USDA Oregon Technical Advisory Committee
March 10, 2016

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http://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/

NRCS Natural Resources Conservation Service

- **BTL Jay Gibbs organized meeting in January to discuss post fire situation in Baker (Cornet Windy Ridge Fire) and Grant (Canyon Creek Fire) Counties**

- **EQIP fire recovery re-seeding projects were underway (discussed later), but wanted to discuss community preparedness relating to snowpack runoff scenarios**

- **As a result, the NRCS snow survey program worked with DC's from Baker and Grant (and Public Affairs, Thank you Tracy!) to develop weekly products to keep local constituents informed of current snowpack conditions**

If you can look uphill from where you are and see an area burned by wildfire, you are at risk.

Lands damaged by wildfire experience a higher risk for flash flooding. Even areas that aren't traditionally prone to flooding are at risk, because the burned soils can't absorb as much water. Flooding after a fire can cause significant soil erosion and trigger debris slides (such as ash, rocks, and burned trees) that can damage roads and infrastructure.

Flash Flooding, Snowpack & Rainfall

The potential for flooding depends greatly on rainfall intensity. Heavy rainfall on melting snow is a trigger for flash flooding. Generally, you can look at the density of the snowpack to gage snowmelt. Higher-density readings are an indicator that the snow is getting ready to melt. A general rule of thumb is that half an inch of rain falling in less than one hour is enough to cause flash flooding in a burned area, but this can be more or less depending on the fire severity and the steepness of the terrain.

Understanding the current snowpack conditions in your area and the potential for rain-on-snow events can help you stay better informed and prepared to anticipate flash flooding after a wildfire.

The USDA Natural Resources Conservation Service (NRCS) Snow Survey Program in Oregon measures snowpack and other pertinent data at about 300 mountain sites across Oregon and Washington. This data is available in near real-time online, so be sure to check the website for the latest information.

A view of the damage from the Canyon Creek Wildfire that blazed through John Day, Oregon in the summer of 2015.

Understanding the current snowpack conditions and the potential for rain-on-snow events can help you stay better informed and prepared to anticipate flash flooding after a wildfire.

LEARN MORE

Scan code with your smartphone for more information on Oregon snow survey data. Requires QR reader app.

Or Visit Us Online at:
www.or.nrcs.usda.gov/snow

- General informative flier
- Discusses understanding of terrain
- Monitoring of weather conditions
- Monitoring of snowpack and changing snowpack conditions

What factors should I look for in the snowpack as it relates to flood risk after a fire?

Heavy rainfall–and heavy rainfall in conjunction with melting snow–are the primary factors to consider for flood risk. There are several indicators you can look for to gage when the snowpack is starting to melt.

First, check the snowpack density at the sites in your area. If densities reach 40% or more, there is a greater risk for flooding if a moderate or heavy rainstorm falls on top of that snow. A high snow density means that the snowpack is reaching a point where melting is imminent. Density is calculated by dividing the snow water equivalent (SWE)–which refers to the amount of water stored in the snow–by the snow depth, multiplied by 100%. A 40% dense snowpack means that the snow is 40% water.

$$\frac{\text{SWE (inches)}}{\text{Snow Depth (inches)}} = \frac{10}{25} \times 100\% = 40\%$$

It's also important to note the trend in SWE. If there's a pattern of decreasing SWE levels, this also means the snowpack is beginning to melt, and thus the chances for flooding during a rainstorm are higher. Keep in mind that it's normal to see a gradual decrease in snow depth as the snow settles–so a downward trend in depth doesn't always indicate snowmelt.

As the snowpack begins to melt, which typically begins after the peak of the season in March and April, there's a greater risk for higher run-off as the snowmelt flows into streams and rivers.

At remote mountain sites, NRCS staff must manually measure the snowpack using a carefully-calibrated set of tubes and a scale. These sites are called Snow Courses and are typically measured about once a month. Most sites are equipped with automated SNOTEL stations that record data every hour, available online.

Be sure to check the National Weather Service River Forecast Center to see if rivers in your area are approaching flood levels.

