay true to its Mission Statement while accomplishing the following goals in developing its Plan:

- to protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identity and self-governance;
- to identify and recommend future projects and programs for the Tribe that, upon implementation, would eliminate, reduce or otherwise mitigate the vulnerability of the Tribe’s people, property, natural resources and economic vitality which may result from impacts of future disasters;
- to guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development; and
- to promote a disaster resilient community.

OBJECTIVES:

The Tribe’s plan objectives include, but are not limited to:

- Focusing on risk assessment to keep future developments outside of known hazard areas;
- Protecting culturally and historically significant Tribal sites and resources;
- Increasing mitigation and emergency management capabilities for the Tribe; and
- Supporting local and regional mitigation efforts that do not conflict with the Tribe's Mitigation Goals.

This NHMP provides detailed recommendations and an action plan designed to meet each objective and, ultimately, the goals of the plan.

1.1. Authority to Plan

Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) 42 U.S.C. 5165, as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Indian Tribal governments, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning.

The National Flood Insurance Act of 1968, 42 U.S.C. 4001 et seq., as amended, further reinforces the need and requirement for mitigation plans, linking flood mitigation assistance programs to State, Tribal, and Local Mitigation Plans.

In recognition of tribal sovereignty and the government-to-government relationship that FEMA has with Indian Tribal governments, FEMA amended 44 CFR Part 201 at 72 Fed. Reg. 61720, on October 31, 2007, and again at 74 Fed. Reg. 47471, on September 16, 2009, to consolidate and clarify the requirements for Indian Tribal governments, establish Tribal Mitigation Plans separately from State and Local Mitigation Plans, and finalize the Mitigation Planning rule.

1.2. Grant Eligibility¹

Indian Tribal governments with an approved Tribal Mitigation Plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Indian Tribal government coordinates with the State for review of their Tribal Mitigation Plan, then the Indian Tribal government also has the option to apply as a subgrantee through a State or another tribe. A grantee is an entity such as a State, territory, or Indian Tribal government to which a grant is awarded and that is accountable for the funds provided. A subgrantee is an entity, such as a community, local, or Indian Tribal government; State-recognized tribe; or a private nonprofit organization to which a subgrant is awarded and that is accountable to the grantee for use of the funds provided.

If the Indian Tribal government is eligible as a grantee or subgrantee because it has an approved Tribal Mitigation Plan and has coordinated with the State for review, it can decide which option it wants to take on a case-by-case basis with respect to each Presidential Disaster Declaration, and for each grant program under a Declaration, but not on a project-by-project basis within a grant program. For example, an Indian Tribal government can participate as a subgrantee for Public Assistance (PA), and also as a grantee for the Hazard Mitigation Grant Program (HMGP) under the same Declaration. However, the Indian Tribal government would not be able to request grantee status under HMGP for one HMGP project, then request subgrantee status for another HMGP project under the same Declaration.

¹ FEMA Tribal Multi-Hazard Mitigation Planning Guidance, March 2010, p. 2

Under the Stafford Act and the National Flood Insurance Act, Indian Tribal governments must have an approved, adopted Tribal Mitigation Plan to meet the eligibility requirements types of assistance, which may differ depending on whether the Indian Tribal government intends to apply as a grantee or subgrantee, as outlined in the following table.

Table 1-1: FEMA Programs Requiring Tribal Mitigation Plan

Program	Enabling Legislation	Funding Authorization	Tribal Mitigation Plan Requirement	
			Grantee Status	Subgrantee Status
Public Assistance (PA) (Categories A, B: e.g., debris removal, emergency protective measures)	Stafford Act	Presidential Disaster Declaration	No Plan Required	No Plan Required
Public Assistance (Categories C-G: e.g., repairs to damaged infrastructure, publicly owned buildings)	Stafford Act	Presidential Disaster Declaration	✓	No Plan Required
Individual Assistance (IA)	Stafford Act	Presidential Disaster Declaration	No Plan Required	No Plan Required
Fire Management Assistance Grants	Stafford Act	Fire Management Assistance Declaration	✓	No Plan Required
Hazard Mitigation Grant Program (HMGP) Planning Grant	Stafford Act	Presidential Disaster Declaration	✓	No Plan Required
HMGP Project Grant	Stafford Act	Presidential Disaster Declaration	✓	✓
Pre-Disaster Mitigation (PDM) Planning Grant	Stafford Act	Annual Appropriation	No Plan Required	No Plan Required
PDM Project Grant	Stafford Act	Annual Appropriation	✓	✓

Program	Enabling Legislation	Funding Authorization	Tribal Mitigation Plan Requirement	
			Grantee Status	Subgrantee Status
Flood Mitigation Assistance (FMA)	National Flood Insurance Act	Annual Appropriation	✓	✓
Severe Repetitive Loss (SRL)	National Flood Insurance Act	Annual Appropriation	✓	✓
Repetitive Flood Claims (RFC)	National Flood Insurance Act	Annual Appropriation	✓	No Plan Required

✓ = Tribal Mitigation Plan Required

1.3. Adoption

The Cow Creek Tribal Council formally adopted the Cow Creek Tribal Hazard Mitigation Plan on *****, 2012** as Resolution #2012-11.

The Resolution adopting the plan can be found in **Appendix A**.

1.4. Assurances

The Cow Creek Indian Tribe assures that it will continue to comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The Tribe will amend its plan whenever necessary to reflect changes in Tribal or Federal laws and statutes as required in 44 CFR 13.11(d).

1.5. Organization of the Plan

The Cow Creek Tribal NHMP is divided into eight sections plus appendices:

- Section 1 is this introduction;
- Section 2 describes how the Tribal NHMP was prepared including the planning process and public involvement;
- Section 3 describes the land use, socioeconomic conditions, and physical characteristics of the Cow Creek Tribe's lands and surrounding area;
- Section 4 presents an assessment of hazard risks to Cow Creek Tribal Lands;
- Section 5 presents the Cow Creek Tribe's mitigation strategy;

- Section 6 describes the Tribal NHMP maintenance process;
- Section 7 describes the Tribe's Repetitive Loss Plan (in development).

The references cited in this plan are footnoted and any additional references are listed in Section 8.

Additional materials, such as Resolutions adopting the plan, meeting notes and survey results are located in the Appendices.

2. Planning Process

This section will discuss the planning process used to develop the Cow Creek Tribal Hazard Mitigation Plan.

The planning process is an extremely important aspect in the development of a hazard mitigation plan. It is crucial for the success of the plan to have the public ask questions and comment on the plan. In addition, by involving the public in the planning process, it increases the public's awareness of the hazards affecting the Cow Creek Tribe and informs them about the importance of hazard mitigation planning. Having public involvement in the planning process also allows the plan to reflect the public's views and opinions. The Cow Creek Tribe defines "public" as its Tribal Membership, Tribal Government and employees, the surrounding local communities such Roseburg, Winston, Myrtle Creek, Tri-City and Canyonville as well as Douglas County, the State of Oregon, Federal agencies and relevant non-government organizations. The Tribe maintains final authority on decision making related to this Plan.

The following sections will detail who was responsible for developing and producing the plan, and other associated activities such as coordinating the planning process; a listing of participating departments and agencies; and a timeline of the plan development process, dating back to 2010 and ending with the adoption of the Tribal NHMP by the Cow Creek Tribal Council and Final FEMA approval..

Furthermore this section will discuss opportunities the Public was given to comment and give suggestions on the Plan during development.

2.1. Plan Preparation

Plan preparation was led by the Cow Creek Tribe's Administration and Legal Departments with assistance from a Planning Consultant with experience in developing tribal-level hazard mitigation plans. The Planning Consultant led in the drafting of the Plan and worked with the Tribe in preparing the different components and meeting FEMA requirements necessary for a successful and approved Plan.

The Cow Creek Tribe was chosen as a recipient for a FEMA Pre-Disaster Mitigation (PDM) planning grant to develop a plan in 2010. The Tribe decided to hire an outside planning consultant to assist with the development of the Plan. The Tribe sent out invitations to bid for the project in November 2010, with a contractor selected in January 2011. Planning began in February 2011 with an initial completion date of September 2012. This date was later moved up to March 2012 due to contractual requirements. Later this date was extended out to include more a detailed building inventory and hazard assessment, as well as additional public comment.

In general, weekly conference calls were conducted with the Consultant and Tribal staff with additional calls and e-mails as needed for data and comments. The Consultant led the External Stakeholder Workgroup meeting on June 20th, 2011. A picture from the meeting is shown in **Figure 2-1**. The Minutes are shown in **Appendix D**.

Internally the Tribe put together an Emergency Planning Committee that met and communicated to discuss various components of the Plan as well as gather data and planning documents and to review the Plan.

A first draft of the Plan was submitted by the consultant to the tribe on October 28, 2011.

Figure 2-1: External Stakeholder Workgroup Meeting June 20, 2011



A Final draft that included most current data on tribal buildings and inventory was prepared and submitted to the Cow Creek Emergency Planning Committee by the Planning Consultant on February 10, 2012. The Plan was distributed internally within the Tribal government for comment with the comment period ending March 19, 2012. The Emergency Planning Committee met on March 22, 2012 to discuss comments and corrections to the draft plan. The Committee was satisfied with the Plan and chose to move forward on submitting the Plan to FEMA for review, Public comment and to have the Tribal Council formally adopt the Plan. Comments and corrections were sent to the Planning Consultant to prepare a draft for FEMA and Public review as well as Council adoption.

GIS and Hazard Mapping Data

The Planning Consultant worked with the Tribe's GIS Operations Manager to gather hazards data to better identify exposure and vulnerability to tribal lands and structures. This data was analyzed for discussion and maps were created for the Risk Assessment. Flood inundation data from the Tribe's Utility in Canyonville and FEMA Floodplain data was provided by the Tribe. Other hazards data including Wildfire Risk, Past Wildfires, and Locations of Past Landslides, were gathered online from the Oregon Geospatial Enterprise Office and the Oregon Department of Forestry. GIS databases of tribal lands and properties, current to April 2011 and tribal buildings and infrastructure (such as transformers), current to January 2012, was provided by the Tribe.

2.2. Plan Participation

The planning process was led by the Cow Creek Tribal Emergency Planning Committee and led in the formulation of goals and objectives; identification of hazards and past events; and the identification of Mitigation Actions, with ultimate approval resting upon the Cow Creek Tribal Council.

Efforts to include broad public participation included the development of community surveys, formation of an external stakeholder workgroup, site tours with tribal staff, meetings with tribal, county and state officials, and informal discussions amongst tribal staff and membership.

Emergency Planning Committee

The Emergency Planning Committee was composed of representatives from the Legal Department, Tribal Administration, the Health Clinic, Risk Management, GIS and tribal membership. See **Table 2-1** for a list of members on the Committee.

Table 2-1: Cow Creek Tribal Emergency Planning Committee

Dept./Program	Title	Name
Administration	Gov't Operations Officer	Lonnie Rainville
Legal	General Counsel	Wayne Shammel
Legal	Certified Paralegal	Jhana McCullum
Risk Management	Risk Manager	Joe Pospisil
GIS Operations	GIS Ops Manager	Brian Mladenich
Health & Wellness	Health Director	Dr. Sharon Stanphill
Cow Creek Tribe	Member Rep.	LuAnn Urban

Tribal Membership Participation

Effort was made to get participation and input from the Cow Creek Tribal membership. Many on tribal staff are Tribal members and thus were able to participate via the core Planning team. Other efforts include notification about the plan and other emergency preparedness efforts in the tribal newsletter, as well as information and the survey on the tribal website.

Local and Regional Participation

The Tribe also invited local and regional partners to participate as the External Stakeholder Group. This included tribal representatives from the Emergency Planning Committee as well as:

Table 2-2: External Stakeholder Participants

Agency	Title	Name
City of Roseburg	Deputy Fire Marshall	Monte Bryan
Douglas County Planning Department	Director	Keith L. Cubic
Oregon Public Health Division	Healthcare Liaison	Ken Quiner
Oregon Emergency Management	Tribal Liaison	Chuck Perino
Douglas Forest Protection Assoc.	Unit Forester	Patrick Skrip
Douglas County Sheriff's Office	Emergency Manager	Wayne Stinson
City of Myrtle Creek	Administrator	Aaron Cubic
Douglas Co. Environmental Health Services	Bioterrorism Coordinator	Eugene Regan
Douglas Co. Health & Social Services	Administrator	Peggy Madison
Douglas Co. Health & Social Services	Region 3 Preparedness Coordinator	Tracy DePew

2.3. Project Timeline

2010: Cow Creek Tribe receives FEMA Pre-Disaster Mitigation planning grant to develop a tribal hazard mitigation plan. Tribe sends out invitation for planning consultants to bid on contract to help the tribe develop the Plan.

February 2011: Begin project, initial site visit by project consultant. Meeting to discuss Tribe's Mitigation Goals, potential hazard areas and issues and critical facilities.

March – June, 2011: Initial data gathering, formation of planning committees, development of survey, review of local and regional plans for integration and risk assessment, identification of potential mitigation actions.

June 20, 2011: External Stakeholder Workgroup Meeting, discussion of hazard issues, critical facilities, review and discussion of mitigation actions. Site visit of tribal properties and Cow Creek watershed by consultant.

June, 2011: Survey sent internally to tribal staff and membership.

July – August, 2011: Internal review and prioritization of Mitigation Goals, Objectives and Actions. Forwarded to Tribal Council for review and adoption.

August 14, 2011: Mitigation Goals, Objectives and Actions adopted by Tribal Council.

August, 2011: Begin drafting of Plan document.

October 28, 2011: First draft submitted to Tribe for review. After review, it was determined that a more detailed inventory (including geo-locations) of Tribal structures was needed for the risk assessment to better identify and demonstrate vulnerability to hazards, particularly flooding.

January 2012: Insurance statement of values, listing all Tribal structures and related GIS database of structures was submitted to consultant for analysis and inclusion in the risk assessment.

February 2012: Final draft submitted to Tribe by consultant for internal review and comment. The Plan was distributed internally to members of the Emergency Planning Committee and other Tribal staff for comment. Comments were due March 19, 2011

March 19, 2012: Internal Tribal comment period closes.

March 22, 2012: Cow Creek Emergency Planning Committee meets to discuss comments and revisions to Plan. Committee is satisfied with the Plan and agrees to move forward on submitting the Plan for FEMA review as well as releasing it for public comment. The committee will seek formal adoption of the Plan by the Tribal Council.

April 2012: Draft Plan made available to Public, including External Stakeholders, for review and comment. Plan also submitted to FEMA for pre-review compliance.

2.4. Program Integration

Every effort was made to integrate this planning process into other Tribal planning processes. The Tribe does not have a large planning portfolio but will integrate this plan into current and future planning efforts such as the yearly budgeting process. This plan will also be incorporated into the Emergency Operations Plan as it is developed and updated.

During the planning process discussions with other tribal departments, it was agreed that current and future planning efforts will integrate the Tribal Natural Hazard Mitigation Plan. Effort will be made so that this Plan will also be integrated into other FEMA programs and initiatives that the Tribe is involved in, such as potential participation in the National Flood Insurance Program.

The plans and documents reviewed for integration include:

Tribal

Emergency Operations Plan

This Plan currently has:

- Emergency Action Plan for Creekside Development Dams (Freshwater & Septic);
- Emergency Response Plan for Tribal Health Clinic;
- Evacuation Procedures for NESIKA employees; and
- Emergency Response Plan for Departments within the Seven Feathers Casino.

The Mitigation Plan will be incorporated into the Emergency Operations Plan as the Mitigation component.

Local

Douglas County Natural Hazards Mitigation Plan, Revised 2009.

http://www.co.douglas.or.us/planning/Natural_Hazard/default.asp

Douglas County Community Wildfire Protection Plan, latest update, 2011.

http://www.co.douglas.or.us/planning/wildfire_plans/default.asp

State

State of Oregon Enhanced Natural Hazards Mitigation Plan, adopted 2009.

<http://csc.uoregon.edu/opdr/stateplan>

3. Community Profile

3.1. Introduction

The Cow Creek Band of Umpqua Tribe of Indians is one of nine federally recognized Indian Tribal Governments in the State of Oregon. The Cow Creek Tribal Nation, located in southwestern Oregon, has 1,553 members who are governed by an elected eleven member council known as the Tribal Board of Directors. The Cow Creeks have a rich history in southern Oregon that reflects hard work, perseverance and the desire to be self-reliant. See **Figure 3-1** for a map of the Tribe's location.

This section will discuss the geographic and climatic setting of the Tribe's homeland and define and discuss its lands, properties, facilities and infrastructure. This section will also discuss the Tribe's history, demographics and economy. This background information is vital to understanding the Tribe's exposure to natural hazards and its resiliency in mitigating, preparing, responding and recovering from disasters.

Figure 3-1: Location Map of Cow Creek Tribe Showing Traditional Homeland



Governance

Once the Cow Creek Tribe regained Tribal sovereignty, the Tribe established the Constitution of the Cow Creek Tribe and a structure of ordinances, charters, and committees to guide their newly regained jurisdiction over Tribal lands, businesses and community members. An eleven-member elected Tribal Board of Directors (“Tribal Board” or “Board”) is the governing authority for the Tribe's legislative and executive functions. The Board-appointed Chief Judge of the Tribal Court oversees the Tribe's judicial matters.

One of the primary responsibilities of the Tribal Board is to ensure that all of the Tribe's government functions are in accordance with Tribal law. Elected by Tribal members at least 18 years of age, Board members serve staggered four-year terms. Tribal officers include a Tribal Chairperson, a Vice-Chair, a Secretary and a Treasurer, any of whom can act as a spokesperson for the Tribe and Board on cultural, historical, and spiritual matters.

The Board has authority to establish committees and advisory boards when appropriate to conduct Tribal functions. The Tribe has a Board appointed Tribal Administrator and Government Operations Officer to run the Tribe's daily affairs. These positions, however, remain under the Board's general authority.

3.2. Geography

The Cow Creek Tribe is located in present day Douglas County, with current tribal lands centered along a 22 mile stretch of the Interstate 5 corridor along the South Umpqua River between Roseburg to the north down to Canyonville.

Douglas County is located in Southwest Oregon and covers an area of 5,071 square miles. The County extends from sea level to 9,182-foot Mount Thielsen in the Cascade Range. The entire Umpqua Watershed is within Douglas County, which contains nearly 2.8 million acres of forest lands.

Over 50% of the land area in Douglas County is owned by the federal government. The US Forest Service and the Bureau of Land Management manage these lands.

Cow Creek Tribal lands are generally defined as its Usual and Accustomed Area (U&A), which is the Tribe's traditional pre-contact lands, its Treaty Ceded lands, which were defined and ceded in the 1853 treaty with the United States, and its current Reservation and lands, which is Trust lands and other properties, comprised of parcels in Douglas County.

Geology

Douglas County is comprised of four geologic provinces, three of which converge near the center of the County. See **Figure 3-2**.

The **Klamath Mountains Province** occupies south central Douglas County. It is the oldest geological province in the County, which was created through volcanic activity, and sedimentary formations of sandstone, siltstone and mudstone. This province consists of four north-south-trending belts of metamorphic and igneous rocks that formed in an oceanic setting and subsequently collided with the North American continent about 150 million years ago. Complexly folded and faulted rocks are bounded by belts of sparsely vegetated bands of serpentinite. Mountains in the Klamath Province are rugged and rise to an elevation of nearly 4,100 feet. The mountains are steep with a valley floor of about 400 feet.

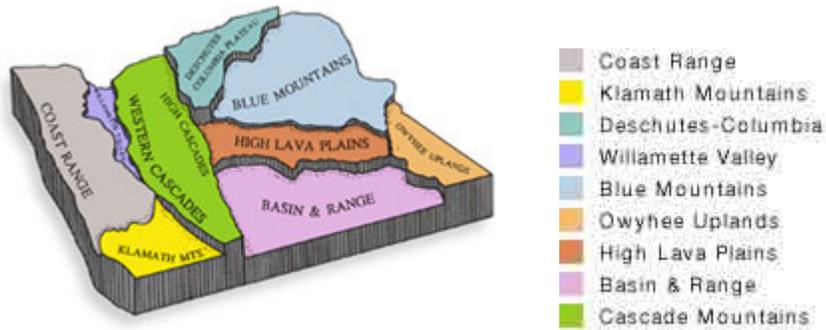
The **Coast Range Province** contains rugged mountains rising to an elevation of 3,000 feet. The valleys in this Province are fertile, with an elevation of about 300 feet above sea level. Sea level is the lowest point in this province which encompasses the northwestern portion of Douglas County, to the Pacific Ocean. Rocks of the Coast Range province are typically igneous and sandstone. Its basement was formed by a volcanic island chain that collided with North America about 50 million years ago. The ancient volcanoes form many of the scenic headlands along the coast, and the sediments that have accumulated around them contain marine fossils.

The **Western Cascade Province** is the third oldest in the county. Here igneous rocks were made from material squeezed and flung in volcanic activity. Narrow "V" shaped valleys are a common natural feature in this region. Elevations in the Western Cascade region top 6,000 feet.

The **High Cascade Province** is the youngest in the county. This region was formed by volcanic activity. Rocks are much less weathered in this province. Mount Thielsen (6,182 feet) is the most obvious formation in this province.

The Tribal U&A encompasses all these provinces, with the Ceded Lands and most properties located in the Klamath Province. Properties in Winston and north to Roseburg lie within the Coast Range Province. For a more detailed map of the geology of the Tribe's U&A and southwest Oregon, see **Figure 3-8**.

Figure 3-2: Geologic Provinces of Oregon²



Minerals and Soils

The soils present in Douglas County are the acidic and leached products of weathering in a moist temperate climate under coniferous cover. Upland soil in Douglas County is characterized by variable thickness, moderate to rapid runoff, and moderate to extreme erosion hazard. Terrace soils have slow to moderate runoff and slight to high erosion potential depending on the steepness of slope. Lowland soils in the Umpqua Valley are the products of ongoing deposition. These deep alluvial soils are rich in minerals and are great for agriculture.

Potential soil related hazards include; landslides when steep slope, shallow soils are inundated and liquefaction, an earthquake related hazard where sandy silt soils turn from a solid state to a liquid state as a result of stress and pressure.

Minerals in the Umpqua Valley are abundant and provide ample sources of ore and building materials. The abundance of minerals is due primarily to the close proximity and convergence of the four geologic provinces within Douglas County.

Rivers

Within the boundary of Douglas County lies the entire Umpqua River drainage basin. The basin covers an area of approximately 4,560 square miles. This is unique for a county boundary to entirely encompass a major river watershed. See **Figure 3-3**.

The Umpqua Basin has ten major streams. All ten flow into the main Umpqua River, which meanders westward and joins the Pacific Ocean near Reedsport. From the confluence of the North and South Umpqua Rivers near Roseburg, the Umpqua River flows 111 miles. The North Umpqua, from its headwaters at Maidu Lake, flows 106 miles, while the South

² Graphic by Elizabeth L. Orr, [Geology of Oregon](#), available from Nature of the Northwest

Umpqua River flows roughly 104 miles from the headwaters of Castle Rock Creek. The other major tributaries include Cow Creek, Elk Creek, Calapooya Creek, Little River, Lookingglass Creek, Deer Creek and Smith River.

Stream gradients in the basin vary greatly. The North Umpqua River has an average gradient of 86 feet per mile. The South Umpqua to Cow Creek has a relatively flat average gradient of 6 feet per mile, increasing to an average gradient of 42.5 feet per mile near Castle Rock Creek. On the Mainstem Umpqua, there is a gentle average gradient of 4-4^{1/2} feet per mile from the confluence of the North and South Umpqua Rivers to tidewater at Scottsburg.

Figure 3-3: Umpqua Basin Watersheds³



Tribal Lands and Property

The Tribe's Usual and Accustomed Lands area is about 5,433 sq miles and generally encompasses the Umpqua River basin above the head of tide (near present-day Scottsburg) as well as lands north of the Rogue River up to Crater Lake.

The Tribe's treaty ceded land is generally defined as the Cow Creek watershed and the South Umpqua River basin between Myrtle Creek and Tiller and is about 740 sq miles in size.

Of historic and cultural interest is the proposed Reservation for the 1853 Treaty that was not reserved for the Tribe. It is about 6,000 acres (9.3 sq miles) and is comprised of the hills on the south side of Cow Creek west of Council Creek. The Tribe does not currently own any of the lands within the Proposed 1853 Reservation.

³ <http://oregonexplorer.info/umpqua/>

Current Tribal Lands & Reservation

As of 2011, Cow Creek Tribal lands total about 4,800 acres comprising 187 parcels. Properties are located in the towns and unincorporated areas between Roseburg and Canyonville, including Winston, Myrtle Creek, Riddle, and Tri-City, with an additional small parcel located near the I-5/Glendale Valley Rd interchange east of Glendale. Most properties and development are located in the Canyonville area. Two tribal housing developments are located in Tri-City. Currently the Tribe has 1,378 acres of vacant/undeveloped land.

Trust Status

Of the 187 parcels, 118 have trust status, with 69 parcels not in trust, including four listed as Investment properties. By land area, about 67% of properties or 4,000 acres are in trust.

Historic Sites

The Cow Creek Tribe's Usual and Accustomed area has been inhabited for thousands of years and until the last 200 years, before epidemics wiped out much of the tribal population, was fully utilized and inhabited with a network of villages, summer and winter camping locations, hunting/gathering spots and sacred places, all connected by a vast network of trails. Although much has been lost to memory and re-growth of the forests, remnants of these trails and habitations can still be identified. For this plan, particular locations are not specifically identified for hazard analysis.

3.3. Climate

In the Umpqua Valley, moisture-laden breezes from the Pacific Ocean set the pace for seasonal temperatures and rainfall. These breezes blow over the Coast Range, through the inland valleys, and up to the Cascade Mountains, creating three distinct climatic areas. The coastal areas have the most moderate seasons. The inland valleys experience the hottest summer sun, while the Cascades witness the most extreme winter temperatures. In all three areas, however, the prevailing westerly winds cool the heat of summer and warm the chill of winter.

The ocean winds lose some of their velocity, and much of their moisture as they climb the Coast Range and enter the inland valleys. Coastal Douglas County receives the most rainfall, reporting 80 inches per year at Reedsport, and over 100 inches per year in the Coast Range. In summer, the average countywide temperature ranges between 52 and 70 degrees Fahrenheit. In winter, the average temperature does not drop below 37 degrees Fahrenheit. This temperature climate is due, in part, to the ocean winds that flow onshore.

The protected inland valleys have some of the lowest wind velocities in the United States. Here rainfall averages 35 inches annually. This moderate climate is marked with comfortable winters

and temperate summers. Days without frost generally occur between April and October. The first hard frost usually does not arrive until December.

As ocean winds climb up the western face of the High Cascade Range they bring relatively warm days, except in winter when they bring cool and wet weather. Winter temperatures are the most extreme at high elevations. Rainfall increases to 70 inches annually. Snow is common at elevations above 2,500 feet.

3.4. Tribal History

Today's members of the Cow Creek Tribe are descendants of a people who for thousands of years lived in the watersheds of Cow Creek and the Umpqua River Basin, and areas north and south of the Umpqua River. Their ancestral territory included more than 800,000 square miles which, as part of their Treaty with the United States which was ratified on April 12, 1854, they ceded to the United States. This Treaty left the Tribe landless and, although it promised the people health, housing and education, did not honor those promises. The Tribe received no services since 1855.

Shortly after signing the treaties, the Cow Creek people were forced onto already established reservation lands; the Siletz Indian Reservation and the Grande Ronde Indian Reservation, north of the Cow Creek Tribe's traditional territory.

In 1954, the federal government terminated the Cow Creek Tribe before it gained official recognition and without prior notice to the Tribe. The Cow Creek Tribe, however, was recognized by the United States for purposes of involuntary termination by the government. This resulted in the Cow Creek Tribe being allowed to take action in 1980 by filing a land claims case in the U.S. Court of Claims. After this litigation, the Cow Creek Tribe negotiated a settlement with the United States. Thereafter, the Cow Creek Tribe gained federal recognition on December 29, 1982, when the Cow Creek Band Recognition Act (Public Law 97-391) was enacted.

The modern Cow Creek Tribe has subsequently made several land purchases, and today the Tribe owns 4,800 acres of land in Douglas County, Oregon.

3.5. Demographic

Although historic population counts are not available, it is known that interactions with fur trappers in the 1700s decimated entire villages by introducing small pox, measles, and the plague. The 1850s brought white gold miners to ancestral lands and resulted in many deaths from miners who burned entire Indian villages, killing all inhabitants. Overcrowding and disease

further decimated the Cow Creek population following the Tribe's forced move to reservation lands (also in the 1850s).

According to a study of the Tribe's population, as of 2011 the Tribe included 1,553 members. More than 51% of the tribal population was younger than 25 and only about 4% (67 members) was older than 65 years. Of the tribal members with permanent addresses, approximately 52% lived in Oregon (including minors).

[Most resided in Douglas County (26%), but many lived in several other Oregon Counties (which together with Douglas County comprise the Tribe's Service Area) as follows: Coos County (6 members), Josephine County (50 members), Klamath County (12 members), Lane County (34 members), Deschutes County (54 members), and Jackson County (60 members). Together these equal roughly 45 of the Tribe's population.]

Additionally other members lived in California (12%), Washington (14%) and 33 other states (22%).

3.6. Economic

In 1998, the Umpqua Indian Development Corporation ("UIDC") was established and chartered to take the lead in making the Tribe economically self-sufficient. Working closely with the Tribal Board, UIDC manages and administers the Tribe's business ventures. UIDC's most financially productive venture is the Seven Feathers Hotel & Casino Resort. First established in 1992 as the Cow Creek Bingo Hall, the Seven Feathers Hotel & Casino Resort employs over 772 people (both Tribal and non-Tribal).

The Cow Creek Tribe is the second largest employer in Douglas County, employing over 1,200 people. Over 63% of the Tribe's employees work at the Seven Feathers Hotel & Casino Resort in Canyonville, Oregon. Tribal businesses account for one in every 25 jobs in Douglas County, according to a 2010 study conducted by ECO-Northwest, Inc. for the Cow Creek Tribe.

The Cow Creek Tribe also owns and operates other businesses under UIDC as follows:

- Canyon Cubbyholes located in Canyonville, Oregon – a mini storage facility.
- Creative Images Printing located in Roseburg, Oregon – a multi media and printing facility.
- K-Bar Ranches located in Myrtle Creek, Oregon – a working ranch which raises cattle and agricultural products such as hay.
- Nesika Health Group located in Roseburg, Oregon – provides health insurance coverage for Tribal members and Tribal employees.
- Rio Networks located in Roseburg, Oregon a telecommunications service provider.

- Seven Feathers Truck & Travel Center / Creekside Restaurant located in Canyonville, Oregon – a truck stop providing a restaurant, tire shop, fuel, retail store and other personal services to the public and its trucking customers such as showers, internet, etc.
- Seven Feathers RV Resort, Riverside Lodge and Valley View Motel all located in Canyonville, Oregon and Rivers West RV Park located in Myrtle Creek, Oregon – provide all aspects of the hospitality industry to the public.
- Umpqua Indian Foods located in Canyonville, Oregon – a beef jerky and other food product manufacturing company.

In addition, the Tribe itself owns and operates the following:

- Umpqua Indian Utility Co-Operative, located in Canyonville, Oregon – consists of an electrical utility operation and a state of the art water treatment plant which provides power, water and sewer services to all of the Tribe’s entities located in Canyonville, Oregon as well as emergency power, water and sewer to the City of Canyonville, Oregon.
- Cow Creek Health & Wellness Center, located in Canyonville and Roseburg, Oregon – provides comprehensive health and wellness care to all Cow Creek Tribal members, other Tribal members residing or passing through its area, and Cow Creek employees and their families. Recently, a satellite clinic was opened in Canyonville, Oregon, making it more convenient for Tribal members and employees in southern Douglas County to access Tribal health care services.

The Tribe’s newest venture is the Umpqua Business Center (UBC). It is located at 522 SE Washington Ave. in Roseburg, Oregon. The Upper level is 12,500 sq. ft. Business Incubator/Executive Suite space will promote new business ventures and create new jobs within Douglas County. The Lower level is 12,500 sq. ft. includes 5000 sq. ft. state of the art data co-location facility and 4000 sq. ft. office space to support the facility. See **Figure 3-4** for a picture of the Umpqua Business Center. **Figure 3-5** shows the UBC in 2008 before its renovation.

Figure 3-4: Umpqua Business Center



Figure 3-5: UBC in 2008 before Renovation⁴



3.7. Services and Special Districts

The Cow Creek Tribe is generally served by local and county services for schools, police and fire protection and emergency services. The Tribe utilizes local utility providers for most of its needs outside of Canyonville.

⁴ Google Maps Street View, image date Sept. 2008

Representation:State:

Senate District 1: Jeff Kruse, R

Representative District 1: Wayne Kreiger, R

Note these are the representatives for the Tribe's lands within the Roseburg-Canyonville area. The Tribe's Usual and Accustomed areas may be served by additional districts and representatives.

National:

Congressional District 4, US Rep Peter DeFazio, D

U.S. Senator Jeff Merkley, D

U.S. Senator Ron Wyden, D

3.8. Buildings and Critical Facilities**Buildings**

Using the Tribe's Insurance Statement of Values for 2012, current to Dec. 20, 2011, an analysis of tribal buildings and facilities was conducted. In total, it was determined that the Tribe had 220 buildings valued at approx. \$140,000,000. Of these 220 buildings, 28 are HUD-built homes for tribal members. Other structures include the Tribal Administration & Health Clinic buildings in Roseburg and a small clinic in Canyonville. The Tribe is building a new Health Clinic in Canyonville which will open in May 2013.

The remaining structures are used for tribal businesses, investments and facilities for its Utility Co-Op. These buildings include the Seven Feathers Casino/Hotel, offices buildings, production plants, farm houses, barns and other farm related structures, storage facilities, other homes with garages and sheds, back-up generators and other miscellaneous structures. The most valuable structure is the \$92,000,000 Seven Feathers Casino/Hotel, with the remaining structures worth about \$48 million.

The Tribe's HUD built homes, built between 2005-2011, are worth approx \$3.072 million. The Tribe's Development Corporation owns an additional 51 homes (not including garages, barns, sheds and other out-buildings), worth about \$7.831 million, and consists mostly of houses and manufactured homes on properties, including farms and ranches, that the Tribe has purchased. The houses tend to be older structures, generally built in the 1950s and 60s, while the mobile homes were built during the 1970s onward. These homes are used as rental properties for tribal members and the general public.

Critical Facilities

"Critical facilities" are defined as those structures from which essential services and functions for victim survival, continuation of public safety actions, and disaster recovery are performed or provided. Shelters, emergency operation centers, public health, public drinking water, sewer and wastewater facilities are examples of critical facilities. Though not explicitly included in the definition, supporting life-line infrastructure essential to the mission of critical facilities must also be included in the inventory when appropriate. Some essential economic-generating facilities may also be considered.

For this inventory, the Tribe's critical facilities are shown in **Table 3-1**. Please note that these facilities may include multiple structures.

Table 3-1: Cow Creek Tribal Critical Facilities

Name/Description	Year built	address	Structure values
Tribal Administration, Health and Wellness Center Complex (4 bldgs.)	1997, 2005	2371 NE Stephens, Roseburg, OR 97470	\$4,582,000
Canyonville Health Clinic Annex	1981	270 Gazeley Bridge Road, Canyonville, OR	\$150,000
New Canyonville Clinic (opening May 2013)	2012	480 Wartahoo Lane, Canyonville, OR	\$3,184,000
UIUC Umpqua Indian utility Co-op (10 bldgs.)	2005	1050 Lagoon Rd, Canyonville, OR 146 Chief Miwaleta Lane, Canyonville, OR Wartahoo Lane & Grazley Bridge Rd, Canyonville, OR	\$8,466,000
Seven Feather Casino & Hotel (6 bldgs, generators & sign)	1992, 1995	145 & 146 Chief Miwaleta Lane, Canyonville, 231 Gazeley Bridge Road, Canyonville, OR	\$92,739,000
Seven Feathers Truck & Travel Center (4 bldgs & generator)	2002	130 Creekside Drive, Canyonville, OR	\$8,417,000
Umpqua Business & Data Center (old Co-op Bldg.)	1964, renovated 2012	522 SW Washington, Roseburg, OR	\$1,909,000
Rio Communications Building	1964	520 Spruce Street, Roseburg, OR 97470	\$859,000

3.9. Infrastructure

The Cow Creek Tribe, apart from its utility in Canyonville, does not own or maintain any major infrastructure, but does utilize local and regional infrastructure, particularly Interstate 5.

Transportation

The Tribe does not own or maintain any transportation infrastructure but utilizes local, state and federal roads, the most important being Interstate 5. Interstate-5, part of the nationwide interstate freeway system, was completed in 1966 and runs north and south through Douglas County's interior and connects Roseburg down to Canyonville, Glendale and on to Grants Pass. Most Cow Creek tribal lands are near I-5.

Traffic on I-5 exceeds 13,000 vehicles daily. Cars and other light vehicles comprise 74% of the traffic and heavy truck traffic makes up 26% of the total traffic volume.

The other major road of tribal importance is Old Highway 99/Pacific Highway. This road, completed in the 1920s, mostly parallels and was replaced or incorporated into I-5, but is still heavily used locally. Most tribal properties are adjacent to and can be accessed from Old Highway 99.

The highways and other local roads utilize many bridges to cross the meandering South Umpqua River, its tributaries and the steep hillside slopes surrounding the valley. Loss of these bridges from earthquakes, landslides and flooding are a major hazard concern.

Utilities

Umpqua Indian Utility Co-Operative, located in Canyonville, consists of an electrical utility operation and a state of the art water treatment plant which provides power, water and sewer services to all of the Tribe's entities located in Canyonville as well as emergency power, water and sewer to the City of Canyonville, Oregon. It is part of the Creekside Development Project⁵. See **Figure 3-6**. **Figure 3-7** shows a view of the Tribe's Creekside Reservoir No. 1 in Feb. 2011. Creekside Reservoir No. 1 was completed in 2005, while the Irrigation Water Reservoir dams were completed in 2007.

