Methods

Information, photos and reports for the monitoring project on the Fremont/Winema National Forest

Gathering such a diverse amount of data requires many different types of survey methods and techniques. Among those used on this project are the selection of locations, vegetation surveys, canopy surveys, soil surveys.

One of the most striking things about this project is the depth and connection that each piece of data has with each other. The methods used to collect the data were conducive for understanding the interrelationships of the various components of the ecosystem. The combination of particular elements of data and the unity achieved in the database create the ability to see both the broad picture of the watershed and the specific particulars within their proper context.

The listed methods here provide our own descriptions of what we do in the field and how we do it. We have tried to be concise and simplify as we continually try and test new methods we therefore expect to modify our descriptions accordingly.

Choosing a Base Area

Base areas are chosen because they contain one or more of the following characteristics: dynamic, representative, unique, and/or managed. The meanings of these terms are as follows:

Dynamic: A base area or individual transect which possesses ecological factors or elements that are unique in combination and/or rapidity of change.

Representative: A base area or transect which contains ecological factors or elements which represent a significantly larger area than the particular vicinity of a certain base area.

Unique: A base area or transect which contains one or more ecological factors or elements that are one-of-a-kind or at least extremely rare in occurrence for the watershed.

Managed: A base area or transect which has been, is being, or will be managed in some way (e.g. – restoration, treatment, and/or logging).

Location & Base Area Mapping Method

After choosing a base area, an individual tree within sight from the road nearest the base area is painted with a green dot and designated as the marker tree (MT). Either before or after painting the MT the individual transects are designated by placing small flags in the ground and stretching a measuring tape in the desired direction.

Next, small pieces of rebar are pounded in the ground at the ends of the stretched tape. The rebar is then marked by attaching a small, round, aluminum tag (marked by alpha-numeric sets with the

appropriate transect code and stake letter). The tags are then attached with aluminum wire. The same tags are also used to label the MT and are attached with a galvanized nail. After the transects are set up (the tapes are laid out and the stakes are pounded in) and the MT is painted, then the distance and bearing can be measured. By standing at the MT a compass is used to determine the direction from the MT to the various transects' stake "A" within that base area. Distance from the MT to a stake A can be measured with a GPS.
GPS distancing involves using the GPS device's 'route' function. The GPS coordinates are always taken for all stake A's, the MT (and sub-MT if applicable).

After providing all the necessary location information (distance, bearing, GPS coordinates), the orientation of each transect is measured by standing at stake A and looking with a compass to stake B. The 'A to B orientation' can be recorded. The slope and the aspect of the slope is measured by a clinometer and compass and is always directed uphill. The slope is measured in percent, not degrees. If there is more than one distinct slope then each slope relative to the individual transects is recorded. If the transects are in a riparian zone the slope and aspect of the stream is recorded.

The final element after collecting all the previous information is the actual drawing of the Location Map. Though it can be accomplished in a variety of ways, the following is recommended. The field form is placed in an orientation that will suit the general shape of the base area's layout. The compass is set to North and rotated, not the field form, until North is found. North is marked in the circle on the lower-right corner of the field form. Generally a 1 mm = 1 meter ratio scale is used to draw the distance accurately. The form is left in the same orientation as it was when North was marked. Using the compass the bearing and distance is representatively drawn on the form. The MT is labeled in the drawing and the transects are oriented with the compass and marked with a dotted line between two circles with X's. The aspect of the slope is also drawn using the compass in the same manner as the bearing to stake A and the A to B orientation.

Finally, the other key features are sketched in roughly, such as the nearest road, streams, or partially distinguishing features.

Vegetation Survey Method

Quadrats:
Quadrats are used to sample vegetation found in one-tenth acre plots that are not necessarily on the line intercept. Quadrates are used as well to sample areas in transition within the plot. The specie

name and the number of plants per specie are recorded along with the percent of effective ground cover. Percent effective ground cover is recorded as litter, moss, or grasses/herbs. A picture of each quadrat is taken and identified by recording the following on a small whiteboard: 1) plot location, 2) quadrat number within the plot, 3) location in the plot, and 4) date.
Location of the quadrat within the plot uses a Cartesian coordinate system with the 30 meter tape stretched from the A stake to the B stake being used as the X axis and the distance above and below the tape as the Y axis. To orient the graphing coordinates correctly, stand with the A stake on your left and the B stake on your right. The area above the 30 meter tape is positive, and the area below is negative. Quadrat distances are measured to the center of the quadrat.
Quadrat pictures are taken with the photographer's back toward the A stake and the whiteboard identifying in the lower right corner of the quadrat.
Quadrat information is combined with line intercept data to calculate species richness. Quadrats from different years can be compared in trend studies to identify changes that are occurring within the quadrat. These can be combined with line intercept data to extrapolate changes occurring within the plot.