View the Northwest River Forecast online at:
http://water.weather.gov/ahps2/index.php?wfo=pdt

How long will there be an elevated risk of flash flooding?

This depends on the severity of the wildfire and how much erosion occurs, but most burned areas are prone to flash flooding and debris flows for at least two years after the wildfire. It could take many years for trees and plants to re-establish. Vegetation is the primary factor that slows down the precipitation run-off that creates flash flooding and debris flows. Each burned area poses its own unique risk due to many factors including proximity to population centers, burn severity, steepness of terrain, and size of the burned area.

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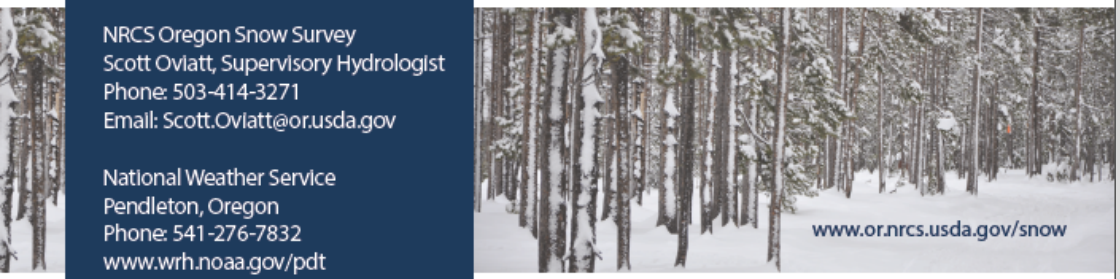


- **Factors in snowpack that relate to melt and runoff potential**
- **Other resources such as NWS office or River Forecast Center for flood information**
- **Duration of increased awareness**

Mar. 7, 2016

AFTER THE FIRE
KNOW THE SNOW TO PREPARE FOR THE FLOW

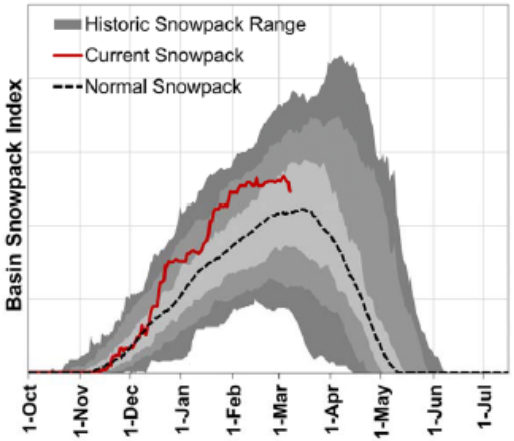
USDA United States Department of Agriculture
Natural Resources Conservation Service

Cornet Windy Ridge Fire—Baker City, Oregon

Today's Summary for Mar. 7, 2016

- The sites west of Baker City, located in or near the Elkhorn Mountains, have near normal to above normal snowpack for today. The snow densities are in the 40% range, and the snowpack has begun melting.
- Water year-to-date precipitation has been above average. The last 7 days have brought 0.6" to 1.4" of precipitation.
- The National Weather Service (NWS) mountain forecast calls for temperatures in the upper 30's to upper 40's, with lows near freezing through the week, and several chances for snow or rain mixed with snow. The NWS River Forecasting Center is not forecasting imminent flooding at this point.
- Snow densities range from 40% to 42%, meaning the snow has limited porosity, and is near melting stage, and in some cases melting. With temperatures lowering to near freezing each night, the snowpack is maintaining some stability. Snow density is simply (snow water equivalent/snow depth) x 100%.
- Decreases in snow depth can occur naturally during and after cold snow storms. Decreasing snow depth is not the best indicator of snowmelt.