⁵ www.creekside-development.com

Figure 3-6: Creekside Development

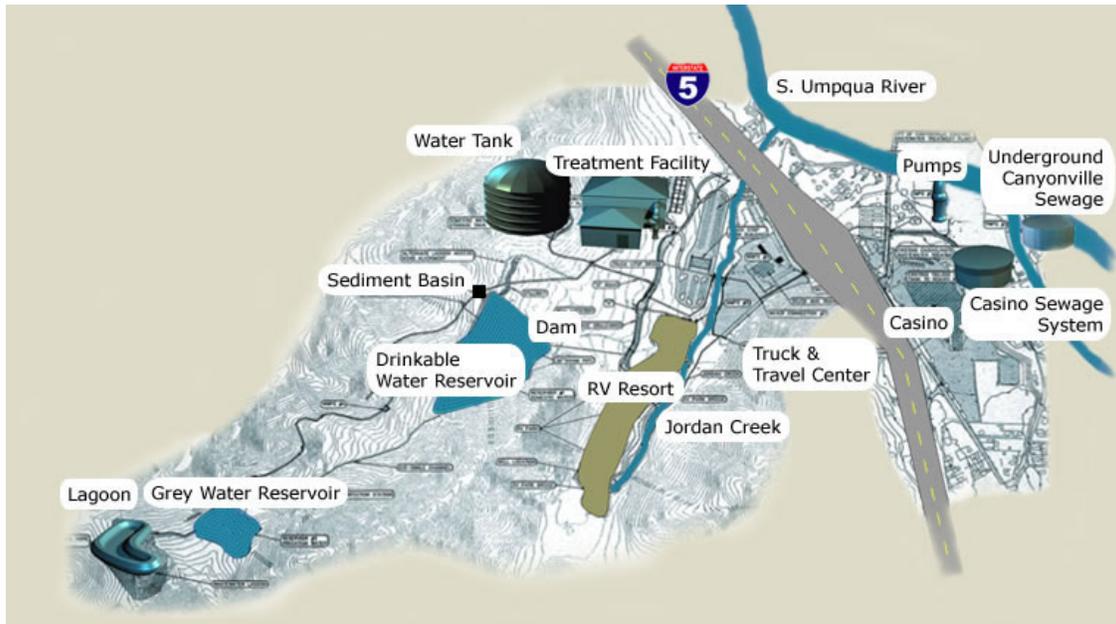


Figure 3-7: Creekside Reservoir No. 1, Looking NE, Feb. 2011



Map prepared by
Glenn B. Coil
Feb. 2012
for Cow Creek Tribal
Hazard Mitigation Plan

Scale: 1:650,000

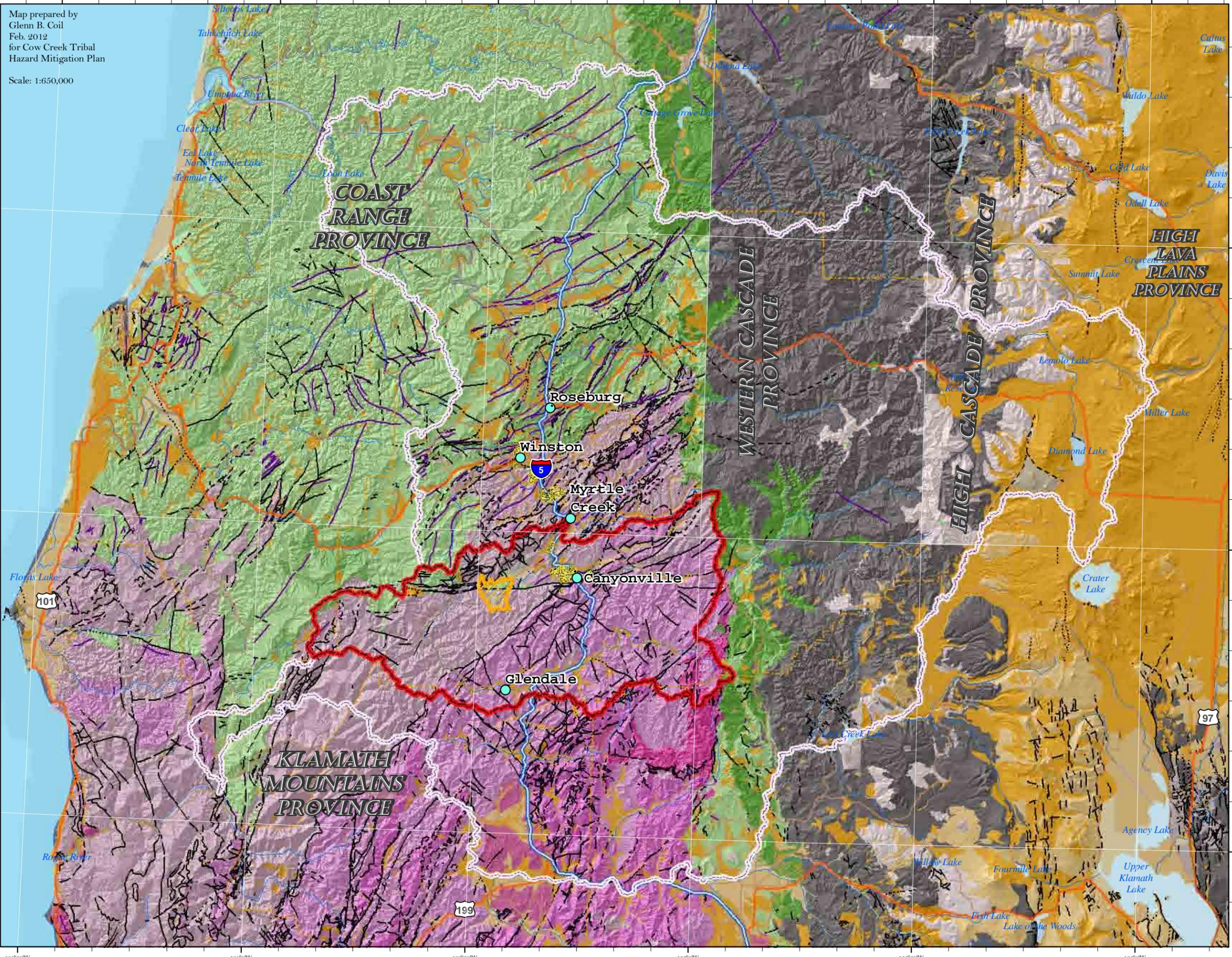


**Figure 3-8:
Geology of SW Oregon &
Cow Creek Tribal U & A**

Usual and Accustomed Area
Treaty Ceded Lands
Tribal Parcels & Properties

Geology
Age Name, Youngest - Oldest

- Recent
- Pleistocene
- Quaternary
- Pliocene/Quaternary
- Pliocene/Pleistocene
- Tertiary/Quaternary
- Pliocene
- Miocene
- Miocene/Quaternary
- Miocene/Pleistocene
- Miocene/Pliocene
- Oligocene
- Oligocene/Miocene
- Eocene
- Eocene/Miocene
- Eocene/Oligocene
- Paleocene/Oligocene
- Paleocene/Eocene
- Cretaceous
- Jurassic/Cretaceous
- Jurassic
- Triassic/Cretaceous
- Triassic/Jurassic
- Paleozoic/Jurassic



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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4. Risk Assessment

4.1. Introduction

This chapter will identify the potential natural hazards that could affect the Cow Creek Tribe and then assess the vulnerabilities of its people, property and natural environment. The geographic focus of the Risk Assessment will be the Tribe's Usual and Accustomed Areas (which generally consist of the Umpqua River watershed and the north side of the Rogue River drainage), with attention and analysis focused on the Roseburg, Winston, Myrtle Creek/Tri-City and Canyonville areas along the Interstate 5 corridor where the majority of Tribe's facilities and properties are located.

The Cow Creek Tribe and their ancestors have been dealing with natural hazards for thousands of years and through experience had become resilient to them. During fierce winter storms and long rainy winters, Cow Creek Umpquas gathered in their semi-subterranean plank and bark covered lodges, located in sheltered canyons below the 300 foot fir and cedar canopy. During the Fall, they would deliberately set wildfires to clear out potential fuels that could create catastrophic wildfires while also maintaining grazing habitat for deer and elk and space for huckleberries and other foods to grow.

The Cow Creek Umpquas knew and are still aware of the dangers natural hazards can create and their stories, histories and legends, some still spoken today, remind us of those dangers and serve as cautionary tales that man will never control nature, but can mitigate against its effects.

One of the most famous Cow Creek Umpqua stories is "The Mountain with a Hole in the Top". It tells the tale of the extremely violent eruption of Mt. Mazama that formed Crater Lake, in the Cascade Mountains on the eastern boundary of the Cow Creek Umpqua's traditional territory. Former Tribal Chairman, Susan Crispen Shaffer, attributes the story to her mother, Ellen Furlong Crispen. According to Shaffer:

"The stories of our people usually had a moral and in this story the setting was during the time the animal-people and the man-people spoke together, but an evil person grew up among the man-people who wanted to be the Chief. He wanted to be greater than old man God, himself, who was Chief of the world (the Great Spirit). He caused much trouble and unrest and finally the animal-people were sent away, then the mountain blew high in the sky and filled with beautiful blue water. The spirits of the Evil ones were put in the bottom of the lake. The animal-people came back and then the man-people but they were never to speak with each other again. The moral is that greed and lust for power often brings destruction."⁶

⁶ A complete telling of "The Mountain with a Hole on Top" can be found at <http://www.cowcreek.com/index.php/the-mountain-with-a-hole-on-top>

Hazards Profiled

The first step in preparing a risk assessment for the Cow Creek Tribe is to identify which natural hazards affect the Tribe. Numerous documents, including the Douglas County Natural Hazards Mitigation Plan, were reviewed. The County encompasses most of the Umpqua River watershed and thus the County Plan analyzes Tribal areas within the scope of this plan. The Douglas County NHMP analyzed seven hazards to see if they affected the county region. They were:

- Flood
- Severe Winter Storms
- Earthquake
- Tsunami
- Windstorm
- Wildfire
- Landslide

Further analysis was conducted to identify which of these hazards specifically affect the Cow Creek Tribe. The study was conducted by analyzing data and maps from a wide range of sources, including State of Oregon GIS hazard data layers and FEMA floodplain maps, and by interviewing Tribal, county and local officials. From this consultation, it was decided to focus on and profile all of the above hazards except **tsunamis**. The Tribe is located in a river valley at least 50 miles inland from the coast and, at Roseburg, at least 450 feet elevation above sea level. *Severe Winter Weather* and *Windstorms* were profiled together under the heading “**Severe Weather**”.

Although Mt. Mazama/Crater Lake volcano lies at the top of the Tribe’s Usual and Accustomed Area, it is not a threat for an eruption nor if it did, would it specifically impact the Tribe’s current properties and facilities in the South Umpqua Valley.

Each hazard profile is broken down into the following sections:

Definitions: a primer of some of the key terms used in the study of the hazard.

General Background: a general overview of the causes and effects of the hazard, focusing on the geological and climatological conditions needed to create the hazard.

Hazard Profile: A detailed profile of the hazard as it affects the Tribe. It is broken down into the following headings:

Location: Where in the study area the hazard could impact people, property and the natural environment;

Extent: How severe or destructive the event could be;

Past Events: A review of past hazard events in the study area; and

Probability: How often a severe event can occur and the likelihood it will occur in the future.

Vulnerability Assessment: This section will describe the Tribe’s vulnerability to each hazard, including its impact on the Tribe’s infrastructure, buildings, houses and critical facilities. The amount, type and values of structures will be discussed if information is available. Land use, current and future, within the hazard area will also be discussed.

Cultural and Historic Sites

For this Plan, specific cultural and historic sites were not identified or analyzed for hazard exposure and vulnerability, although certain locations, such as the 1853 Reservation site, Huckleberry Patch, South Umpqua Falls, family burial grounds and the Tiller Area, were mentioned during meetings and in the surveys as areas of concern.

The tribe’s archeologist will continue to identify areas and locations of Tribal cultural and historic value and will identify, internally, any potential hazards exposure and vulnerability. In general, all historic and cultural sites are considered exposed and vulnerable to all of the hazards discussed in this Risk Assessment.

Tribal Critical Facilities, Exposure and Vulnerability

Table 4-1 discusses the exposure and vulnerability of tribal structures to natural hazards. Vulnerability was ranked by

High: high probability, high risk to damages from natural events

Moderate: has some risk from natural events, either located in hazard area or has structural issues

Low: infrequent risk, newer structures and/or located outside of zones

Comments about vulnerability for each structure (if applicable) are also shown in the Table.

Table 4-1: Tribal Facilities Exposure & Vulnerability Assessment

Facility	Address	Structure Value	Hazards Exposure						Vulnerability	Mitigation Actions	Comment
			Earthquake	Flood	Landslides	Severe Winter Weather & Wind	Wildland Fire	Dam Failure			
Tribal Administration, Health and Wellness Center Complex (4 bldgs.)	2371 NE Stephens Street, Roseburg OR	\$4,582,000	✓	✓		✓			Low	n/a	near Newton Creek
Cow Creek Health and Wellness Center Annex	270 Gazley Bridge Road, Cayonville OR	\$150,000	✓			✓		✓	Low	n/a	
New Canyonville Clinic (opening May 2013)	480 Wantahoo Ln Cayonville, OR	\$3,184,000	✓			✓			Low	n/a	
UIUC (Utility Co-op) (10 bldgs.)	1050 Lagoon Rd, Canyonville, OR 146 Chief Miwaleta Lane, Canyonville, OR Wantahoo Lane & Grazley Bridge Rd, Canyonville, OR	\$8,466,000	✓		✓	✓	✓	✓	Med	n/a	

Facility	Address	Structure Value	Hazards Exposure						Vulnerability	Mitigation Actions	Comment
			Earthquake	Flood	Landslides	Severe Winter Weather & Wind	Wildland Fire	Dam Failure			
Seven Feather Casino & Hotel (6 bldgs, generators & sign)	145 & 146 Chief Miwaleta Lane, Canyonville, 231 Gazeley Bridge Road, Canyonville, OR	\$92,739,000	✓			✓			Low	n/a	
Seven Feathers Truck & Travel Center (4 bldgs & generator)	130 Creekside Drive, Canyonville, OR	\$8,417,000	✓			✓	✓	✓	Low	n/a	
Umpqua Business & Data Center (old Co-op Bldg.)	522 SW Washington, Roseburg, OR	\$1,909,000	✓	✓		✓			Med	n/a	older structure, located near S Umpqua River, downtown Roseburg, isolation
Rio Communications Building	520 Spruce Street, Roseburg, OR 97470	\$859,000	✓	✓		✓			Med	n/a	older structure, located near S Umpqua River, downtown Roseburg, isolation

Future Land Use

The Cow Creek Tribe is committed to expanding its land holdings, developing housing and government services for its Tribal members, and developing its business enterprises, all done with a consideration of the impact natural hazards will have on this continued development.

The Tribe is committed to developing outside of hazard areas. When not possible to develop outside of hazard areas, the Tribe will implement mitigation measures, such as building to or exceeding the highest building code standards, or reducing wildfire fuel loads near structures in the Wildland/Urban Interface, that will minimize the vulnerability of that development. If applicable, each hazard section will discuss future land use in relation to that hazard.

4.2. Earthquake

Definitions

Benioff Zone Earthquake: Sometimes called “deep quakes,” or Intraplate, these occur in the Pacific Northwest when the Juan de Fuca plate breaks up underneath the continental plate, approximately 30 miles beneath the earth’s surface.

Crustal Earthquake: Crustal quakes occur at a depth of 5 to 10 miles beneath the earth’s surface and are associated with fault movement within a surface plate.

Earthquake: An earthquake is the shaking of the ground caused by an abrupt shift of rock along a fracture in the earth such as a fault or a contact zone between tectonic plates. Earthquakes are measured in both magnitude and intensity.

Intensity: Intensity is a measure of the effects of an earthquake. It is measured by the Modified Mercalli scale and is expressed in Roman numerals.

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Magnitude: Magnitude (M) is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Subduction Zone Earthquake: This type of quake, also called Interplate, occurs along two converging plates, attached to one another along their interface. When the interfaces between these two plates slips, a sudden, dramatic release of energy results, propagated along the entire fault line.

General Background⁷

An earthquake is a sudden movement of the Earth, caused by the abrupt release of strain that has accumulated over a long time. Sometimes the movement is gradual. At other times, the

⁷ <http://csc.uoregon.edu/opdr/resources/earthquake>

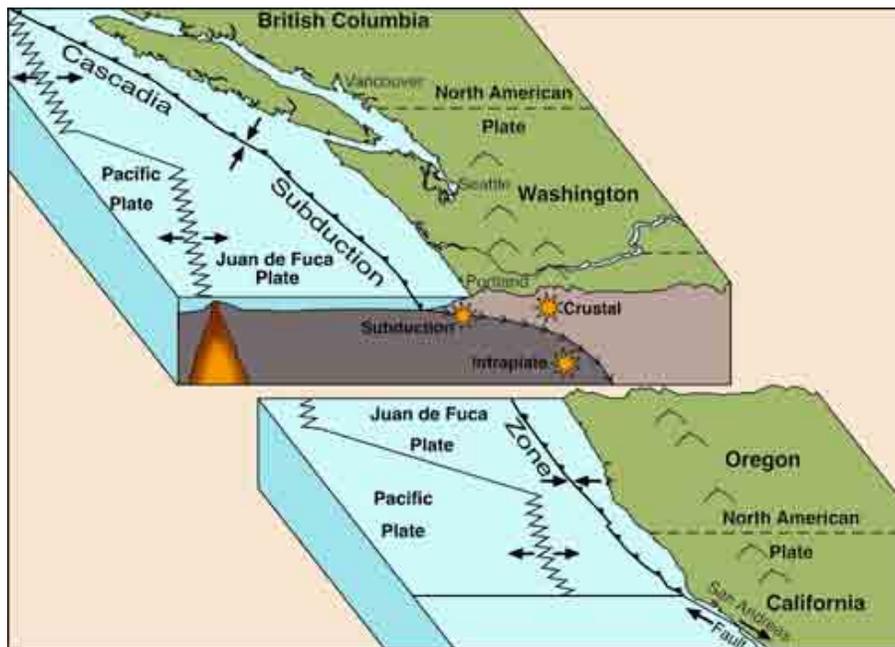
plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free. If the earthquake occurs near populated areas, it may cause many deaths and injuries, and extensive property damage.

Hazard Profile

Location

Oregon is affected by the Cascadia Subduction Zone where the Juan de Fuca plate slides underneath the North American plate. While earthquakes along this zone occur infrequently, plate movement can produce major earthquakes. In addition, Western Oregon is underlain by a large and complex system of faults that can produce damaging earthquakes; these smaller faults produce lower magnitude events, but their ground shaking can be strong and damage can be great to structures nearby. **Figure 4-1** shows the types and causes of earthquakes that can affect western Oregon. **Figure 4-2** show the faults in the Roseburg area and **Table 4-2** is a key to the fault names.

Figure 4-1: Earthquake Causes, Oregon⁸



⁸ Shoreland Solutions. Chronic Coastal Natural Hazards Model Overlay Zone. Salem, OR: Oregon Department of Land Conservation and Development (1998) Technical Guide-3.

Earthquakes can trigger other geologic and soils failures that contribute to damage. While surface fault rupture can produce damage to facilities and infrastructure astride the fault, losses from this are minor compared to those resulting from strong ground shaking and associated ground failures. These include landslides and slope failures, lateral spreading and slumping, and liquefaction.

Figure 4-2: Faults near Roseburg, OR⁹

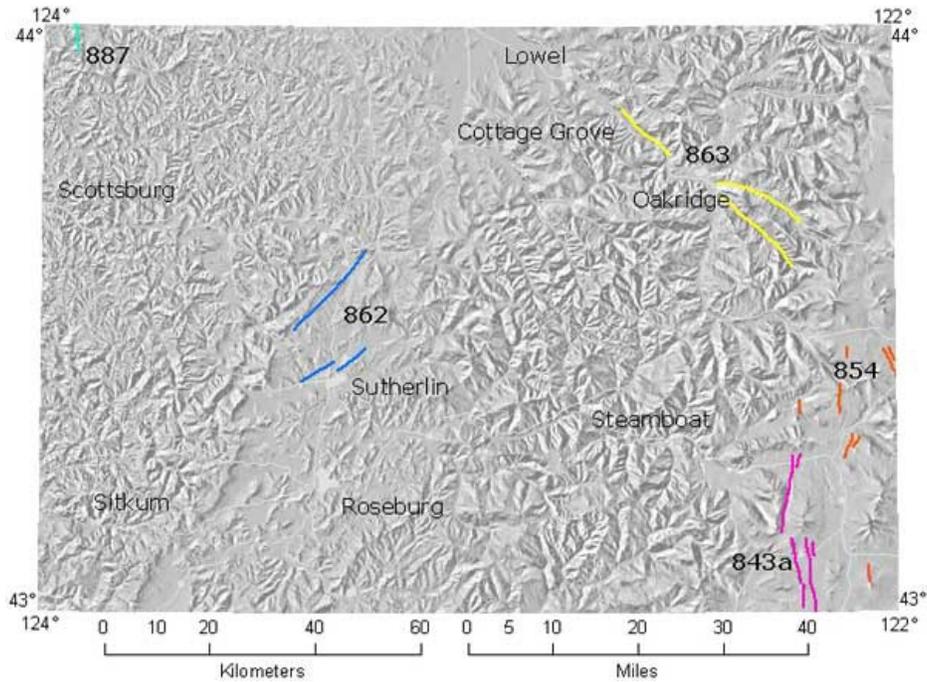


Table 4-2: Key to Roseburg Area Faults

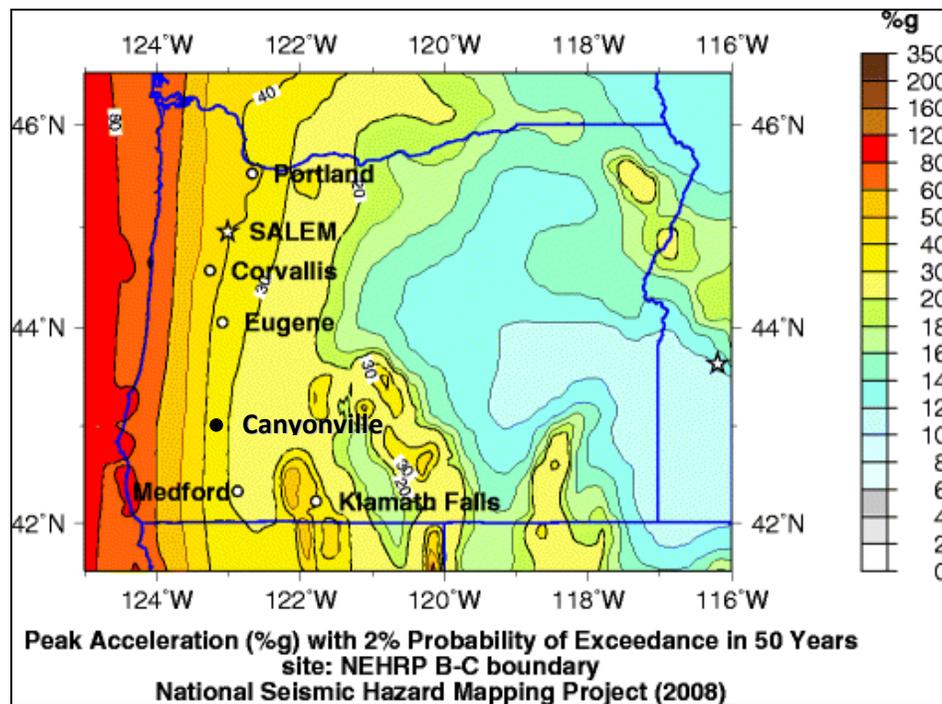
Fault No.	Fault Name
843a	Klamath graben fault system, West Klamath Lake section
854	Unnamed faults north of Diamond Lake
862	Unnamed faults near Sutherlin
863	Upper Willamette River fault zone
887	Unnamed Siuslaw River anticline

⁹ <http://earthquake.usgs.gov/hazards/afaults/or/ros.html>

Severity

The United States Geological Survey (USGS) estimates that the Umpqua Valley area generally would experience peak ground accelerations of 30-40% of gravity. The severity could increase from events caused by local faults and in areas underlain by softer soils such as river valleys and floodplains such as the South Umpqua River valley. **Figure 4-3** shows the seismic risk of Oregon in terms of Peak Acceleration with a 2% probability of exceedance in 50 years, a common measure for severity.

Figure 4-3: Seismic Risk, Oregon



Past Events

The Pacific Northwest has a written history of less than 200 years, much shorter than the recurrence intervals of most active crustal faults, but even this brief history has documented many earthquakes in the region. Nonetheless, dating back to 1841, there have been over 6,000 recorded earthquakes in Oregon, with five significant events since 1910. These are shown below in **Table 4-3**. **Figure 4-4** shows earthquakes in Oregon from 1990 -2006. Colors indicate depth, thus showing most have been shallow (less that 33 miles deep).

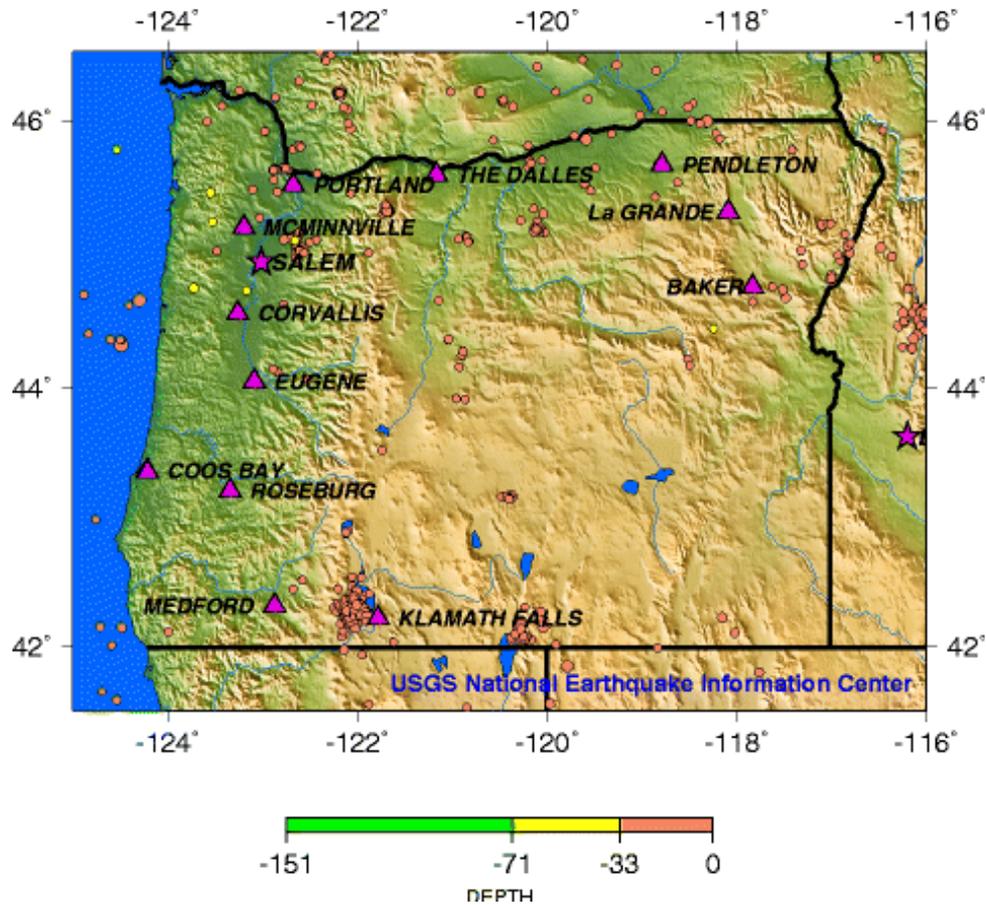
The largest historical earthquake in Oregon occurred on November 23, 1873 near the California border at the coast, estimated M 6.8. Property damage occurred in Crescent City, Port Orford, Grants Pass and Jacksonville. The earthquake was felt in Portland and San Francisco. The earthquake may have occurred in the subducting plate of the Cascadia Subduction Zone.

There have been no recorded earthquakes that have occurred within the Cow Creek Tribe's Usual & Accustomed Areas that have affected the Tribe.

Table 4-3: Past Earthquake Events, Oregon¹⁰

- **1910 08 05 - Oregon - M 6.8**
- **1993 09 21 - Klamath Falls, Oregon - M 6.0 Fatalities 2**
- 2002 06 29 - near Mt. Hood Volcano, Oregon - M 4.5
- 2003 01 16 - Blanco Fracture Zone - Offshore Oregon, - M 6.3
- 2004 07 12 - Offshore Oregon - M 4.9

Figure 4-4: Earthquakes in Oregon 1990-2006, Circles Indicate Earthquakes and Depth



¹⁰ http://earthquake.usgs.gov/earthquakes/states/historical_state.php#oregon

Probability

Although the Cow Creek Tribe has not had a recorded earthquake within its traditional lands, it is 100% likely that the Tribe will feel the effects of an earthquake from regional sources in the future. Evidence shows that Magnitude 9.0 Subduction Zone quakes have occurred on average once every 500 to 600 years, with some gaps between events as little as 200 years and as large as 1,000 years.

Vulnerability

Although the Cow Creek Tribe’s people, property and facilities are exposed to earthquakes, the vulnerability is low to moderate. The tribe has a limited amount of facilities and many were built after Seismic Building Codes for Oregon were strengthened in 1993. The Cow Creek Tribe’s area is encompassed in Seismic Zone 3 of the State Building Code map.

The Tribe’s newer structures, such as the Casino and Administration/Clinic Building, are built to highest seismic standards and would experience minimal structural damage. The Tribe’s wastewater and potable water systems and dams in Canyonville are built to the highest standards and have redundancies for a worst-case scenario. Nonetheless, after a significant event, all Tribal facilities and infrastructure will be inspected for damage.

Structures most vulnerable would be its older commercial facilities in Roseburg and Canyonville. These buildings are listed in **Table 4-4** below.

Table 4-4: Earthquake Vulnerable Buildings

Name	Address	Year Built	Structure Type
Umpqua Indian Foods Production Plant	402 SW Main Street, Canyonville, OR	1945	frame
Riverside Lodge	1786 Stanton Park Road, Canyonville, OR	1948	frame
Rivers West RV Park	333 Ruckles, Canyonville, OR	1950, 1954	frame
UBC /Co-op Building	522 SW Washington, Roseburg, OR	1964	masonry, frame
Rio Networks office bldg.	520 Spruce Street, Roseburg, OR	1964	frame
Swift Building (Surplus Center)	515 Spruce Street, Roseburg, OR	1964	masonry
Starlite Theater	400 Grant Smith Road, Roseburg, OR	1960	masonry
Lilja Office Building	451, 453, & 455 W Corey Court, Roseburg, OR	1965	frame

Name	Address	Year Built	Structure Type
Nelson Building	2058 Airport Rd, Roseburg, OR 97470	1967	frame
UIDC Administration Bldg.	2340 NE Stephens, Roseburg, OR	1946	n/a
Nesika Health Group Office Bldg.	2360 NE Stephens, Roseburg, OR	1965	n/a
Indian Lanes (old bowling alley)	1028 NE Stephens, Roseburg, OR	1962	frame

The Tribe's biggest concern will be the lack of access along the I-5 corridor from damage to local, county and state infrastructure, such as bridges, due to the earthquake or secondary hazards such as landslides. Disruption of critical services will also be an issue for tribal operations, especially in the immediate aftermath of an earthquake.

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4.3. Flooding

Definitions

Base Flood Elevation (BFE): The base flood elevation is the elevation of a 100 year flood event, or a flood which has a 1% chance of occurring in any given year.

Basin: A basin is the area within which all surface water, whether from rainfall, snowmelt, springs or other sources, flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Basins are also referred to as Watersheds or Drainage Basins.

Channel Migration Zone (CMZ)¹¹: Dynamic physical processes of rivers can cause channels in some areas to move laterally, or "migrate," over time. The area within which a river channel is likely to move over a period of time is referred to as the channel migration zone.

Channel migration can occur **gradually**, as a river erodes one bank and deposits sediment along the other. The natural meander patterns of stream channels are the result of the dissipation of energy of flowing water and the transportation of sediment. Channel migration also can occur **abruptly**, as the river channel shifts (or "avulses") to a new location. Avulsions are usually unpredictable events that occur during high flood flows when the existing channel cannot transport all of the water and sediment supplied to it. The highest rates of channel migration generally occur where steep rivers flow out of foothills onto flatter floodplains.

Cubic Feet per Second (cfs): Discharge or river flow is commonly measured in cfs. One cubic foot is about 7.5 gallons of liquid.

Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area (SFHA).

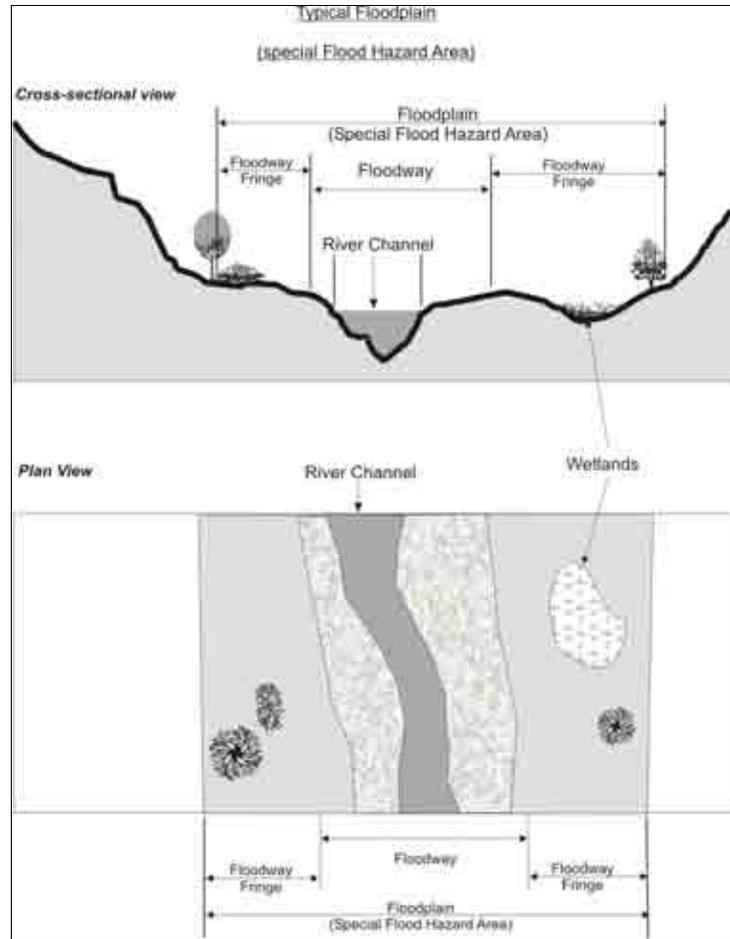
Floodplain: Floodplains are the land area along the sides of rivers that becomes inundated with water during a flood. Floodplain can be defined in different ways, but is commonly defined as the area that is also called the 100 year floodplain. The term 100 year flood is misleading. It is not the flood that will occur once every 100 years. Rather, it is the flood that has a 1% chance of being equaled or exceeded each year. Thus, the 100 year flood could occur more than once in a relatively short period of time. Because this term is misleading, FEMA has properly defined it as the 1% annual chance flood. This 1% annual chance flood is now the standard used by most Federal and State agencies and by the National Flood Insurance Program.

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than one-foot.

¹¹ http://www.ecy.wa.gov/programs/sea/sma/st_guide/jurisdiction/CMZ.html

Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters. See **Figure 4-5**.

Figure 4-5: Floodway Schematic



Floodway Fringe: Floodway fringe areas are those lands that are in the floodplain but outside of the floodway. Some development is generally allowed in these areas with a variety of different restrictions.

Flood Zone Designations: These are the different flood hazard zones FEMA uses for FIRMs. These designations may be found on the flood hazard maps for Whitman County's communities.

Zone A: An area inundated by 100-year flooding, for which no Base Flood Elevations (BFEs) have been determined.

Zone AE: An area inundated by 100-year flooding, and which BFEs have been determined.

Zone ANI: An area that is located within a community or county that is not mapped on any published FIRM.

Zone X500 (0.2% annual chance): An area inundated by 500-year flooding; an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile; or an area protected by levees from the 100-year flooding.

National Flood Insurance Program: In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods.

The Mitigation Division is a section of the Federal Emergency Management Agency (FEMA) manages the NFIP, and oversees the floodplain management and mapping components of the Program. Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities.

FEMA contracted the Army Corps of Engineers to map the floodplains, floodways, and floodway fringes. Figure 4-5 depicts the relationship among the three designations.

Pre and Post FIRM rates: Category of rates published in the National Flood Insurance Program Manual, applying to buildings located in a community qualifying for the regular flood program. Post-FIRM rates are used on building construction that started after December 31, 1974, or after the community's initial Flood Insurance Rate Map was published, whichever is later. These rates are lower than pre-FIRM rates.

Repetitive Loss Properties:¹² A **residential property** that is covered under an NFIP flood insurance policy and:

- (a) That has at least four NFIP claim payments (including building and contents) over \$5,000 each, and the cumulative amount of such claims payments exceeds \$20,000; or
- (b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and Zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems.

¹² Definition from FEMA: <http://www.fema.gov/government/grant/srl/>

Stream Bank Erosion:¹³ Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are “bad” and in need of repair.

Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Streamgage: A streamgage is a structure located beside a river that contains a device to measure and record the water level in a river. Generally these measurements occur every 15 minutes. The USGS operates a network of about 7,000 streamgages nationwide, and at about 5,000 of these, the data is sent back via satellite to an USGS office every 4 hours and more frequently in time of flooding. The flow and gage-height data are then made available to users over the internet (<http://water.usgs.gov/nwis/>).

Subbasin: A subbasin is a tributary basin of a larger basin or watershed. Cow Creek and South Umpqua River watersheds are subbasins of the Umpqua basin.

Zero-Rise Floodway: A ‘zero-rise’ floodway is an area reserved to carry the discharge of a flood without raising the base flood elevation. Some communities have chosen to implement zero-rise floodways because they provide greater flood protection than the floodway described above, which allows a one foot rise in the base flood elevation.

General Background

A flood is the inundation of normally dry land resulting from the rising and overflowing of a body of water. A natural geologic process that shapes the landscape, floods provide habitat and create rich agricultural lands. Human activities and settlements tend to use floodplains, frequently competing with the natural processes and suffering inconvenience or catastrophe as a result. Human activities encroach upon floodplains, affecting the distribution and timing of drainage, and thereby increasing flood problems. The built environment creates often localized flooding problems outside natural floodplains by altering or confining drainage channels. This increases flood potential in two ways: 1) it reduces the stream’s capacity to contain flows; and 2) increases flow rates downstream. Floods also cause erosion and landslides, and can transport debris and toxic substances that can cause secondary hazards.

¹³ Definition from: <http://washtenawcd.org/az/streambankeros.php>

Hazard Profile

Flooding represents the most common and best known of the natural hazard threats in Douglas County and the Cow Creek Tribe's Usual and Accustomed Area. They also encompass the broadest range of characteristics among natural hazards. Floods can occur quickly, as in flash floods, or slowly, as those resulting from the spring thaws. Floods can be of extreme magnitudes in confined locations, such as canyons, or a costly nuisance, as in broad river valleys. The topography and geology of the Umpqua River Basin are conducive to runoff, and peak flows on many of the tributaries occur within hours of the passage of weather fronts. Historically, the highest flows usually occur during the period from November through March as a result of the heavy rains augmented by snow melts. Heavy rains in Douglas County occur on a semi-annual basis and often affects the safety of property and/or life as does major flooding events.

Location

The Cow Creek Tribe is generally affected by riverine flooding from the South Umpqua River between Roseburg and Canyonville and to a lesser extent by its tributaries. The Tribe can also be affected by urban flooding and dam failure flooding.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural process of riverine flooding adds sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers.

Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100- year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

The Tribe's exposure to riverine flooding is from the South Umpqua River. Newton Creek, in Roseburg, may affect the Tribal Administration building and nearby facilities, especially if combined with urban flooding. Deer Creek in downtown Roseburg, combined with the South Umpqua River, may also affect tribal facilities in Downtown Roseburg. In Canyonville, tribal property and facilities located near the confluence of Canyon Creek and the South Umpqua River are exposed.

Maps of Tribal exposed lands and structures in the FEMA floodplain can be seen in **Figure 4-6** through **Figure 4-13**. The maps are ordered from north to south, starting with north Roseburg and the Administration Building and ending at Canyonville.

Urban Flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force.

Although most of the Tribe's lands are located in rural areas, its government facilities and economic developments, such as the Seven Feathers Casino and Truck Stop, are located in urban areas with impermeable surfaces that either collect water, or concentrate the flow of water. During periods of urban flooding, streets carry water to culverts. Culverts and storm drains sometimes back up with vegetative debris causing localized flooding.

The Tribe's urban flooding risks are in Roseburg and Canyonville.

Dam Failure Flooding

Loss of life and damage to structures, roads, utilities and crops may result from a dam failure. Economic losses can also result from a lowered tax base and lack of utility profits. These effects could possibly accompany the failure of one of the major dams in Douglas County. Six major water impoundment dams have been developed in Douglas County to serve flood control and water needs. Because dam failure can have severe consequences, FEMA requires that all dam owners develop Emergency Action Plans (EAP) for warning, evacuation, and post-flood actions. Although there may be coordination with tribal, county and state officials in the development of the EAP, the responsibility for developing potential flood inundation maps and facilitation of emergency response is the responsibility of the dam owner.

Tribal lands and facilities, as well as local businesses and homes can be affected by flooding from the dam failures of its Creekside Development Project, which consists of three dams above Jordan Creek in Canyonville. The Tribe has prepared an Emergency Action Plan that includes detailed inundation maps based on different flooding scenarios.

Tribal lands and structures exposed to dam failure inundation are shown in **Figure 4-14** through **Figure 4-17**. Each map shows a different flood inundation scenario as discussed in the Vulnerability section.

Severity

Severity of flooding can be determined by the height of the South Umpqua River and its tributaries in comparison to flood stages determined for the USGS streamgages located throughout the area. See **Table 4-5** for a list of highest flood crests in Douglas County for major events from 1950-2005.

Severity can also be measured by past damages from flooding, but because of lack of specific tribal history and damages from flooding, county-wide figures can only be used to generalize the severity of flooding that may affect tribal lands and facilities.

The 1964 and 1996 floods are considered the most severe floods in Douglas County history. Using information from the Douglas County Hazard Mitigation Plan, the 1964 flood caused \$26 million in damages, while the 1996 flood caused \$2 million in reported damages to county and private property. Correcting for inflation to 1996 dollars, the 1964 flood would have cost \$131 million.

Using the SHELDUS database¹⁴, which is an online compilation of National Climatic Data Center (NCDC) storm damage reports, it was found that the most severe flood event in Douglas County, adjusted to 2011 dollars, was in 1974, with the November 1996 floods the second most severe. See **Table 4-6** for a summary of damages as reported in the SHELDUS database for Douglas County.

