# Private land mapping, assessment, and wildfire response preplan

Landscape restoration involves an integrated resource approach. Much of the focus of this publication is on forest health and wildfire risk reduction. However, consider "restoration" in the context of ecosystem restoration, as it is defined by the U.S. Department of Agriculture:

"The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems' sustainability, resilience, and health under current and future conditions."

When designing a landscape restoration project of tens of thousands of acres of private, nonindustrial land, consider all the potential data needed to complete ecosystem restoration objectives. When collecting data on private land, you also have the opportunity to collect a variety of data and information to inform all restoration goals and objectives.
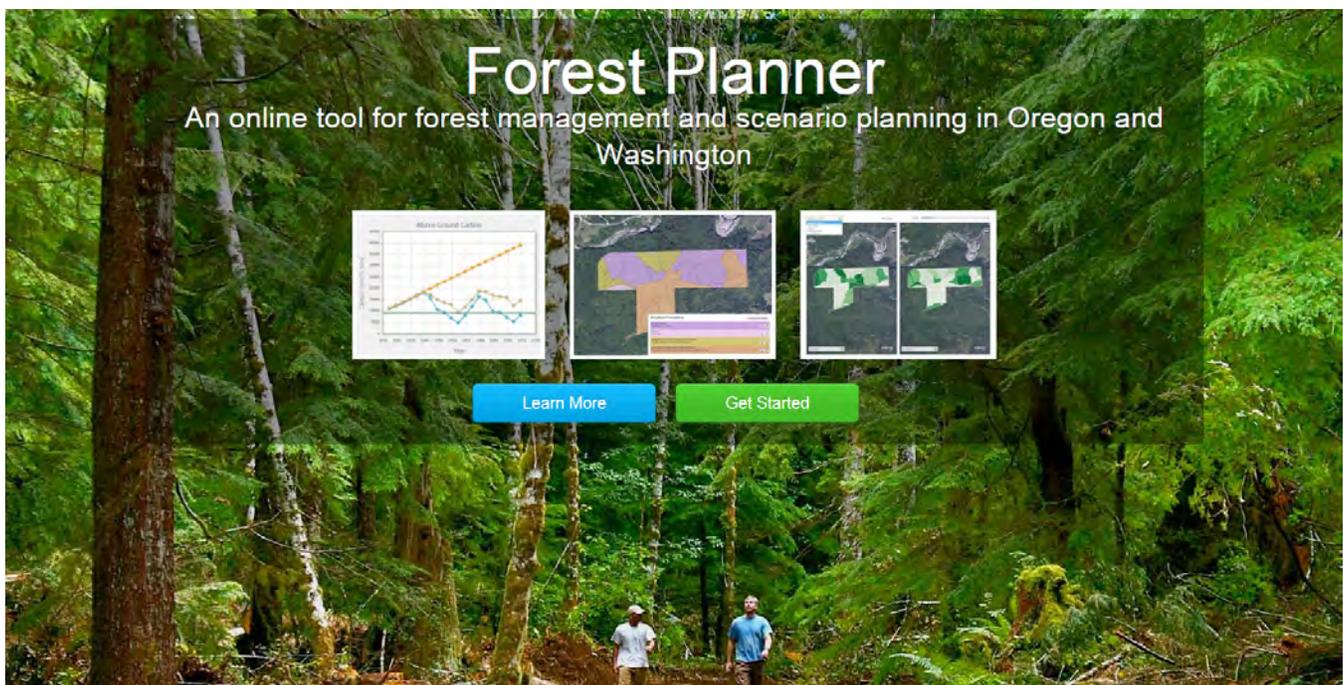
Forest Planner: An interactive tool for private land management planning

In Oregon, there is a lack of detailed natural resource information across large landscapes of private, nonindustrial land at a scale suitable for private land management planning. The nonprofit Ecotrust (sponsored by the NRCS and USFS) has developed an interactive tool called Forest Planner that makes forest management scenario planning accessible to all Oregon and Washington land managers. Forest Planner is designed to help users visualize alternative management scenarios on their lands and receive immediate feedback on how decisions might pay off in terms of timber harvests and financial returns, as well as public benefits like carbon storage and ecosystem services. OSU Extension Service is consolidating the Forest Planner tool into the land management planning process used in Klamath and Lake counties. In time, it might be possible to generalize this information to apply to private land areas elsewhere.