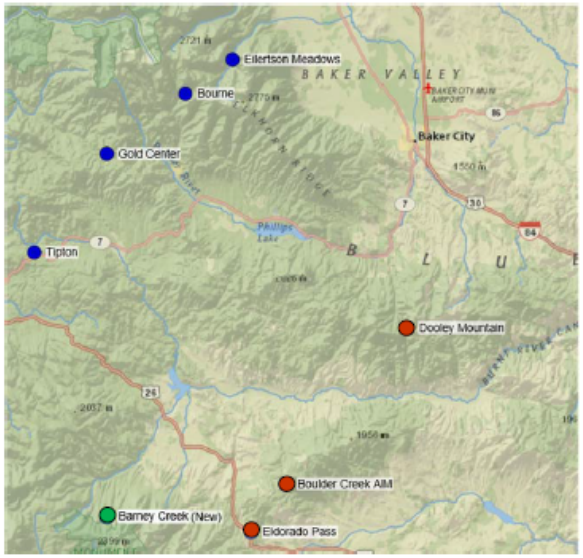
Mountain Snowpack



This graph shows today's mountain snowpack levels recorded at four NRCS snow telemetry (SNOTEL) sites in the Eastern Elkhorn Mountains in Baker County, Oregon.

- Daily, consecutive decreases in snow water equivalent of 0.5" or greater along with densities of about 40% or greater (typically during springtime) will be an indicator that it is time to watch the weather forecast for the potential of heavy rain.

- Summary discusses where the sites are located and current snowpack conditions
- Details precipitation trends for water year and previous 7 days
- Details the current NWS for fire scar region and associated region
- Details current snow density and trends and how that relates to snowpack and runoff
- Graph displays water year snowpack trend from selected sites relating to normal and historic max and min



Where does the Baker City snow data come from?

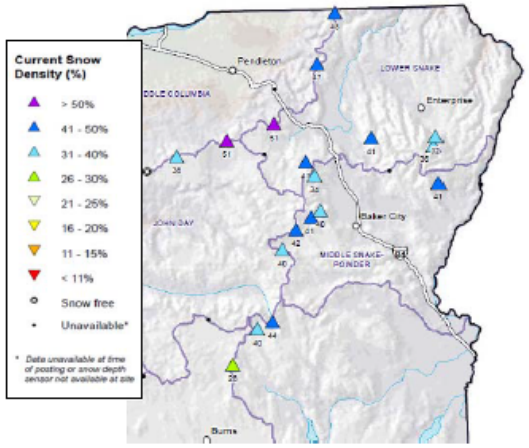
The USDA Natural Resources Conservation Service has several snow measuring sites in the mountains surrounding Baker City, shown here on this map. The four snow telemetry (SNOTEL) sites record data every hour; the three snow course sites require a manual measurement, which usual occurs about once a month. The Barney Creek SNOLITE site records only hourly snow depth and air temperature. For the latest, real-time snowpack data, check the NRCS Snow Survey website.

- NRCS snow telemetry (SNOTEL) site
- NRCS manual snow course site
- NRCS SNOLITE site

Site	Elevation	Snow Water Equivalent inches	SWE % of Normal	Snow Depth inches	Snow Density %	Precipitation (Oct. 1 to date) inches	Precipitation % of Average	Midnight Air Temperature (Degrees F)
Bourne	5,850	14.0	97%	34	41%	21.6	107%	33
Barney Creek	5,830	n/a	n/a	26	n/a	n/a	n/a	34
Eilertson Meadows	5,510	8.1	90%	20	41%	19.0	111%	36
Gold Center	5,410	11.7	139%	28	42%	17.9	119%	33
Tipton	5,150	15.1	130%	38	40%	17.1	112%	30

What's the current snow density?

This map shows the current snow densities at NRCS snow survey sites across the region. When snow density reaches 40% or more, there is a greater risk for flooding if a moderate or heavy rainstorm falls on top of that snow.