¹⁴ "Hazards & Vulnerability Research Institute (2011). The Spatial Hazard Events and Losses Database for the United States, Version 9.0 [Online Database]. Columbia, SC: University of South Carolina. Available from <http://www.sheldus.org> "

Table 4-5: Flood Levels in Douglas County, 1950-2005¹⁵

STATION NAME	FLOOD STAGE (feet)	1950 10/29-30	1955 12/22	1961 2/10	1961 11/23	1964 12/22-23	1965 12/28	1971 1/17-18	1974 1/15	1981 12/6	1983 2/17-18	1996 11/18-19	1996 12/7-8	1998 11/21-22	2005 12/30-31
South Umpqua River @ Tiller	18.0'	22.35'	20.85'		16.53'	25.72'		18.46'	18.36'	18.37'	16.80'	22.17'	17.08'	15.87'	18.40'
South Umpqua River nr. Riddle	19.0'											19.00'	20.09'	15.18'	20.38'
South Umpqua River @ Winston	26.0'	32.4'	31.55'		25.50'	34.28'		30.62'	32.64'	28.74'	30.32'	24.63'	28.46'	18.18'	26.63'
South Umpqua River @ Roseburg	22'		29.20'			34.05'		27.83'	30.50'	24.90'	27.70'	22.09'	26.29'	17.54'	23.80'
Deer Creek nr. Roseburg	10.0'	13.38'	13.67'		12.45'	11.88'	14.76'	13.43'	12.73'	15.39'	14.29'	14.35'	13.96'	12.76'	13.68' 13.44'
Cow Creek Blw. McCullough Creek nr. Glendale	12.0'											7.68'	14.56'	7.39'	12.85'
Cow Creek nr. Azalea	10.0'	14.37'	12.76'		9.13'	15.63'		11.80'	16.40'	14.94'	14.78'				
Cow Creek nr. Riddle	22.0'	28.50'	27.35'		17.57'	27.67'		25.01'	28.17'	24.42'	26.79'	15.75'	22.45'	12.90'	20.42'

* red fonts denotes record stage

¹⁵ Douglas Co. River Flood Crest History, http://www.co.douglas.or.us/flood_crest.asp

Table 4-6: Severity of Flooding in Douglas County, by Monetary Damages, SHELUS

Hazard ID #	Begin Date	End Date	Hazard Type	Property Damage, Adjusted to 2011 dollars	Property Damage, event year dollars	Injuries	Fatalities	Remarks
8632201	1/13/1974	1/17/1974	Flooding	\$54,260,870	\$12,000,000	0	10	Floods
62631	11/17/1996	11/21/1996	Flooding	\$20,222,222	\$14,000,000	2	1.67	Floods
48257	1/1/1997	1/5/1997	Flooding	\$15,379,151	\$10,942,857	0	0	Floods
8990838	12/20/1964	12/25/1964	Flooding - Severe Storm/Thunder Storm	\$11,255,411	\$1,515,152	0	0.55	Rain and flooding
405297	12/26/2005	12/31/2005	Flooding	\$3,281,778	\$2,840,000	0	0	Flood
62632	12/7/1996	12/10/1996	Flooding	\$1,925,926	\$1,333,333	0	0	Floods
8676217	2/22/1986	2/23/1986	Flooding - Severe Storm/Thunder Storm	\$358,621	\$172,414	0	0	Heavy Rain, Flooding
8646950	12/12/1977	12/20/1977	Flooding - Landslide - Severe Storm/Thunder Storm - Wind - Winter Weather	\$80,745	\$21,739	0	0.17	High Wind, Heavy Rain, Flood, Heavy Snow, Mudslide
62633	2/6/1996	2/15/1996	Flooding	\$41,270	\$28,571	0	0.5	Floods
8676206	2/15/1986	2/16/1986	Flooding - Severe Storm/Thunder Storm	\$17,333	\$8,333	0	0	Heavy Rain, Flooding
8549550	12/27/1965	12/29/1965	Flooding - Severe Storm/Thunder Storm - Winter Weather	\$14,286	\$1,923	0.38	0	Heavy rains in western valleys, snow in mountains and Columbia Gorge

Hazard ID #	Begin Date	End Date	Hazard Type	Property Damage, Adjusted to 2011 dollars	Property Damage, event year dollars	Injuries	Fatalities	Remarks
8682339	1/2/1987	1/3/1987	Coastal - Flooding - Wind	\$14,286	\$7,143	0	0	High Wind and Coastal Flood
8683331	2/1/1987	2/4/1987	Flooding	\$14,286	\$7,143	0	0.14	Flood
8687964	12/1/1987	12/3/1987	Coastal - Flooding - Wind	\$14,286	\$7,143	0	0	High Wind, Coast Stream Flood
8688747	1/13/1988	1/14/1988	Flooding - Wind	\$13,757	\$7,143	0	0	Wind, Flood
9055080	1/14/1980	1/14/1980	Flooding - Severe Storm/Thunder Storm	\$13,684	\$5,000	0	0	Rain/Floods
8538428	2/1/1963	2/3/1963	Flooding - Winter Weather	\$10,317	\$1,389	0	0	Flooding from rapid snow melt
8646973	12/2/1977	12/4/1977	Flooding - Severe Storm/Thunder Storm	\$8,075	\$2,174	0	0.04	Heavy Rain, Flood
8692580	11/21/1988	11/22/1988	Flooding - Wind	\$8,025	\$4,167	0	0	Wind, Flood
8715568	12/1/1980	12/3/1980	Flooding - Severe Storm/Thunder Storm	\$5,950	\$2,174	0	0	Rain, flood
8886761	11/16/1960	11/17/1960	Flooding - Severe Storm/Thunder Storm - Wind	\$1,615	\$217	0	0	Wind, Rain, High Water
8886785	11/19/1960	11/20/1960	Flooding - Severe Storm/Thunder Storm - Wind	\$1,161	\$156	0	0	Wind, rain, flooding

Past Events

Floods have been a fact of life in the Cow Creek Tribe's Usual and Accustomed Areas for thousands of years of tribal inhabitation.

Recorded flooding history in the Douglas County area began as early as 1861 when the great freshet of 1861 washed away lower Scottsburg.

Years with Established Flood Records are 1861, 1890, 1893, 1907, 1909, 1927, 1931, 1932, 1942, 1945, 1948, 1950, 1953, 1955, 1956, 1958, 1961, 1964, 1971, 1974, 1981, 1983, 1996, and 2005.

The floods which occurred in 1945, 1955, 1961, 1964, 1971, 1974, 1974, 1981, 1983, 1996, and 2005 represent when the North, South and Main Umpqua, Cow Creek, Deer Creek, Elk Creek and Calapooya Creek were at or above established flood levels, representing moderate to major flooding.

Although the 1996 floods were devastating to the entire region, the floods of 1890, and 1964 were larger.

The 1996 Flood is a good example of what a typical major flood would look like, and thus will be quoted in full from the Douglas County Hazard Mitigation Plan¹⁶:

"A heavy rainstorm occurred in Douglas County on November 17, 18 and 19, 1996. The storm delivered between 2-4 inches of rain in one night depending on location. Roseburg received 4.35 inches of rain in one day, breaking the old 1965 record of 3.28 inches. Many of the rivers and smaller tributaries in the county quickly reached their flood levels, causing flooding. The flooding warranted road closures (including washing out a portion of Interstate 5 near Roseburg) and the evacuation of some homes in the County.

Strong winter storms beginning in early December 1996 and continuing through December 15, 1996 began building the snowpack over the southwestern portion of the state. Water equivalent of the snow pack ranged from 2-6 inches in southwest Oregon. Widespread rain showers followed the storm that brought heavy snows to the Cascade Mountains on December 19 and 20, 1996.

Beginning on December 25, 1996, a moist weather front, originating near the Hawaiian Islands, began moving toward Oregon. This front moved inland over the state, starting a series of storms that lasted through January 1, 1997. The moist front that existed during this period produced repeated periods of moderate to heavy rainfall and the freezing level to above 10,000 feet by December 30, 1996. The melting snow pack and moderate

¹⁶ 2009 Douglas County NHMP – Flooding, pages 21-22

to heavy rainfall that resulted from these conditions produced near record flows in rivers and streams of Douglas County. Rivers began decreasing in flow by January 3.

A combination of high river levels, accumulated silt and debris, land and mudslides and saturated soils created public safety concerns.

The combined effects of flooding, land/mud slides and sinkholes damaged many city and county transportation facilities. As a result of road closures, many rural communities were difficult to reach by road. Road closings affected access to private and federal timber harvest areas. Major highways experienced damage, including Interstate Highway 5, U.S. Highway 101 and State Highways 42 and 38.

In addition, both disasters damaged the agricultural economy by damaging crops, outbuildings and equipment. Erosion of productive soils and deposition of debris in agricultural areas caused problems. Businesses throughout the County experienced damage and lost revenues.”

The USGS also prepared a study on the 1996 floods titled **“Floods of November 1996 through January 1997 in the Umpqua River Basin, Oregon”**. This can be found at <http://pubs.usgs.gov/fs/2004/3134/>.

The Tribe is well aware of the damages caused by the 1996 Flood and to a lesser extent by the 2005 flood event, but did not incur any specific damages from these events. Nonetheless the Tribal land base has grown since the 1996 flood, with more properties and buildings located in the floodplain and thus is preparing, as well as mitigating, for the next major event.

Probability/Frequency

The region experiences some flooding at least twice a year, with larger floods occurring at least once a decade. Based on past events, major flooding seems to occur at least every 30 -50 years.

Vulnerability

GIS analysis was used to determine tribal property and structures vulnerable to flooding. Property and buildings located within the FEMA 100- or 500- year floodplain as well as the Creekside Dam Failure Inundation Zones were used to determine risk.

Property

For property, the Tribe's GIS layer "ParcelsFebruary10_2010_CCBUTI", current to April 2011, was analyzed. To calculate area of parcels within floodplain, the ACREAGE field, which depicts GIS area, as opposed to Douglas County Assessor's area, was used.

Analysis determined that 67 of the Tribe's 187 parcels were at least partially located in the 100- or 500- year floodplain. Further analysis found that 490 acres, or about 10% of the Tribe's total land area of 4,786 acres, are located within the 100- or 500- year floodplain.

Of the 67 parcels,

- o at least 43 also contain areas located in the FEMA designated Floodway.
- o 36 parcels have 50% or more of their land area located in the 100 or 500 year floodplain

A list of tribal parcels with land area within the 100- or 500- year floodplain is shown in **Appendix E**.

The parking lot of the Umpqua Business and Data Center is located in the 100 & 500-year floodplain.

Buildings/Facilities

In Roseburg, the Kennerly property and its building are located within the floodplain of nearby Newton Creek. The building is partially located in the 500-year floodplain. Part of the Administration Building's property is also located in the Newton Creek floodplain, although there is no development located in the floodplain area of this property.

Downtown properties, including the UBC/Co-op Building, Rio Communications, the Swift Building and the Lilja Office Building, although not located in the floodplain, are considered vulnerable due to their proximity to the Umpqua River and potential isolation and damage or wash-out of the Washington St and Oak St Bridges.

The Rivers West RV Park is vulnerable to flooding.

GIS analysis of building vulnerability

GIS analysis found 17 tribal structures located in the FEMA 100-year floodplain. Two of these structures will be torn down during the renovation of the UBC Co-op Building and will be used as a parking lot.

These structures are listed in **Table 4-7**.

Table 4-7: Structures in FEMA 100-Year Floodplain

Address	City	Description
1878 Stanton Park Rd.	Canyonville	House (office building) (Riverside)
231 Gazley Bridge Rd.*	Canyonville	House/Garage (Block)
100 Aviation Dr.	Myrtle Creek	Single wide mobile home (Weaver Interchange)
8643 Old Highway 99 South	Winston	Apartment (UCC Foundation)
8645 Old Highway 99 South	Winston	House (UCC Foundation)
4623 Dole Rd.	Myrtle Creek	n/a
724 Aviation Dr.	Myrtle Creek	Double wide mobile home (Manshack)
322 Aviation Dr.*	Myrtle Creek	House (Walker)
724 Aviation Dr.*	Myrtle Creek	Workshop (Manshack)
100 Aviation Dr.	Myrtle Creek	Maintenance Shop (Weaver Interchange)
322 Aviation Dr.*	Myrtle Creek	Barn (Walker)
8643 Old Highway 99 South	Winston	Bldg. 1 two story barn (UCC Foundation)
8643 Old Highway 99 South	Winston	Bldg. 2 barn (UCC Foundation)
522 SE Washington Ave – being torn down, 2012	Roseburg	Bldg. 2 storage bldg. (DC Coop) (RBIC)
522 SE Washington Ave – being torn down, 2012	Roseburg	Bldg. 1 storage bldg. (DC Coop) (RBIC)
231 Gazley Bridge Rd.	Canyonville	n/a
231 Gazley Bridge Rd.	Canyonville	Bus garage

* **Bold indicates in floodway**

Of these, building information was available for 15 structures. Six of these structures are listed as dwellings, with the remainder workshops and barns. The two old Co-op storage buildings which are being torn down are included. Altogether, about **\$1.367 million** worth of buildings are located in the floodplain.

Of these, four (4) structures were found to be located in the floodway. They are shown in **Table 4-8**.

Table 4-8: Structures in FEMA Floodway

Address	City	Description
231 Gazley Bridge Rd.	Canyonville	House/Garage (Block)
322 Aviation Dr.	Myrtle Creek	House (Walker)
322 Aviation Dr.	Myrtle Creek	Barn (Walker)
724 Aviation Dr.	Myrtle Creek	Workshop (Manshack)

In addition, eight (8) structures were found to be in the FEMA 500-year floodplain. In total these structures are worth \$362,681. These are listed in **Table 4-9**. Structure data was not available for one of the buildings.

Table 4-9: Structures in FEMA 500-Year Floodplain

Address	City	Description
295 Gazely Rd.	Canyonville	Double wide mobile home (McNeil Casino)
299 Gazely Rd.	Canyonville	Two story house (McNeil Casino)
299 Gazely Rd.	Canyonville	Workshop (McNeil Casino)
1878 Stanton Pk.	Canyonville	Bldg 1 shed (Riverside)
1878 Stanton Pk.	Canyonville	Bldg 2 garage/carport (Riverside)
5719 Dole Rd.	Myrtle Creek	Barn 1 – Lower Gray
5719 Dole Rd.	Myrtle Creek	Barn

Structures and Facilities Exposed to Creekside Dam Flood Inundation

For the Creekside Dam No. 1 and Irrigation Water Reservoir Emergency Action Plan, four flood inundation scenarios were mapped:

- S1: Creekside Dam No. 1 failure, Flood from Creekside Reservoir into Jordan Creek and through Jeffreys Rd/I-5 underpass.
- S2: Creekside Dam No. 1 failure, Flood from Creekside Reservoir into Jordan Creek, and Jeffreys Rd/I-5 underpass **BLOCKED**.
- S3: Irrigation Water Reservoir (IWR) main Dam failure, flood from IWR into Jordan Creek and through Jeffreys Rd/I-5 underpass.
- S4: Irrigation Water Reservoir (IWR) main Dam failure, flood from IWR into Jordan Creek and Jeffreys Rd/I-5 underpass **BLOCKED**.

GIS analysis was conducted to determine the amount and value of structures potentially exposed to the flooding.

- Scenario 1: 26 structures & 9 transformers, **\$2,847,065** in property exposed.
- Scenario 2: 14 structures & 9 transformers, **\$2,024,266** in property exposed.
- Scenario 3: 32 structures & 27 transformers (26 structures & 9 transformers from S1, plus six additional structures and 18 transformers) , **\$4,442,939** in property exposed.
- Scenario 4: 20 structures & 27 transformers (14 structures & 9 transformers from S2, plus six additional structures and 18 transformers) , **\$3,620,140** in property exposed.

Flooded facilities include the Riverside Lodge, Canyon Cubbyholes self-storage (unless Underpass blocked), Seven Feathers RV Resort, the Travel Center Sign, the Clinic annex, and some mobile homes along Rod & Gun Club Rd.

Cultural/Sacred

Many tribal historic and cultural sites, such as fishing camps and traditional villages, are located in flood-prone areas. For this plan, no exact locations have not been identified at this time.

Future Land Use

The Tribe has no plans to locate any major facilities or development in the Floodplain. The new clinic in Canyonville, scheduled to open in May 2013, was originally identified as being located in the floodplain. It was relocated/redesigned out of the floodplain before construction began.



**Figure 4-6:
FEMA Flood Zones &
Exposed Structures
North Roseburg, OR**

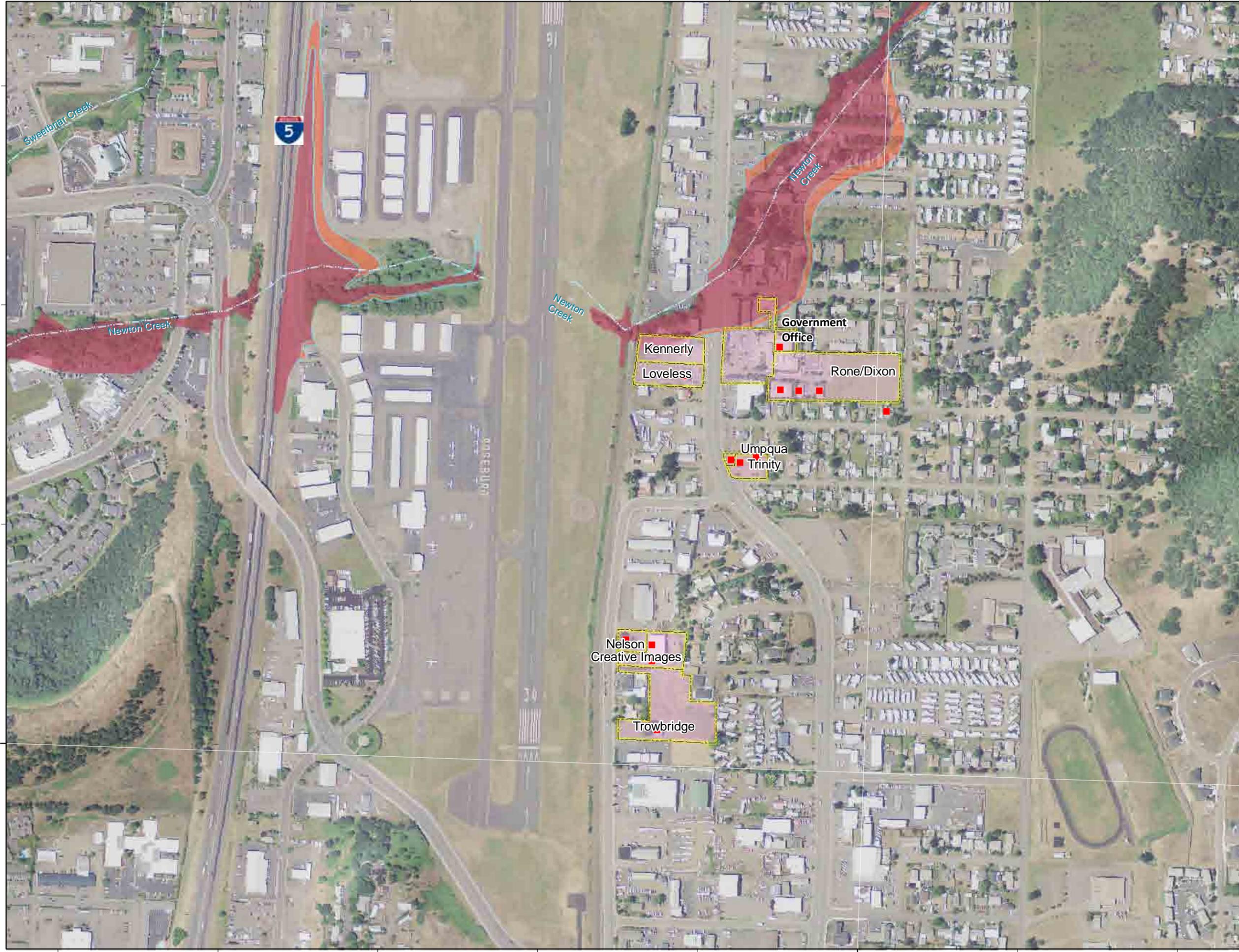
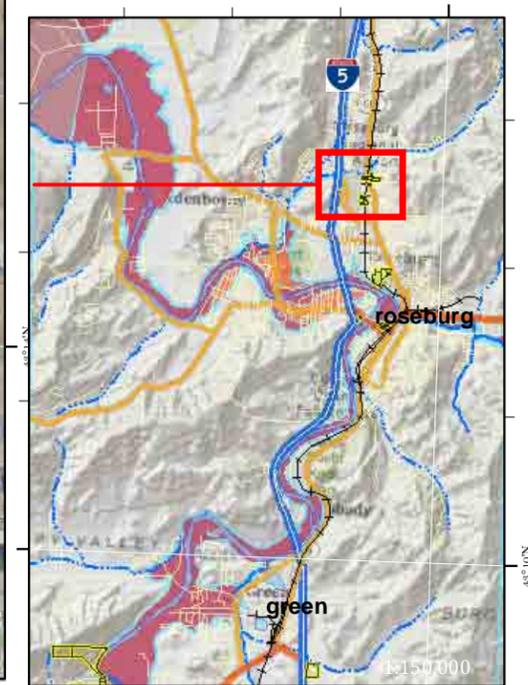
- Tribal Parcels & Properties
 - Tribal Buildings
 - ▲ Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Floodzones in the downtown Roseburg, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:7,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-7:
FEMA Flood Zones &
Exposed Structures
Downtown Roseburg, OR**

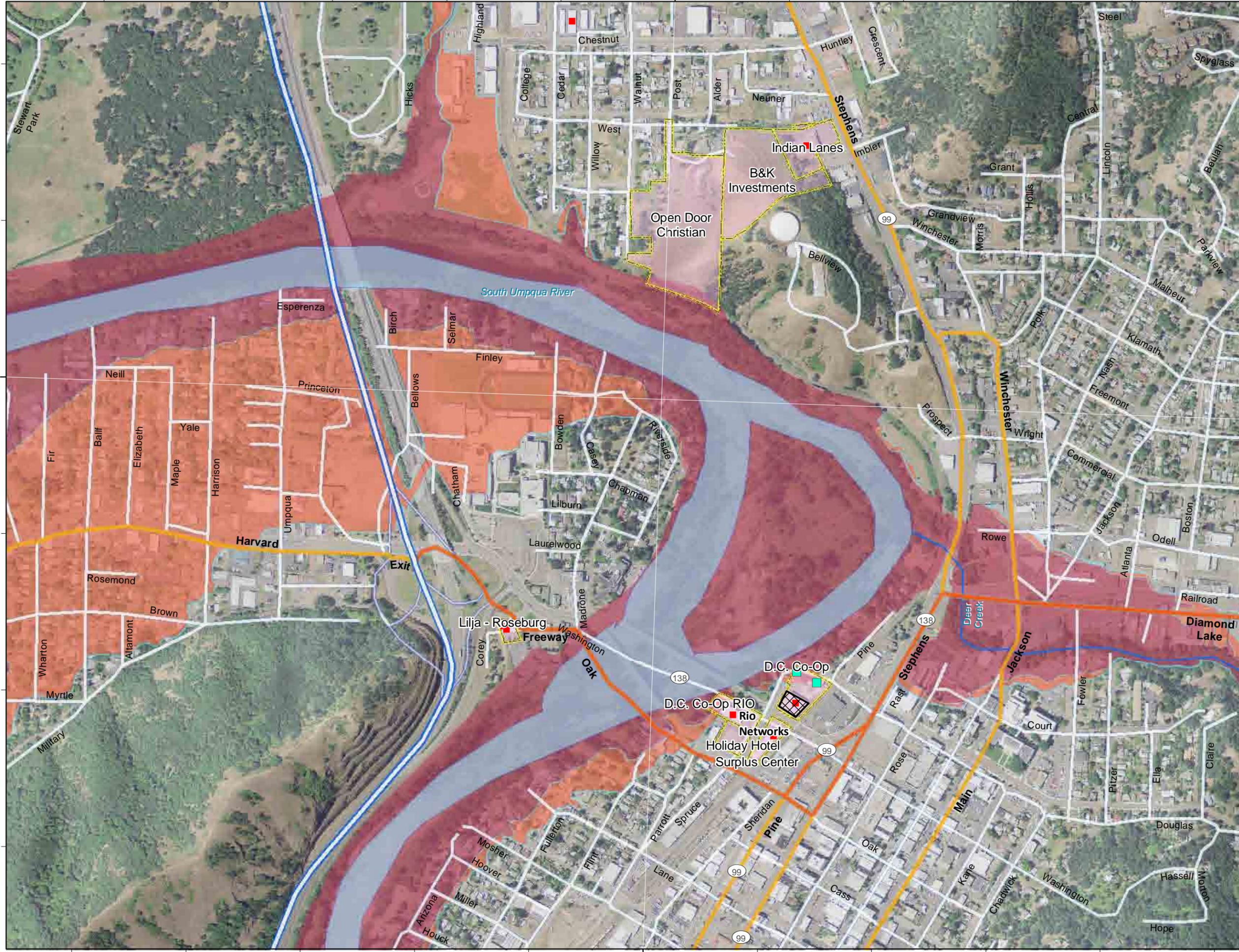
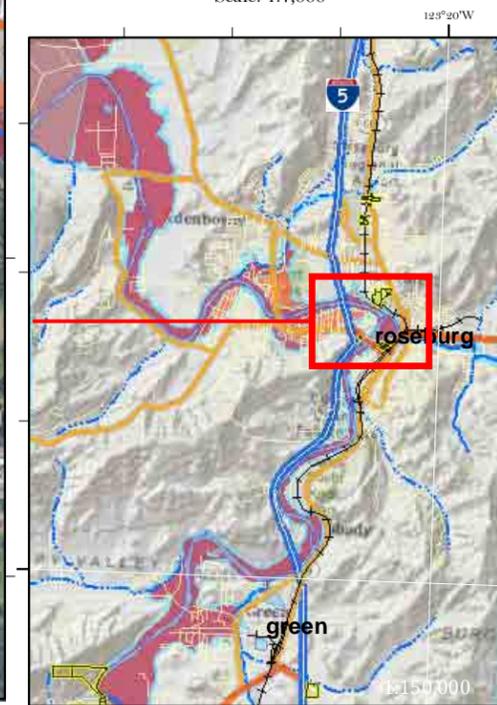
- Tribal Parcels & Properties
 - Tribal Buildings
 - ▲ Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Floodzones in the downtown Roseburg, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:7,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-8:
FEMA Flood Zones &
Exposed Structures
Winston-Dillard, OR**

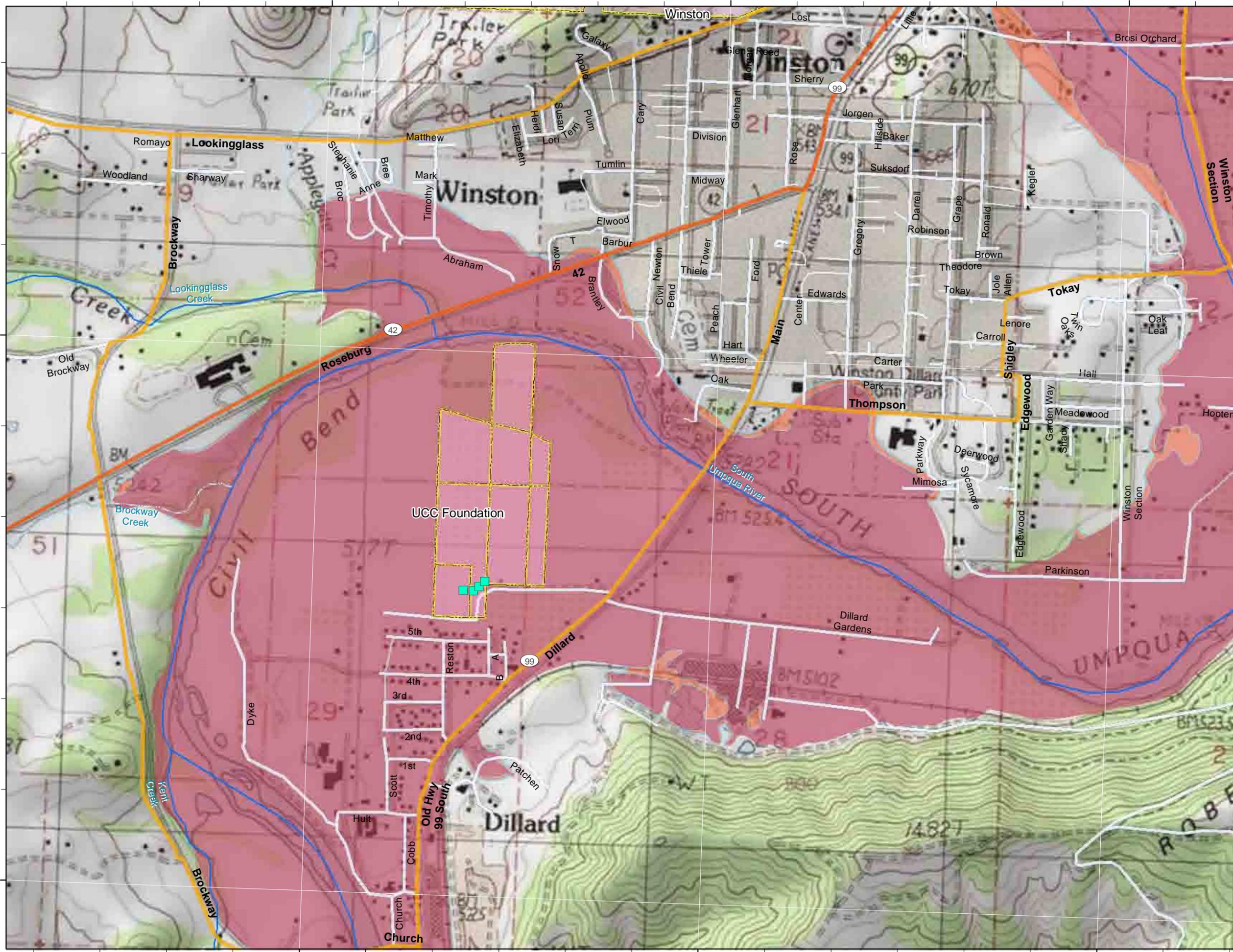
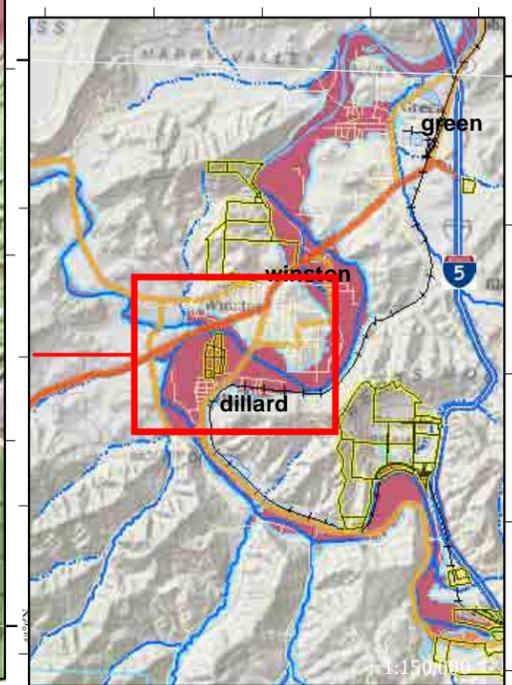
- Tribal Parcels & Properties
 - Tribal Buildings
 - Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Floodzones in the Dillard, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:12,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-9:
FEMA Flood Zones &
Exposed Structures
K-Bar Ranch/Round Prairie**

- Tribal Parcels & Properties
- Tribal Buildings
- ▲ Buildings in Floodway
- Buildings in 100-Year Floodplain
- Buildings in 500-Year Floodplain

FEMA Flood Hazard Areas

Flood Zones

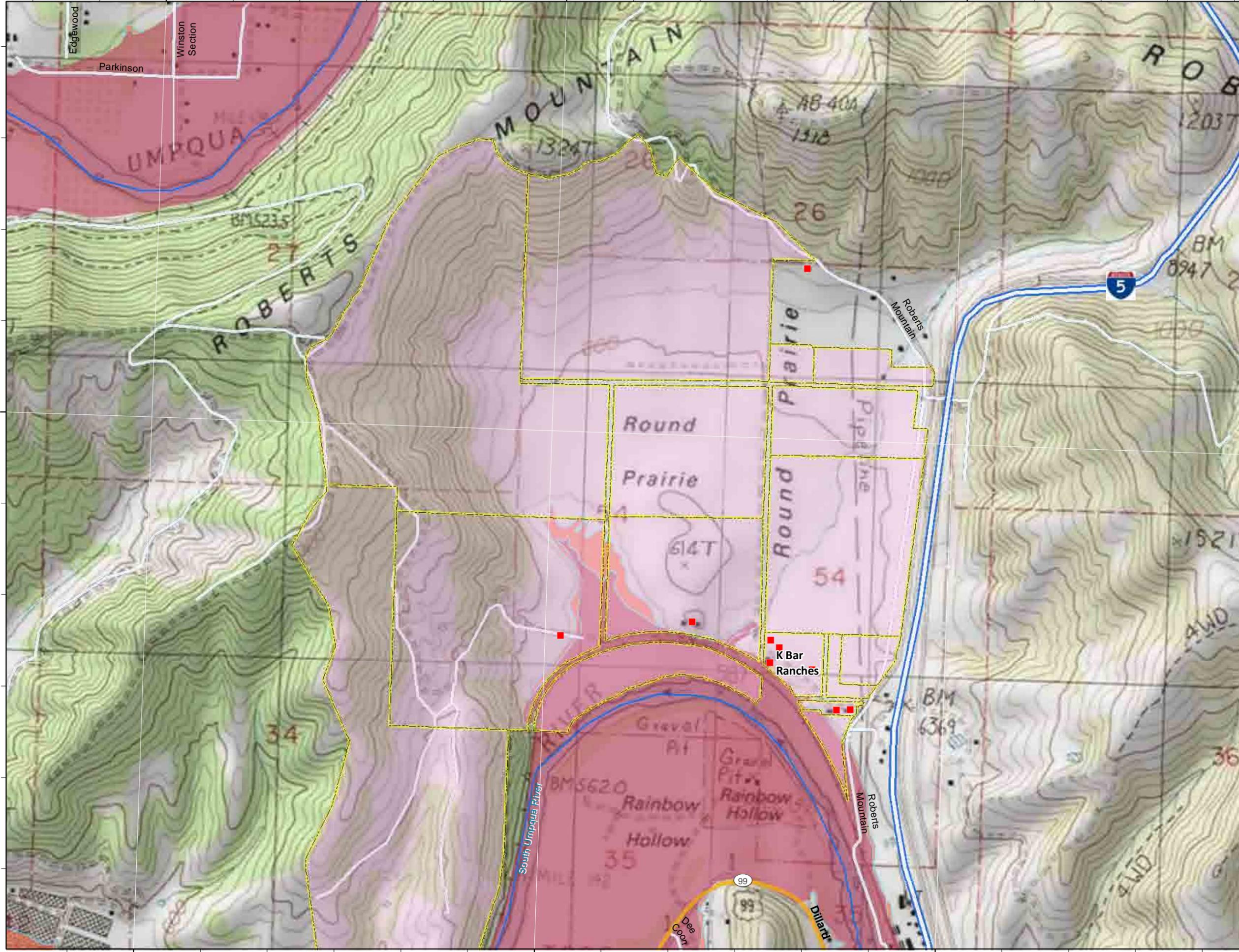
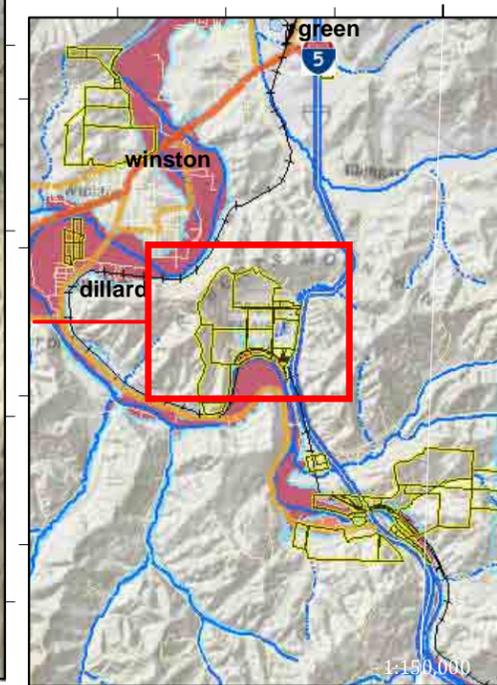
- AE -100 Yr
- 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Floodzones in the K-Bar Ranch, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:12,000



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**Figure 4-10:
FEMA Flood Zones &
Exposed Structures
Dole, OR**

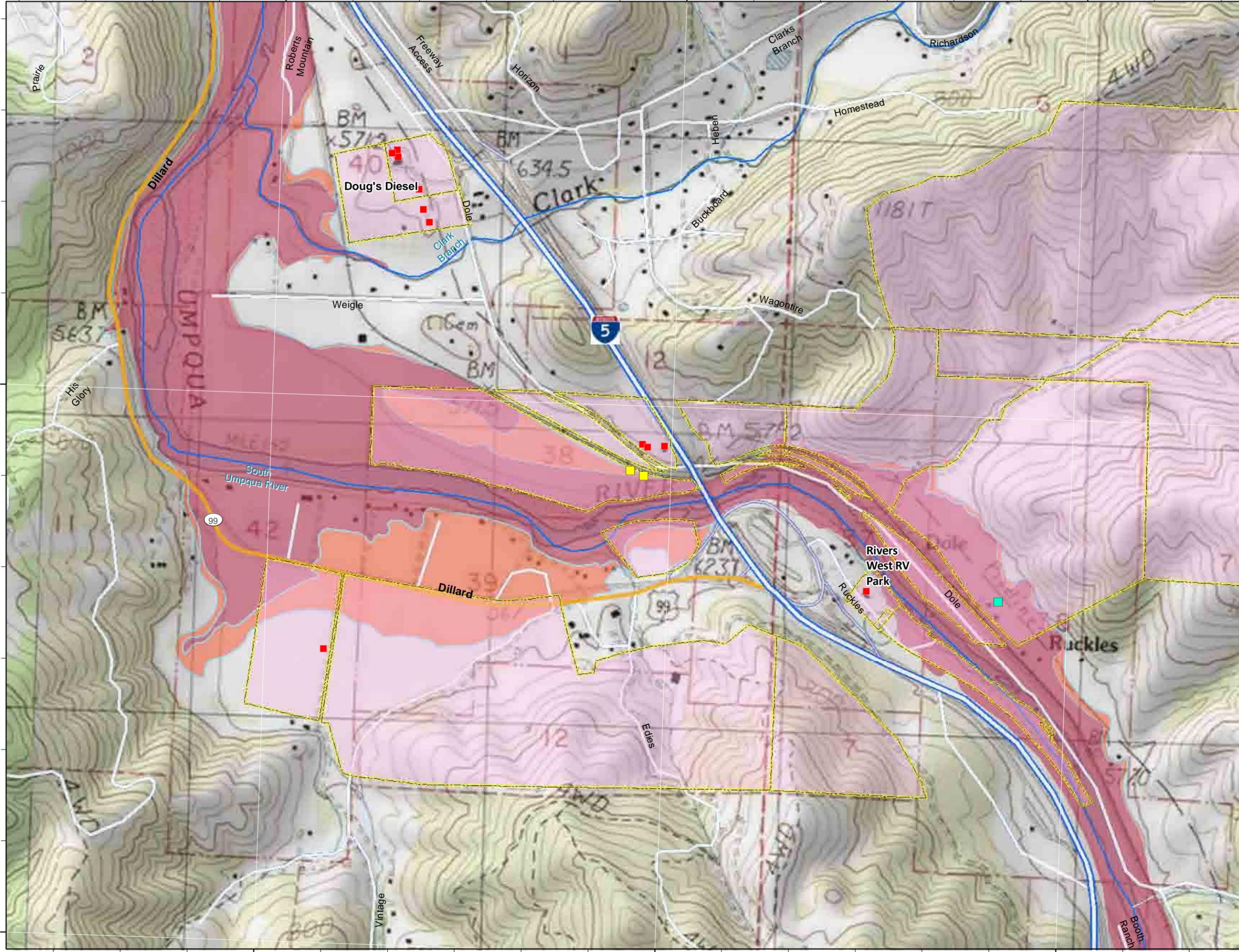
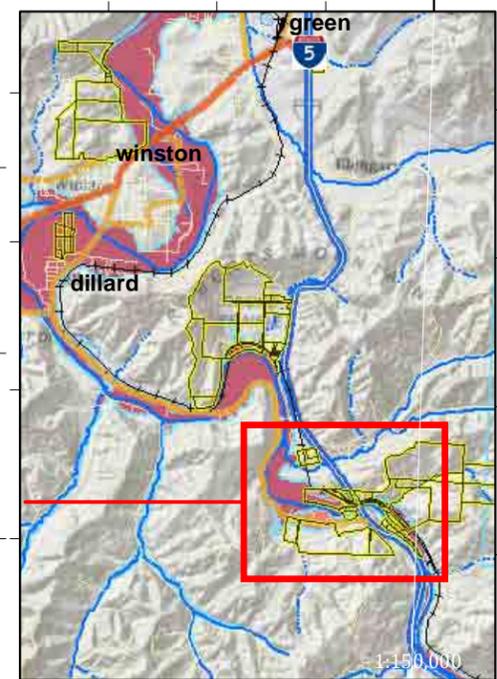
- Tribal Parcels & Properties
 - Tribal Buildings
 - ▲ Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Flood Zones in the Dole, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:12,000



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**Figure 4-11:
FEMA Flood Zones &
Exposed Structures
Weaver, OR**