Private land mapping and assessment

The development of mapping and assessment protocols depends on identifying ecosystem restoration goals for the landscape (e.g., forest health, wildlife habitat, defensible space, safe and effective wildfire response, fire risk, livestock grazing, and noxious weeds). Any mapping and assessment effort should provide sufficient base information to identify the needs and priorities necessary to meet the stated objectives. This process allows you to assist landowners with developing land management plans, better communicate with specialists and landowners, create education and outreach tools, and form the basis of grant proposals. It is important to have a baseline of quantitative data and/or qualitative information about the natural resources. Current datasets such as LiDAR, Gradient Nearest Neighbor (GNN), and LANDFIRE can inform the preliminary assessment of private land, but it is important to also do ground-truthing and complete a field visit. The recommended steps for completing a private-land rapid assessment is outlined below.

1. Pursue funding

Explore options for potential funding through grant writing or existing funding sources. The total cost will depend on the mapping and rapid assessment protocol. Once funding is secured, determine which partner will oversee the mapping and data collection.

2. Develop a rapid-assessment protocol

Develop a rapid-assessment protocol to collect the necessary information to inform ecosystem restoration needs and develop a land management plan for private landowners. Collect additional information based on the needs or priorities within the landscape (e.g., noxious weed locations, shrub condition, special wildlife habitats—such as aspen and springs). Refer to Appendix C (page 72) for an example of a rapid-assessment protocol for natural resources.

3. Develop a wildfire risk assessment protocol

Develop a wildfire risk assessment protocol to evaluate the risk of wildfire for individual structures, subdivisions, and surrounding vegetation. Collect additional information for ingress, egress, evacuation routes, water sources, locked gates, and power sources and placement. Refer to Appendix D (page 75) for an example of a rapid-assessment protocol for wildfire risk to structures.

Current datasets such as LiDAR, Gradient Nearest Neighbor (GNN), and LANDFIRE can inform the preliminary assessment of private land, but it is important to also do ground-truthing and complete a field visit.

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4. Generate a preliminary GIS mapping, stand delineation, and overstory classification

A GIS analyst assigned to the project completes the following:

- Create a geodatabase for the landscape (map scale 1:100,000), using ESRI's ArcMap10 and compiling publicly available datasets from both state and federal agencies. Integrated datasets include National Agriculture Imagery Program (NAIP imagery), hydrologic information, roadway, vegetative cover, forest canopy cover, a digital elevation model (DEM), land ownership information (tax lot information), soils information, geologic information, structures, and tax lot layers.

- Create a polygon shapefile for each private landowner within the landscape (map scale 1:15,840 and 1:3600). This file will delineate stands based on overstory vegetation, using

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Tips for success: Private land mapping and rapid assessment

- Keep the data collection methodology simple and understandable for landowners. Avoid using silvicultural terminology such as basal area (BA) or stand density index (SDI).

- Find a dedicated GIS analyst to assist with the project, from planning through implementation.

1-meter resolution NAIP imagery as a guide. Polygon boundaries will be based on changes in landcover appearance related to cover type, density, and age of dominant vegetation.

- Give each stand a unique stand ID (see Appendix C, page 72). Create georeferenced maps as viewed and processed with field tablets using software such as Avenza Maps (map scale 1:15,840) or a similar product.

5. Complete the private land rapid assessment in the field

Before entering a property, agency partners need to get permission from the landowner. Using existing staff or a contractor with appropriate forestry background and experience, ground-truth and validate every stand in the field. Verify and update the initial overstory classification and stand boundaries, and collect any additional data and information while walking from stand to stand. Reference each verification point using the original stand ID as well as a two-digit modifier to identify multiple points collected within each stand polygon. (Note: Tablet software collects this additional data in point format [X, Y] using a custom attribute schema drop-down menu explicitly created for this purpose.) During the initial walk-through, record stocking levels, species composition, noxious weeds, insect and disease outbreaks, overall forest health, and any information that will be pertinent to implementing the grant. Assess the structures following the wildfire risk protocol (see Appendix E, page 79).

Note any natural stand delineations when validating boundaries on the map, and natural or human-made elements (such as roads or structures), which could aid in creating the logistical plan for implementation. During this initial walk-through of the property, balance three considerations to discuss later with the landowner:

- What forest health and fire hazard issues are most apparent?

- What land management objectives could be of the highest priority to the landowner?

- What are the goals and/or requirements of the potential agency administering the grant?

Lastly, identify potential monitoring and photo point locations, management needs, and priorities. This data can then be summarized for the entire landscape and for each individual landowner.

6. Data summary and prioritization

When a tax lot assessment is complete, provide the data to the GIS analyst for analysis (including any adjustments needed in cover type, density, age, and stand boundary) and the production of the final map. Using the data collected, identify a recommended treatment as high, moderate, or low priority regarding forest health. See Appendix G (page 88) for an example of a simple matrix to determine preliminary priority and treatment recommendations.