Get the latest data online at:
www.or.nrcs.usda.gov/snow
For questions, contact:
Scott Oviatt, NRCS Snow Survey
503-414-3271, Scott.Oviatt@or.usda.gov
National Weather Service Pendleton
541-276-7832, www.wrh.noaa.gov/pdt

- **Page 2 provides a map and description of SNOTEL and snow course sites used in the summary**
- **Table provides individual site detail of snow water equivalent (SWE), SWE% of normal, snow depth, snow density, water year precipitation and % of average, and midnight air temperature**
- **2nd map provides snow density readings for regional SNOTEL sites**

Canyon Creek – Grant County

Malheur Forest Service Contacts:
Garner, Susan C; Outreach coordinator
Namitz, Steven M; hydrologist
Hassmiller, Robert J; hydrologist

ODFW Contacts:
Brent Smith; fish biologist
Kelly Stokes

County/City Staff Contacts:
Doug Ferguson; county engineer
Lance Woodcock
Peggy Gray
Ted Williams; Emergency management coordinator
Allan Hickerson; county road department
Peggy Gray
Scott Myers; county court

SWCD Contacts:
Jason Kehrberg; district coordinator

NWS Contacts:
Marilyn Lohmann, Hydrologist
Dennis Hull, Warning Coordination Meteorologist

Oregon Water Resources Contacts:
Eric Julsrud; water master
BOETHIN Hailey D
STAHR Ken L
MORRIS Kara B
MARVIN Richard K