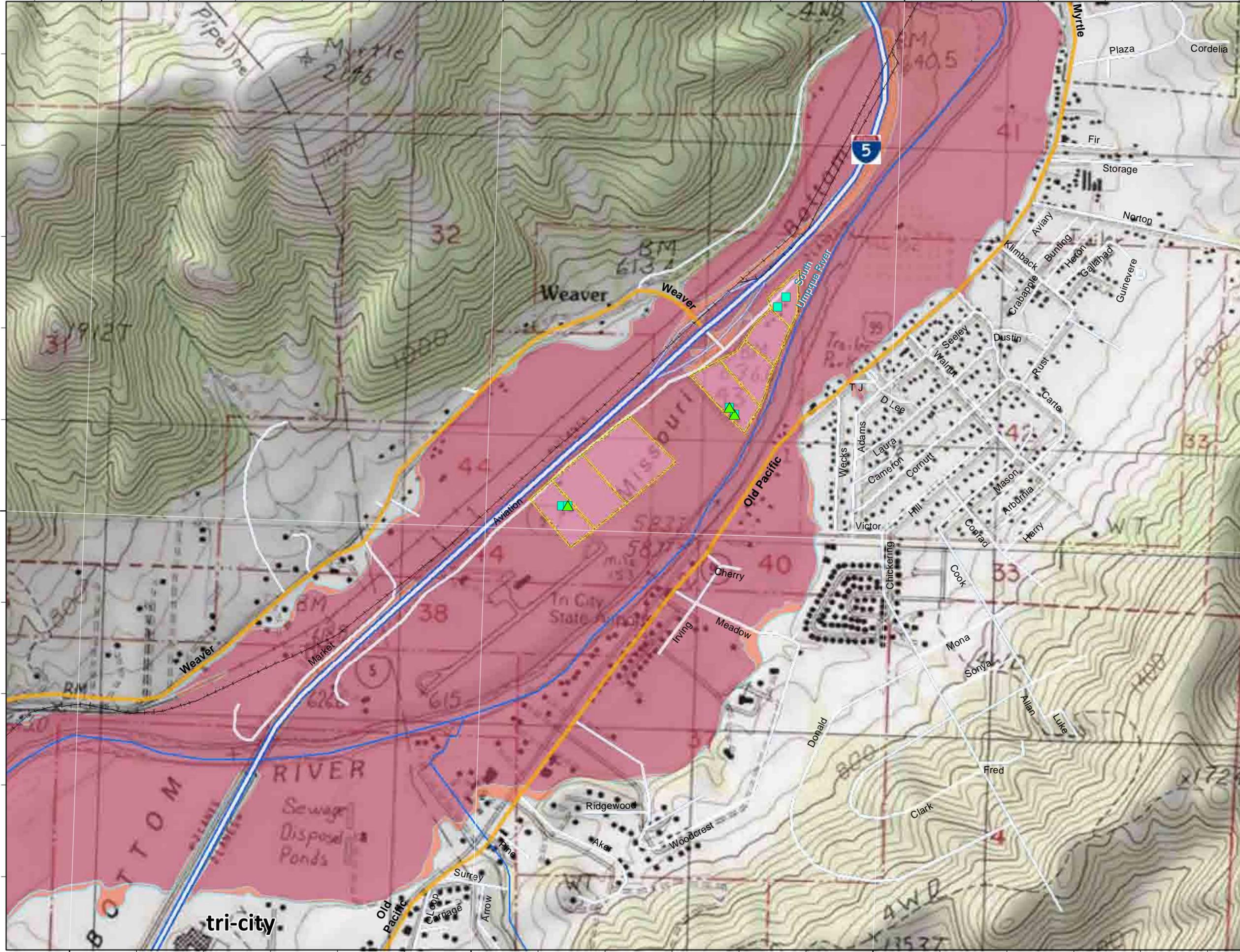
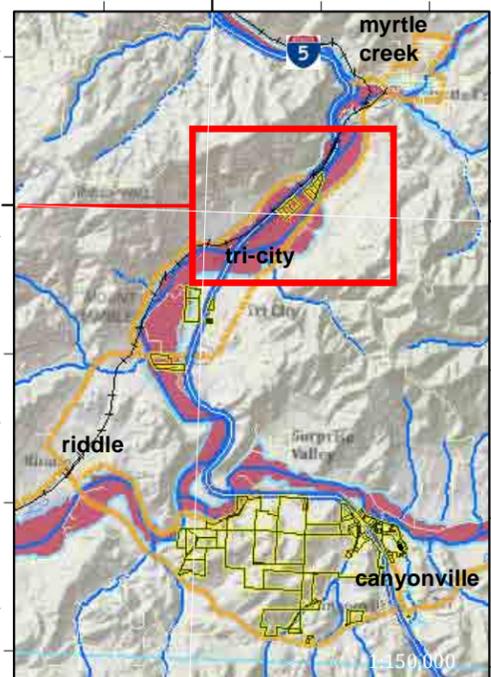
- Tribal Parcels & Properties
 - Tribal Buildings
 - ▲ Buildings in Floodway
 - ▲ Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Flood Zones in the Weaver/Tri-City, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:12,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-12:
FEMA Flood Zones &
Exposed Structures
Tri City, OR**

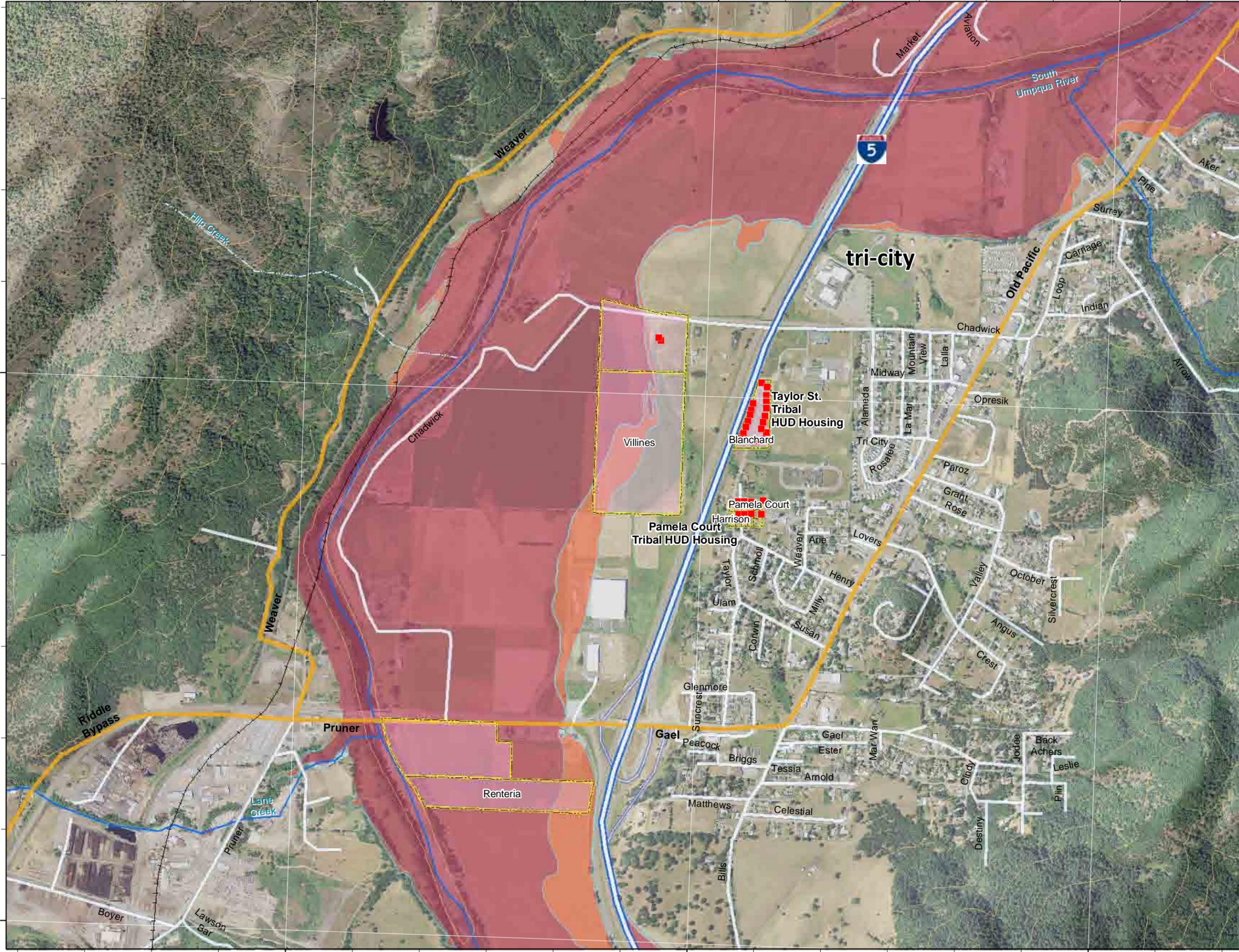
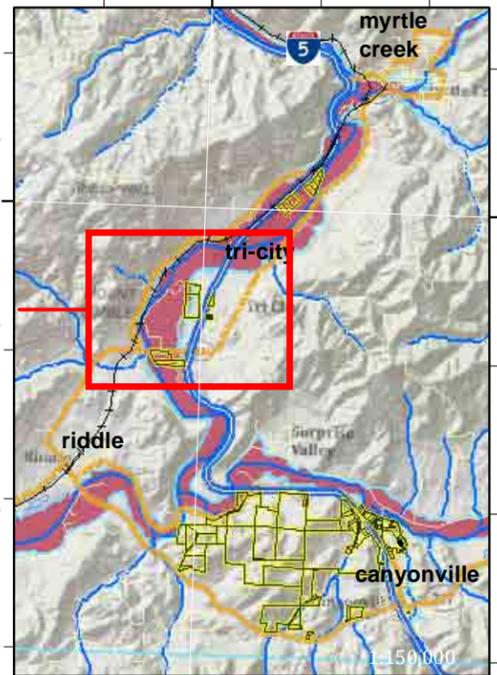
- Tribal Parcels & Properties
 - Tribal Buildings
 - ▲ Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Flood Zones in the Tri City, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:12,000
125°20'W



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-13:
FEMA Flood Zones &
Exposed Structures
Canyonville/Reservation Area**

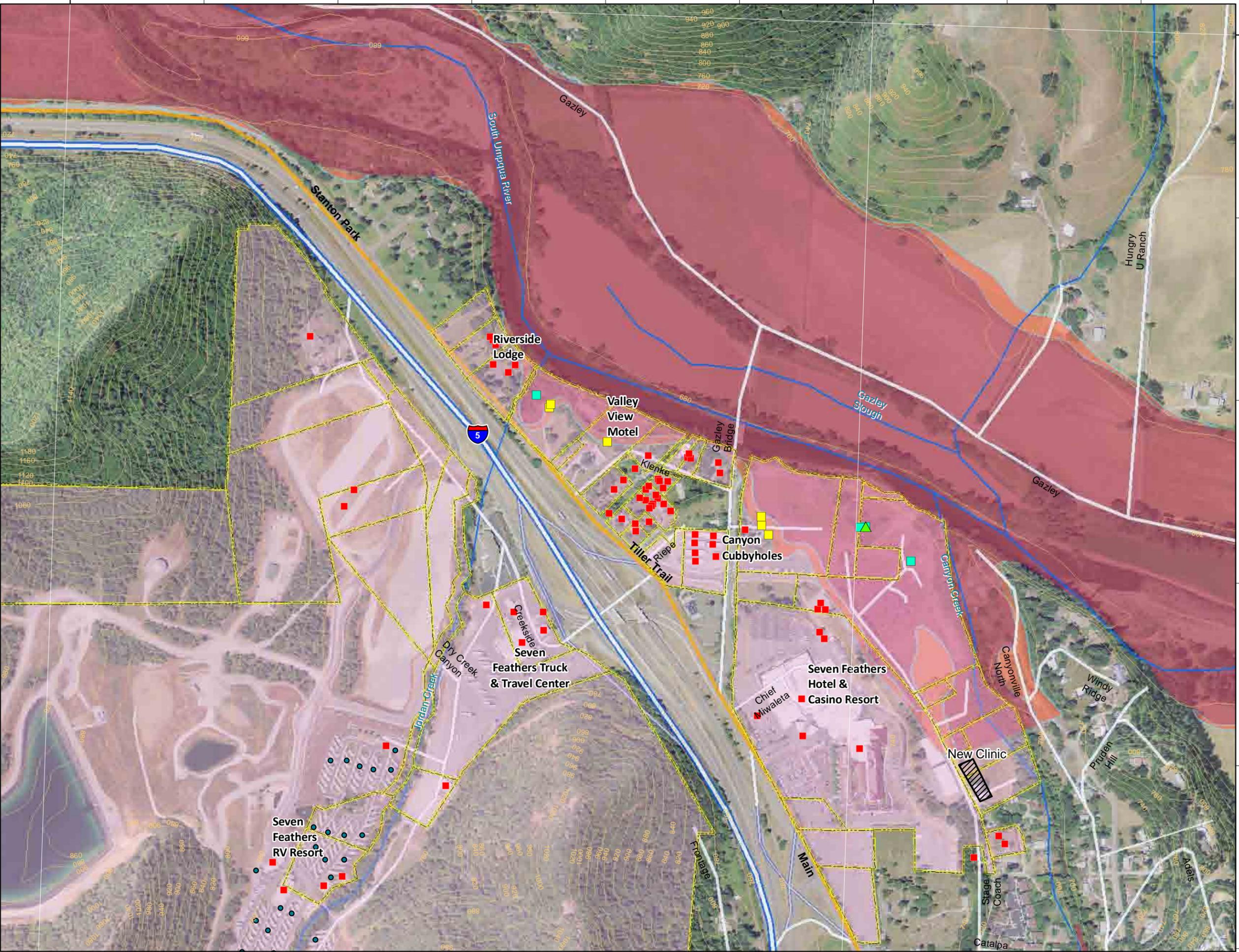
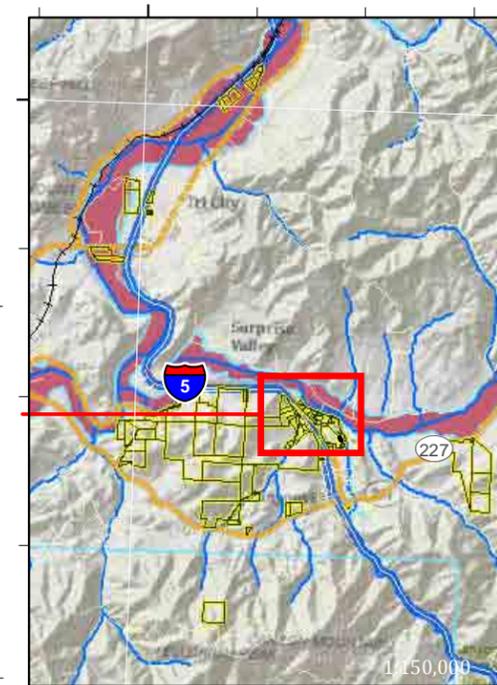
- Tribal Parcels & Properties
 - Tribal Buildings
 - Transformers
 - ▲ Buildings in Floodway
 - Buildings in 100-Year Floodplain
 - Buildings in 500-Year Floodplain
- FEMA Flood Hazard Areas**
- Flood Zones**
- AE -100 Yr
 - 0.2% - 500 Yr



This map shows Cow Creek structures located in the FEMA Flood Zones in the Canyonville, OR area. Building inventory current to January, 2012

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:6,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

129°17'W

48°5'N

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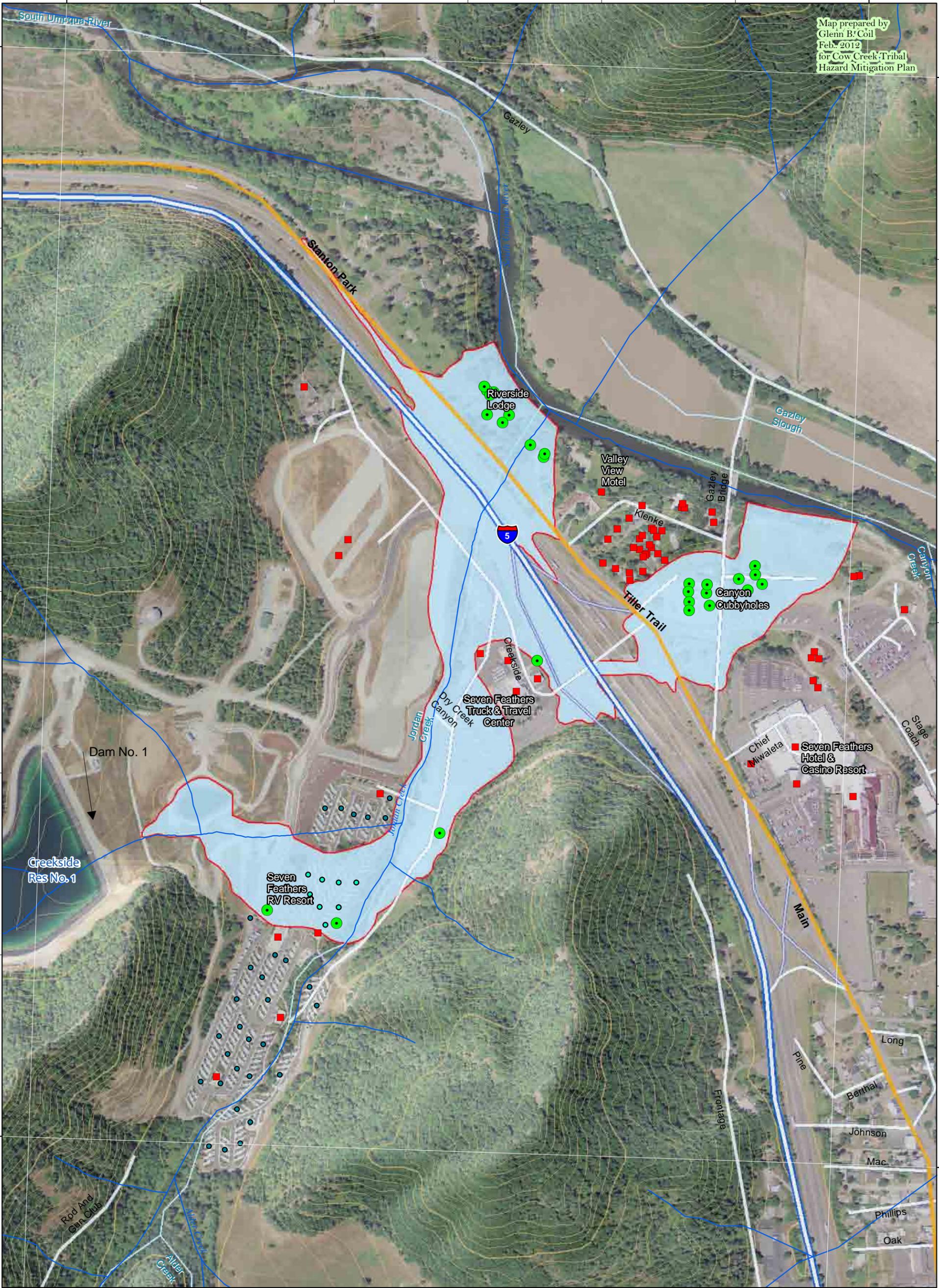
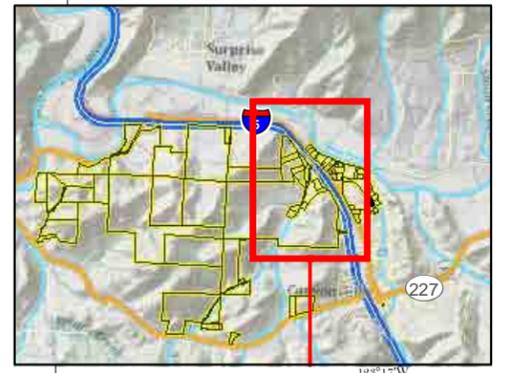
- Tribal Buildings
- Transformers
- Flood Exposed Structures
- Flood Exposed Transformers
- ▭ Tribal Parcels & Properties
- S1 Inundation Limits

1:6,000



Figure 4-14: Flood Inundation Scenario 1: Creekside Dam No. 1 Failure

This map shows S1: Creekside Dam No. 1 failure, Flood from Creekside Reservoir into Jordan Creek and through Jeffreys Rd/I-5 underpass. 26 structures & 9 transformers, \$2,847,065 in property exposed.



Map prepared by
Glenn B. Coil
Feb., 2012
for Cow Creek Tribal
Hazard Mitigation Plan

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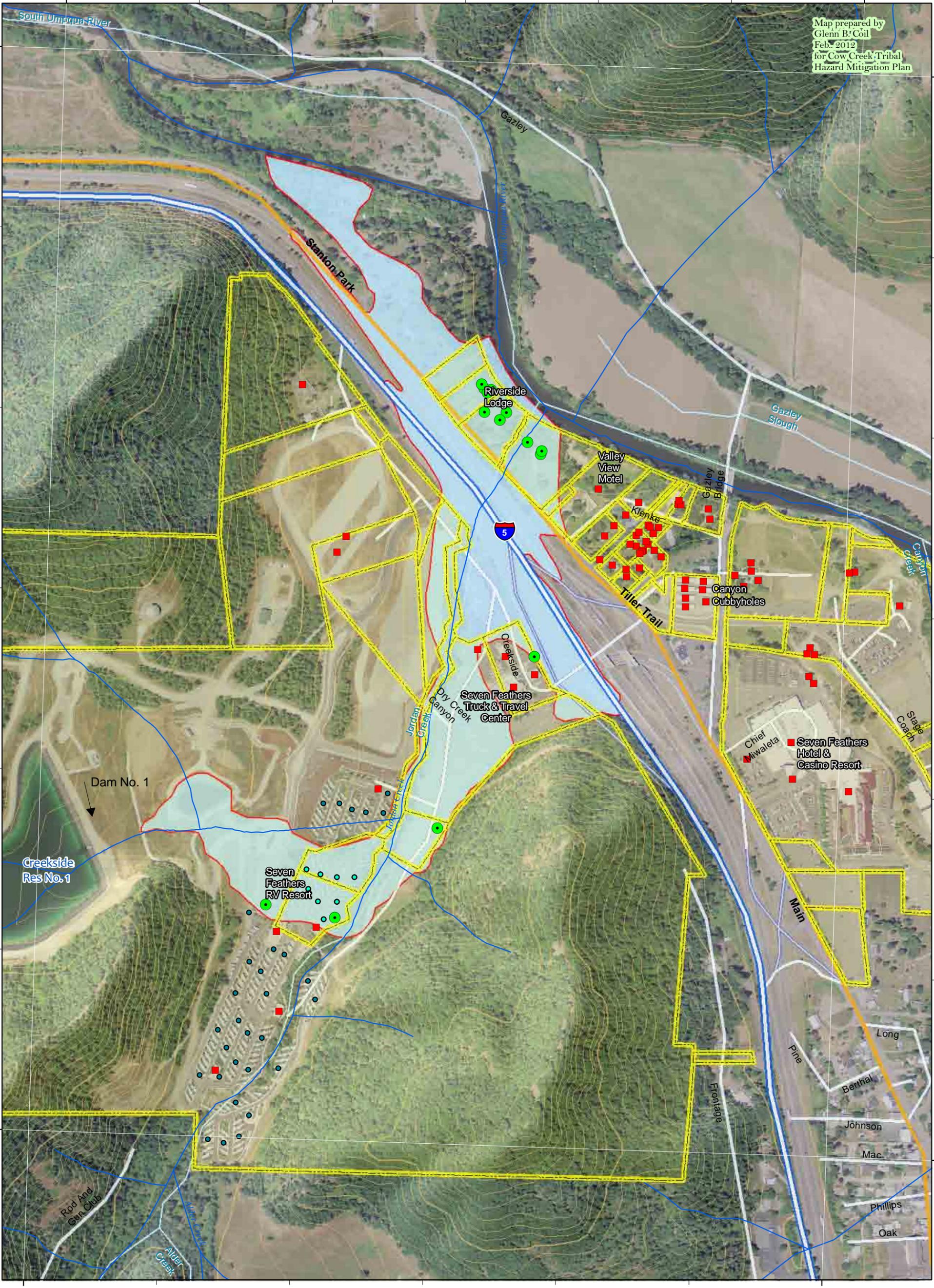
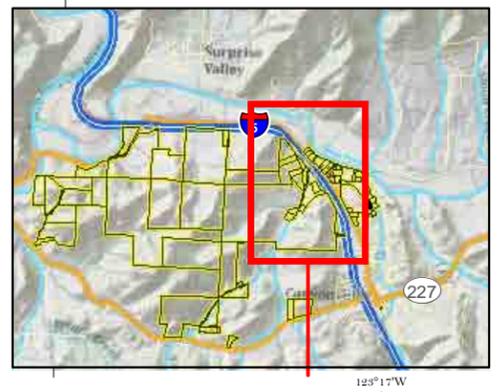
- Tribal Buildings
- Transformers
- Flood Exposed Structures
- Flood Exposed Transformers
- ▭ Tribal Parcels & Properties
- ⬇ S2 Inundation Limits

1:6,000



Figure 4-15: Flood Inundation Scenario 2: Creekside Dam No. 1 Failure BLOCKED I-5 Underpass

This map shows S2: Creekside Dam No. 1 failure, Flood from Creekside Reservoir into Jordan Creek, and Jeffreys Rd/I-5 underpass **BLOCKED**. 14 structures & 9 transformers, \$2,024,266 in property exposed.



Map prepared by
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Feb., 2012
for Cow Creek Tribal
Hazard Mitigation Plan

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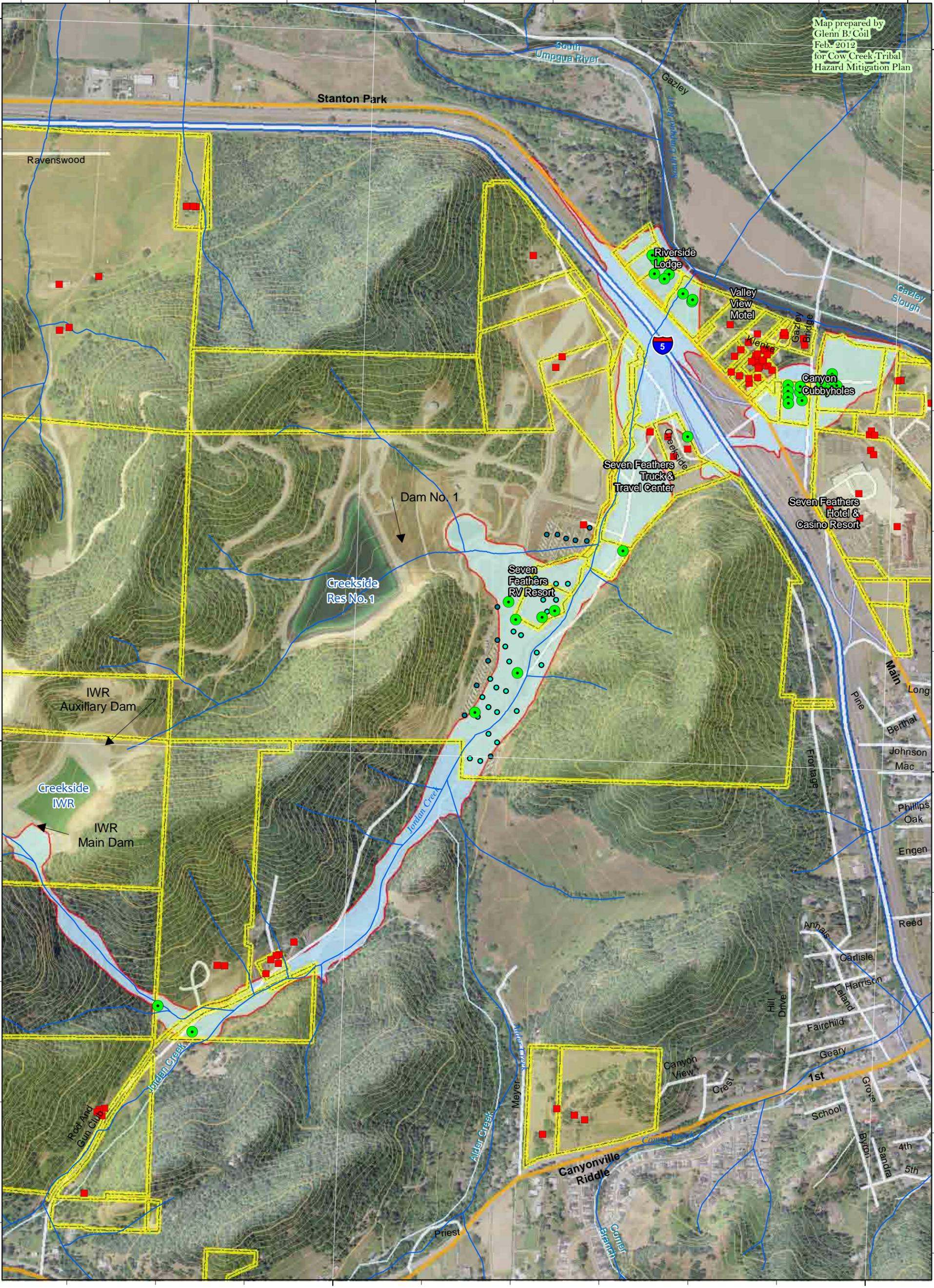
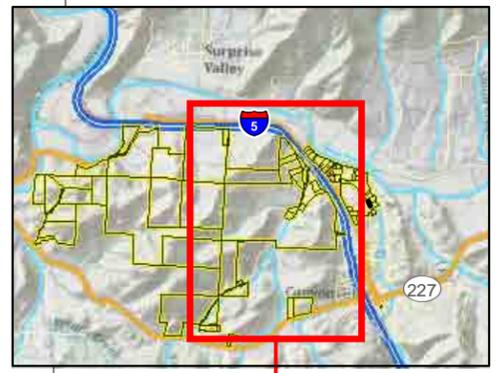
- Tribal Buildings
- Transformers
- Flood Exposed Structures
- Flood Exposed Transformers
- ▭ Tribal Parcels & Properties
- ⬜ S3 Inundation Limits

1:9,000



Figure 4-16: Flood Inundation Scenario 3: Creekside IWR Main Dam Failure

This map shows S3: Irrigation Water Reservoir (IWR) main Dam failure, flood from IWR into Jordan Creek and through Jeffreys Rd/I-5 underpass. 32 structures & 27 transformers, \$4,442,939 in property exposed.



Map prepared by
Glenn B. Coil
Feb., 2012
for Cow Creek Tribal
Hazard Mitigation Plan

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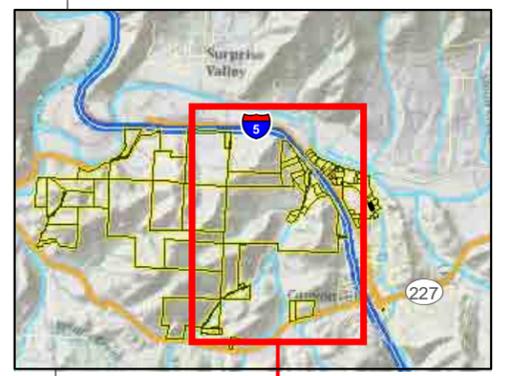
- Tribal Buildings
- Transformers
- Flood Exposed Structures
- Flood Exposed Transformers
- ▭ Tribal Parcels & Properties
- ⬇ S4 Inundation Limits

1:9,000

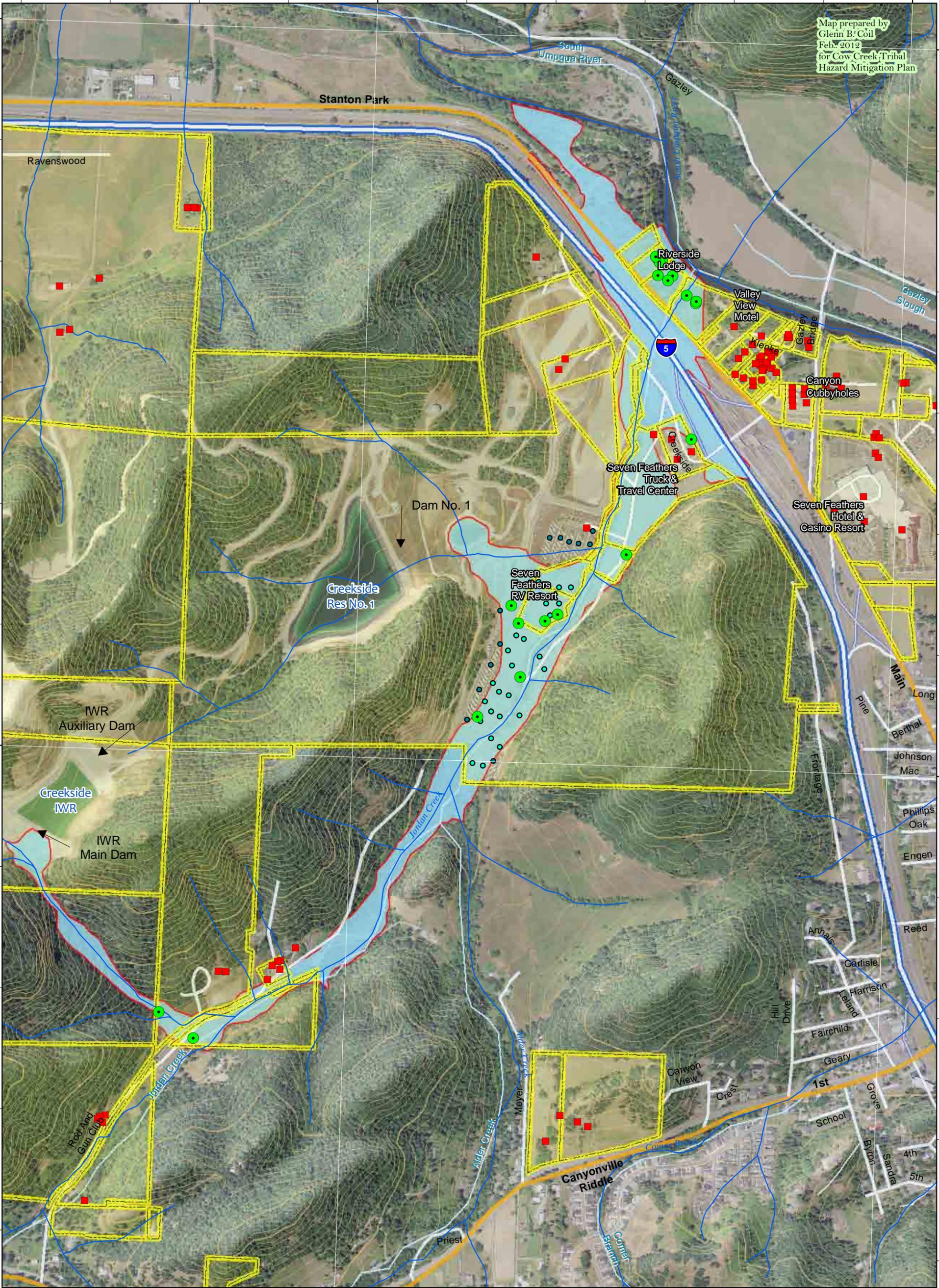


Figure 4-17: Flood Inundation Scenario 4: Creekside IWR Main Dam Failure BLOCKED I-5 Underpass

This map shows S4: Irrigation Water Reservoir (IWR) Main Dam failure, flood from IWR into Jordan Creek and Jeffreys Rd/I-5 underpass BLOCKED. 20 structures & 27 transformers, \$3,620,140 in property exposed.



Map prepared by
Glenn B. Coil
Feb., 2012
for Cow Creek Tribal
Hazard Mitigation Plan



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4.4. Landslide

Definitions

Debris Slides: Debris slides consist of unconsolidated rock or soil that have moved rapidly down slope. They occur on slopes greater than 65%.

Earthflows: Earthflows are slow to rapid down slope movements of saturated clay-rich soils. This type of landslide typically occurs on gentle to moderate slopes but can occur on steeper slopes especially after vegetation removal.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

Mass Movements: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Rock Falls: A type of landslide that typically occurs on rock slopes greater than 40% near ridge crests, artificially cut slopes and slopes undercut by active erosion.

Rotational-Translational Slides: A type of landslide characterized by the deep failure of slopes, resulting in the flow of large amounts of soil and rock. In general, they occur in cohesive slide masses and are usually saturated clayey soils.

Sinkholes: A collapse depression in the ground with no visible outlet. Its drainage is subterranean, its size typically measured in meters or tens of meters, and it is commonly vertical-sided or funnel-shaped.

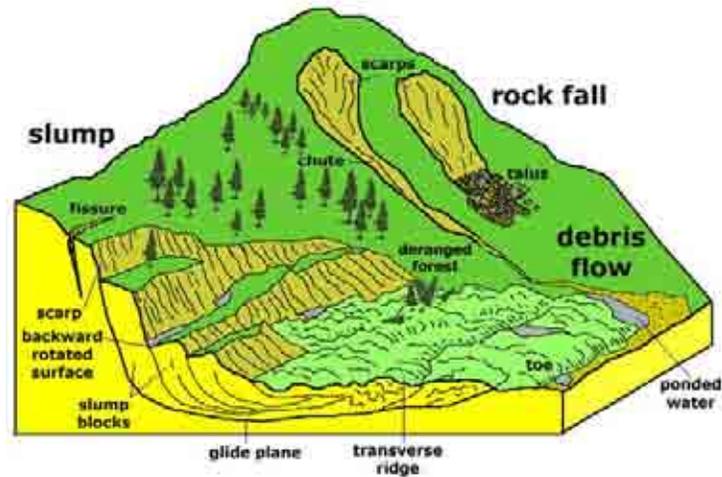
Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%.

General Background

Landslides (or more properly, mass movement), are caused by a combination of geological and climatological conditions. This includes steep topography, as well as the encroaching influence of urbanization. **Figure 4-18** shows landscape features associated with landslides.

A landslide is a mass of rock, earth or debris moving down a slope. Landslides may be minor or very large, and can move at slow to very high speeds. They can be initiated by storms, earthquakes, fires, volcanic eruptions, and by human modification of the land.

Figure 4-18: Landscape Features Associated with Landslides



Mudslides or mudflows (or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry."

A debris flow or mudflow can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them. Locally, they can be some of the most destructive events in nature.

A sinkhole is a collapse depression in the ground with no visible outlet. Its drainage is subterranean; its size is typically measured in meters or tens of meters, and it is commonly vertical-sided or funnel-shaped.

Landslides are caused by one or a combination of the following factors: change in slope gradient, which increases the load the land must bear, shocks and vibrations, change in water content, ground water movement, frost action, weathering of rocks, and removal or changing the type of vegetation covering slopes.

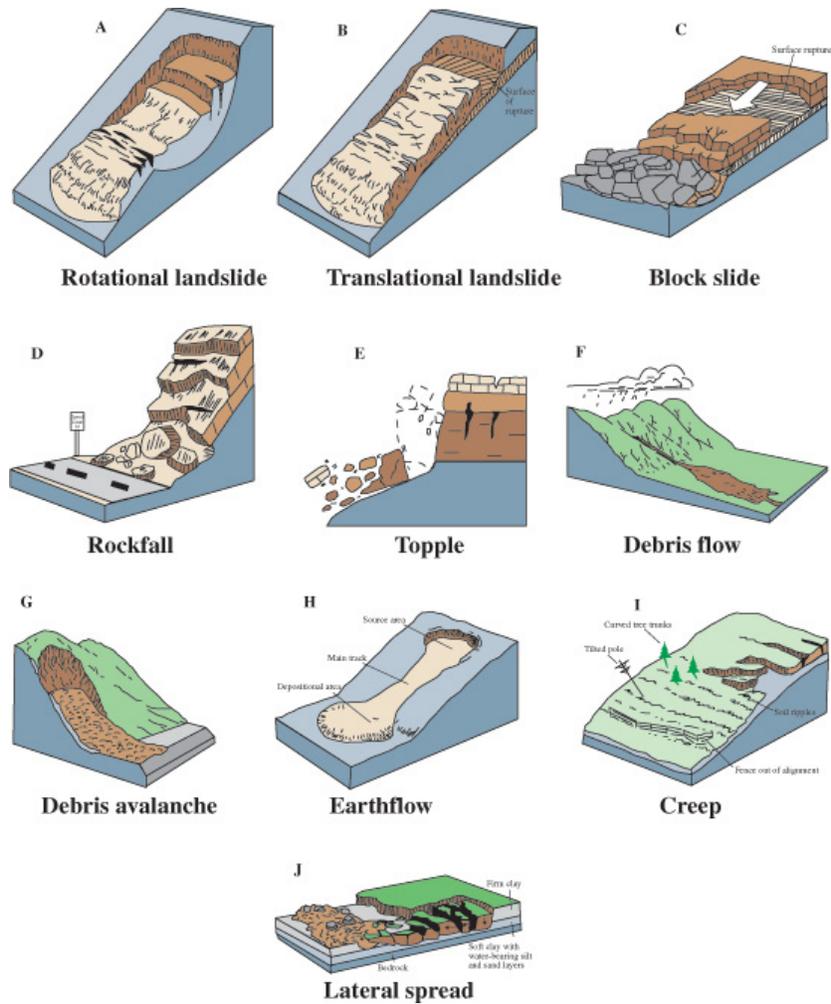
In general, landslide hazard areas occur where the land has certain characteristics, which contribute to the risk of the downhill movement of material. These characteristics include:

- A slope greater than 15 percent.
- Landslide activity or movement occurred during the last 10,000 years.