Green Line:

Green line surveys are used to determine changes occurring within the one-tenth acre plot. Species changes are indicators of disturbance and succession, as well as soil, canopy and/or water changes. The standard line intercept protocol of vegetation analysis is employed along the 30 meter tape/transect in the middle of the plot.
The 30 meter transect is divided into 10 subsections each three meters long. The species, number of plants and medium width of each species is recorded for each subsection. Vegetation measurements of density, cover, frequency, importance and diversity are then calculated. All plants are identified by a six letter code consisting of the first three letters of the genus followed by the first three letters of the specie.

LMS (Landscape Management System) Protocols

LMS is a forest modeling program that calculates stand characteristics including average heights, diameter, and basal area as well as variances of height and diameter. It also draws representations of the stand showing canopy closure, basal area, and stem profiles. It can be used to model future growth and responses to various
Stand measurements for correct modeling include aspect, slope, latitude, habitat, and average age. Individual tree measurements include species, diameter, height, crown ratio, crown width, and rings per centimeter. All data is measured using the Empirical system utilized in forestry.

Sampling is carried out by gridding the site, and taking data in one-fiftieth acre circular plots (16.4 ft radius), along the grid.

Canopy Survey Method

Canopy data includes information on trees such as height, diameter at breast height (DBH), crown width, crown ratio and growth index as well as spatial orientation details and the location of trees, boulders, downed woody debris, noxious weeds, seedlings, skid trails and other prominent features.

Tree species, composition, height of saplings, length, width and orientation of downed woody debris are all recorded on the canopy map. Each tree greater than 10cm is given a number so that attributes of that tree can be cross-referenced. Each tree is identified by specie using a six letter code. The first three letters are the first three letters of the genus. The second three letters are the first three letters of the specie.

Diameter at Breast Height (DBH) is measured with a DBH tape at 1.3 meters from the uphill side of the tree and is recorded in cm.

Tree Height is measured using a clinometer. The surveyor paces parallel to the slope a distance of 10-30m (the greater the distance the more accurate) and notes the percent reading on the clinometer. The percent of base is then multiplied by the distance from the base of the tree to get the height which is recorded in feet.
Crown Ratio is found by visually breaking the tree into 10 portions. The number of portions that contain live photosynthetic material (i.e. green crown) is recorded as a decimal between 0 and 1, which represents the Live Crown Ratio in percent.

Canopy Width is determined by measuring the maximum width of the living branches starting at the furthermost point of the initial branch straight through the tree to the outermost point of the opposite branch. A clinometer is used at 90 degrees to make sure the measurement starts and stops directly under the end of the longest branches. Each tree is also surveyed for health status, damage and disease.

Canopy position of the trees is also taken. Canopy position refers to the amount of direct sunlight a tree gets. A dominate tree gets direct sunlight without much competition. A co-dominate tree is competing proportionally with surrounding trees for sunlight but still gets direct sunlight. An intermediate tree rarely gets direct sunlight. A suppressed tree is one that is in the understory of the stand. A tree that has an open canopy position doesn’t have to compete for light at all.

Rings per Centimeter of each tree is taken using an increment borer. Each individual ring represents one year of growth of the tree. The higher the number of rings per unit of measure the slower the tree is growing. Rings per centimeter is always taken on the north side of the tree and does not include the new phloem and xylem of the tree, (i.e. excluding this year's growth).

The **canopy survey map** is a hand drawn map of trees that shows the general layout of the transect. The purpose of the canopy map is to show tree spacing, large woody debris, (LWD, greater than 5m) boulders, shrubs, grasses, noxious weeds. The map also captures information about the transect that can't be seen on the vegetation survey by photos or by soil information. Tree specie, quadrats, topographic changes, heights of sapling sized trees, lengths and widths of LWD and species of LWD are all characterized on the canopy survey map.

Forest Collaboration

Lakeview Stewardship Group – Where Forest Collaboration Got its Start in Lake County

The Lakeview Stewardship Group has as its goal "a sustainable forest that will ensure quality of life for present and future generations." It works to achieve that goal through the incorporation of restoration and community values in the management of the Lakeview Federal Stewardship Unit (LFSU).

Cultivating Common Ground – The Story of the Lakeview Stewardship Group

https://youtu.be/6cFSzpEKqTg

"Like many other western rural communities, Lake County has been affected by shrinking timber supplies on federal lands, " said Jane O'Keeffe, Chair Sustainable Northwest and LCRI board member. "What's different here is the collaborative effort to redefine our land management goals in a way that nurtures and sustains the special relationship this community has with the national forest. I think it could become a successful model for other places that are looking for ways to restore forest health and create local jobs."


Thinning tree stands is a primary goal of the Stewardship Unit.

Location: Lakeview Federal Stewardship Unit (495,000 acres) of the Fremont-Winema National Forest, Lake County, Oregon.