Windy Ridge – Baker County

Bill Harvey-Baker County Commissioner

Bob Parker-OSU extension agent

Jana Peterson- ODF local stewardship forester

Joe Hessel- ODF

Jason Yencopal- Baker County Emergency Management

Mark Bennett- Baker County Commissioner

Logan McCrae- ODF local stewardship forester

Mike Kee- Baker City Manager

Rick Wagner- ODF

Steve Meyer-ODF

Tim Kerns – Baker County Commissioner

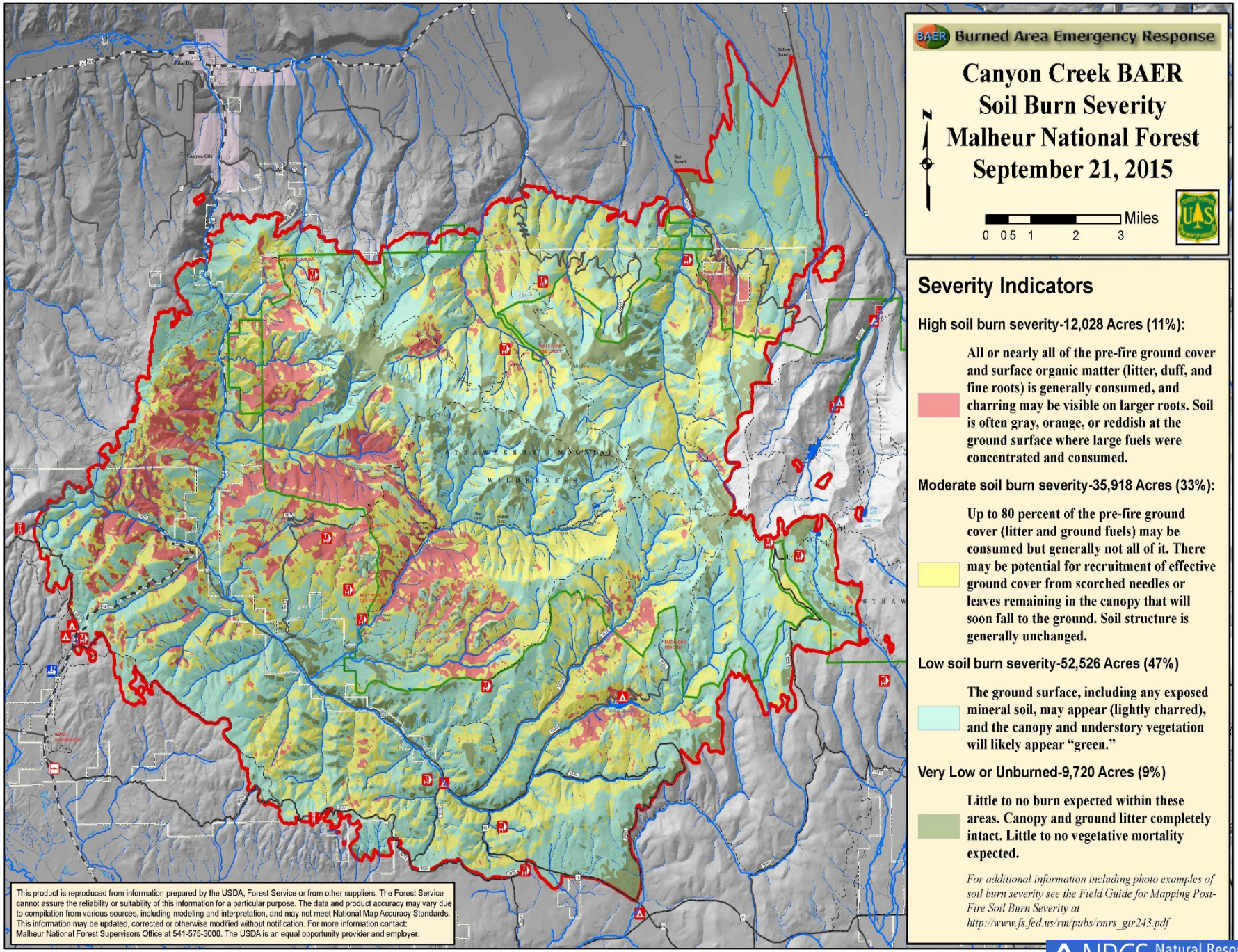
Gary Timm- Baker County

Whitney Collins- Baker Co SWCD Manager

Trent Luschen- FSA CED Baker County

Being forwarded to ODOT in Baker and the County Road Department

Bowen Valley RFD Chief is getting it, forwarded from someone in the group.


BAER Burned Area Emergency Response
Canyon Creek BAER
Soil Burn Severity
Malheur National Forest
September 21, 2015
N
Miles
0 0.5 1 2 3
Severity Indicators
High soil burn severity-12,028 Acres (11%):
All or nearly all of the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) is generally consumed, and charring may be visible on larger roots. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.
Moderate soil burn severity-35,918 Acres (33%):
Up to 80 percent of the pre-fire ground cover (litter and ground fuels) may be consumed but generally not all of it. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. Soil structure is generally unchanged.
Low soil burn severity-52,526 Acres (47%)
The ground surface, including any exposed mineral soil, may appear (lightly charred), and the canopy and understory vegetation will likely appear "green."
Very Low or Unburned-9,720 Acres (9%)
Little to no burn expected within these areas. Canopy and ground litter completely intact. Little to no vegetative mortality expected.
For additional information including photo examples of soil burn severity see the Field Guide for Mapping Post-Fire Soil Burn Severity at http://www.fs.fed.us/rm/pubs/rmrs_gtr243.pdf
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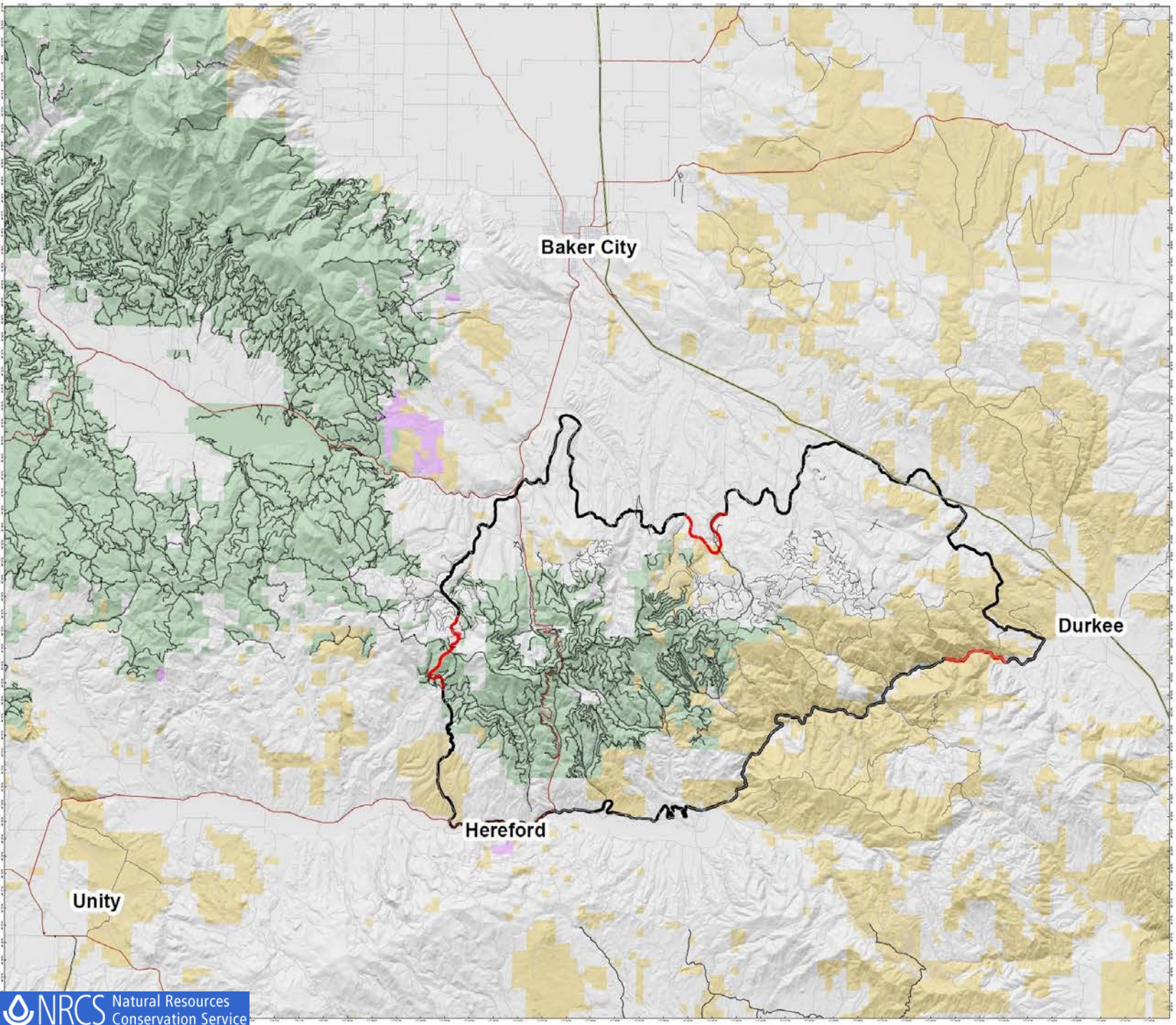