- Stream or wave activity, which has caused erosion, undercut a bank or cut into a bank to cause the surrounding land to be unstable.
- The presence or potential for snow avalanches.
- The presence of an alluvial fan, which indicates vulnerability to the flow of debris or sediments.
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.

Figure 4-19 shows a diagram of the different landslide types and processes.

Figure 4-19: Landslide Types and Processes¹⁷



¹⁷ <http://pubs.usgs.gov/fs/2004/3072/fs-2004-3072.html>

Hazard Profile

Location

In many parts of Douglas County, weathering and the decomposition of geological materials produces conditions conducive to landslides. Human activity is believed to further exacerbate the landslide problem. Landslides can occur all through the Tribe's area and on tribal lands. In particular, locations at risk from landslides or debris flows include areas with one or more of the following conditions:

- On or close to steep hills;
- Steep road-cuts or excavations;
- Existing landslides or places of known historic landslides (such sites often have tilted power lines, trees tilted in various directions, cracks in the ground, and irregular-surfaced ground);
- Steep areas where surface runoff is channeled, such as below culverts, V-shaped valleys, canyon bottoms, and steep stream channels; and
- Fan-shaped areas of sediment and boulder accumulation at the outlets of canyons.

The Oregon Department of Geology and Mineral Industries (DOGAMI) has created a database of landslide deposits and past events, dating back to 1931. This database is called Statewide Landslide Information Database of Oregon (SLIDO)¹⁸ and was last updated in 2011. Within the Tribe's U&A, past events are recorded back to the 1996 Winter Storm event. These areas were mapped and exposure of tribal lands and facilities was determined.

GIS analysis found 15 parcels that had landslide deposits. Tribal lands on or containing landslide deposits include the Winston property near the South Umpqua River, the west side of K-Bar Ranch below Roberts Mountain, the SE of the Lilja Property near Rivers West RV Park, and ten parcels of Pamela Court Tribal housing are located on a large landslide deposit encompassing most of Tri-City.

Past landslides and landslide deposit hazard maps for exposed tribal lands are shown in **Figure 4-20** through **Figure 4-24**. The maps are ordered from north to south, starting in Roseburg and ending in Tri-City.

¹⁸ <http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/SLIDOr2.htm>

Severity

Most landslides are minor, but a major landslide can wash out and/or block roads, railroads and even rivers/streams. In rural areas, especially below logging clearcuts, debris flows can destroy homes and kill and injure its occupants, as was the case from the Hubbard Creek landslide in November 1996.

Past events

There have been frequent landslides and mudflows in the Douglas County/ Cow Creek area, and are usually associated with severe weather, flooding and potentially earthquakes. The Oregon Dept. of Geology and Minerals (DOGAMI) has been compiling a GIS database of past landslides and this was used to analyze past events on Cow Creek Tribal Lands and the area. It was found that since 1996, there have at least 824 recorded landslides within the Cow Creek's U&A. These were generally recorded with specific events such as the 1996 storms, 2005 storms, winter 2006, fall 2008, and September 2010. Many of these events were recorded with road damage/blockage. No events were recorded on tribal lands, but as mentioned, tribal lands lie on landslide deposits in a few locations.

The most recent events were from the January 2011 Severe Weather that caused numerous landslides in Douglas County and led to a federal disaster declaration, DR-1956-OR¹⁹, for the County. Tribal assets were not affected.

Probability/Frequency

Landslides can occur at any time, but most increase in frequency during and after times of severe weather, flooding and earthquakes.

Vulnerability

Tribal lands located on hills are most vulnerable to landslides, although the Tribe is not at risk from any catastrophic flows. As the Tribe increases development in the hills, particularly on steep slopes, its vulnerability will increase. The Tribe is also vulnerable to landslides that close and block roads as they can prevent access to the Tribes properties, facilities and businesses.

Although some tribal lands have mapped landslide deposits, they are located in undeveloped, remote areas. The Tribe's Pamela Court HUD housing is located at the end of a mapped

¹⁹ <http://www.fema.gov/news/event.fema?id=13672>

landslide deposit, but due to its flat location on an area called Missouri Bottom, evidence indicates the landslide occurred a long time ago and would not affect the Tribal housing development.

Future Land Use

Although the Tribe does not have any specific plans to develop in landslide prone areas, it has purchased lands on steep hills that could be potentially developed, including for tribal housing. The Tribe will ensure that landslide hazards are mitigated before any development occurs in landslide hazard areas.



**Figure 4-20:
Past Landslides &
Landslide Deposits
Roseburg, OR**

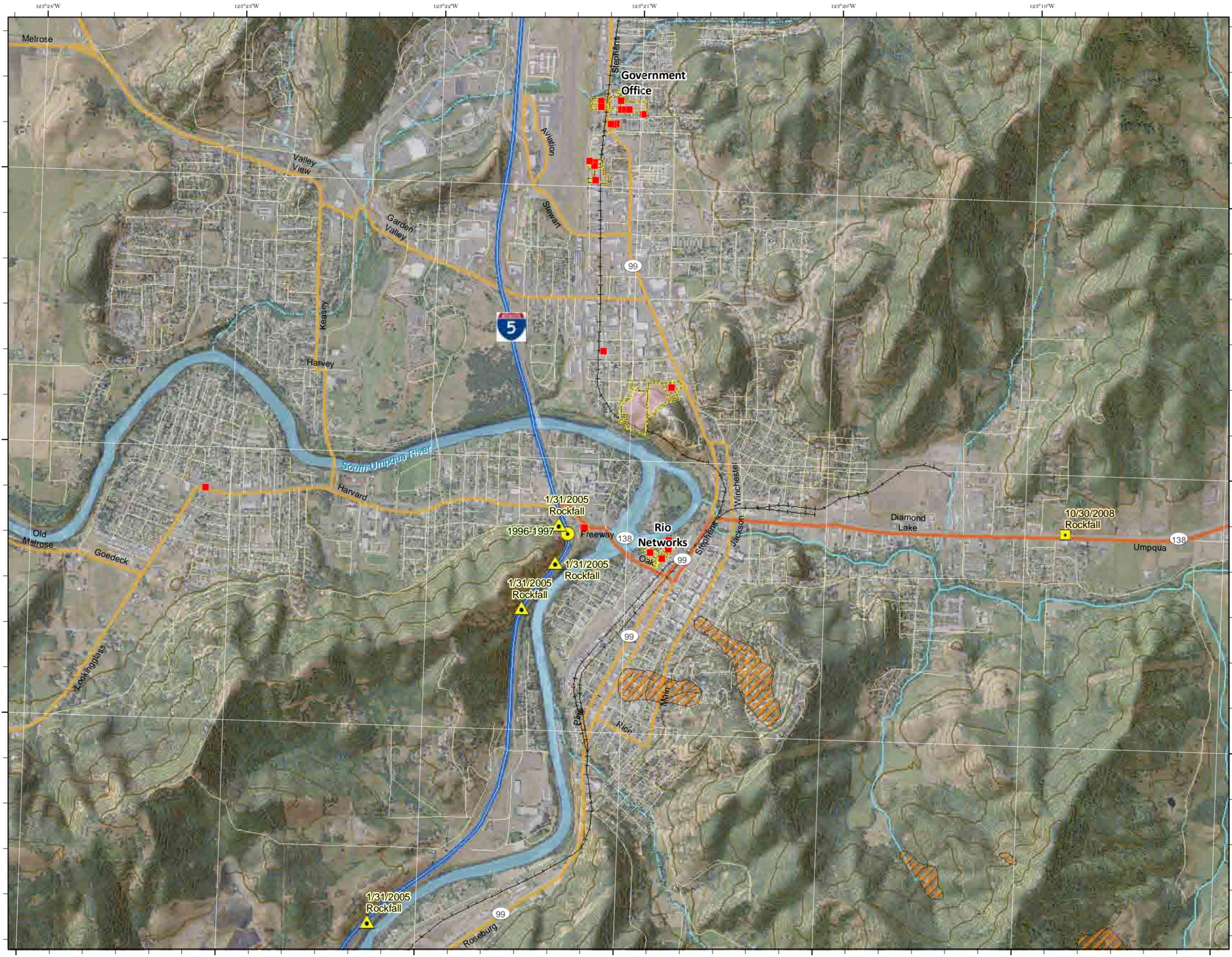
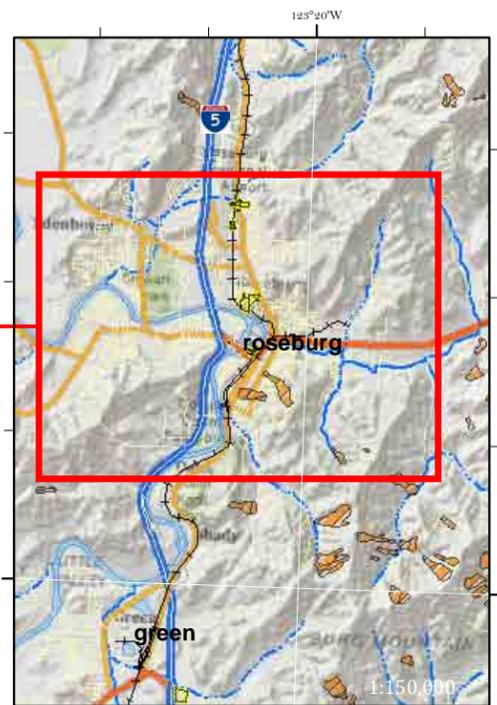
- Tribal Parcels & Properties
- Tribal Buildings
- Landslides 2006 - 2010
- ▲ Landslides 2001 - 2005
- Landslides 1996 - 2000
- Landslide Deposits



This map shows past landslides and landslide deposits as well as Cow Creek structures and properties located in the Roseburg, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:24,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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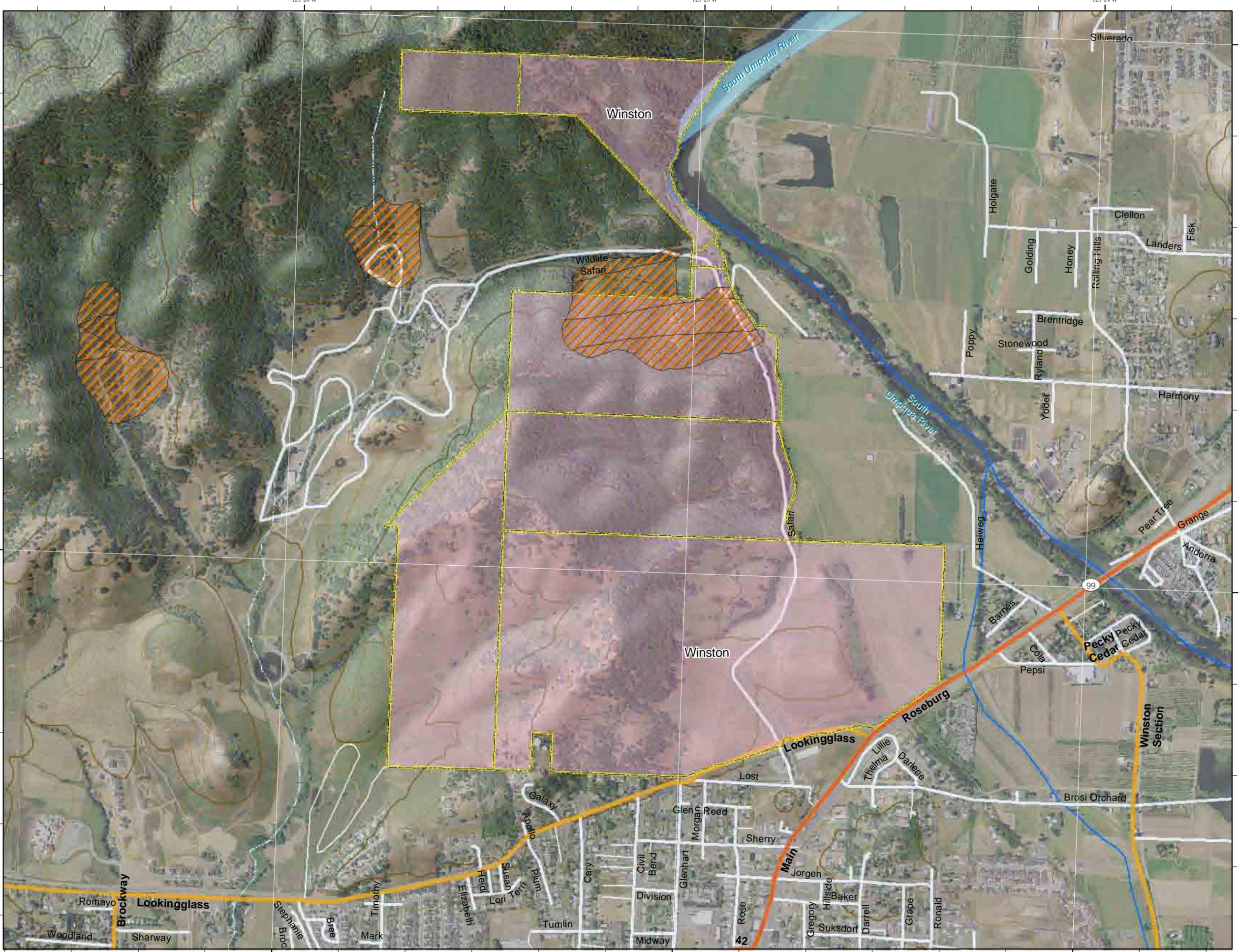
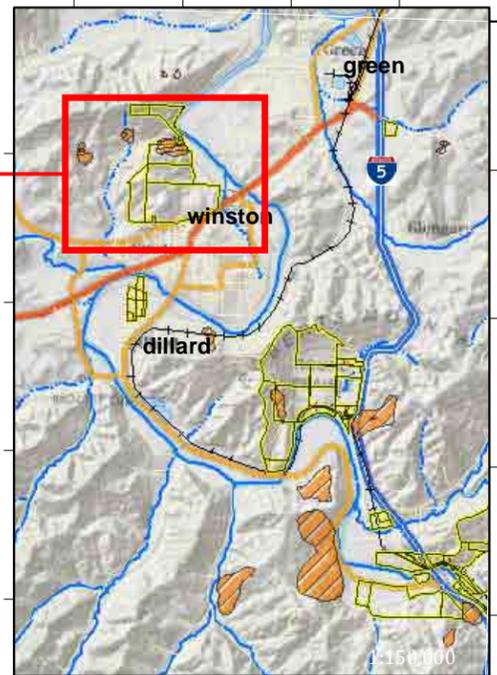
**Figure 4-21:
Past Landslides &
Landslide Deposits
Winston Properties**

- Tribal Parcels & Properties
- Tribal Buildings
- ▲ Landslides 2001 - 2005
- Landslides 1996 - 2000
- Landslide Deposits



This map shows past landslides and landslide deposits as well as Cow Creek structures and properties located in the Winston, OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan
Scale: 1:12,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

2009 1m ortho | 20 ft contours

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**Figure 4-22:
Past Landslides &
Landslide Deposits
K-Bar Ranch/Round Prairie**

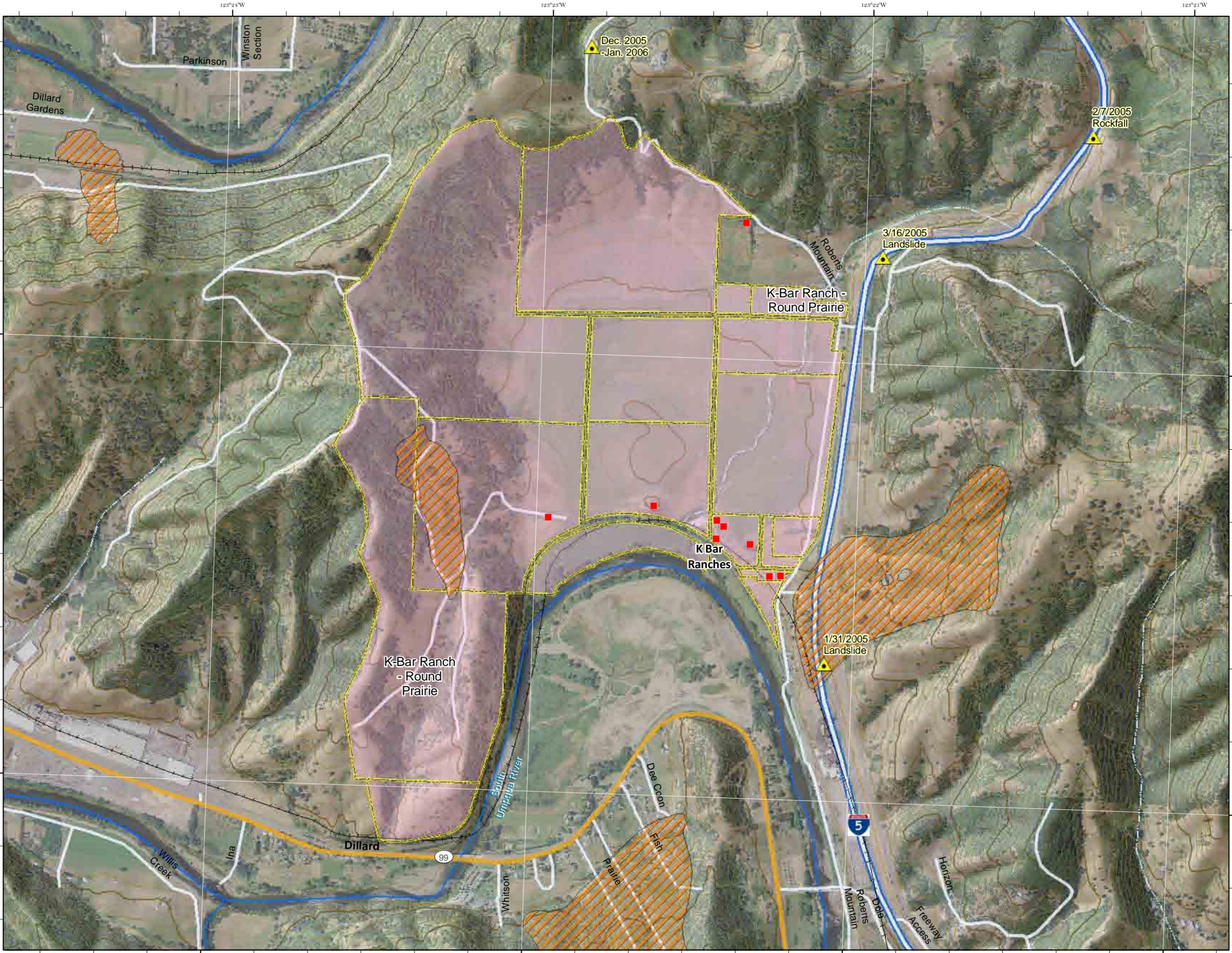
- Tribal Parcels & Properties
- Tribal Buildings
- Landslides 2001 - 2005
- Landslides 1996 - 2000
- Landslide Deposits



This map shows past landslides and landslide deposits as well as Cow Creek structures and properties located in the K-Bar Ranch/Round Prairie area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:15,000



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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**Figure 4-23:
Past Landslides &
Landslide Deposits
Dole Road Properties**

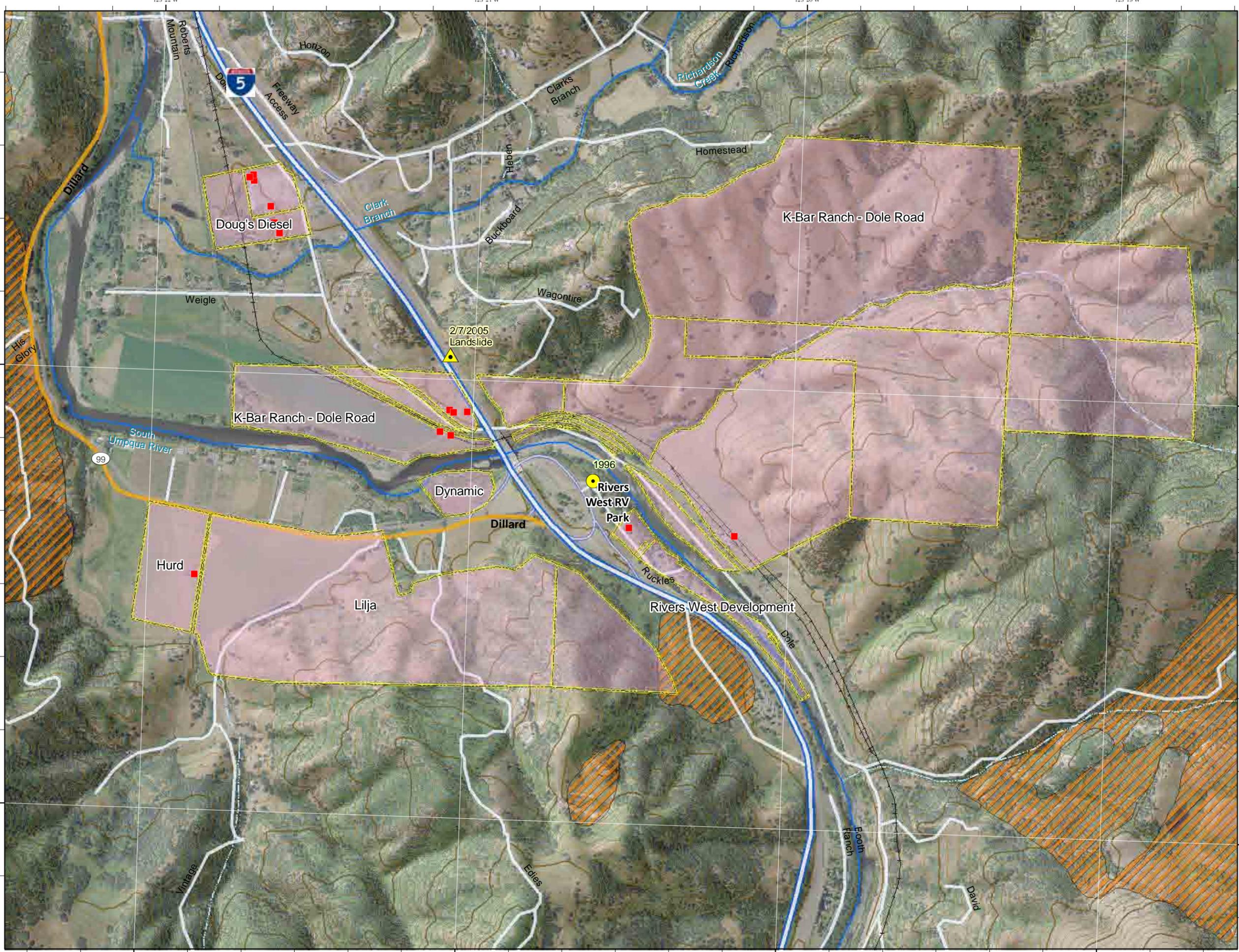
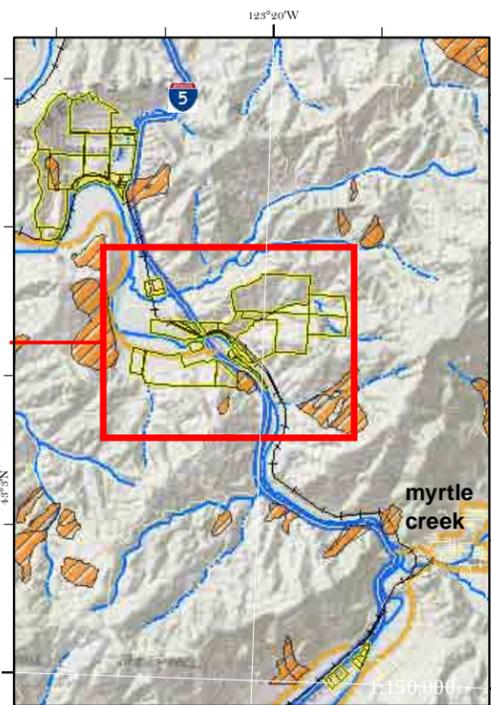
- Tribal Parcels & Properties
- Tribal Buildings
- ▲ Landslides 2001 - 2005
- Landslides 1996 - 2000
- Landslide Deposits



This map shows past landslides and landslide deposits as well as Cow Creek structures and properties located in the Dole Road area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:15,000



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**Figure 4-24:
Past Landslides &
Landslide Deposits
Tri City Tribal Housing**

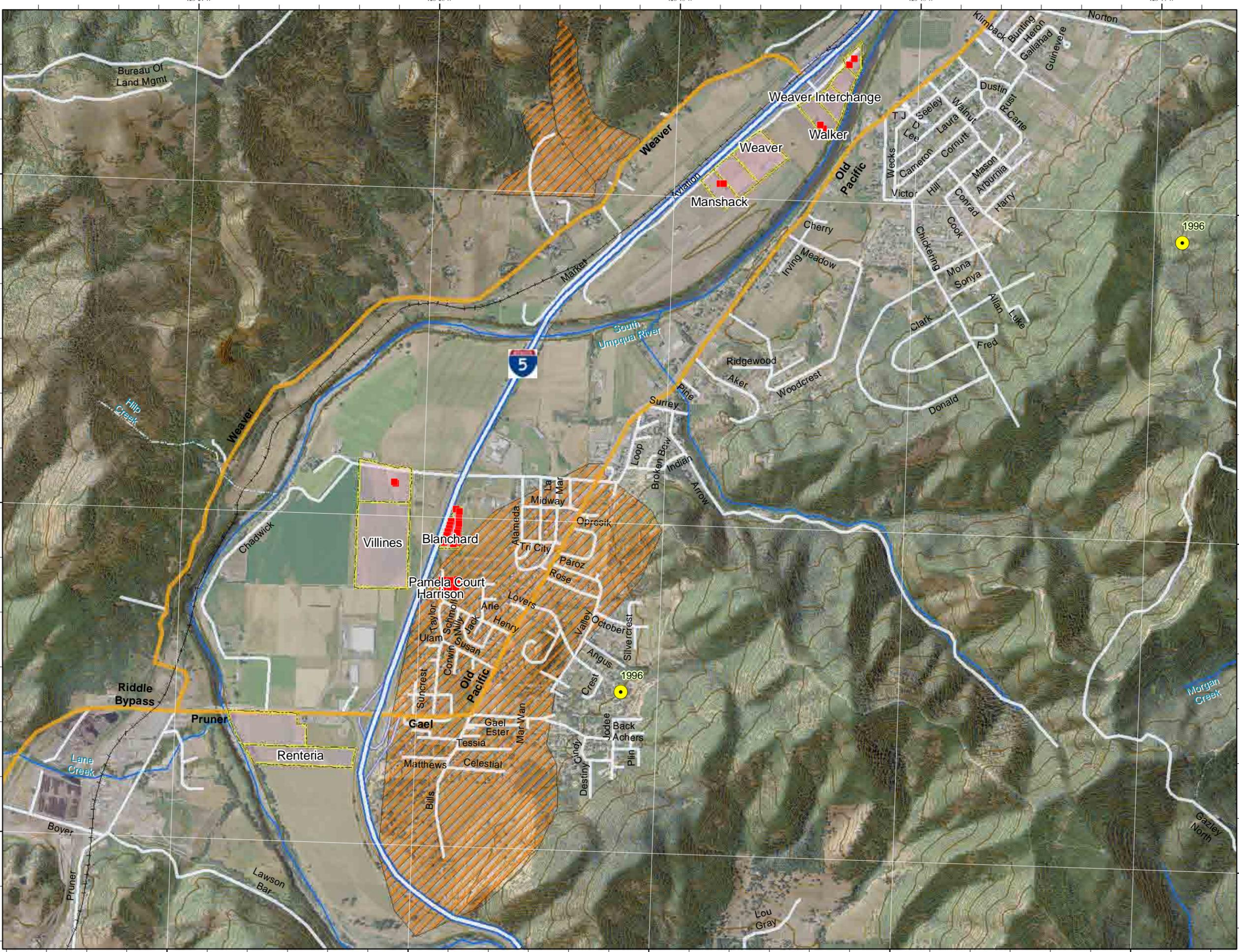
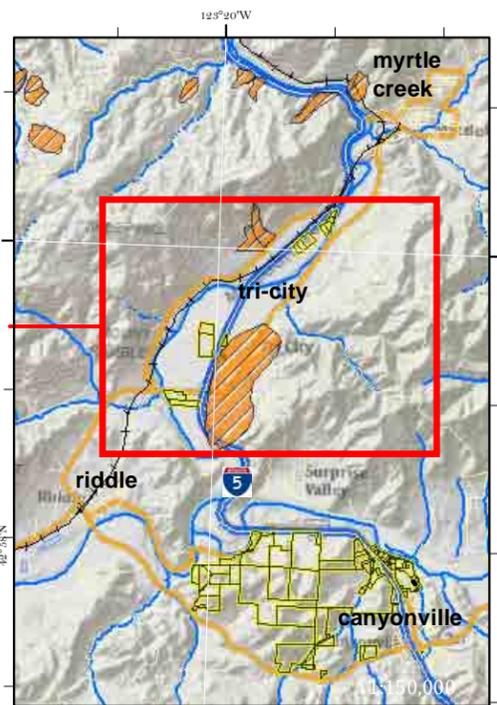
- Tribal Parcels & Properties
- Tribal Buildings
- ▲ Landslides 2001 - 2005
- Landslides 1996 - 2000
- Landslide Deposits



This map shows past landslides and landslide deposits as well as Cow Creek structures and properties located in the Tri City OR area. Building inventory current to January, 2012.

Map prepared by Glenn B. Coil
Feb. 2012
for Cow Creek Tribal Hazard Mitigation Plan

Scale: 1:20,000



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4.5. Severe Weather

Definitions

Blizzard: A storm with considerable falling and/or blowing snow combined with sustained winds or frequent gusts of 35 mph or greater that frequently reduces visibility to less than one-quarter mile.

Freezing Rain: This is the result of rain occurring when the temperature is below the freezing point. When this occurs, the rain will freeze on impact and will result in a layer of glaze ice over everything it touches. Although the layer of glaze is generally quite thin it can measure up to one inch in depth. In a severe ice storm an evergreen tree measuring 20 meters high and 10 meters wide can be burdened with up to six tons of ice, creating a serious threat to power and telephone lines and transportation routes.

Severe Local Storms: These include what are termed “microscale” atmospheric systems: tornadoes, thunderstorms, windstorms, ice storms and snowstorms. Typically, major impacts from a severe storm are to transportation and loss of utilities. The major characteristic all of these events have in common is that their effects are usually limited in scope. Although one of these storms may cause a great deal of destruction and even death, its impact is generally confined to a small area.

Snowstorms: These are caused by a war between air of different temperatures and densities. This resultant low pressure system can cover thousands of square miles with snow. Heavy snow in western Oregon is generally confined to the mountains with heavy accumulation in the lowlands uncommon.

Thunderstorms: This is the most common of severe weather systems. These are typically 25 kilometers in diameter and last 30 minutes from birth to growth through maturity to decay. Thunderstorms are underrated hazards. Lightning, which occurs with all thunderstorms, is a serious threat to human life nationwide. Heavy rains dumped in a small area over a very short time can lead to flash flooding. Strong winds, hail and tornadoes are also dangers associated with thunderstorms.

Tornadoes: Tornadoes are characterized by funnel clouds of varying sizes that generate winds as fast as 500 miles per hour. They can affect an area of $\frac{1}{4}$ to $\frac{3}{4}$ of a mile, with the path varying in width and length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale ranging from F0 to F6.

Windstorms: These are storms consisting of violent winds. There are several sources of windstorms. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the Cascade Mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

General Background

Severe winter storms can produce rain, freezing rain, ice, snow, cold temperatures and wind. Severe winter storms affecting Douglas County and the Cow Creek Tribe originate in the Gulf of Alaska and the central Pacific Ocean and are most common from October through March. Wind storms are also an issue, but are diminished in the Umpqua Valley due to its being surrounded by the Coast Range and Cascade Mountains.

Hazard Profile

Location

All of the Tribe's properties and buildings can be affected by severe weather, including snow and ice, in the South Umpqua Valley. The tops of hills and mountains, as well as higher elevations exposed to the prevailing winds, are most exposed to the damaging effects of severe weather including wind storms.

Severity

Windstorms having sustained winds of at least 50 miles per hour (mph) cause significant damage and occur frequently. Damage from storms includes loss from automobile accidents, damage to vegetation and structures, business and school closure, and power outages. Emergency response may be affected. During La Nina weather years, severe weather can be more extreme. The worst storm years, such as 1996 flooding, were associated with La Nina climate patterns.

In general though, the Cow Creek Tribe's location in the Umpqua Valley decreases the severity of even the most extreme storms. Nonetheless damages and power outages can still occur.

Past Events²⁰

The Tribe did not report any specific events that caused damages or disruptions from severe weather and windstorms. Although not as common as in other areas, the Umpqua Valley has been affected by strong winds, ice and snow in the past and will be discussed below.

The most recent severe weather event in the area occurred in **January 2011** and led to a federal disaster declaration, DR-1956-OR, for Douglas County. The Tribe did not report any specific damages from this event.

²⁰ Douglas County HMP, Severe Winter Weather, Wind Storms

Snow

In the past 80 years, there were over 80 days where an inch of snow or greater fell in Roseburg and other areas of the Umpqua Valley. All of the snow events occurred between November and April.

December 24, 1889 to February 13, 1890

The big snow of '90 started the day before Christmas. Snow fell continually for 52 days, leaving between 5 ½ and 7 ½ feet in the town of Glendale, and more in the surrounding mountains. The weather then turned warm and the snow began to melt so fast, the ground became soggy and there was high water and flooding. A severe landslide covered the railroad tracks and dammed up Cow Creek near West Fork below Glendale for many days.

Reportedly, several Chinese workers perished in the slide and that unstable area of the mountain became known as the Chinaman's slide. Nothing could get through except people on foot, by climbing on the canyon wall high above the slide and mud area.

December 1919

The December 1919 storm was recorded as the third heaviest snow-producing storm in Oregon.

January 1950

A total of 28.0 inches of snow fell in Roseburg January 9-15, 1950. Riddle was hit even harder with 42.9 inches of snow. Crater Lake received 136 inches of snow. There were three severe storms in January 1950, with very little time separating them. Their net effect was a nearly continuous storm. The storm had severe effects on infrastructure, residents, and businesses across the state. Deep snowdrifts closed all highways west of the Cascades. Sleet that turned to freezing rain caused unsafe conditions on highways and damaged trees and power lines.

Winter 1969

January 21 to February 6, 1969 when strong storms, accompanied by snow, ice, wind, and freezing rain hit Oregon statewide. In the Roseburg area alone, 43.7 inches of snow fell over an 8-day period, including 25.5 inches between January 26th and 27th.

Ice storms

In the winter of 1978, freezing rain covered the Umpqua Valley. The build-up of ice caused power failures, brought down trees, and created serious hazards for motorists.

Windstorms

The most recent windstorms to affect the area were in 1995 and in 2002. Douglas County received Presidential Disaster Declarations for those storms, but severe damages were generally limited to coastal areas.

December 4, 1951

The highest winds were on the coast, reaching 60- 100 mph, but in Roseburg the highest wind was recorded at 40 mph.

Columbus Day Windstorm of 1962

This was the most destructive windstorm ever recorded in the Pacific Northwest. Roseburg recorded gusts of up to 62mph.

October 2, 1967

Another major event, this brought gusts of 69 mph to Roseburg

Other events include **April 1972, November 1981, December 1995** and **February 7, 2002** Windstorms.

Probability/ Frequency

The severe winter weather and windstorm season is typically between October and April and damaging events occur every year.

Large events typically occur about once a decade. Large snow events used to occur every 20-30 years during the late 19th to mid 20th centuries, but have become less frequent. This may be attributable to changing climate patterns.

Vulnerability

The Tribe's primary vulnerability from severe weather and windstorms is from power outages and isolation from road closures. Business disruption, especially for facilities without back-up generators, is also a vulnerability. Tribal elders are vulnerable, especially those that can be trapped in their homes from power failures, heavy snow and ice, and debris from falling trees and power lines. Some older homes and buildings (such as barns) may also be affected by heavy wet snow on roofs. The Tribe's timber and forest resources may also be affected by wind, although not as common or severe as forests near the coast.

4.6. Wildland Fire

Definitions

Forest Fire: Forest fires are the uncontrolled destruction of forested lands caused by natural or human-initiated events. Wildfires occur primarily in undeveloped areas; these natural lands contain dense vegetation such as forest, grasslands or agricultural croplands. Because of their distance from firefighting resources and manpower, these fires can be difficult to contain and can cause a great deal of destruction.

Conflagration: A conflagration is a fire which grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup and explosions are usually the elements behind a wildfire conflagration.

Firestorm: This term describes a fire that expands to cover a large area, often more than a square mile. A firestorm usually occurs when many individual fires grow together to make one huge conflagration. The involved area becomes so hot that all combustible materials ignite, even if they are not exposed to direct flame. Temperatures may exceed 1000° Celsius as the fire creates its own local weather: superheated air and hot gases of combustion rise upward over the fire zone, drawing surface winds in from all sides, often at velocities approaching fifty miles per hour. Although firestorms seldom spread because of the inward direction of the winds, once started there is no known way of stopping them. Within the area of the fire, lethal concentrations of carbon monoxide are present; combined with the intense heat this hazard poses a serious life threat to responding fire forces. In exceptionally large events, the rising column of heated air and combustion gases carries enough soot and particulate matter into the upper atmosphere to cause cloud nucleation, creating a locally intense thunderstorm and the hazard of lightning strikes.

Wildland/Urban Interface (WUI) Area: The Wildland-Urban Interface (WUI) is an area within or adjacent to an at-risk community identified in an Oregon Community Wildfire Protection Plan (CWPP). Some Community Wildfire Protection Plans delineate WUI boundaries (CWPP WUI). The Wildland-Urban Interface is the area where structures or human improvement meet or intermingle with wildland vegetation, which includes timber, grassland and brush fields. Communities with wildland fire risk (and their boundaries) are identified by the state through the risk assessment process or during development of Community Wildfire Protection Plans.

General Background

Wildfires are a common and widespread natural hazard in Oregon. Fire is a critical component of the forest and rangeland ecosystems found in all portions of the state. Over 41 million acres of forest and rangeland in Oregon are susceptible to wildfire, which may occur during any month of the year, but usually occur between July and October. In addition to wildland/urban interface fires, Oregon experiences wildland fires that do not threaten structures, and also occasionally

has prescribed fires. The principal type affecting Oregon communities is interface fire, which occurs where wildland and developed areas intermingle with both vegetation and structures combining to provide fuel. As more people have moved into wildland interface areas, the number of large wildfires impacting homes has escalated dramatically. The areas of highest risk are in central, southwest, and northeast Oregon. Fuel, slope, weather, and development are key components in wildfire hazard identification.

The southwest Oregon region, including Douglas County and the Cow Creek Tribe, is one of the highest risk areas for wildfires in Oregon.

Seventy percent of the wildfires suppressed on lands protected by the Oregon Department of Forestry (ODF) result from human activity. The remaining thirty percent result from lightning. Typically, large wildfires which threaten WUI communities result primarily from lightning.

For a more detailed discussion of wildfire issues within the Cow Creek Tribe's Usual and Accustomed areas, including Douglas County, please see the Douglas County Community Protection Plan. Of particular interest is Appendix B, **Tiller Pre-Contact Reference Condition Study**²¹, which discusses tribal wildfire and vegetation management and from which research and findings were used for this hazard profile.

Fire Management by tribal people before the 20th Century²²

The Cow Creek Tribe's ancestors continually burned the forests and grasslands to maintain the prairies and reduce the threat of catastrophic wildfires.

Patch fires were used seasonally to rejuvenate food plants, for weeding, and to create weaving materials; late winter and early spring fires were used to maintain bracken fern prairies ("brakes"); summer fires were used for harvesting tarweed and other seed crops; and fall burning was used to rejuvenate huckleberry fields, treat hazel clumps, and harvest acorns.

Broadcast burning was performed on seasonal basis for clearing trails and underbrush, for hunting, and for creating fuels; mostly in late summer and early fall when plants were dry and before snow or heavy rains had set in. Individual trees and clumps of trees were burned to create firewood and harvest pitch.

²¹ Tiller Pre-Contact Reference Condition Study, By Bob Zybach, PhD. 2011
http://www.co.douglas.or.us/planning/wildfire_plans/AppBSupp.asp

²² Tiller Pre-Contact Reference Condition Study: Final Report, Fire History

Some quotes from tribal members and early researchers explain and reiterate the need for these successful practices.

All the oak timber was owned by well-to-do families and was divided off by lines and boundaries as carefully as the whites have got it surveyed today. It can be easily seen by this that the Indians have carefully preserved the oak timber and have never at any time destroyed it.

The Douglas fir timber they say has always encroached on the open prairies and crowded out the other timber; therefore they have continuously burned it and have done all they could to keep it from covering the open lands. Our legends tell when they arrived in the Klamath River country that there were thousands of acres of prairie lands, and with all the burning that they could do the country has been growing up to timber more and more.