Participants: The Collins Companies, Concerned Friends of the Fremont-Winema, Defenders of Wildlife, Fremont-Winema National Forest, Lake County Chamber of Commerce, Lake County Resources Initiative, Lakeview High School, Lakeview Ranger District, Oregon Department of Economic and Community Development, Oregon Wild, Paisley Ranger District, Sustainable Northwest, The Nature Conservancy, The Wilderness Society, and local citizens.

History: The Lakeview Stewardship Group (LSG) collaboration began in 1998 to develop a strategy for sustainable forest

Sharing information plays a key role in the success of the Stewardship Unit management of the 500,000-acre Lakeview Federal Sustained Yield Unit (the Unit) in the Fremont-Winema National Forest in southern Oregon.

Established in 1950, the Unit had a single goal- providing a steady supply of timber for local mills. However, by the late 1990s, federal timber sales had plummeted, and all but one mill had closed. In the summer of 1998, with the assistance of Sustainable Northwest, community leaders brought together conservationists, business interests, scientists, timber workers and other local residents to plan for the future of the Unit and the community. Convening as the Lakeview Stewardship Group (LSG), the participants commissioned a third-party review of the Unit's operations and, after studying the results, collaboratively developed and proposed a new, restoration-based management approach.

Accomplishments: According to participants, the hard work, honesty, and respect developed among the LSG participants have been rewarded by tangible achievements:

- The Forest Service responded positively, and in 2001, it re-designated the Unit as the Lakeview Federal Stewardship Unit (LFSU).
- In 2002, the Lake County Resources Initiative (LCRI), a non-profit corporation, was formed to promote local workforce training and sustainable forest management.
- A biomass utilization feasibility study was completed in 2004.
- The Forest Service and the Bureau of Land Management (BLM) used the proposed Lakeview Biomass Project (LBP) as the basis of a pilot test of the Coordinated Resource Offering Protocol (CROP). CROP is designed to assess how biomass removal from federal land-dominated landscapes can be coordinated among agencies, hopefully giving potential investors in biomass

facilities greater confidence in the availability of adequate raw material supplies over the long-term. The LBP CROP report was completed in 2005.

- In late 2007, the Collins Companies opened a $6.8 million small diameter sawmill in Lakeview which can process logs less than 10 inches in diameter, an essential capacity to enable a viable restoration program. The mill processes material from the Collins' own FSC-certified Lakeview Forest, as well as logs from other private landowners and national forest and BLM lands.
- A year later, Collins was awarded a 10-year Forest Service stewardship contract for restoration work in the LFSU.
- LCRI and the Collins Companies are currently working with Iberdrola Renewables to develop the Lakeview Biomass Plant. The estimated $90-million facility will produce 26.9 MW and employ 20 people at the plant and 50-80 in the woods.
- Currently the Forest Service and Stewardship Group successfully completed a Collaborative Forest Landscape Restoration Act (CFLRA) proposal that will provide an additional $3.5 million in restoration work over the next 9 years. A big part of this successful proposal was the ***Long-range Strategy for the Lakeview Federal Stewardship Unit***. The strategy was completed in 2005 and updated in 2010 and 2011. Before the CFLRA award the amount of forest treatments were insufficient to get ahead of the forest health problems. The CFLRA allows us to get the treatments on the ground necessary to restore natural functions in the forest.

For a nice concise and printable write-up about the Lakeview Stewardship Group see the Lakeview Story.

Update on the Federal Forest Health Program: February 2, 2015

In 2015-2017, ODF proposes establishing a Federal Forest Health Program to invest $6.05 million for expanding initial restoration work statewide, supporting local collaborative groups that demonstrate results and readiness, and acting on the Good Neighbor Authority granted in the 2014 Farm Bill. This provision allows the USFS and the Bureau of Land Management to authorize state foresters to implement forest management activities on federal forestlands. This 2015-2017 investment would:

- Boost collaboration statewide: Provide grants and contracts for forest collaborative work to enhance capacity, provide technical assistance, and provide new data for planning and on-the ground projects. The Oregon Watershed Enhancement Board (OWEB) will continue as ODF's implementing partner for collaborative grants.
- Use the Good Neighbor Agreement Plan to increase projects: Fund both seasonal and permanent ODF staff as implementation partners for setting restoration projects in motion,

and ensure return on state investment (7.6 full-time equivalent positions). Contracts would test innovative efficiencies and best practices to complete required environmental analysis.

- Ensure success: Less than 10% of funds would be spent on administration. These funds would connect statewide efforts and provide ODF capacity to develop agreements, oversee contracts, and monitor results. A small portion of the package would provide similar capacity to OWEB.
- Set results-focused targets for 2015-2017: State investment would provide additional capacity to the Federal Forest Health Program to evaluate progress and set targets, including establishment of statewide goals; increasing economic impact (e.g. jobs and economic support) from restoration work; increasing timber volume sold and under contract; increasing habitat quality and watershed health; and leveraging additional federal investment and process efficiencies.

Read the whole document here: 2015 ODF Federal Forest Leave Behind