Cornet-Windy Ridge Fire
Public Information Map

103,887 ac
Perimeter as of
8/21/2015, 1930 hrs

08/22/2015

Legend

FLType

- Completed Line
- Uncontrolled Fire Edge

Land Ownership

- Bureau of Land Management
- U.S. Forest Service
- State
- Private/Unknown

N

SOUTHWEST AREA INCIDENT MANAGEMENT TEAM

Southwest Area Type 1 Team 2
08/21/2015 2031 fah

NRCS Natural Resources Conservation Service

EOIP Post Fire Seeding

Canvon Creek Fire

Contracted 3844 acres

46 Landowners

Seeded by helicopter

Grant SWCD

3792 acres

rs

1 Additional 36 Acre contract (Sugarloaf Fire)

Total Cost of seeding $ 512,524.00

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Setting up and calibrating at Indian Creek site

NRCS Natural Resources Conservation Service

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N938D
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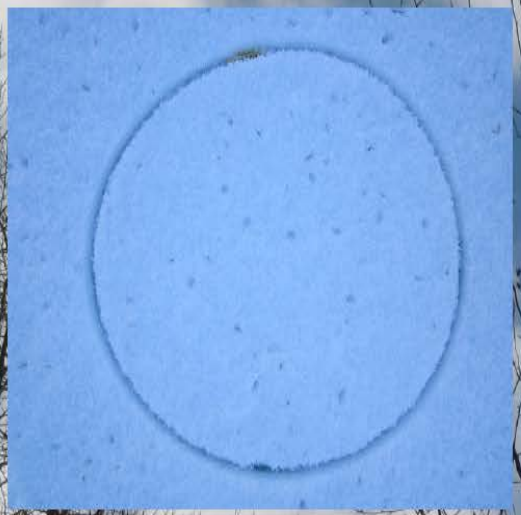
Seeding Verification