--Chenawah Weitchahwah, 1916 (Thompson 1991: 33)

Instead of finding an uninterrupted forest carrying 100,000 feet or more per acre reaching from the Cascades to the Pacific, the first settlers seventy-five years ago [ca. 1840] found in the valleys great areas of "prairie" land covered with grass, brakes, or brush which were burned and kept treeless by the Indians, and mountain sides upon which forest fires had destroyed the mature forest and which were then covered by a "second-growth" of Douglas fir saplings or poles.

--Thornton Munger (1916: 92).

Susan Crispen Shaffer (1990) of the Cow Creek Band of the Umpqua Tribe of Indians noted that:

Indians were the first environmentalists. Our ties to our Mother Earth are different than those of the people who came after us. We have always understood that we must protect the resources that sustain us. The fall burning practices to keep our forests clean were common. This was to keep the forest clear of fallen logs, underbrush, and other debris that collected. It also served the purpose of killing unwanted bugs and insects, harmful to the forest.

By keeping the forest floor clean there was an assurance of plentiful food for the game animals which were the main food source for many tribes. It also provided a clear view of the animals for the hunters. Fish habitat was protected as well. In my Great-grandfather's diaries, he has many entries of burning.

My Great-uncle [Bob Thomason] continued this practice and when the Forest Service came to the Tiller Ranger District here in the Umpqua National Forest in Douglas County, Oregon, their system was not to burn. Here was this old Indian fellow that they knew was continuing to do the burning – what to do with him? They ended up hiring him so that they could keep an eye on him! Some old timers maintain that he sometimes still had a little smoke going here and there! When I was a very little girl, I remember asking Uncle Bob,

“When do you do the burning?” His reply was always, “When the time is right.” He would often go out in the field, away from the house and sniff the air, also wet his finger and hold it up (although there was no wind that I could perceive), and say, “Not yet” or “It’s time.” I never knew on what he based his reasoning. The fires were set annually, but I’m sure on a rotating basis.

As for the time of the year, it would appear that some burning was done in the early Spring, although the bulk of it was in the Fall, perhaps after the first rain, for even in aboriginal times the annual fires were recognized as a way to balance the ecology. After Fall fires, there was a quick greening, providing food for the forest animals.

Hazard Profile

To show exposure and vulnerability to wildfires, GIS data created by Oregon Dept of Forestry (ODF) was used to show Wildland Urban Interface Areas which are also defined as Community Wildfire Protection Plan Boundaries of which the Tribe falls under numerous Plans in Douglas County. ODF mapped variables to determine risk which are shown in the hazard maps that follow.

Location

Douglas County is 90% covered by forest and thus a wildfire can occur anywhere in this area if the conditions are met.

To better define risk, two ODF mapped risk layers are shown to illustrate potential wildfire hazard zones.

- Community at Risk (CAR), Overall Score²³
 - This was based upon a calculated value from the 4 CAR ratings: Risk, Hazard, Protection Capability, and Value. Range of Risk: 1 lowest, 3 highest
 - These maps, including past events, are shown in **Figure 4-26**, **Figure 4-27**, and **Figure 4-28**.
- Community at Risk, Hazard Rating²⁴
 - Resistance to control once a fire starts, considering weather, topography, and fuels characteristics that adversely affect suppression efforts. Based upon a

²³ <http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/overall.htm>

²⁴ <http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/hazard.xml>

calculated value from 7 grids: weather, slope, aspect, elevation, fuel, crown fire potential, and insect damage. Ratings are from 0 (no fuel) to 4 (very high).

- These maps, including past events, are shown in **Figure 4-29**, **Figure 4-30**, and **Figure 4-31**.

Severity

GIS analysis of past wildfire events within the Cow Creek Tribe U&A revealed that 67% of all past events were less than 1/4 of an acre in size, with 95% of all events less than ten (10) acres. There were 28 events larger than 1,000 acres including nine (9) larger than 5,000 acres.

The risk of large and severe fires appears much greater today than in any other time in history due to increased living and dead fuel accumulations, continuity of fuels across the landscape, extended canopy closures, and prevalence of ladder fuels.

Past Events²⁵

Until the 20th century, fires were intentionally set in order to keep the land clear. As forests begin to grow and move into what was previously prairie lands, wildfires became larger. With increased human development in these areas, wildfires also became more dangerous. After 1910, the policy for wildfire management was fire suppression. This led to an increase in fuels and thus an increase in fires, especially large catastrophic fires. Some of the region's most catastrophic fire events have taken place in Douglas County.

Some years stand out above all others such as 1951 and 1987. In 1951, four large fires burned over 40,000 acres and took one life. The Hubbard Creek Fire accounted for much of the damage, burning 15,574 acres, a fire lookout tower and 19 homes. The most costly fire that year took place near Myrtle Creek on the Russell Creek Fire when a Good Samaritan lost his life while helping put the fire out. The uncanny Bland Mountain Fires of 1987 and 2004 (FEMA-2549-FMAGP) started less than 100 yards apart from one another and followed the same path of destruction. The '87 fire burned 10,300 acres and took two lives, while the 2004 blaze scorched 4,700 acres. An additional 30,000 acres burned in 1987 that resulted from hundreds of lightning strikes during the Douglas Complex. The 1961 Clarks Branch Fire burned 5,000 acres and claimed the life of retired DFPA employee, John J. Richards.

Other significant fires in Douglas County are listed below.

- **2002 Tiller Complex:** 68,862 acres.
- **2002 Apple Fire:** 17,600 acres.

²⁵ http://www.co.douglas.or.us/planning/wildfire_plans/pdfs/Introduction.pdf p.1

- **1980 Tye Mountain Fire:** 1,056 acres.
- **1979 Cougar Ridge Fire:** 259 acres, one death.
- **1973 Doe Creek Fire:** 2,332 acres, FEMA-2013-FSA.
- **1966 Oxbow Fire:** 44,368 acres, one death

GIS analysis of past events compiled by the Oregon Dept of Forestry²⁶ found that there were 8,135 wildfires within the Cow Creek Tribe Usual and Accustomed area between 1967 and 2010. These events are shown in **Figure 4-25** and give a good visualization of the amount of wildfires in the area. The additional hazard maps shown in **Figure 4-26** through **Figure 4-34** also show past events, including those on tribal lands.

Table 4-10 shows wildfire causes within the Tribe’s U&A. Note that 25% were caused by lightning.

Table 4-10: Wildfire Causes within Cow Creek U & A

Wildfire Causes	# of Events	% of Total
Fisherman	30	0.37%
Hiker	19	0.23%
Hunter	140	1.72%
Lightning	2,028	24.93%
Motorist	974	11.97%
Other Forest Mgt. Worker	457	5.62%
Other-Landowner Related	366	4.50%
Other-Public	639	7.86%
Public Utility	669	8.22%
Rancher-Farmer	164	2.02%
Recreationist	522	6.42%
Ruralist-Non-Paying	176	2.16%
Ruralist-Paying	1,653	20.32%
Timber Harvest Worker	297	3.65%
Grand Total	8,134	100.00%

It was also found that there were 11 wildfires on tribal properties, although at the time the properties were not owned by the Tribe. There were no reports of damages to property or structures from these events, the majority of which were less than 1/3 acre. The largest of the past events on tribal lands was the Safari Hill fire in October 1998 on what is now the Tribe’s Winston properties, north of Lookingglass Rd in Winston, OR. It burned 55 acres and was caused by debris burning. **Table 4-11** shows the causes of past wildfire events on tribal lands.

²⁶ Historic Fires GIS data layer, <http://www.oregon.gov/ODF/GIS/gisdata.shtml>

Table 4-11: Wildfire Causes on Cow Creek Tribal Lands

Wildfire Causes	# of Events
Burning Vehicle or Equipment	2
Cigarette or Cigar Thrown From Auto	2
Electric Fence	1
Heat from Vehicle Manifold or Exhaust	1
Other - Burning Related	2
Playing With Fire (Juveniles 12 years and under)	1
Track Maintenance (Welding & Grinding)	1
Using Fireworks (Juveniles 12 years and under)	1
Grand Total	11

The Cow Creek Tribe has only begun acquiring land in the last 15 years with most land located in urban areas or in the Umpqua River Valley and thus has not had any reported losses from wildfires. However, as the Tribe increases its land holdings and development, especially into the foothills, the potential and likelihood of losses is certain.

Probability/ Frequency

Fire is a natural component of forest and rangeland ecosystems found in all portions of the state. Many of these ecosystems are dependent upon the existence of frequent fire, or on a viable substitute, for their continued existence. Even western Oregon forests, in the "wet" northwestern portion of the state, depend upon fire. It is a common myth that an unbroken carpet of old growth timber blanketed western Oregon prior to the beginning of European American settlement. In fact, fire and other natural forces had created a mosaic of different aged timber stands across the region. Factors now influencing the occurrence and severity of wildfires include poor forest health, invasive plant and tree species, high amounts of vegetation arising from long-term fire exclusion, changes in weather patterns, and the presence of humans and human development.

In Oregon, wildfires are inevitable. Although usually thought of as being a summer occurrence, wildland fires can occur during any month of the year. The vast majority of wildfires burn during the June to October time period. Dry spells during the winter months, especially when combined with winds and dead fuels, may result in fires that burn with an intensity and a rate of spread that surprises many people.

Since 1967, there has been an average of 185 wildfires per year recorded by ODF within the Cow Creek Tribe's U&A.

It should be noted that with current forest management policies that focus on suppression, wildfires have been trending towards increased size and severity and have become harder to

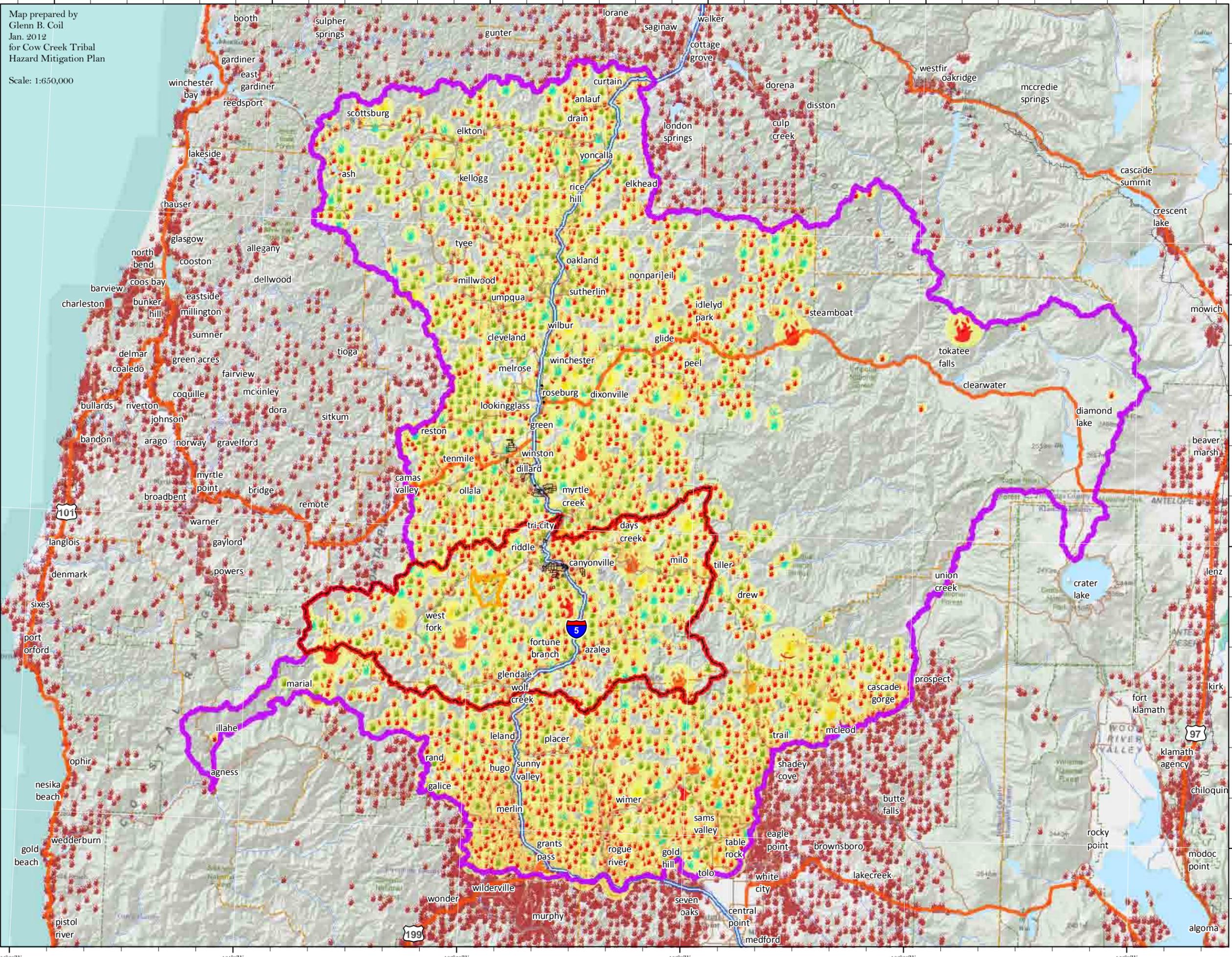
contain. Catastrophic fires, those which burn over 100,000 acres during a single event or catastrophic fire years, calendar years in which more than 100,000 acres of forestland within a given area are burned by wildfire, whether during the course of a single event, or as a result of numerous events, have become more frequent in historic times.

The ODF has also created a hazard layer, “Community at Risk Rating, likelihood of a fire occurring” and depicts amount of fires per 1,000 acres per 10 years. Less than 0.1 is considered low likelihood, while 1.1 or more is considered high likelihood. These maps, which also depict past wildfire events, are shown in **Figure 4-32**, **Figure 4-33**, and **Figure 4-34**.

Vulnerability

The Cow Creek Tribe is located in one of the most wildfire –prone areas of the country and thus is highly vulnerable from wildfires. This vulnerability will increase as the Tribe increases its land holdings, especially into the surrounding hills outside of the urban areas of Douglas County, although the towns themselves are not safe from wildfires. All of the Tribe’s lands are within the Wildland -urban interface areas of Douglas County.

As the Tribe develops more of its lands, the vulnerability of its structures will increase, especially if effective mitigation efforts are not utilized. The Tribe has been proactive in mitigating wildfires on its lands, working with local and regional fire agencies and the Bureau of Indian Affairs to reduce fuels, with emphasis in the WUI areas and near critical infrastructure, such as the Tribe’s drinking water system near Canyonville. One of the most sustainable methods for reducing damaging wildfires is returning to the forest management employed by the Tribe before the 20th Century that consisted of small frequent burns of fuels and underbrush.



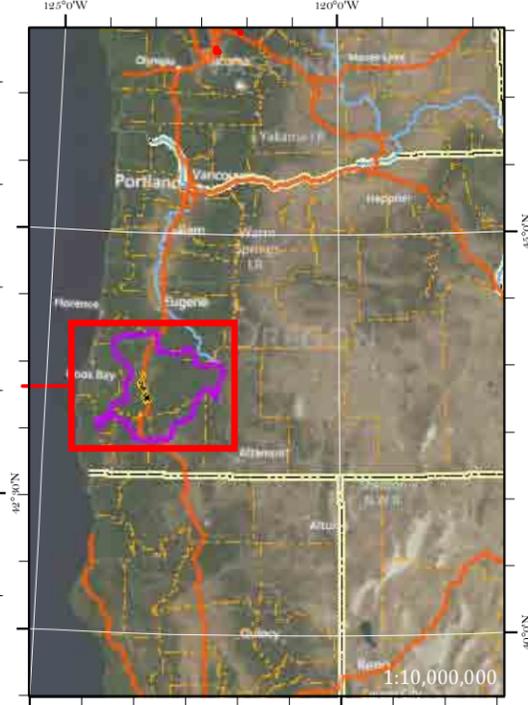
**Figure 4-25:
Past Wildfires within
Cow Creek Tribal U & A**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres
- Other Past Wildfires

This map shows the 8,135 ODF recorded wildfires from 1967-2010 within the Cow Creek Tribe's U&A as well as other regional wildfire events.



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Map prepared by
Glenn B. Coil
Feb. 2012
for Cow Creek Tribal
Hazard Mitigation Plan

Scale: 1:48,000

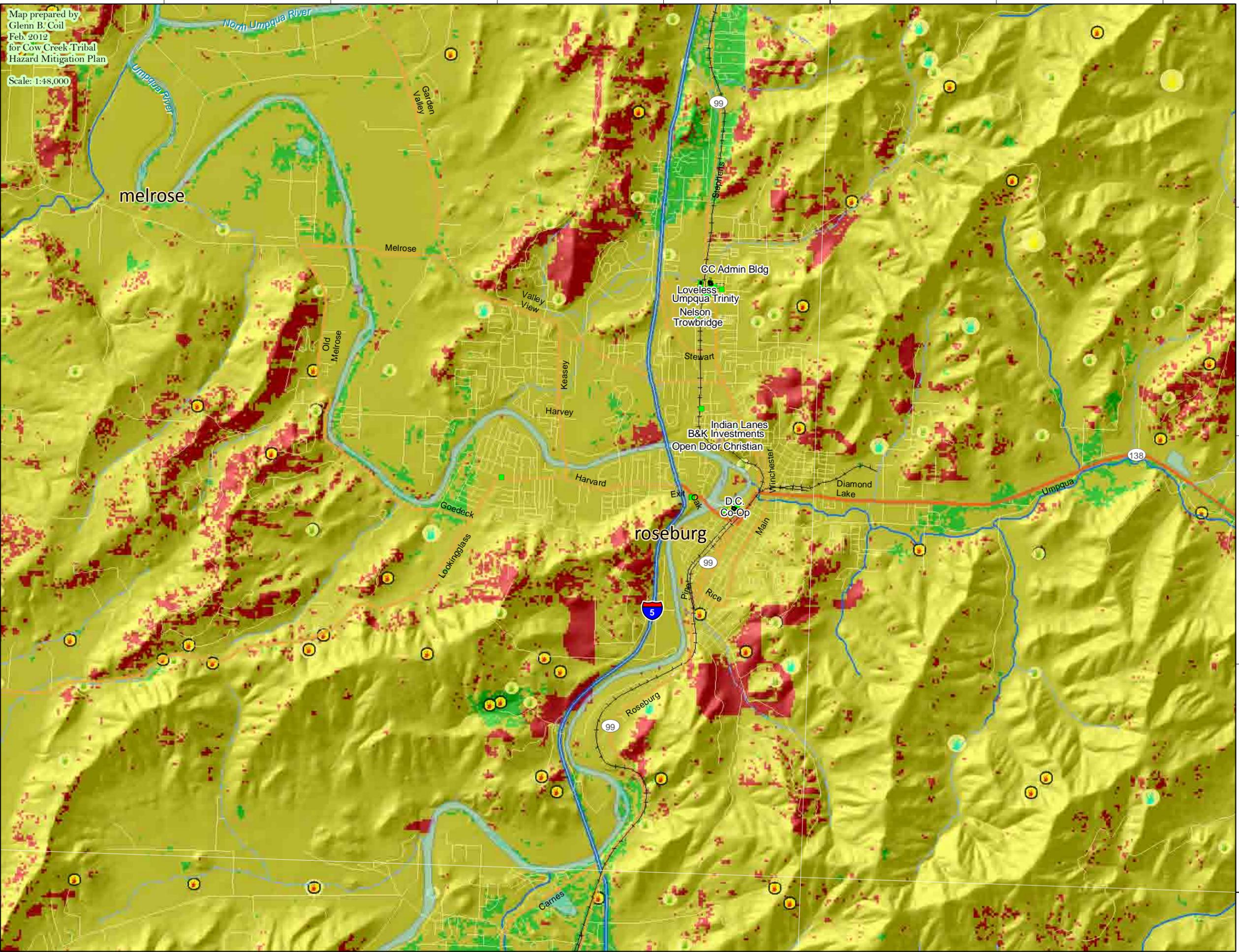


Figure 4-26:
Wildfire Community at Risk,
Overall Score & Past Events
Roseburg, OR

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

CAR - Overall Score

- 1 - Low
- 2 - Medium
- 3 - High

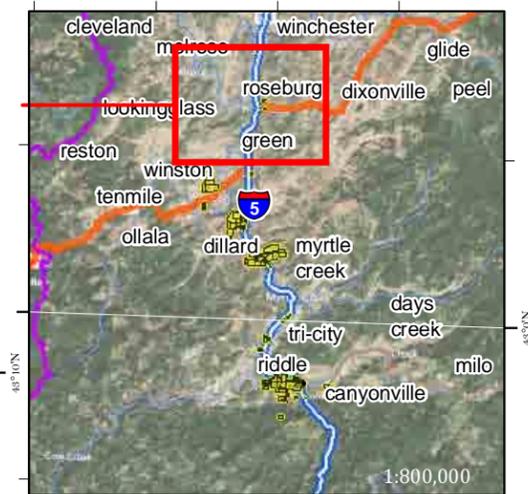
- Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Roseburg, OR area.

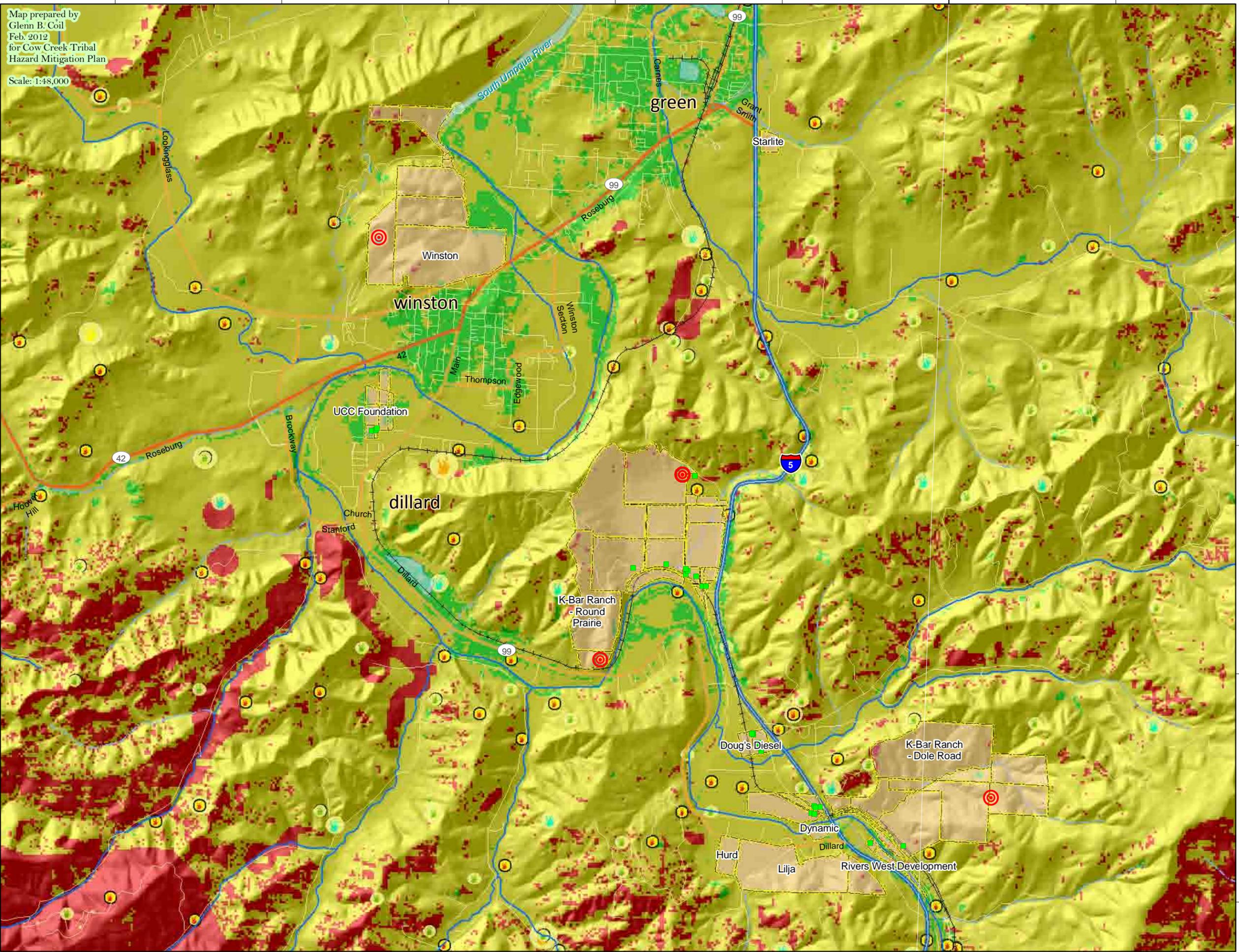
Community At Risk overall score: Based upon a calculated value from the 4 CAR ratings: Risk, Hazard, Protection Capability, and Value.



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Scale: 1:48,000



**Figure 4-27:
Wildfire Community at Risk,
Overall Score & Past Events
Winston-Dillard, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

CAR - Overall Score

- 1 - Low
- 2 - Medium
- 3 - High

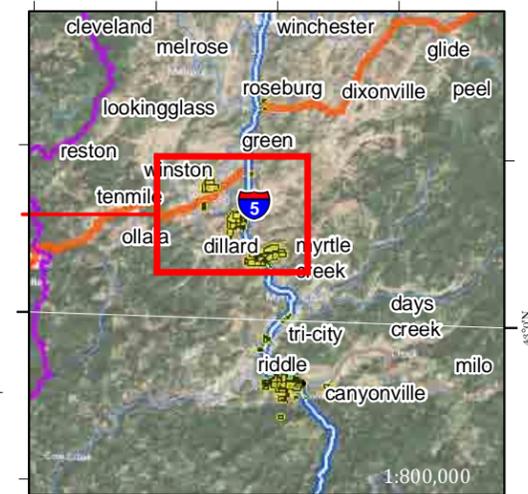
Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Winston-Dillard area.

Community At Risk overall score: Based upon a calculated value from the 4 CAR ratings: Risk, Hazard, Protection Capability, and Value.



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125°20'W

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Scale: 1:48,000



**Figure 4-28:
Wildfire Community at Risk
Overall Score & Past Events
Myrtle Creek/Canyonville, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

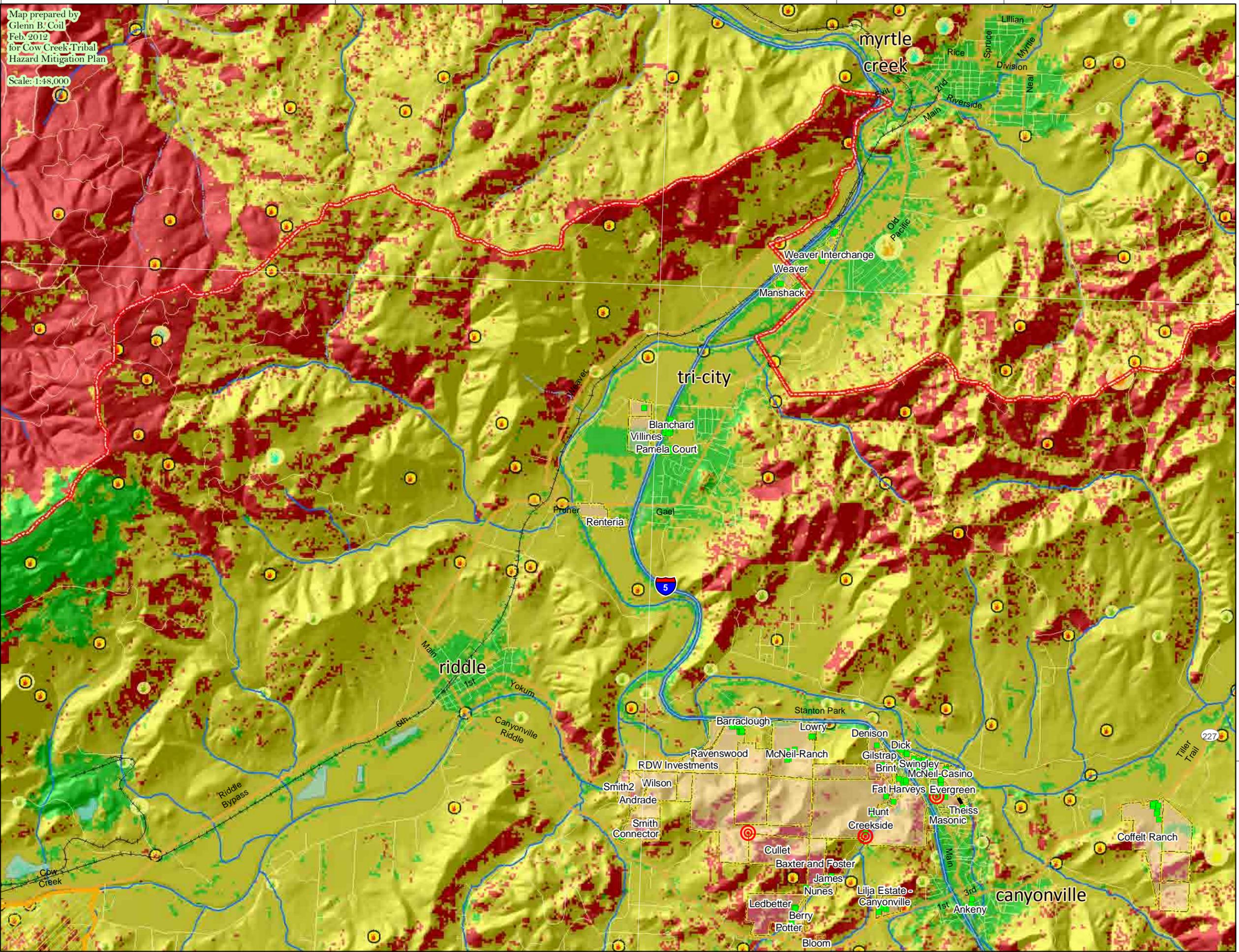
CAR - Overall Score

- 1 - Low
- 2 - Medium
- 3 - High

- Wildfires on Tribal Lands

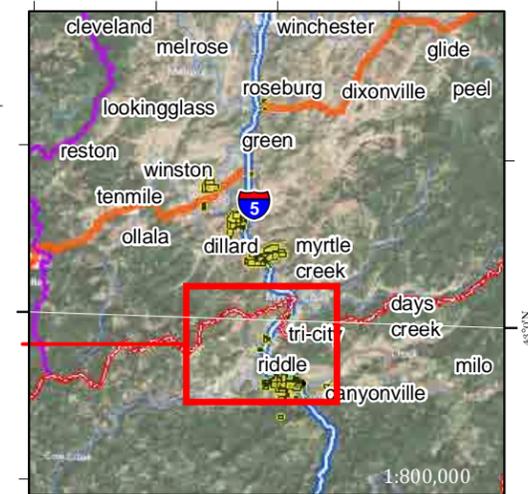
Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres



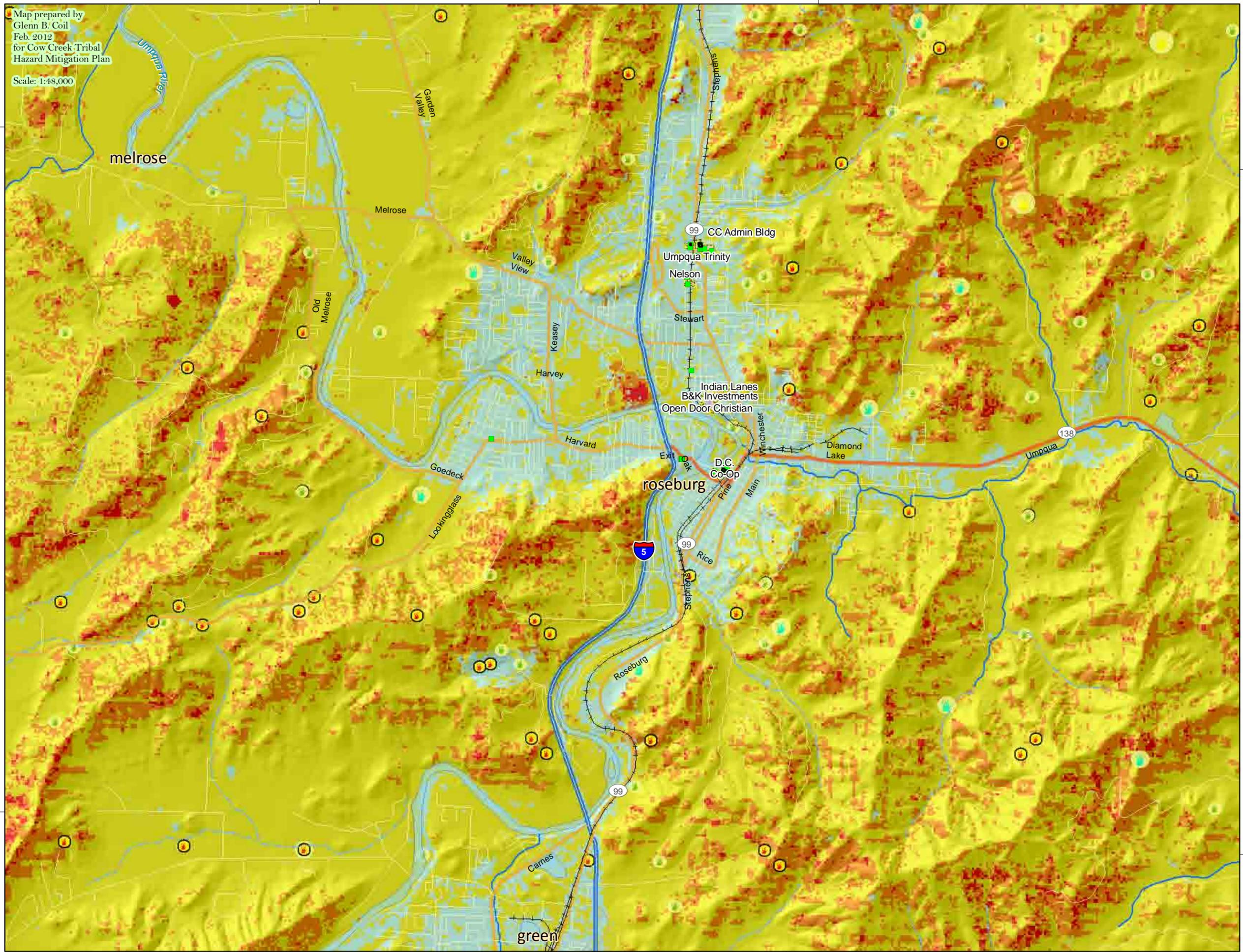
This map shows the ODF recorded wildfires from 1967-2010 in the Myrtle Creek/Canyonville area.

Community At Risk overall score: Based upon a calculated value from the 4 CAR ratings: Risk, Hazard, Protection Capability, and Value.



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Feb. 2012
for Cow Creek Tribal
Hazard Mitigation Plan
Scale: 1:48,000



**Figure 4-29:
Wildfire Hazard Rating & Past Events
Roseburg, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

Wildfire Hazard Rating

- 0 - No Fuel
- 1 - Low
- 2 - Medium
- 3 - High
- 4 - Very High

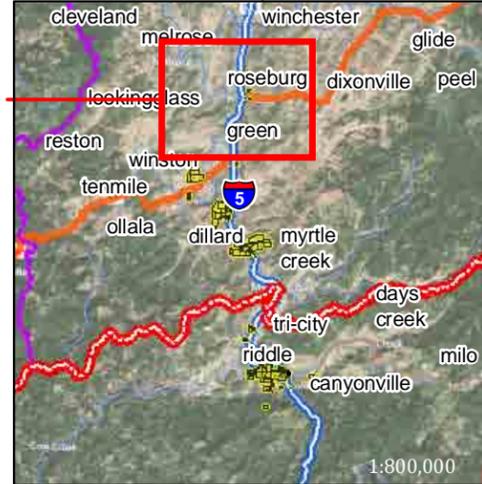
Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Roseburg, OR area.

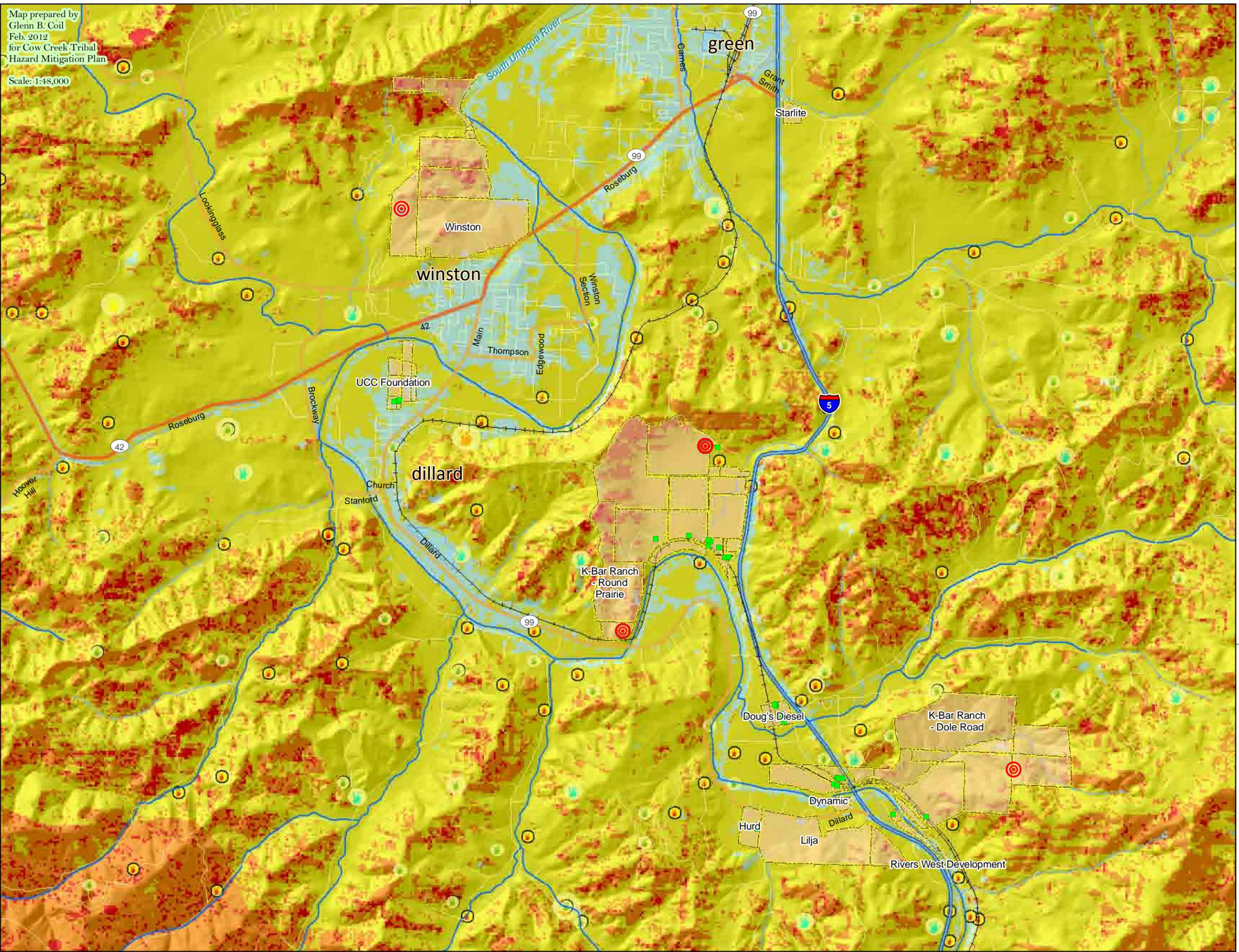
Community At Risk rating for Hazard: Resistance to control once a fire starts, considering weather, topography, and fuels characteristics that adversely effects suppression efforts. Based upon a calculated value from 7 grids: weather, slope, aspect, elevation, fuel, crown fire potential, and insect damage.



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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Map prepared by
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Feb. 2012
for Cow Creek Tribal
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Scale: 1:48,000



**Figure 4-30:
Wildfire Hazard Rating & Past Events
Winston-Dillard, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

Wildfire Hazard Rating

- 0 - No Fuel
- 1 - Low
- 2 - Medium
- 3 - High
- 4 - Very High

- Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Winston-Dillard area.

