

## **Broad Landscape Level Recommendations**

### **Forest Management Activities:**

While our recommendations for specific communities and neighborhoods will reduce the risk of casualty loss, it must be combined with aggressive, active, forest management activities in the forests that surround these communities to have a substantial impact. Specifically, historic data indicates that fires in this region have spread in a northeasterly direction from their point of ignition. Therefore, the forests southwest of each community for a distance of 5 to 10 miles should be targeted initially to reduce the potential of fire spreading with full force into populated places.

As a separate document, we have prepared a series of silvicultural prescriptions with photographs detailing our recommendations for the managers of rural lands to consider when managing forestlands outside of the rural-urban interface. This region evolved with forest fires. Although the Shoshone County has not experienced a large landscape level fire (20,000+ acres) in the past 70 years, surrounding regions have. The lack of landscape level fires is a credit to the fire fighting agencies in the county. However, it is likely that unless the remote forestlands of this region are aggressively managed to reduce fire risk, that they will burn and take homes with it. We urge the state and federal land managers in this region to address this risk and implement the recommendations in the areas identified.

A large fire ignited south of the Silver Valley would spread by frontal winds toward the valley from the south, like it did in 1910. Landscape treatments south of the Valley could help slow the spread of a large fire and help protect communities. Although the primary threat to the Silver Valley would be from south of I-90, the communities of Prichard, Murray, and Eagle could be threatened by a large fire spread by frontal winds that started north of the Silver Valley. The Beaver Creek and Prichard Creek drainages would be the secondary areas to implement these aggressive landscape treatments.

We feel that the restoration of dry sites that supported ponderosa pine as a seral species should be encouraged on the remote forestlands surrounding the populated

places detailed earlier. Because of 70 years worth of fire suppression efforts, these sites have become overcrowded with tree regeneration and thick shrubs, much of which is of commercial size now. These areas could be returned to a stand structure that would support the low intensity, frequent fire interval that they evolved with. Many of these sites are now outside their historic range of variability, and would support intense crown fires that could threaten homes, no matter how much home defensibility space has been created. Prime areas for this kind of work would be on the north side of the Silver Valley (the south facing slope), and Pine Creek (aptly named).

### **Municipal Watersheds**

The threat of severe fire in the municipal watersheds of the county must to be considered as well. Approximately 7,000 people get their water from the drainages near of the Silver Valley (at Big Creek, McFarren Gulch, Placer Creek, Boulder Creek, and Milo Gulch). Maps of the municipal water supplies in the county have been created showing the locations of ground water and surface water collection points. Beyond the surface water points exist watersheds that contribute to the supply of community drinking water. These are the watersheds that are of highest risk to damage in the event of a wildfire.

A large, severe fire could have major adverse impacts to the water quality in these watersheds, and render the water undrinkable for a period of time. Active management aimed at reducing the potential severity of a fire (taking the fire out of the crowns) could serve as a measure of protection for these watersheds. These treatments could also be placed on the landscape in such a manner to retard the spread of a large fire coming out of the St. Joe River valley.

It is the strong recommendation of this analysis team that the major forestland managers in Shoshone County (US Forest Service, Bureau of Land Management, Idaho Department of Lands) implement aggressive forest management activities in the watersheds they manage that supply domestic water to the communities of this region. These watersheds represent community sustainability. For the part of the communities,

it is recommended that each city in the Silver Valley explore the possibility of diversifying water supplies through the creation of wells such as Pinehurst has done.

Data does not exist currently on the size of the surface watersheds contributing to these points although a cursory look at the areas upstream of the collection points indicates that the areas are large and have fire risk ratings that contain property in the highest categories of risk. We recommend that each surface water collection point used for community distribution have a resource assessment and management plan written. These plans should determine accurately the size and scope of each watershed and specifically assess the fire risk of the forests in these zones using the region's existing growth models and the Fire and Fuels Extension discussed in the next section. This analysis will require a detailed forest inventory and management plan. Once this baseline is established predictions can be made of fire spread rates and crowning potential, and forest management activities can be developed that reduce the potential for a crown fire while maintaining water quality and even improving the timing of the summer water flows. A separate plan for each surface watershed should be developed starting with the East Shoshone County Water District's (Wallace) Placer Creek. Additional watershed management plans should be selected based on the population served (Central Shoshone County Water District collection points next). These plans can play an instrumental role in the overall risk reduction of the region as many of these watersheds are in the zone that a fire would cross to threaten the communities of the county.

The following table details each of the wells and surface water collection points in Shoshone County that are used for public consumption and corresponds to the maps in the document. Data for this information was obtained from the Idaho Department of Water Resources. That office continues to update information and is currently developing new GIS data that will estimate the extent of each watershed used for public consumption. As this project is developed new data from this state office should be sought.