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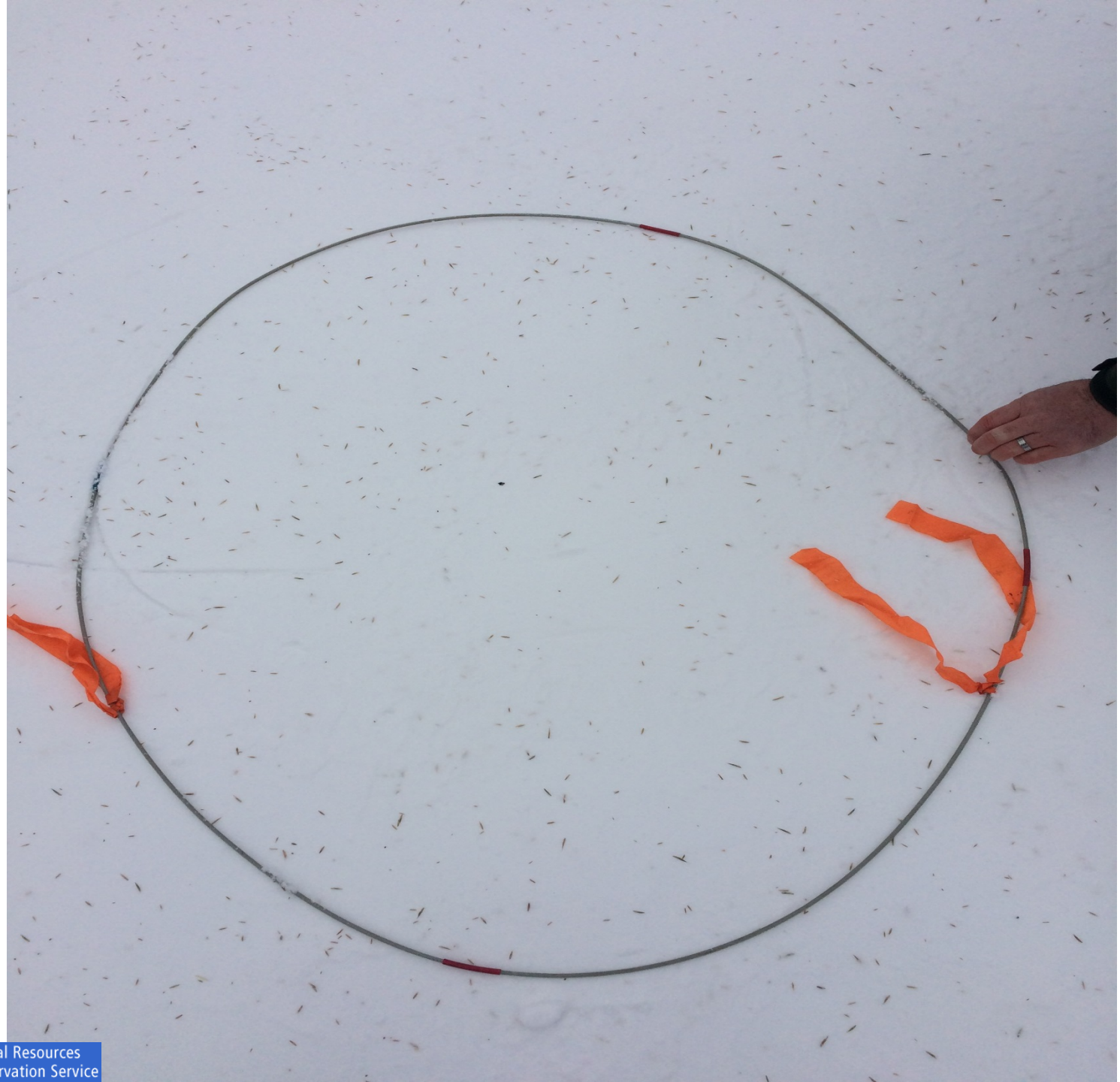

Thank you, QUESTIONS??