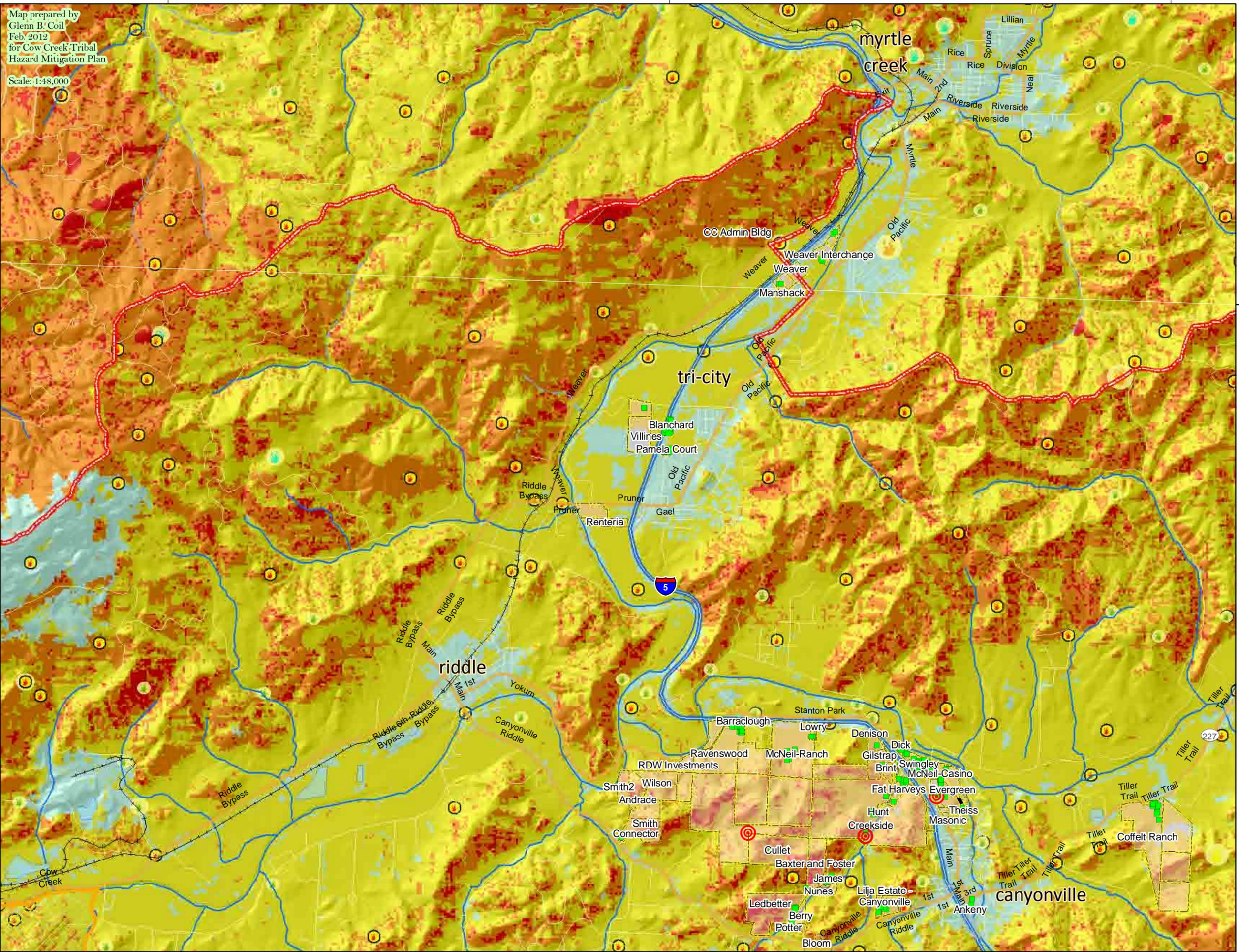
Community At Risk rating for Hazard: Resistance to control once a fire starts, considering weather, topography, and fuels characteristics that adversely effects suppression efforts. Based upon a calculated value from 7 grids: weather, slope, aspect, elevation, fuel, crown fire potential, and insect damage.



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Feb. 2012
for Cow Creek Tribal
Hazard Mitigation Plan

Scale: 1:48,000



**Figure 4-31:
Wildfire Hazard Rating & Past Events
Myrtle Creek/Canyonville, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings
- Wildfire Hazard Rating**
- 0 - No Fuel
- 1 - Low
- 2 - Medium
- 3 - High
- 4 - Very High
- Wildfires on Tribal Lands
- Wildfires, by Size, 1967-2010**
- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Myrtle Creek/Canyonville area.

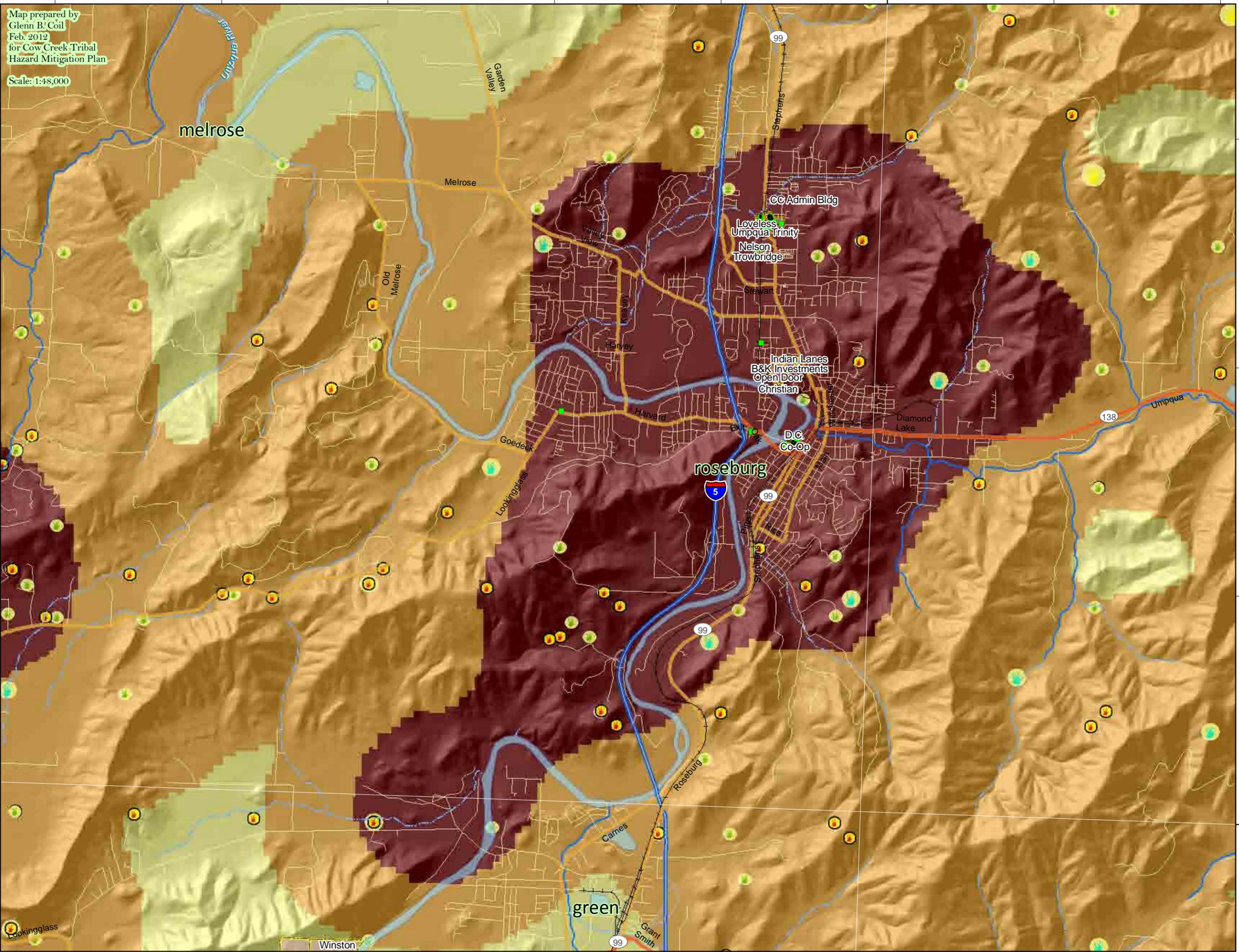
Community At Risk rating for Hazard: Resistance to control once a fire starts, considering weather, topography, and fuels characteristics that adversely effects suppression efforts. Based upon a calculated value from 7 grids: weather, slope, aspect, elevation, fuel, crown fire potential, and insect damage.



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**Figure 4-32:
Community at Risk,
Likelihood of a Fire Occurring & Past Events
Roseburg, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

CAR - Likelihood of a Fire Occurring

- Low: 0-0.1 fires per 1,000 acres per 10 years
- Moderate: 0.1-1.1 fires " " " " " "
- High: 1.1+ fires " " " " " "

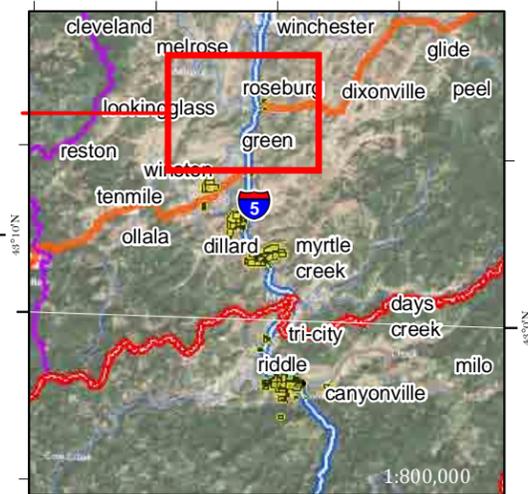
- Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Roseburg, OR area.

Community At Risk rating for risk: Likelihood of a fire occurring. Determined using historic wildfires. Risk rating based upon # wildfires per 1,000 acres per 10 years



For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

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Map prepared by
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Feb. 2012
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Scale: 1:48,000

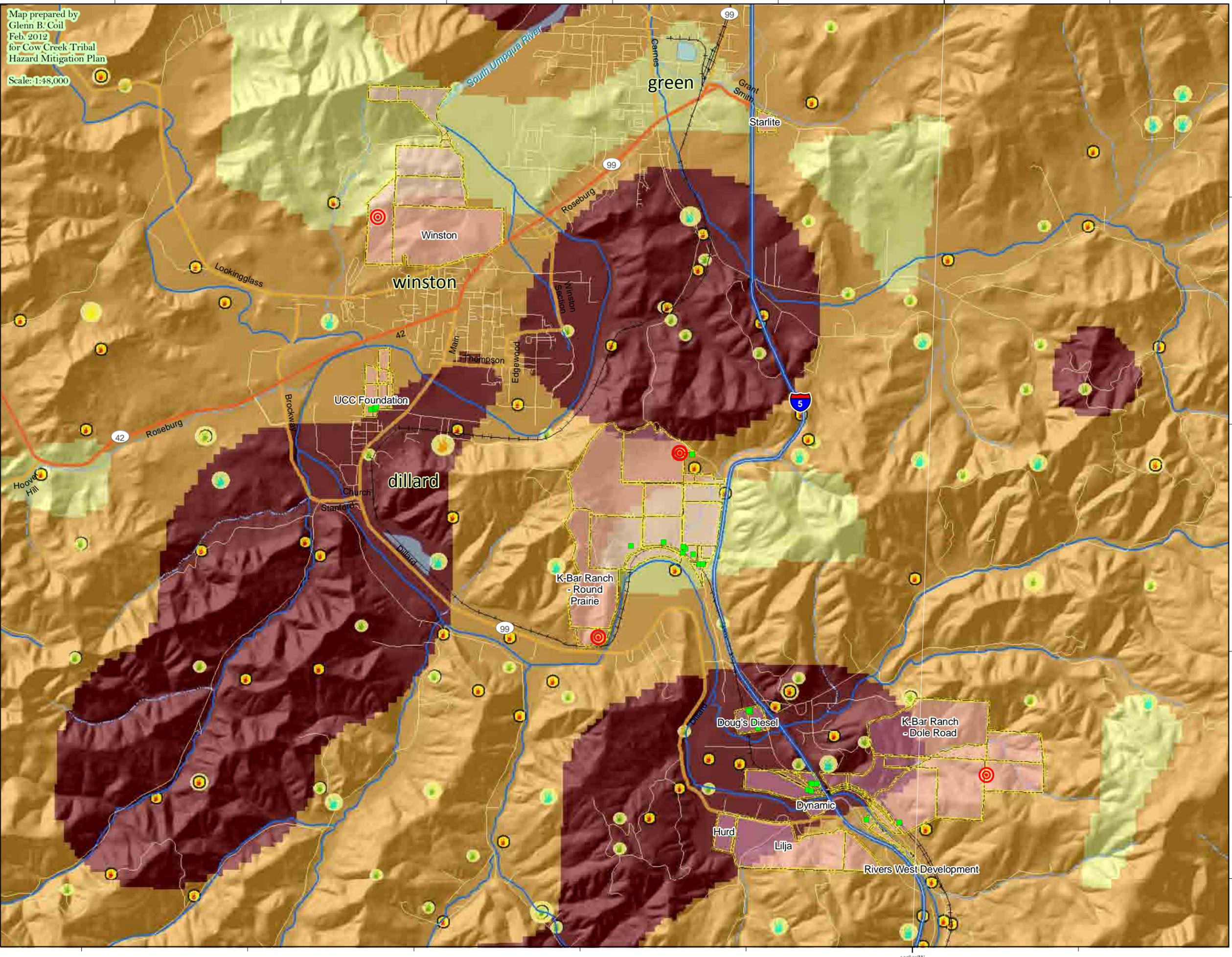


Figure 4-33:
Wildfire Community at Risk
Likelihood of a Fire Occurring & Past Events
Winston-Dillard, OR

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

CAR - Likelihood of a Fire Occurring

- Low: 0-0.1 fires per 1,000 acres per 10 years
- Moderate: 0.1-1.1 fires " " " " " "
- High: 1.1+ fires " " " " " "

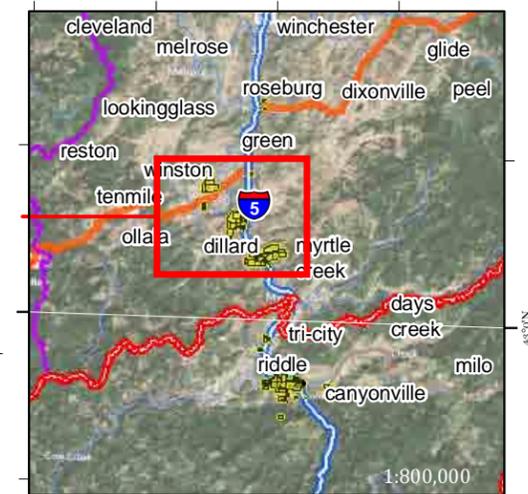
- Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Winston-Dillard area.

Community At Risk rating for risk: Likelihood of a fire occurring. Determined using historic wildfires. Risk rating based upon # wildfires per 1,000 acres per 10 years.

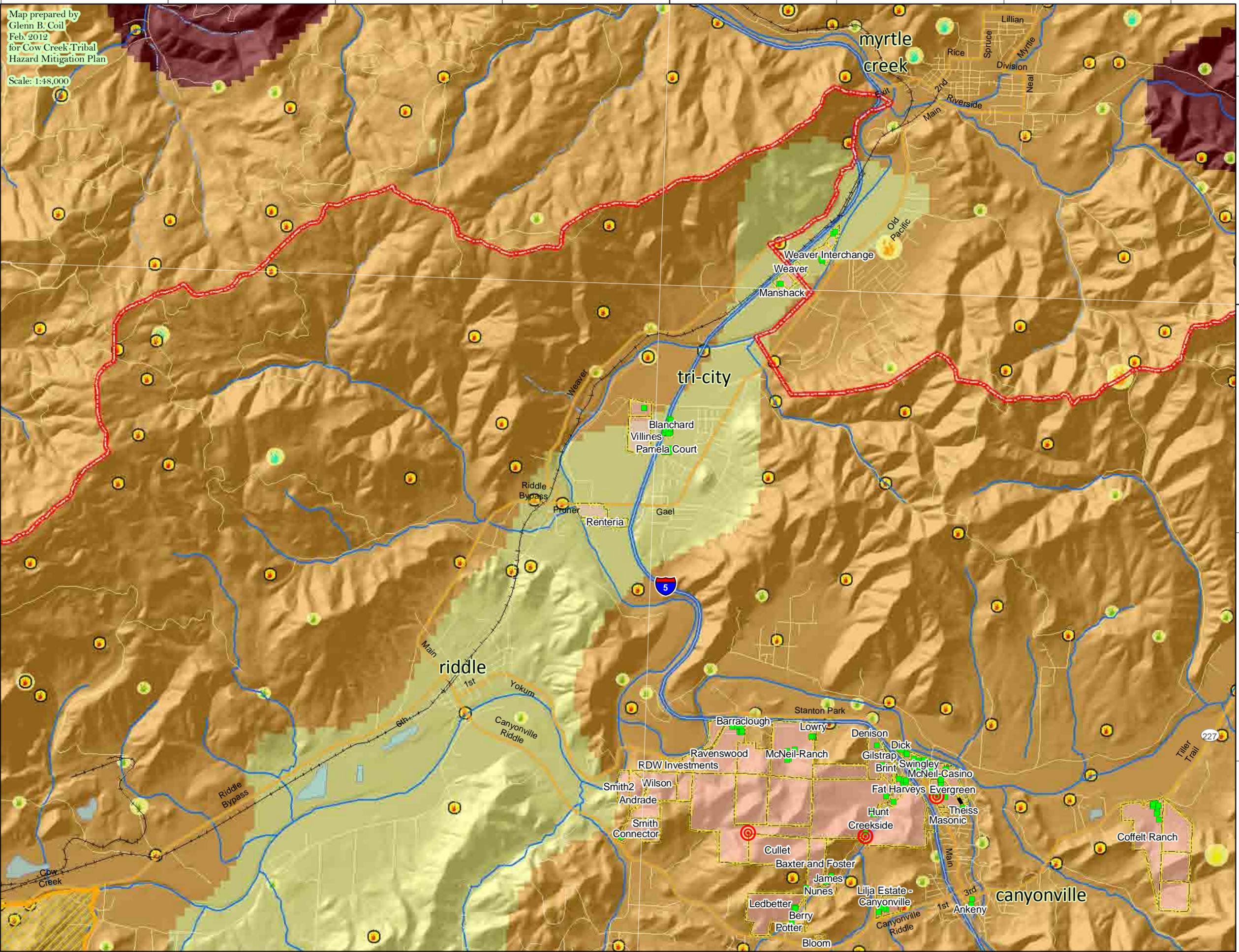


For reference use only. Data compiled from state, federal, ESRI and Cow Creek Tribal Sources.

125°20'W

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Map prepared by
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Feb. 2012
for Cow Creek Tribal
Hazard Mitigation Plan
Scale: 1:48,000



**Figure 4-34:
Community at Risk
Likelihood of a Fire Occurring & Past Events
Myrtle Creek/Canyonville, OR**

- Usual and Accustomed Area
- Treaty Ceded Lands
- Tribal Parcels & Properties
- Tribal Buildings

CAR - Likelihood of a Fire Occurring

- Low: 0-0.1 fires per 1,000 acres per 10 years
- Moderate: 0.1-1.1 fires " " " " " "
- High: 1.1+ fires " " " " " "

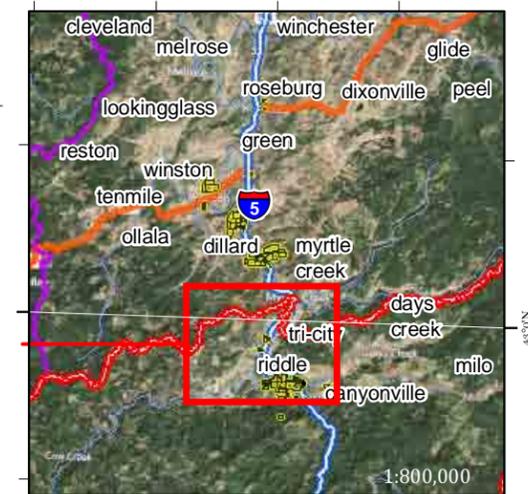
- Wildfires on Tribal Lands

Wildfires, by Size, 1967-2010

- .25 acres or less
- .26 to 10 acres
- 10.01 to 100 acres
- 100.01 to 300 acres
- 300.01 to 1,000 acres
- 1,000.01 to 5,000 acres
- 5,000.01 or more acres

This map shows the ODF recorded wildfires from 1967-2010 in the Myrtle Creek/Canyonville area.

Community At Risk rating for risk: Likelihood of a fire occurring. Determined using historic wildfires. Risk rating based upon # wildfires per 1,000 acres per 10 years.



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5. Mitigation Strategy

This section provides the blueprint for the Cow Creek Tribe to reduce potential losses from the natural hazards identified in the Risk Assessment found in Chapter 4. The format of this chapter is as follows:

Section 5.1 will describe the Goals and Objectives the Cow Creek Tribe has formulated to guide the selection of mitigation strategies.

Section 5.2 is an assessment of the Tribe's pre-and post-disaster capabilities.

Section 5.3 identifies, evaluates and prioritizes the mitigation strategies the Tribe is pursuing.

Section 5.4 identifies current and potential sources of Federal, State, Tribal, local and private funding to implement mitigation activities.

5.1. Goals and Objectives

This section defines the general outcomes that can be expected as a result of successful implementation of this plan. Plan goals are broad statements describing the principles that guide the actions suggested in this document. Plan objectives are more targeted statements that define strategies and implementation steps to attain the goals. The plan goals and objectives below were developed based on the Tribe's overall Mission Statement, the outcome of planning meetings and the results of the Risk Assessment.

Tribal Mission Statement:

"The mission of the Cow Creek Band of Umpqua Tribe of Indians is to uphold Tribal Government, protect and preserve Tribal history, culture and the general welfare of the Tribal membership, as well as to provide for the economic needs of the Tribe and its members through land acquisition and business development. To further fulfill its mission, the Tribe fosters a "good work ethic" and independence for the membership and strongly upholds the "government to government" relationship with local, State and Federal governments. The Tribe constantly develops strong cooperative relationships that benefit not only the Tribe, but the local community as well."

Goals and objectives:

The Tribe intends to stay true to its Mission Statement while accomplishing the following goals in developing its Plan:

- to protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identity and self-governance;
- to identify and recommend future projects and programs for the Tribe that, upon implementation, would eliminate, reduce or otherwise mitigate the vulnerability of the Tribe's people, property, natural resources and economic vitality which may result from impacts of future disasters;
- to guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development; and
- to promote a disaster resilient community.

The Tribe's plan objectives include, but are not limited to:

- Focusing on risk assessment to keep future developments outside of known hazard areas;
- Protecting culturally and historically significant Tribal sites and resources;
- Increasing mitigation and emergency management capabilities for the Tribe; and
- Supporting local and regional mitigation efforts that do not conflict with the Tribe's Mitigation Goals.

5.2. Identification & Analysis of Tribal Mitigation Actions

The Mitigations actions proposed for this Tribal Hazard Mitigation Plan were identified through the Community Hazards Survey and meetings with Tribal, Federal and local/state officials. This section identifies the mitigation actions the Cow Creek Band of Umpqua Tribe will implement as resources and funding become available.

Mitigation actions can be grouped into six broad categories:²⁷

1. Prevention. Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.

²⁷ State and Local Mitigation Planning How-to Guide, p 2-1
<http://www.fema.gov/library/viewRecord.do?id=1886>

2. Property Protection. Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area. Examples include acquisition, elevation, relocation, structural retrofits, storm shutters, and shatter-resistant glass.

3. Public Education and Awareness. Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

4. Natural Resource Protection. Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

5. Emergency Services. Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

6. Structural Projects. Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

5.3. Review of Local/Regional Mitigation Actions

The Tribe's process of identifying and prioritizing mitigations actions began by reviewing local and regional mitigation actions that could potentially affect the Tribe and its interests. The Mitigation actions reviewed came from:

Douglas County Hazard Mitigation Plan – 2009 update

- Actions identified for specific review of tribal support

State of Oregon Natural Hazards Mitigation Plan – 2009 update

Through meetings and workshops with Tribal officials, the External Stakeholder Workgroup and staff and community members, the Cow Creek Tribe identified 19 mitigation actions for prioritization and implementation.

The criteria used to prioritize included feasibility, costs and need. As the specific mitigation projects are further defined, the FEMA Benefit-Cost Analysis software will be used to rank said projects for feasibility.

The initially identified Mitigation Actions include:

Suggested from External Stakeholder meeting June 20, 2011:

- Continued Coordination with City, County and State.
- Wildfire Fuel Reduction Program (w/ Douglas Forest Protective Association).
- Continued maintenance - continuing planning process – highest standards.
- Integrate Best Practices & Lessons Learned.
- Education & Outreach.
- Hazard awareness & emergency info for employees, guests and tourists.
- Plan for redundancy of resources & facilities.
- Build structures to highest standards for those in hazard areas.
- Develop Emergency Operations Plan.

Other suggested actions: (from review of Douglas County Plan, other tribal plans & surveys)

- Become a Firewise Community: <http://www.firewise.org/Communities/USA-Recognition-Program.aspx>.
- Become a NWS StormReady Community: <http://www.stormready.noaa.gov/>.
- Develop and maintain an Emergency Management Program.
- Join FEMA National Flood Insurance Program.
- Maintain flood & earthquake insurance coverage for tribal facilities and housing.
- Support Douglas County Mitigation Actions.
- Develop a system to protect and maintain historical and archival Tribal records.
- Identify elders and other vulnerable populations to prioritize for mitigation and disaster assistance.
- Implement a program such as Community Emergency Response Training (CERT) to train Tribal members to respond to an emergency.
- Assure that the Tribal community is informed of the necessity of maintaining a 14-21 day supply of food and water, along with basic first aid and medical supplies.

5.4. Implementation of Mitigation Actions

This section will describe how the Cow Creek Tribe's mitigation actions were prioritized, and will be implemented and administrated by the Tribe.

Prioritization

After the initial identification of mitigation actions, the Emergency Planning Committee reviewed the actions for prioritization. They made internal recommendations that were submitted to Tribal Council for review and adoption. On August 14, 2011, the Cow Creek Tribal Council adopted, via Resolution 2011-31, ten (10) mitigation actions. This Resolution can be found in **Appendix C**. Upon additional discussions and review within the Emergency Planning Committee, it was determined to add one additional mitigation action, making the total of eleven.

A formal method of evaluation was not used, but the following considerations were used during the prioritization process:

- **Cost effective:** Can this project be implemented within the current budget or with current available funding?
- **Relevancy:** Is this project relevant to the Mitigation Goals of the Tribe?
- **Political will:** Is this a project that the Tribe can implement and see through?

Due to the nature of the mitigation actions identified, especially in regards to a lack of FEMA PDM eligible projects, a formal benefit-cost analysis (BCA) was not conducted for each identified action. If certain projects are deemed fundable, a BCA will be conducted prior to the development of grant applications.

Implementation

The Cow Creek Tribal Emergency Planning Committee will oversee the implementation of the mitigation plan and will identify and work with relevant departments and outside agencies. Each mitigation action also has an implementation timeline which is as follows:

On-going: Mitigation action will begin short-term and will continue indefinitely.

Short-term: Mitigation action can be implemented within five (5) years.

Long-term: Mitigation action will be implemented in the future. If not begun within five (5) years, will be re-evaluated in the update.

At this time, a detailed implementation strategy for each mitigation action has not been developed but will be when the Tribe determines it is feasible to implement the specific action.

Administration

The Cow Creek Tribe's Emergency Planning Committee will lead in the administration of the mitigation actions and direct/oversee relevant departments in the implementation.

The Emergency Planning Committee will work to identify funding sources, if applicable, for the implementation of actions. Many of the mitigation actions identified can be implemented without major sources of outside funding, and thus can be carried out within the existing tribal budget.

5.5. Prioritized Mitigation Actions

In keeping with the above listed goals and objectives, the Tribe plans to implement the following eleven mitigation actions to reduce the effects of natural hazards:

- Plan for redundancy of Tribal resources and facilities;
- Continue to plan and build Tribal structures to highest standards and, if possible, to keep such structures out of known hazard areas;
- Develop and maintain an Emergency Management Program and overall Tribal Emergency Operations Plan;
- Become a member community of FEMA's National Flood Insurance Program (NFIP);
- Maintain flood and earthquake insurance coverage for existing Tribal facilities and housing which are located within a known hazard area, with future evaluation whether it remains prudent to maintain said insurance (cost benefit ratio);
- Identify Tribal elders and other vulnerable populations so mitigation and disaster assistance can be prioritized;
- Educate members of the Tribal community and Tribal employees regarding importance of personal and/or family preparedness, for natural disasters and/or terrorism to aid in self reliance during a disaster or event;
- Develop hazard awareness and emergency information for Tribal employees, guests and tourists;
- Conduct drills and tests of mitigation and emergency system developed;
- Continue to coordinate with City, County and State in mitigation efforts; and
- Support State and County mitigation actions and exercises.

The format and explanation of each mitigation measure is shown below:

Mitigation Strategy: The mitigation action or activity is shown here. “T” stands for Tribal. These actions are proposed in the Cow Creek Tribal Hazard Mitigation Plan.

Associated Hazards: Each mitigation strategy is related to one or more of the hazards that could affect the Cow Creek Tribe.

Timeline: This estimates the amount of time it will take to begin implementation of each strategy. Under timeline there are three categories, short term, long term and ongoing.

- Ongoing: the mitigation strategy will be implemented in years one to five and will continue into the future indefinitely.
- Short Term: the mitigation strategy will be implemented in years one to two.
- Long Term: the mitigation strategy will be implemented in years three to five.

Lead Agency: This is the agency or agencies that will organize resources, find appropriate funding or oversee project implementation, monitoring and evaluation.

Implementation Cost: This is the approximate amount that the strategy will cost to implement.

Related Goals: Each mitigation strategy is related to a Goal listed in Section 5.1.

Table 5-1: Prioritized Mitigation Strategy 2012-2017

Cow Creek Tribe Mitigation Strategy 2012-2017	Associated Hazards					Timeline	Lead Agency	Implementation Costs	Plan Goals Addressed			
	Earthquake	Flood	Landslide	Severe Weather	Wildland Fire				Goal 1: Protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identify and self-governance.	Goal 2: Identify and recommend future projects and programs for the Tribe.	Goal 3: Guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development.	Goal 4: Promote a disaster resilient community.
Plan for redundancy of Tribal resources and facilities	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓
Continue to plan and build Tribal structures to highest standards and, if possible, to keep such structures out of known hazard areas	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓
Develop and maintain an Emergency Management Program and overall Tribal Emergency Operations Plan	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓
Become a member community of FEMA's National Flood Insurance Program (NFIP);		✓				Short-term	Emergency Planning Committee	n/a	✓	✓	✓	✓
Maintain flood and earthquake insurance coverage for existing Tribal facilities and housing which are located within a known hazard area, with future evaluation whether it remains prudent to maintain said insurance (cost benefit ratio)	✓	✓				On-going	Emergency Planning Committee	n/a	✓			✓

Cow Creek Tribe Mitigation Strategy 2012-2017	Associated Hazards					Timeline	Lead Agency	Implementation Costs	Plan Goals Addressed			
	Earthquake	Flood	Landslide	Severe Weather	Wildland Fire				Goal 1: Protect its people, property, natural environment, natural resources and economic vitality while upholding its sovereignty, identify and self-governance.	Goal 2: Identify and recommend future projects and programs for the Tribe.	Goal 3: Guide future economic planning and development to include natural hazard risk assessment as a component of future economic planning and development.	Goal 4: Promote a disaster resilient community.
Identify Tribal elders and other vulnerable populations so mitigation and disaster assistance can be prioritized	✓	✓	✓	✓	✓	Short-term	Emergency Planning Committee	n/a	✓	✓		
Educate members of the Tribal community and Tribal employees regarding importance of personal and/or family preparedness, for natural disasters and/or terrorism to aid in self reliance during a disaster or event	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓		✓
Develop hazard awareness and emergency information for Tribal employees, guests and tourists	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓
Conduct drills and tests of mitigation and emergency system developed	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓		✓
Continue to coordinate with City, County and State in mitigation efforts	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓
Support State and County mitigation actions and exercises	✓	✓	✓	✓	✓	On-going	Emergency Planning Committee	n/a	✓	✓	✓	✓

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5.6. Capability Assessment

This section will discuss the pre- and post-disaster hazard management policies, programs, and mitigation capabilities of the Cow Creek Tribe. This discussion will include an evaluation of Tribal laws, regulations, policies, and programs that are relevant to hazard mitigation and to development activity in hazard-prone areas.

Tribal Capabilities

Currently the Cow Creek Tribe's capabilities to deal with disaster events are quite limited. Nonetheless, a framework is in place to develop and expand Tribal pre- and post-disaster hazard management policies, programs, and mitigation capabilities. This mitigation plan and the actions identified in it are the first step that will help to ensure a disaster resilient community in the future. The Tribe has some funding capabilities for hazard mitigation planning and projects. The Tribe is committed to supporting its post-disaster recovery efforts and will supplement its recovery efforts with federal support and programs.

Planning

Apart from this Mitigation Plan, the Tribe does not have any other formal planning capabilities related to hazard mitigation. This Plan will be included in the Tribe's overall Emergency Operation Plan (also under development) as the pre-disaster mitigation component.

Forest Management Planning

The Natural Resources Department is currently planning a forest inventory project with the support of the Bureau of Indian Affairs. This work will be informative for developing a forest management plan for Tribal lands. Such a plan, along with the environmental assessment required by the National Environmental Policy Act (NEPA), will soon be underway on Tribal lands.

Ordinances & Regulations

The Tribe does not have any adopted ordinances or regulations in regards to hazard mitigation, but the Tribe contracts with the following outside agencies as follows to ensure that the Tribe is protected against the effects of natural hazards:

- Douglas County, a subdivision of Oregon. This is for building inspections to insure Tribe is meeting all building codes when constructing a new building. There is no resolution adopting the County's or State's building codes; however, the agreement itself specifies

that the County will review for compliance with standards specified in the Uniform Structural Code, Uniform Plumbing Code, Uniform Mechanical Code and related codes nationally recognized and publications including the Douglas County Code Chapter 15.25 solely as related to building safety and structural specifications. The County Building Code was adopted in 1997.

- Canyonville South Umpqua Fire Protection District for fire suppression services on the Reservation.
- City of Roseburg for building plan review and inspection services, water and storm drain services, and fire and police services. No particular codes are mentioned, nor have any been officially adopted by the Tribe.

Communications

The Tribe does not currently maintain communications assets or equipment. The Tribe is working closely with Douglas County Emergency Management to identify equipment that is interoperable with county/state equipment and is developing agreements to use emergency frequencies for events. The Tribe is identifying funding sources to purchase communications equipment.

Agencies and Programs

Douglas Forest Protective Association (DFPA)²⁸

The Douglas Forest Protective Association provides wildland fire protection to 1.6 million acres of private, county, state and Bureau of Land Management lands within the Douglas District.

Formed in 1912 by landowners with common interests and goals, DFPA has grown to be one of the premier fire protection agencies in the nation. The Association is governed by a board of directors comprised of landowners representing large timber companies, grazing, and small woodland owners.

Often mistaken as a state government agency, DFPA is actually a non-profit association that contracts with the Oregon Department of Forestry to provide fire protection for the Douglas District. And due to Bureau of Land Management's (BLM) checkerboard ownership west of the Cascade Mountain Range, the agreement with the State Forester covers these lands as well.

²⁸ <http://www.dfpa.net/about%20dfpa.asp>

The Tribe currently has an informal mutual aid agreement with DFPA for wildfire assistance. The Tribe also has an agreement with DFPA for forest management for the Tribe's timber lands such as the Winston and Creekside Properties as well as Jordan Creek that runs through it.

This agreement is specific to emergency management/hazard mitigation as it aims to reduce the Tribe's contribution to fire fuels that could contribute to wildfires. Recent fuels reduction work on Tribal lands includes 47 acres of cutting, lopping, and scattering on the Winston property adjacent to Wildlife Safari. An earlier project on the same property involved cutting and piling of slash; these piles will be burned during the coming wet season. Another recent project included cutting and piling, then burning the piles on 43 acres of Tribal properties along the Canyonville-Riddle Highway and Rod & Gun Club Road.

The Tribe's fuels reduction work is targeted toward the "wildland-urban interface", or areas where population centers meet rural forestlands, as well as areas surrounding critical infrastructure, such as the Tribe's drinking water system near Canyonville. As an added benefit, timber that is removed as part of this effort is given to Tribal members to be used for firewood.

As part of its mitigation strategy, the Tribe intends to continue partnering with DFPA as well as increase its efforts at fuel reduction.

National Flood Insurance Program (NFIP)

The Cow Creek Band of Umpqua does not currently belong to the National Flood Insurance Program but as part of its mitigation strategy intends to do so in the short-term. However, the Tribe does purchase flood insurance for its flood vulnerable properties.

Training

The Tribe is active in having key staff trained in emergency management. The Tribe continually has staff attend County and State training sessions and hopes at some point to conduct emergency training internally for Tribal staff, tenants and members.

National Incident Management System (NIMS) compliance training

The Cow Creek has trained key staff for NIMS compliance as part of its effort to increase emergency management capabilities. Trained staff include:

- Government Operations Officer;
- Certified Paralegal;
- Risk Manager;
- Executive Administrative Assistant of the Tribal Gaming Commission, and tribal member;

- Tribal Member Representative;
- General Manager of the Casino; and
- Casino Security Director.

The Tribe's Legal Department maintains training records. As the Tribe continues to build its safety team and Emergency Planning Committee, additional staff and Tribal members will be trained to NIMS standards.

Northwest Tribal Emergency Management Council

The Cow Creek Tribe is a member of the Northwest Tribal Emergency Management Council (NWTEMC), which was formed to address homeland security and emergency management issues each tribe faces.

The development of the Northwest Tribal Emergency Management Council not only better prepares Tribal entities for emergency incidents, but will also provide more opportunities for the tribes to work collaboratively to assist one another in meeting the mandates of related emergency management programs and foster partnerships with their neighboring counties and municipalities. The Department of Homeland Security's guidance identifies tribal entities as key stakeholders in partnerships with state, local and private sectors.

Projects

There are currently no identified projects that the Tribe has or is engaging in that strengthens the capabilities of the Tribe to deal with disasters.

Federal/Regional Capabilities

If the Governor of Oregon asks for a Presidential Disaster Declaration, federal aid and assets will become available. All requests for a declaration by the President that a major disaster exists shall be made by the Governor. Such a request shall be based on a finding that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected tribal governments and that federal assistance is necessary.

Oregon Emergency Management (OEM) will include impacted Tribal Governments when processing requests for disaster assistance automatically when processing adjacent county or city requests. OEM will also offer Tribal Governments technical assistance to assure that their damage and impact assessments provides the necessary justification for the declaration request. OEM will also serve as a conduit if necessary to relay tribal disaster concerns with Federal Government agencies.

It is important to note though that the State of Oregon does not pass disaster funding through to the Tribes. The Cow Creek Tribe needs to apply directly to FEMA for disaster aid and assistance, including mitigation funding, once a declaration is made.

Support following a Presidential Declaration

There is considerable support for risk reduction measures following a Federal disaster declaration. Often these programs and their implications are not taken advantage of before permanent repairs are made. Some of the more significant ones include:

- The Hazard Mitigation Grant Program (HMGP) offers assistance for a wide range of mitigation projects following a presidential declaration. Eligibility is restricted to projects that have gone through a comprehensive hazard mitigation planning process.
- Minimal Repair Program often funds risk reduction such as the anchoring of mobile homes.
- The Small Business Administration will fund eligible mitigation measures to qualified owners of damaged homes.
- Outreach is available through Disaster Reconstruction Assistance Centers (DRACs), Recovery Information Centers or Hazard Mitigation Teams.
- Benefit/Cost Mitigation support is available from FEMA on infrastructure repair. To break the damage-rebuild-damage cycle, FEMA Region 10 is encouraging communities to:
 - Institute mitigation betterments taking advantage of multi-hazard, multi-objective approaches whenever possible;
 - Strengthen existing infrastructure and facilities to more effectively withstand the next disaster; and
 - Ensure that communities address natural hazards through comprehensive planning.

Following a federal disaster declaration, FEMA can support cost effective mitigation on infrastructure and have published a manual on the subject.

5.7. Current and Potential Funding Sources

This section identifies current and potential sources of federal, tribal, state, local and private funding to implement the mitigation actions and activities identified. Due to the Cow Creek's Tribe's position as a sovereign Indian Nation with a limited revenue base, most funding to implement mitigation measures will come from the federal government through grant programs. With this in mind, the mitigation actions identified in this Plan can be implemented

within the normal Tribal operating budget and without considerable resources in terms of time and money.

Current

The Cow Creek Tribes does not currently receive or allocate any funding to mitigation planning apart from the grant to develop this plan.

The Tribe does allocate staff time to work towards its mitigation goals and objectives.

Potential

Federal

Below is a list of the primary federal programs and agencies that can potentially fund mitigation actions and planning.

Pre-Disaster Mitigation Program, which provides funds to develop mitigation plans and implement mitigation projects, is administered by FEMA (by submitting a tribal level plan, the Cow Creek Tribe will qualify as a direct grantee);

Hazard Mitigation Grant Program, which provides post-disaster funds for hazard reduction projects (e.g., elevation, relocation, or buyout of structures), is administered by FEMA and Oregon Emergency Management;

Flood Control Assistance Account Program, which provides funds for developing flood hazard management plans, for flood damage reduction projects and studies, and for emergency flood projects (e.g., repair of levees);

Flood Mitigation Assistance Program, which provides funds for flood mitigation on buildings that carry flood insurance and have been damaged by floods, is administered by FEMA;

Department of Homeland Security Funding, in addition to FEMA programs;

U.S. Fire Administration, which provides wildfire program funds;

Environmental Protection Agency, which could provide funds for projects with dual hazard mitigation and environmental protection goals as well as updates to this NHMP and related planning efforts such as spill prevention and response planning;

Indian Health Service, which could provide funds for hazard mitigation projects that address public health and safety;

Rural Development Agency, USDA, which provides loan and grant funds for housing assistance, business assistance, community development, and emergency community water and wastewater assistance in areas covered by a federal disaster declaration;

Community Development Block Grant, which provides funds for a variety of community development projects, is administered by the Department of Housing and Urban Development;

Small Business Administration Loans, which help businesses recover from disaster damages, is administered by the Small Business Administration;

Bureau of Indian Affairs, which provides funds to support tribal activities; and

U.S. Army Corps of Engineers, which provides funding for coastal and waterway projects.