## Ground Water and Surface Water Points in Shoshone County Used for Community Consumption

PWSNO	NAME	SYS_TYPE	SRCE_NAME	SRCE_TYPE	LATITUDE	LONGITUDE	POP
1400005	BABINS TRAILER COURT	Non-community Transient	WELL #1	Groundwater	47.63617	-115.98215	30
1400012	CATALDO WATER DIST	Community	WELL #1	Groundwater	47.55004	-116.323	600
1400016	E SHOSHONE COUNTY WATER DIST BURKE	Community	SAWMILL CREEK	Surface Water	47.52679	-115.79412	100
1400017	E SHOSHONE COUNTY WATER DIST MULLAN	Community	BOULDER CREEK	Surface Water	47.46004	-115.79563	821
1400017	E SHOSHONE COUNTY WATER DIST MULLAN EAST SHOSHONE COUNTY WATER DIST	Community	MILL CREEK	Surface Water	47.48584	-115.79985	821
1400019	WALLACE	Community	PLACER CREEK	Surface Water	47.4457	-115.93537	2040
1400021	CLARKIA WATER AND SEWER DIST	Community	WELL #1	Groundwater	47.00419	-116.25774	75
1400024	GENE DAY PARK SHOSHONE COUNTY	Non-community Transient	WELL	Groundwater	47.51521	-116.03261	25
1400032	LEISURE ACRES TRAILER COURT	Community	WELL #1	Groundwater	47.51233	-116.02978	180
1400035	M AND H TRAILER PARK	Community	WELL #1	Groundwater	47.49265	-115.9642	45
1400036	MARBLE CREEK SERVICE	Non-community Transient	WELL #1	Groundwater	47.2505	-116.02669	50
1400039	MURRAY WATER WORKS	Community	ALDER CREEK	Surface Water	47.6365	-115.85191	34
1400039	MURRAY WATER WORKS	Community	WELL	Groundwater	47.62755	-115.85875	34
1400041	PINEHURST WATER DIST	Community	WELL #1	Groundwater	47.53312	-116.23851	2000
1400041	PINEHURST WATER DIST	Community	WELL #2	Groundwater	47.53312	-116.23851	2000
1400042	PRICHARD TAVERN	Non-community Transient	WELL #1	Groundwater	47.65636	-115.97033	25
1400047	SUNNY ACRES	Community	WELL #1	Groundwater	47.50452	-116.0813	25
1400049	SUNNYSLOPE SUBD	Community	WELL #1	Groundwater	47.51116	-116.01877	150
1400050	SUNSHINE PRECIOUS METALS INC	Non-community Non-transient	BIG CREEK #1	Surface Water	47.49247	-116.06984	320
1400059	USFS BIG HANK CAMPGROUND EAST	Non-community Transient	WELL #1	Groundwater	47.82382	-116.10086	25
1400089	CENTRAL SHOSHONE COUNTY WATER DIST	Community	MILO CREEK	Surface Water	47.51013	-116.14327	4052
1400089	CENTRAL SHOSHONE COUNTY WATER DIST	Community	SHIELDS CREEK	Surface Water	47.54158	-116.04931	4052
1400089	CENTRAL SHOSHONE COUNTY WATER DIST	Community	ENAVILLE WELL	GWUDI	47.55868	-116.25731	4052
1400089	CENTRAL SHOSHONE COUNTY WATER DIST	Community	BIG CREEK	Surface Water	47.48745	-116.06391	4052
1400091	USFS MARBLE CREEK INTERPRETATIVE SITE	Non-community Transient	WELL	Groundwater	47.24932	-116.02121	54

See attached maps for point locations

## **Fire Behavior:**

During a forest fire, the fire can be maintained at two levels: a ground fire, and a crown fire. Ground fires are easier to control because the heat of the fire is concentrated at ground level, burning slash, debris, and trees within ten feet of the ground. Ground fires are generally low intensity fires which cause less resource damage. Fire breaks and water can often times control this type of fire while the fire is still relatively small. A crown fire occurs when winds blow the fire into ladder fuels that are able to carry a ground fire into low branches of trees, up the crowns to taller trees, and into the crowns of the overstory. Once in the crowns of the dominant trees the fire moves rapidly through a stand, up slopes, and engulfs entire watersheds. Crown fires are moderate to high intensity fires generally causing significant resource damage and loss. These are the fire scenes played on the evening news with 100 foot flame lengths that destroy communities and forests in their path. These fires are the most dangerous because fire suppression activities have minimal effect in controlling the fire.

In order for a ground fire to make the transition to a crown fire, many conditions must be present: ground fuels to carry the heat of the fire and ladder fuels to carry the fire into the crown. Heavy fuel loading both vertically and horizontally is provided by a continuous canopy of fuel, dead standing trees or snags provide an added fuel source, while dry conditions and wind all combine to make conditions prime for an intense wildfire. Many of these conditions are present in the forests of Shoshone County during the summer season.

Fiedler *et al.* (2001) from the University of Montana recently published findings of research completed on the forests of Montana where they assessed the fire hazard of that state as a function of wind speed using an extension to the Forest Vegetation Simulator. Potential fire hazard can be analyzed using the Fire and Fuels Extension (FFE; Beukema *et al.* 2002, Scott and Reinhardt 2001) to the Forest Vegetation Simulator (FVS; Stage 1973, Crookston 1990, Van Dyck 2000). This model (extension) estimates crown fire hazard based on tree, stand, and site characteristics, and expresses fire hazard/effects in terms of Crowning Index, Torching Index, and Basal Area Mortality.