Once editing is complete, assign restoration priorities, with the additional data parsed into individual datasets. The final step is the development of maps and datasets. Assemble a variety of map products depicting

a range of themes (as needed and appropriate) for each participating landowner. Create small-scale (1:100,000) base maps for the entire landscape project area, as appropriate, and larger-scale (1:15,840 and 1:3,600) thematic maps for each particular property.

The wildfire risk assessment data is stored and processed to prioritize a wildfire response preattack plan for the entire landscape, which identifies future projects to mitigate high-priority risks and hazards. Maps can be generated to show structure risk visually (e.g., red, yellow, green) based on the determination of risk from the assessment. Share the plan with local and county emergency management authorities as preplans via GIS technology. These preplans will help improve safe and effective wildfire response, especially with the situation unit of any responding incident management team and/or local fire district.

Wildfire risk mitigation plan

A wildfire risk mitigation plan identifies data needs and opportunities to mitigate the potential risks of a wildfire in the project area. This document should reference the information and recommendations identified in the Oregon Natural Hazards Mitigation Plan and the Lake and Klamath County Wildfire Protection Plans (CWPPs). This plan is designed to identify and characterize the probability and vulnerability of hazards to important features such as structures or infrastructure. Efforts to reduce the hazards will then mitigate the risks involved. The mapping and rapid-assessment information can feed directly into the wildfire risk mitigation plan. The following are planned actions for the risk mitigation plan:

1. Collect data on access **ingress and egress**, and identify hazards to response vehicle movement, evacuation routes, and safety zones.

2. Recommend and implement **defensible space treatments** around structures, subdivisions, businesses, and throughout the landscape.

3. Use landscape-scale private land and USFS vegetation data to inform priority and placement of **strategic fuel breaks**.

4. Identify **state and nonstate critical and essential facilities**, such as communication towers and power lines, and recommend strategic fuel breaks.

5. Evaluate current **water systems and sources for emergency operations**, and recommend necessary upgrades or new water developments.

Landowner outreach

Photo: John Wagoner

6. Develop an **evacuation plan** for the community.

7. Encourage landowners to implement **defensible space treatments and other fuel reduction treatments**, and prepare for evacuation in conjunction with land management plans.

Wildfire response preattack plan

All agencies responsible for wildfire response (ODF, USFS, BLM, FWS, BIA, Rangeland Associations, Forest Protection Associations, and local fire departments) can coordinate to develop a wildfire response preattack plan for public and private lands for the landscape area defined in Chapter 3 (page 13). This preplan is designed to meet the needs of the community and guide initial attack and incident management teams in wildland, urban-interface wildfire suppression efforts within the jurisdictional boundaries of the rural county fire district. The mapping and rapid-assessment information can feed directly into the wildfire response preattack plan. The following are planned actions for the preattack plan:

1. Develop **designated response zones** detailed for each fire station and responding agency. The response zones list the hazards and risks identified, as well as the resources for wildfire response available on a typical staffing day.

2. Develop **response actions** that incorporate firefighter and public safety, and that minimize the loss to property (including property used for triage priorities, and response and evacuation routes).

3. Ensure **compliance** with agency and stakeholder priorities, laws, and authorities.

4. Develop **command and tactical considerations**, communications plans (e.g., frequencies, contact numbers), water sources, air operations, safety considerations, evacuation plans, shelter locations, special population needs, contingency needs, and potential incident command post (ICP) locations.

5. Further develop **tactical plans** to accurately identify high-risk areas, access and egress, and potential suppression plans under normal to extreme fire season conditions. Provide emergency response strategies for the direct and/or indirect attack commonly used for the fuel type, and identify safety zones and escape routes. Tactical plans will be in a brief, written format along with detailed georeferenced maps.

6. Provide copies of local agreements for **fire suppression-specific activities**, local energy release component (ERC) values, and pocket cards for the area. The homeowner risk assessment reports can also be provided through the Klamath County Ready, Set, Go website, County Emergency Response website, and Klamath County situation analyst for Klamath County (login permissions needed). See Resources (page 111) for more information.

"We find that sincere relationships bring awesome results. When people re-engage with historical homelands, they emotionally reconnect with the land. When new outcomes for the land are collaboratively set, it can bring deep changes that lead to better relationships, shared decision making, more resilient systems, and a higher degree of relevance externally."

Craig Bienz, Director of The Nature Conservancy Sycan Marsh Preserve