Tribal

The Cow Creek Band of Umpqua Tribe is fully committed to the public safety and welfare of its residents and Tribal members and to the goals of the Tribal Natural Hazard Mitigation Plan. The Tribe has only limited resources, though, to devote to mitigation planning. Nonetheless, the Tribe may be willing to match grant funding, either through direct monies or through the allocation of resources, such as labor and expertise, in order to implement the actions discussed in this plan. Funding from the Tribe's economic development capabilities may also be utilized.

State/Local

In some cases, funding may be available from the State of Oregon and/or Douglas County, especially on mitigation actions that overlap jurisdictions, such as road and flood mitigation projects. The Cow Creek Tribe is committed to building relationships with the State of Oregon, Douglas County as well as local communities, such as Roseburg and Canyonville, in order to develop partnerships to implement mitigation measures that are regional in scope.

Private

No potential funding from the private sector is currently identified. Nonetheless, local businesses and residents will be encouraged to participate and contribute to the mitigation effort.

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6. Plan Maintenance Process

The Cow Creek Tribal Natural Hazard Mitigation Plan is a living document that is intended to provide a guide for hazard mitigation to the Cow Creek Band of Umpqua Tribe. A formal plan maintenance process is required to ensure that the Tribal Mitigation Plan remains an active and relevant document. The plan maintenance process includes a method and schedule for monitoring, evaluating, and updating the plan at least every five years. This section also includes an explanation of how the Cow Creek Tribe intends to incorporate the mitigation strategies into existing planning mechanisms. Lastly, a strategy to ensure continued participation throughout the plan maintenance process by the “public,” as defined by the Cow Creek Tribe, will be discussed.

6.1. Responsibility for Plan Maintenance

The Cow Creek Tribal Board of Directors has final authority and responsibility over the Tribal Natural Hazard Mitigation Plan. Responsibility for plan maintenance and coordinating implementation of mitigation measures will be overseen by the Tribe’s Emergency Planning Committee, which is composed of representatives from the Administration, Legal, Risk Management and Health Clinic Departments.

The Cow Creek Tribe’s Emergency Planning Committee will also be responsible for annual progress reports to the Tribal Board of Directors and for the five-year updates to be submitted to the Board and subsequently to FEMA for approval.

6.2. Monitoring, Evaluating and Updating the Plan

The Cow Creek Tribe’s Emergency Planning Committee will review this NHMP annually and will update the NHMP every five years. Annual reviews will:

- Identify progress made on the implementation of mitigation measures and projects;
- Assess the impacts of disasters to the Tribe’s people, property and natural environment to determine whether the NHMP should be revised based on the new information;
- Examine and ensure that the Mitigation Plan requirements, as well as goals, objectives and mitigation actions are incorporated into current and future Tribal planning processes.

The annual review will occur during the **first quarter** of each calendar year to coincide with the tribal fiscal year and to prepare for PDM grant deadlines.

The effectiveness of projects and other actions will be evaluated at appropriate, project specific intervals or, at a minimum, when the NHMP is updated every five years as required for Tribal plans submitted to FEMA. The process of updating the NHMP will include a review of hazard assessments, vulnerability assessments, potential losses, the addition of repetitive and severe repetitive loss properties, tribal capability, and coordination with other planning efforts, funding sources, and recommended and potential new mitigation measures.

In support of the five-year update, the Cow Creek Tribe's Emergency Planning Committee will:

- Examine and revise the Hazard Risk Assessment as necessary to ensure that it describes the current understanding of hazard risks;
- Examine progress on and determine the effectiveness of the mitigation actions and projects recommended in this NHMP;
- Examine and ensure that the Mitigation Plan requirements, as well as goals, objectives and actions, are incorporated into current and future Tribal planning processes;
- Identify implementation problems (technical, political, legal, and financial) and develop recommendations to overcome them; and
- Recommend ways to increase participation by Tribal government departments and businesses and to improve coordination with other jurisdictions and agencies.

The updated NHMP will be presented to the Cow Creek Tribal Board of Directors for approval and adoption before it is submitted to FEMA for re-approval.

6.3. Monitoring Progress of Mitigation Actions

The Cow Creek Tribe's Emergency Planning Committee will frequently review progress on the implementation of mitigation actions. The Emergency Planning Committee will also meet with representatives from Tribal Departments to discuss progress of mitigation activities.

The implementation of all short-term mitigation actions will be monitored by the Emergency Planning Committee, on an ongoing basis until implementation is complete. Long-term actions being actively implemented will be monitored on an ongoing basis, or at least annually as needed. Long-term actions planned for the future will be reviewed during plan updates every five years.

The system for reviewing progress on achieving goals, objectives, and specific actions included in the mitigation strategy will be based on a checklist of all goals, objectives and actions. This checklist will be reviewed annually by the Emergency Planning Committee. As described in the previous section, progress on mitigation actions will be described in an annual report to Cow Creek Tribal Board of Directors and in the five-year update of the Tribal Natural Hazard Mitigation Plan.

6.4. Incorporation into Existing Planning Mechanisms

The Cow Creek Tribe currently has limited to no formal planning mechanisms, but is developing and expanding its capabilities and processes.

This Hazard Mitigation Plan will serve as the basis of all Cow Creek Tribal emergency management planning. This plan's vulnerability results and mitigation actions will be incorporated into the Tribe's Emergency Operations Plan, other Tribal emergency plans as well as land use and development plans as they are developed. A Plan Summary will be added to relevant supporting documents and future plans.

Development projects are currently reviewed for natural hazards exposure, such as landslides, floods and seismic risk. In the future, the Plan and its supporting data, such as hazard maps, will also be reviewed during development projects for potential hazard exposure.

As the Tribe develops and enhances its mitigation capabilities as part of its overall emergency management planning efforts, formal processes, i.e. resolutions, ordinances and polices, will be implemented to better incorporate mitigation planning into other tribal planning mechanisms as they are developed concurrently.

6.5. Continued Public Involvement

In order to continue public participation in the Plan Maintenance and Update process, the Cow Creek Tribal Natural Hazard Mitigation Plan will be available online on the Tribe's website. The Plan will also be available in hardcopy at the Tribal Administration Building. Comments may be submitted via email, telephone or in person at the Administration Building, or during Tribal Board meetings relating to the Plan. Results and information from the Plan will also be incorporated into related emergency preparedness training as applicable as well as be used for disaster preparedness articles in the tribal newsletter and website. Hazard maps and presentations created for the Plan will be used for public outreach opportunities, trainings and other tribal events.

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7. Repetitive Loss Strategy

The Cow Creek Tribe does not currently own or lease any properties or structures defined as Repetitive Loss or Severe Repetitive Loss properties. Nonetheless FEMA encourages Tribes to identify repetitive flood loss structures as part of the risk assessment and include a repetitive loss strategy in their plans.

A repetitive loss structure means any residential or commercial structure insured under the National Flood Insurance Program (NFIP) with two or more claim payments of more than \$1,000 within ten (10) years. In addition, the NFIP defines Severe Repetitive Loss (SRL) structures as single or multifamily residential properties covered under an NFIP flood insurance policy and:

1. That have incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim (including building and contents payments) exceeding \$5,000, and with the cumulative amount of such claims payments exceeding \$20,000; or
2. For which at least two separate claims payments (building payments only) have been made under such coverage, with cumulative amount of such claims exceeding the market value of the property.
3. In both instances, at least two of the claims must be within ten years of each other, and claims made within ten days of each other will be counted as one claim.

In addition, an approved Tribal Mitigation Plan with a repetitive loss strategy that addresses SRL properties makes the Cow Creek Tribe eligible under 44 CFR 201.7(c)(3)(vi) for a reduced non-Federal cost share under the Flood Mitigation Assistance (FMA) and SRL hazard mitigation assistance programs when the Tribe applies directly to FEMA as a grantee. The reduced cost share option would only apply to SRL properties. If the Tribe applies as a subgrantee, their eligibility for receiving a reduced Federal cost share is based on the eligibility of the grantee (such as the State of Oregon or Douglas County), regardless of whether the Tribe has a Repetitive Loss Strategy.

In the Plan update, if the Tribe identifies Repetitive Loss properties, it will expand and develop the Repetitive Loss Strategy.

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8. References

References and sources are footnoted throughout the Plan, additional sources are listed below.

Flood

Floods of November 1996 through January 1997 in the Umpqua River Basin, Oregon

By John C. Risley, U.S. Geological Survey Fact Sheet 2004-3134

<http://pubs.usgs.gov/fs/2004/3134/>

Tribal information from The NFIP Community Status Book, Oregon

<http://www.fema.gov/cis/OR.pdf>

State and Local Mitigation Planning How-to Guide, p 2-1

<http://www.fema.gov/library/viewRecord.do?id=1886>

<http://www.fema.gov/government/grant/government.shtm>

FEMA Tribal Hazard Mitigation Plan guidance: March 2010

<http://www.fema.gov/library/viewRecord.do?id=4135>

GIS Data Sources:

WildFire

Historic Fires, 1960 – 2010, Oregon Dept. of Forestry

<http://www.oregon.gov/ODF/GIS/gisdata.shtml>

metadata: <http://www.oregon.gov/ODF/GIS/pdf/historicFires.pdf>

Point locations for ODF statistical fires from 1960 to 2010. The point locations for the fires were derived from ODF's FIRES database. The location was derived from the legal location for those fires that had a valid legal location entered in the fires database. Most of the locations for fires prior to 2003 were derived by using the legal location taken from the FIRES data fields. These are the more recent fires. This shapefile is updated annually.

Landslide

SLIDO r2 2011 Landslide Deposits

Statewide Landslide Information Database of Oregon (SLIDO)

Data: http://navigator.state.or.us/sdl/data/mdb/k24/SLIDO_r2_ORLAM.zip

metadata: <http://gis.oregon.gov/DAS/EISPD/GEO/docs/metadata/SLIDOr2.htm>

Description

One of the primary chronic and most devastating geologic hazards in Oregon is landslides. Average annual repair costs for landslides in Oregon exceed \$10 million and severe winter storm losses can exceed \$100 million (Wang and others, 2002). As population growth continues to expand and development into increased landslide susceptible terrain occurs, greater losses are likely to result. In order to begin reducing losses from landslides, large-scale endeavors are necessary at all community levels from state government to individual family homes. One successful way to reduce losses from landslides is through pre-disaster mitigation, which can be performed at many scales from statewide to local. To begin pre-disaster mitigation of landslides, the landslide hazard must be located. Once the hazard is located the population and infrastructure vulnerable to the hazards can be identified and the risk mitigated. In order to improve our understanding of the landslide hazard in Oregon the Statewide Landslide Information Database of Oregon (SLIDO) was created. The four main objectives of this study were 1) identify previously mapped landslide deposits statewide, 2) improve the understanding of landslide hazards throughout Oregon, 3) improve the abilities of communities to begin effective landslide management and risk reduction activities, and 4) recommend future improvements and updates to the database. The goals of SLIDO Release 2 were 1) update SLIDOr1, 2) improve historically active landslide portion of the database through review of local municipality (city or county) data, 3) compile references that have detailed data on regionally significant or typical landslides, 4) add non-spatial data related to landslides such as landslide type, activity, certainty of identification, process, estimated age, etc. in specified areas, 5) populate and convene an Oregon Framework Implementation Team (FIT) landslide element subcommittee to develop standards for the statewide landslide theme. Also develop the landslide element stewardship standard.

Appendix A Tribal Resolution Adopting Plan

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Appendix B Adoption Letter from FEMA

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Appendix C Tribal Resolution Adopting Goals, Objectives & Mitigation Strategies

Resolution No: 2011-31

RESOLUTION OF THE COW CREEK BAND OF UMPQUA TRIBE OF INDIANS BOARD OF DIRECTORS ADOPTING HAZARD MITIGATION GOALS, OBJECTIVES AND STRATEGIES

WHEREAS, the Cow Creek Band of Umpqua Tribe of Indians (the “Tribe”) is organized under the Indian Reorganization Act of June 18, 1934 (48 Stat. 984), the provisions of the Cow Creek Band of Umpqua Tribe of Indians Recognition Act of December 29, 1982 (P.L. 97-391), as amended by the Cow Creek Band of Umpqua Tribe of Indians Distribution of Judgment Funds Act of October 26, 1987 (P.L. 100-139), and the Cow Creek Tribal Constitution, duly adopted pursuant to a federally supervised constitutional ballot, on July 8, 1991; and,

WHEREAS, pursuant to Article III, Section 1 of the Tribe’s Constitution, the Cow Creek Tribal Board of Directors (the “Board”) is the governing body of the Tribe; and,

WHEREAS, pursuant to Article VII, Section 1 (a) of the Tribe’s Constitution the Board has the power to “to negotiate with the Federal, state and local governments on behalf of the Tribe and advise and consult with representatives of the Department of the Interior or any other federal, state or local department, agency or office on all activities of those agencies or offices that may affect the Tribe”; and

WHEREAS, pursuant to Article VII, Section 1 (b) of the Tribe’s Constitution the Board has the power to “represent the Tribe before Federal, state and local governments and their departments and agencies”; and

WHEREAS, pursuant to Article VII, Section 1 (l) of the Tribe’s Constitution the Board has the power to “enact ordinances and laws governing the conduct of all persons on tribally owned land; to maintain order and protect the safety, health, and welfare of all persons within the jurisdiction of the Tribe; and to enact any ordinances or laws necessary to govern the administration of justice, and the enforcement of all laws, ordinances or regulations . . .”; and,

WHEREAS, pursuant to Article VII, Section I (t) of the Tribe’s Constitution the Board has the power to “have such other powers and authority necessary to meet its obligations, responsibilities, objectives, and purposes as the governing body of the Tribe”; and,

WHEREAS, the Tribe desires to move forward with its hazard mitigation planning activities which are dependent upon the Tribe developing goals, objectives and strategies; and

WHEREAS, the emergency planning team met and developed goals, objectives and strategies for the Tribe and voted unanimously to present the same to the Board for action; and

Adopting Hazard Mitigation Goals,
Objectives and Strategies

Res. No. 2011-31
Page 1

WHEREAS, the Board believes that it is in the best interests of the Tribe and its members to adopt said goals, objectives and strategies as presented in order to further the Tribe's hazard mitigation planning process;

THEREFORE, BE IT RESOLVED that the Tribe, by and through the Board, hereby adopts the Goals, Objectives and Strategies attached hereto as Exhibit 1 effective as of the date below appearing.

BE IT FURTHER RESOLVED, that any and all actions heretofore or hereafter taken by any Tribal officers, employees or agents regarding the foregoing resolution be, and hereby are, ratified and confirmed as the act and deed of the Tribe taken or made by them within the scope of their duties to the Tribe; and,

BE IT FURTHER RESOLVED, that neither this resolution nor any document or representation related herewith or therewith shall constitute a waiver of the sovereign immunity of the Tribe, or its officers acting in their official capacity within the scope of their authority; and,

BE IT FURTHER RESOLVED, that the actions authorized and taken by this Resolution are intended to advance the sovereign self governance of the Tribe, and to protect the political integrity, economic security and health and welfare of the Tribe and its members; and,

BE IT FURTHER RESOLVED, any prior Tribal regulations, resolutions, orders, motions, legislation, codes or other Tribal law which are materially inconsistent with this Resolution are hereby repealed, but only to the extent of any such inconsistency and as applied to the specific matter in which any such inconsistency arises.

CERTIFICATION

It is hereby certified that the Cow Creek Tribal Board of Directors, governing body of the Cow Creek Band of Umpqua Tribe of Indians, composed of eleven (11) members of whom 10, constituting a quorum, were present at a meeting duly held on the 14th day of August, 2011, adopted the foregoing **RESOLUTION OF THE COW CREEK BAND OF UMPQUA TRIBE OF INDIANS BOARD OF DIRECTORS ADOPTING HAZARD MITIGATION GOALS, OBJECTIVES AND STRATEGIES** by the affirmative vote of 10 for and 0 against.


Daniel Courtney
Tribal Chairman


Attest: Yvonne McCafferty
Tribal Secretary

Adopting Hazard Mitigation Goals,
Objectives and Strategies

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Appendix D Public Meetings**MINUTES OF NHMP STAKEHOLDER GROUP**

DATE: June 20, 2011

PRESENT: Wayne A. Shammel, Lonnie Rainville, Jhana McCullum, Sharon Stanphill and Luann Urban. Jessica Jackson was unable to attend due to military duty.

Stakeholders Present: Keith L. Cubic via Lisa, Douglas County Planning Department; Ken Quiner, Oregon Public Health; and Chuck Perino, Oregon Emergency Management

Glenn B. Coil of Northwest Tribal Emergency Management Council (“NWTEMC”) hosted the meeting. He introduced himself to the group and gave a synopsis of NWTEMC. He explained that the purpose of this meeting was to get the outside stakeholders together with the Tribal committee and brainstorm regarding natural hazards that could affect the Tribe. It was pointed out, when asked, that Mr. Coil already has a copy of the Oregon and Douglas County NHMP. Mr. Quiner asked if the Tribe had defined its goals and objectives for the project yet. Lonnie indicated that was a work in progress. Mr. Quiner said it would be helpful for the outside stakeholders to know what those goals and objectives are. Mr. Coil pointed out that this was something that the Tribe needed to address and decide upon relatively soon as every aspect of the plan developed must coincide with those goals and objectives.

Glenn distributed a Natural Hazard Questionnaire to everyone present. This was followed by open discussion and brainstorming as the group filled in their answers to the questions presented. At the close of the meeting, Mr. Coil took the questionnaires with him indicating to Jhana that he would compile the data contained therein and provide a report to the Tribe. Messrs Quiner and Perino indicated it would be helpful to receive the questionnaire electronically so they could spend more time with it after giving the project some thought. Jhana will provide that form to the stakeholders who requested another copy as well as to all who could not attend the meeting so their input could also be considered. The deadline for returning the completed questionnaires to Jhana is June 30th. Once these are received by Jhana, she will correspond with Mr. Coil and provide the new or amended questionnaires to him.

Jhana handed out a list of all outside stakeholders who had responded to the Tribe’s invitation and pointed out that the Tribe had a 50% participation rate which was excellent. (The day after the close of the meeting, one more response was received and Jhana has updated the stakeholder list accordingly and sent him a questionnaire as well). A copy of this updated list will be provided to everyone involved.

END

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Appendix E Parcels Located in FEMA 100 & 500 Year Floodplain

Past Owner / Property Name	TAXID	PROP_ID	Legal Description	Total Acreage	Acreage in Floodplain	% in Floodplain
Block	30052202200	R31674	ACRES 1.08, (1) PT M&B V104 P315 (2) LESS RD & LESS PT SD (5) 89-18191 91-4065 91-18101	0.26	0.26	100%
Dixon	300527B02601	R31770	ACRES 0.41, (1) P P 1990-13 (2) PARCEL 2B1 (5) 90-3596 PP1990-13	0.45	0.45	100%
Block	30052202100	R31762	ACRES 1.74, (1) M&B INST 80-1315 (5) 89-15659 93-16978	1.71	1.71	100%
Weaver Interchange	290532A01700	R62734	ACRES 2.83, MULT MS'S X# X124164; X207979, Mult Home ID's 197688; 261731, (1) M&B INST 72-1268 (2) M&B INST 272295 (3) M&B INST 71-15554 (5) CCJ 82/7 90-7225 94-14583	2.80	2.80	100%
Weaver Interchange	290532A01800	R62748	ACRES 5.56, (1) M&B V 149 P 642D (2) BEING LOTS 2-29 (3) LESS PT SD (5) 343467 CCJ 82/7 90-7225	3.87	3.87	100%
UCC Foundation	280629A00600	R40649	ACRES 14.28, (1) PT M&B V107 P48: (2) (M&B V107 P49) (3) LESS PT SD (5) 92-21463,64 89-14540	14.42	14.42	100%
Weaver	290532D00900	R62909	TRACT M&B V147 P339D LESS PT SD; M&B INST 73-5056, ACRES 7.77, MS X# X073501, Home ID 159376	7.41	7.41	100%
UCC Foundation	280628B01600	R42201	ACRES 5.13, (1) PT M&B INST 70-8063 (5) 92-21463,64 89-14540	5.14	5.14	100%
UCC Foundation	280620D01200	R40625	ACRES 10.18, (1) PT M&B V107 P48: PT (2) OF RIVER BAR (M&B V107 (3) P49) LESS PT SD (5) 92-21463,64 89-14540	10.05	10.05	100%
Renteria	300507C00900	R33758	BRIGGS MARKET PLAT, LOT 5 PT M&B V105 P224 S OF CO RD 20; LESS PT PLATTED, ACRES 18.70	18.20	18.20	100%
Weaver	290532D00800	R62874	TRACT M&B INSTS 66-12001 & 66-12989 LESS PTS SD, ACRES 12.31	11.63	11.63	100%

Past Owner / Property Name	TAXID	PROP_ID	Legal Description	Total Acreage	Acreage in Floodplain	% in Floodplain
UCC Foundation	280629A00100	R40601	ACRES 11.25, (1) PT M&B V105 P492 & RW (5) 92-21463,64 89-14540	11.29	11.29	100%
UCC Foundation	280620D01400	R40513	ACRES 10.30, (1) PT M&B V 105 P 492D (5) 341516 92-21463,64	9.73	9.73	100%
Renteria	300507C01000	R27650	TRACT M&B V104 P337D LESS PT SD W OF HWY & M&B V108 P552D, ACRES 16.54	15.33	15.33	100%
UCC Foundation	280629A00500	R40641	ACRES 5.41, (1) M&B INST 79-20628 (5) MLP 2/270 79-20628	5.36	5.36	100%
Manshack	290532C02600	R62930	ACRES 5.08, MS X# X150114, Home ID 217458, (1) M&B INST 77-20782 (5) 77-20782 CCJ 82/7 91-4244,45	5.25	5.25	100%
Block	30052202000	R31754	ACRES 1.00, (1) M&B INST 80-1313 (5) 80-1313 89-15659	0.95	0.95	100%
UCC Foundation	280620D01500	R40593	ACRES 6.45, (1) PT M&B V105 P492 & RW (5) 92-21463,64 89-14540	6.50	6.50	100%
Weaver Interchange	290532D00100	R62769	ACRES 5.52, (1) M&B INST 75-16184 (5) 79-20372 CCJ 82/7 90-7225	4.81	4.81	100%
Rigsby	300527B02501	R31794	ACRES 0.36, (1) M&B INST 89-6023 (5) 89-6023 90-17235 94-2165	0.33	0.33	100%
Walker	290532D00200	R62783	ACRES 6.55, (1) M&B INST 274084 (2) LESS HWY (5) 77-7349 7358 P-79-41	5.98	5.98	100%
Dixon	300527B02600	R31746	ACRES 2.11, (1) P P 1990-13 (2) PARCEL 2B2 (5) 206000 MLP 3/112 & 6/43	2.05	2.05	100%
UCC Foundation	28062100500	R42177	ACRES 2.46, (1) PT M&B INST 70-8063 (5) 92-21463,64 89-14540	2.57	2.57	100%
K-Bar Ranch - Round Prairie	28063500200	R58720	ROUND PRAIRIE AMENDED PL, LOT 9 & LOT 11 B 3 & LOT 6 B 4, ACRES 30.80, POT ADDL TAX-FARM	25.46	25.32	99%
Block	30052201900	R31738	ACRES 12.68, (1) PT CL #51 LESS PT SD (2) (M&B V135 P255 (5) 69-9353 80-364 78-6088	12.27	11.47	94%

Past Owner / Property Name	TAXID	PROP_ID	Legal Description	Total Acreage	Acreage in Floodplain	% in Floodplain
Rivers West Development	29050701200	R66668	ACRES 24.63, MS X# X207402, Home ID 261292, (1) M&B INSTS 237593 LESS (2) PT SD & M&B INST 341023 (3) LESS PT SD & LESS RD (5) P-75-143 CC-76-2110	14.67	13.51	92%
K-Bar Ranch - Round Prairie	280635D00700	R58741	ROUND PRAIRIE AMENDED PL, BLOCK 9, ACRES 4.55, POT ADDL TAX-FARM	4.58	3.67	80%
McNeil-Casino	30052201700	R31666	ACRES 8.20, MS X# X161581, Home ID 225990, (1) M&B INST 80-1317 (5) 89-18191 91-4064,65 91-18100	7.04	5.37	76%
K-Bar Ranch - Dole Road	29061200500	R66577	TRACT PT CL #38 N OF RIVER LESS PT SD, ACRES 86.20, MS X# X202984, Home ID 257992, POT ADDL TAX-FARM	75.91	57.24	75%
Dynamic	29061201500	R66661	ACRES 11.20, (1) M&B VOL 185 PG 274D (2) LESS PT SD (5) 95-19661 90-12954	11.19	8.22	73%
Winston	28060900500	R36417	TRACT M&B V123 P322 LESS PT SD, ACRES 2.05	1.76	1.24	70%
Riverside	300521D00500	R30882	ACRES 0.11, (1) PT M&B 65-5323 & PT CL 48 (2) S OF RIV (12' STRIP) (3) LESS PT SD & HWY (5) 93-16027 98-19148,49,50	0.12	0.08	66%
Riverside	300521D00600	R31218	ACRES 4.11, (1) M&B VOL 158 PG 496D (5) 78-10745 78-16298 93-18286	3.69	2.33	63%
Villines	30050601800	R26906	ACRES 14.78, (1) PP 1996-74 (2) PT PARCEL 3 (5) 90-15123 90-15125	15.46	9.58	62%
Villines	30050700600	R26962	ACRES 35.22, (1) PP 1996-74 (2) PT PARCEL 3 (5) 90-15123 90-15125	35.00	18.38	53%
Rigsby	300527B02500	R31786	ACRES 2.14, (1) M&B INST 80-2388 (2) LESS PT SD (5) MLP 6/43 PAR 2A	2.12	1.11	52%
Brown	300521DD02000	R31138	ACRES 1.51, (1) M&B INST 262843 (5) 92-422	1.00	0.48	47%
Valley View	300521DD02100	R31202	TRACT PT M&B V155 P172, ACRES 3.67	2.89	1.36	47%
Kennerly	270612AC00300	R12113	TRACT M&B INST 68-9222, ACRES 0.84	0.85	0.33	40%
Hurd	29061101300	R66493	TRACT PP 1991-10 PARCEL 2; PT IN SEC 12, ACRES 32.84	32.02	10.49	33%

Past Owner / Property Name	TAXID	PROP_ID	Legal Description	Total Acreage	Acreage in Floodplain	% in Floodplain
Winston	28060900600	R36433	TRACT M&B V127 P204 LESS PT SD; PT M&B INST 292371, ACRES 3.95	3.53	1.14	32%
K-Bar Ranch - Dole Road	29050700200	R57841	TRACT N1/2 CL 38 & N1/2 CL 37 N OF RIVER LESS R/W & LOT 3 LESS PT SD, ACRES 138.87, POT ADDL TAX-FARM	137.94	38.52	28%
D.C. Co-Op (RIO)	270624AA02500	R68883	TRACT ROSEBURG M&B V184 P490; M&B INST 71-14582; 72-13040 LESS PT SD, ACRES 1.00	0.99	0.27	27%
D.C. Co-Op	270519BB02300	R68918	ROSEBURG, BLOCK 15, LOT PT 1 THRU 4 & LOT 5 THRU 8: PT VACATED ST, ACRES 1.48	1.45	0.36	25%
Lawson	300521DD00100	R31034	TRACT M&B V211 P434 M&B INST 248261 LESS PT SD, ACRES 1.41	0.96	0.19	19%
K-Bar Ranch - Dole Road	29050700201	R57855	TRACT PT M&B INST 85-1333 LESS CO RD R/W (INSIDE FIRE) SEE R57862 FOR BAL TL, ACRES 5.00, POT ADDL TAX-FARM	55.86	10.14	18%
Rivers West Development	29050701100	R66696	ACRES 5.05, (1) PP 2000-16 (2) PARCEL 1 (5) 74-16245 77-23326 83-6618	4.38	0.75	17%
K-Bar Ranch - Round Prairie	28063500100	R58713	ROUND PRAIRIE AMENDED PL, BLOCK 3, LOT 5 THRU 8 & LOT 10, ACRES 53.40, POT ADDL TAX-FARM	53.21	8.94	17%
Ravenswood	300520C00700	R30266	ACRES 55.38, (1) LOT 2-3: PT CL 43 LESS PT SD (2) (OUT FIRE)SEE 13481.03 FOR BAL (5) 92-16438 96-17178	84.98	14.01	16%
Winston	28060900300	R36401	TRACT W1/2SW1/4 LESS PT SD; M&B V70 P617; LESS LEASED PORTION, ACRES 55.08	50.11	8.08	16%
Winston	28061600900	R38825	P.P. 1994-68, PARCEL 1 (OUTSIDE CITY) SEE R38873 FOR BAL TL, ACRES 252.09, POT ADDL TAX-FARM	266.26	38.29	14%
Smith2	30053000200	R33634	ACRES 16.36, M&B INST 82-2753 LESS PT SD	14.88	2.12	14%
K-Bar Ranch - Dole Road	290612A00500	R66563	TRACT PT CL #38 N OF RIVER LESS PT SD, ACRES 17.05, POT ADDL TAX-FARM	14.85	1.97	13%
Riverside	300521D00400	R30762	ACRES 2.16, (1) M&B VOL 145 PG 435D (5) 71-16330 73-14134 92-1837	1.87	0.23	13%

Past Owner / Property Name	TAXID	PROP_ID	Legal Description	Total Acreage	Acreage in Floodplain	% in Floodplain
Lilja	29061201700	R66591	TRACT PT M&B INST 78-5422, ACRES 212.24	210.38	26.20	12%
K-Bar Ranch - Round Prairie	28063400100	R58657	ROUND PRAIRIE AMENDED PL, BLOCK 1, LOT 25 THRU 29, ACRES 118.00, POT ADDL TAX-FARM	113.94	13.89	12%
Rone/Dixon	270612AD10600	R43620	FRUITVALE DIXON'S ADD, ACRES 1.52, (2) PT B 2 (5) 77-25108, 25109 & 25111	1.53	0.17	11%
Sailers	300521DD00300	R31066	ACRES 0.44, (1) M&B INST 214778 (5) 235754 84-9148 87-14335	0.34	0.03	8%
Lawson	300521DD00200	R31058	TRACT M&B INST 203052 M&B INST 78-8986, ACRES 0.48	0.37	0.03	7%
Open Door Christian	270613DA04200	R58999	ROSEBURG RIVERSIDE ADD, BLOCK PT G, LOT BLOCK 18 LOTS 9 THRU 14: PT VACATED ST, ACRES 10.57	10.72	0.69	6%
Evergreen	300527B02700	R32834	ACRES 27.75, MULT MS'S X# X240175; X252373, Mult Home ID's 286072; 296679, (1) M&B V160 P496:276029:V125 P105 (2) PT VACATED RD (3) LESS EXCS & PT SD (5) P-9615 83-11832 98-15172	27.81	1.40	5%
Winston	28061600500	R38769	TRACT M&B INST 71-9620 (OUTSIDE WATER) SEE R38793 FOR BAL TL, ACRES 3.68	88.33	4.29	5%
K-Bar Ranch - Round Prairie	280635AC00100	R58727	ROUND PRAIRIE AMENDED PL, BLOCK PT 7 & 8 BLOCK 5 & 6, LOT (IN FIRE) SEE R58755 FOR BAL TL, ACRES 8.74, POT ADDL TAX-FARM	14.61	0.45	3%
Winston	28061600600	R38817	TRACT M&B INST 72-8761, ACRES 94.56	95.52	0.68	1%
Coffelt Ranch	30052600100	R32034	ACRES 34.28, MULT MS'S X# X176752; X198495, Mult Home ID's 237825; 103195, (1) M&B VOL 73 PG 578D LESS (2) .60 AC LESS PT SD (INSIDE (3) FIRE DIST) SEE 13536-4 (4) FOR BAL OF TL 1 S 26 (5) 71-4942 76-13909-10 88-8079	96.50	0.46	0%
Dick	300521D00300	R30778	ACRES 1.53, (1) M&B VOL 150 PG 300D (2) M&B V201 P98 LESS PT SD (5) 279205	1.27	0.00	0%
K-Bar Ranch - Round Prairie	28062700300	R58664	ROUND PRAIRIE AMENDED PL, BLOCK 1, LOT 30 THRU 34 & PT M&B INST 77-15305 SEE R58671 FOR BAL TL, ACRES 168.73, POT ADDL TAX-FARM	203.87	0.21	0%

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Appendix F Hazards Survey Results

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
<p><i>What natural hazards could affect the Cow Creek Tribe? Examples of Hazards include flooding, earthquakes, landslides, wildfires, severe storms etc.</i></p>	<p>Flooding, earthquakes (lots of faults), wildfire, landslides - Canyonville; windstorms - high winds; winterstorms</p>		<p>all those (listed in question) winter storms dam breakage flooding windstorm - tornado in Aumsville (OR) this year (Dec 14, 2010), not Douglas Co, freaky but maybe worth a mention</p>	<p>geological - snow & ice wildfires floods high winds health pandemics - this will come later</p>	<p>flooding earthquake wildfires landslides wind storms winter storms dam breaking</p>	<p>windstorms flooding earthquakes wildfires severe storms winter storms dam breakage, etc</p>	<p>flooding earthquake landslides wildfires windstorm winterstorms</p>	<p>Natural Hazards that are common to our area are: Wildfire Flooding Severe Storms</p> <p>There is also a threat to our area from: Earthquakes Landslides</p>	<p>In Roseburg proper, the new offices / business incubation center on SE Washington St. could be susceptible to floods. Fires, of course, are a concern in any building, but can be mitigated with design and occupant education. A severe windstorm like we experienced earlier this year could cause some problems, but, so far, we have not had to deal with these extensively.</p>

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
Can you recall any past hazard events such as floods, earthquakes etc?	Winter Storm 2011 1964 Flood 1996 Flood Myrtle Creek Wildfire		landslide - 1996 floods - '64 & '96 fires - Bland Mt winter storms	2011 winter storms floods 1996 Tiller fire Hubbard Creek landslide - Nov 1996 (due to clearcut)	floods - 1964 100 yr floods 1996 Myrtle Creek Fire 88 or 89 Tiller Fire Biscuit Fire (So. Oregon) landslides 96	flooding 1996, 2006, 1964 winter storms landslides - 1996 wildfires - Bland Mt 1, 2 etc	Flooding - 1996, 2006, sinkhole Bland Mt Fire Inc Fire landslide windstorm - 2011	1999- Severe Winter Storm shut the I-5 corridor. Individuals caught in that storm came to the casino while waiting it out. 1999-2000 Wildfire threatened tribal grounds at South Umpqua Falls. Pow Wow was evacuated. Threatened familial burial grounds in the same area. 2005-2006 South Umpqua River swelled and threatened Rivers West RV Park with flooding.	unknown

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
<i>If yes, when did the hazard occur and how bad did it affect the Tribe?</i>	coastal landslides 88 Fires 1960's landslides telephone company's guys 1996 Tiller area I-5 closed in 1986 major landslide - 1996				not really		1996 2006 2011	No loss of properties or life that I am aware of	unknown
<i>What areas are you concerned about being damaged or destroyed from natural hazards?</i>	Tribal properties in Canyonville transportation routes - I-5 wastewater & freshwater systems - Canyonville mutual aid w/ City of Canyonville		Canyonville area water & sewer	Canyonville - Dams, casino new clinic all businesses	Utilities - dams & water supply Canyonville Infrastructure	dams, water supply, sewer supply lines of transpo & infrastructure Canyonville - hospitality (RV, Casino/Hotel power infrastructure	Canyonville Casino Truck & Travel	K-Bar ranch could suffer agricultural loss if South Umpqua River floods. Rivers West RV Park would lose profit if flooded by South Umpqua River	Potential for flooding at new buildings located in old DC Co-Op building (SE Washington St.)
<i>Have these areas or the property on them been damaged in the past?</i>	tribal lands - all too new to have history		too new bowling alley is vulnerable		No	no newer structures bowling alley is vulnerable (older building)	too new - no history of damage	Not that I am aware of	unknown

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
<i>What areas concern you about people being injured from natural hazards?</i>	N/A				I don't know	Canyonville			Evacuation of buildings and properties in the event of a disaster. If it is a large-scale disaster such as a flood or earthquake, which would affect a larger population, it would be helpful for the Tribe to have plans in place to deal with these emergencies before they occur.
<i>Have people been injured in these areas in the past?</i>	Not known or none	unknown	none in past		No	no	no		unknown

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
Are there any areas (streets, neighborhoods/properties) that could become isolated in a hazard event?	pretty much all tribal lands & businesses	yes - extensive isolation concerns related to bridge damage from earthquake	Douglas Co can be isolated easily		Yes if I-5 is closed Bridges are crucial to all tribal lands & infrastructure	Bridges I-5	yes		Inside Roseburg, the West side could become isolated from downtown if the Washington St. bridge and Oak St. bridge are damaged or made impassable by a flood or earthquake. Some of the lower-lying areas could become isolated or submerged by a large flood, and many low-lying roads could become impassable.
What are the Tribe's critical facilities? Examples of Critical facilities include schools, medical centers, police and fire stations, historic or cultural buildings/sites, water facilities or buildings that are essential to the local economy, such as a Tribal Casino.	Canyonville - Resort Casino Water/Sewer Utility RV Park *Clinic Facilities: annex in Canyonville Cultural sites- archeologist will be involved Cow Creek drainage old Res site Tiller area New clinic in Canyonville - Rigby & Goodin Properties	water sewer transportation buildings	Water system sewer clinics - Roseburg, Canyonville 7 Feathers, commercial sites communications cultural sites		Clinic & clinic annex (Canyonville) Casino & utility archeologist will determine cultural & sacred sites - Tiller, Huckleberry Patch	Canyonville primarily clinic facilities (Roseburg & Canyonville) water sewer hospitality facilities Rio Communication s - critical for data/phone cultural sites - impt aspect (will be working with archeologist	Clinic - Roseburg Clinic Annex - Canyonville new 2012 Clinic in Canyonville Rio Communication s - data & phone *sites tagged by archeologist	The Tribe's main government offices are in Roseburg along with a clinic. Seven Feathers Casino is in Canyonville along with another clinic. South Umpqua Falls outside of Tiller The Huckleberry Patch.	unknown

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
<i>Please explain your concerns with these facilities being damaged or destroyed by natural hazards.</i>	flooding, earthquake - isolation from landslideswildfires - cutting off I-5					suggestion : infrastructure plan - include maps, emergency routes	*just mention in plan, no details at this time	This would cause a loss of profit, infrastructure would be greatly damaged.	unknown
<i>What mitigation actions have already been put in place? Mitigation items are projects, such as retrofitting older buildings to withstand earthquakes, or planning efforts, such as polices that discourage building in flood-prone areas.</i>	most structures fairly new - at or above building codes *hazards taken into consideration before being built new clinic - reviewed for flood risk, location changed out of 100 yr floodplain back-up generators casino- fully disconnected by diesel non-structural up to par? outside inspectors did eval		new facilities built at or greater than code water facilities w/ redundancy & flood protection generators at casino fuel storage		new clinic planned for back-up power inspection done along the way	1. planning - new facilities built at or above current code 2. generators @ casino 3. water facilities (dams) built with redundancies with fail-safe designs	built at or above code, no retrofit on newer buildings inundation zone for dams new clinic outside floodplain hired private inspectors	There is a Pandemic Influenza plan draft and a Mass Prophylaxis plan draft written for ESF 8.	unknown

question	respondent/response								
	glenn/PC - notes from meeting 6/20/11	cc survey 1	cc survey 2	cc_survey 3	jhana	lisa h	luanna u	jessica	monte - roseburg
<p><i>Are there any actions the Tribe could do that could reduce the threat from natural hazards on the Tribe's Reservation and other lands/properties?</i></p>	<p>Oregon codes- build at or exceed code, post 1995 continued coordination with city, state, county wildfire fuel reduction program continued maintenance - continuing planning process - highest standards integrate best practices & lessons learned education & outreach - especially for guest & outsiders plan for redundancy or resources building to highest standard for structures in hazard zones developing emergency operations plan</p>		<p>fuel reduction collaborate w/ county & cities continued building codes education outreach redundancies development outside of hazard areas</p>	<p>assure business practices & soc are maintained - regular reviews & inspections - changes to structures as needed</p>	<p>Coordinate with city & county organizations -education & outreach -keep patrons advised of exit & mitigation plans -secondary water sources -focus development out of hazard areas -highest building standards</p>	<p>working with other local/state entities in area fuel reduction maintain high standards & best practices understanding tribe's geography education & outreach develop secondary sources of public facilities develop outside hazard areas</p>	<p>working closely with cities & Douglas Co. fuel reduction program with DFPA Continuing on with programs for highest practices, best lessons learned emergency information for hotel guests</p>		<p>unknown</p>

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