Crowning Index, defined as the wind speed necessary for a fire that reaches the canopy to continue as a crown fire, is the primary variable used to report hazard in the high risk areas defined earlier. The highest-hazard forest conditions possess a Crowning Index less than 25 mph of wind speed, moderate hazard from 25 to 50 mph, and low hazard as those stands which can withstand a 50 mph wind during a fire and still not spread through the crowns. The Crowning Index should be calculated for each high risk area, and sorted by various combinations of forest type, density, structure, region, and ownership to display fire hazard by the categories of interest. In addition, the FVS model can be used to project forest conditions every 10 years for 30 years into the future (i.e., from 2002 to 2032) to allow managers to determine the longevity of fire risk mitigation efforts.

By manipulating stand conditions through selective thinning, we will be able to determine which trees should be removed in order to improve forest health while reducing the risk that a ground fire will spread into a crown fire and continue to spread in the crowns of trees. Once the management prescriptions are determined on a stand-by-stand basis, they can be implemented on the forest site in an effort to reduce the risk in these fire prone areas. This analysis should be conducted on those forestlands beyond the 1-mile building buffer zone to a distance of 10 miles where fire spread risks are the greatest. Using this data, detailed and targeted fuels management prescriptions can be refined.

### **Access and Escape:**

In some areas, neither fuels management nor stand management will significantly affect the potential that an area will burn during a wildfire. In all areas of the county we recommend improving access where it is limiting through road widening, creating access loops and turnouts for fire fighting equipment, building fire breaks along strategic landscape features, and in some cases building new roads or opening closed roads. These efforts should be coupled with defining better escape routes for residents for the affected communities and working with wildland fire fighting agencies to identify these highest risk areas.

All communities should have an escape route identified and well marked. These signs should clearly indicate where local residents should flee in the event of an emergency where the primary escape route is compromised. Printed escape route maps should be created and made available to local residents through the libraries, at the fire departments (rural and wildland), and even mailed to local citizens with other county mail.

Bridges in the county have been addressed in the discussions of the communities. In summary, all of the bridges that may be crossed by heavy fire fighting equipment (full tanks full of water) should be evaluated for maximum load limits. These bridges should be posted with the results kept on file at the rural fire fighting offices and the wildland fire fighting offices. Residents living behind limiting structures should be notified of deficiencies. Efforts to improve or replace defective crossings should be evaluated.



The same recommendation is given for cattle guards. Some of the structures observed in the county could not support a wildland fire truck heavy with water, while some of the others were too narrow to allow wide vehicles to pass. These structures should be evaluated, the results posted on the structure,



delivered to the landowner, and kept on file at the fire department offices (rural and wildland).

### **Community Education & County Administration**

Leadership for organizing community education and county policy in matters regarding fire mitigation should be administered by the County Commissioners office. That office has demonstrated outstanding leadership in the development of this plan and efforts relating to implementing recommendations. We believe that it is in the best interest of the county to integrate many efforts together in order to make a real impact on reducing the potential for casualty loss in the wildland–urban interface. Specifically, we recommend the following activities:

- Maintain strong fire prevention programs
- Sponsor homeowner “Firewise” and “Landscaping for Fire Prevention” education workshops
- Ensure all agencies and districts are prepared for a wildland-urban fire incident, with proper training, equipment, communications and pre-planning
- Develop a bridge inspection and signing program; require signing of the bridge capacity
- Encourage utility companies to install underground lines and actively maintain overhead lines
- Develop a county-wide incident plan that covers evacuation routes, safe zones, inter-agency responsibilities, possible Incident Command Post locations, etc.
- Encourage or legislate the use of fire safe building materials
- Coordinate mitigation efforts between landowners (private and government)

Education of people about risk factors in the wildland–urban interface can be coordinated with the University of Idaho Cooperative Extension System. Although the U of I CES does not have an office in Shoshone County, the Area Extension Educator–Forestry, located in Coeur d’Alene does landowner education in natural resources in Shoshone County and surrounding counties. The 2002–2003 stewardship education program published by the U of I CES offers “Landscaping for Fire Prevention” workshops on a request basis (as part of the Forest Stewardship program). The materials and training offered as part of this 2-3 hour program are appropriate for beginning the process of working with homeowners in Shoshone County. In addition, this type of training is consistent with the rural homeowner survey results indicating that approximately 70% of the households would be interested in attending a free, or low cost, one-day training seminar designed to teach homeowners in the rural–urban interface how to improve the defensible space surrounding their home and adjacent outbuildings. Requests for this training should be made to:

Chris Schnepf  
Area Extension Educator–Forestry  
Kootenai County Cooperative Extension Office  
106 E. Dalton Avenue  
Coeur d’Alene, ID 83815-7333  
(208) 667-6426

In addition, the county should consider a closer relationship with the Student Conservation Association, Fire Education Corps. This group was located in Coeur d’Alene during the summer of 2002 and made site visits in Shoshone County. Their work is perfectly in line with the recommendations of this document and should be sought in 2003 and beyond.