

Decision support for adaptive post-fire management in the Blue Mountains



Background

In the context of increasing wildfire activity and accelerated post-fire vegetation transitions, such as from forest to non-forest, our project aims to support adaptive decision making in post-fire forest landscapes in the Blue Mountains. Post-fire management can involve multiple, often interacting constraints, whether policy-organizational, social, or ecological. In response, a network of scientists and managers (Blue Mountains Post-Fire Partnership) are co-developing a [FireToolMenu](#) and accompanying [Interactive Map](#) aligned with the Resist – Accept – Direct (RAD) Framework¹. The web-based platform is designed to support managers in selecting the appropriate tools for their management context (application, decision phase, scale) and landscape context within or across management boundaries.

We invite your feedback on this decision support platform for post-fire management. You are welcome to explore the platform on your own and share your feedback through this online form. If helpful, you can follow the steps below to guide you through the [FireToolMenu](#).

Notes on appropriate use of our products

- Know your post-fire management goals before using the [FireToolMenu](#) or [Interactive Map](#).
- Information on our platform is intended to provide guidance supporting tool selection based on the best available science. It is not intended to provide specific recommendations for management.

FireToolMenu testing instructions

A. Open menu, explore the tabs

1. [Click here to access the FireToolMenu](#).
2. Explore the tabs available in the left sidebar:
 - a. **Overview:** summarizes our research products, related definitions, and provides an interactive map
 - b. **Menu of Tools:** enables the user to select relevant decision-support tools based on decision phase and step
 - c. **Literature:** provides scientific articles related to this study and the FireToolMenu platform
 - d. **Funding & Acknowledgements**
 - e. **Contact**
3. **Explore the Tool Selector**
 - a. **Phase:** click the dropdown menu to select your decision phase

¹ See, for example, this webpage hosted by the US Geological Survey: <https://www.usgs.gov/programs/climate-adaptation-science-centers/science/resist-accept-direct-rad-framework>

- b. **Step:** click the dropdown menu to select your decision step. If there are no tools available for that Phase and Step, a box will appear to notify you. If tools are available, a “Tool” dropdown menu will appear below the “Step” menu,
- c. **Tool:** here you can select any of the tools that appear in the dropdown menu to get more information about the tool, including a description and where to access it.

Interactive map testing instructions

A. *Open map, move around and zoom in or out, control layer display*

1. Click [this link](#) to access the map. Expand the window to fill the screen.
2. Expand the **Legend** and **Map Layers** boxes to the full length of the screen by clicking and dragging down the lower right corner of each box.
3. Notice that you can click and drag to move the map around, use the scrolling function on the mouse to zoom in or out. Zoom to the **Monkey Creek** fire perimeter. How many **Owner/Agency** types do you see in that area? This information can help identify which groups or individuals may be involved in post-fire management.
4. Turn off the **Admin1: Owner/Agency** layer by unchecking the box next to it in the Layers box. Then check the box to turn on **Admin2: Protected Status**. This layer shows which areas are wilderness, multiple use, managed for biodiversity, or not protected.

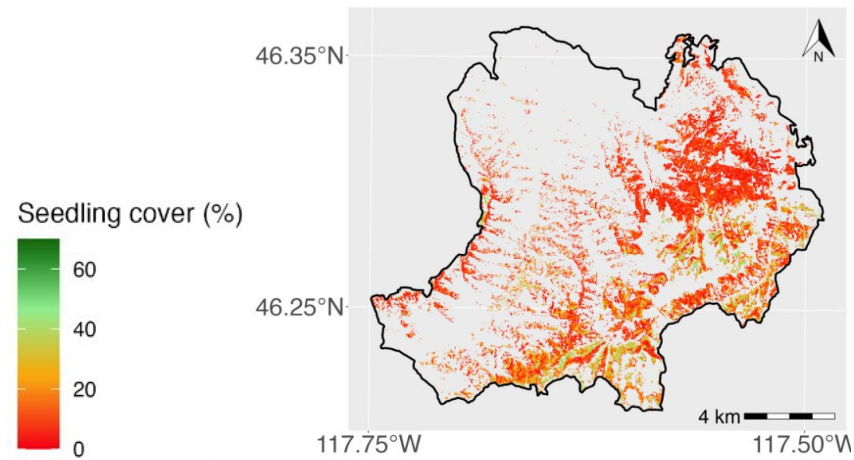
B. *Display land surface (topographic) layers that relate to the post-fire planting decision tree (above), adapted for the Blue Mountains.*

1. Click the boxes to display each of the layers listed below (in the Map Layers box).
 - **Burn1: RAVG fire perimeters** – shows the mapped locations of fires from 2012-2024.
 - **RAD: Topographic Characteristics (R-A-D):**
 - **Slope: 45 degrees or steeper** – shows all locations where the slope is 45 degrees or steeper, which may be low priority for planting. All areas where the slope is shallower than 45 degrees should be further prioritized with other criteria, such as which direction the slope faces (aspect).
 - **South-facing slopes at lowest elevations** – shows all south-facing slopes that are below ~3600 feet in elevation. These areas may be low priority for planting.
 - **South- or West-facing slopes** have the most direct sun exposure and may be more susceptible to drought. Harsher conditions may warrant additional consideration regarding planting.
 - **North- or East-facing slopes** have less direct sun exposure and may be less susceptible to drought, so planting may be recommended.
2. Zoom to the **Monkey Creek** burned area.

3. Check the box next to **Bio2:Current tree cover**. The areas in gray had no tree cover detected in summer 2024. Turn the layer off (uncheck the box) to see the land surface (topographic) characteristics in those areas.

C. Monitoring long-term post-fire recovery: School Fire (2005) as a case study

1. Click the 3 dots to the right of **Burn2: School Fire burned area (2005)** in the Map Layers box to Zoom to that area.
2. Click the box to turn on **Bio1: Predicted seedling cover in School Fire area**. These are preliminary results from a current study that is part of our project (see the figure below). You can explore where trees are coming back or not and how that recovery pattern may relate to elevation, slope and aspect.
3. *Coming soon*: we will update satellite-data-derived layers with newly available imagery (collected in 2025). We will also add more of our study results as they become available, such as the distance to living trees for the School Fire area and other burned areas that are part of this study.



D. Optional: Explore other available map layers

1. You can change the basemap, for example to satellite imagery, by clicking on the basemap button in the



upper right corner of the screen.

2. Several reference layers are included in the **Map Layers**. You can turn them on or off by checking or unchecking the boxes. You can also reorder the layers (choose which is on top) by clicking and dragging

the 6 dots to the left of the layer name.

- a. **Burn3: MTBS fire perimeters (1984-2023)**
- a. **Admin1: Owner/Agency** (from the USGS Protected Areas Database)
- b. **Admin2: Protected Status** (GAP Status from the USGS Protected Areas Database)
- c. **Bio3: Potential Natural Vegetation** (USDA)
- d. **Bio4: Forest Type** (Dry or Moist Mixed Conifer)
- e. **Bio5: Land Cover** (June-August 2024, generated from Sentinel-2 satellite imagery)

- f. **Topo1: Slope Aspect** (generated from 10m-resolution digital elevation model, USGS)
- g. **Topo2: Elevation Categories** (generated from 10m-resolution digital elevation model, USGS)

E. **Your feedback:** Please take a moment to [share your feedback](#) on your experience with our FireToolMenu and interactive map. Thank you for your help!

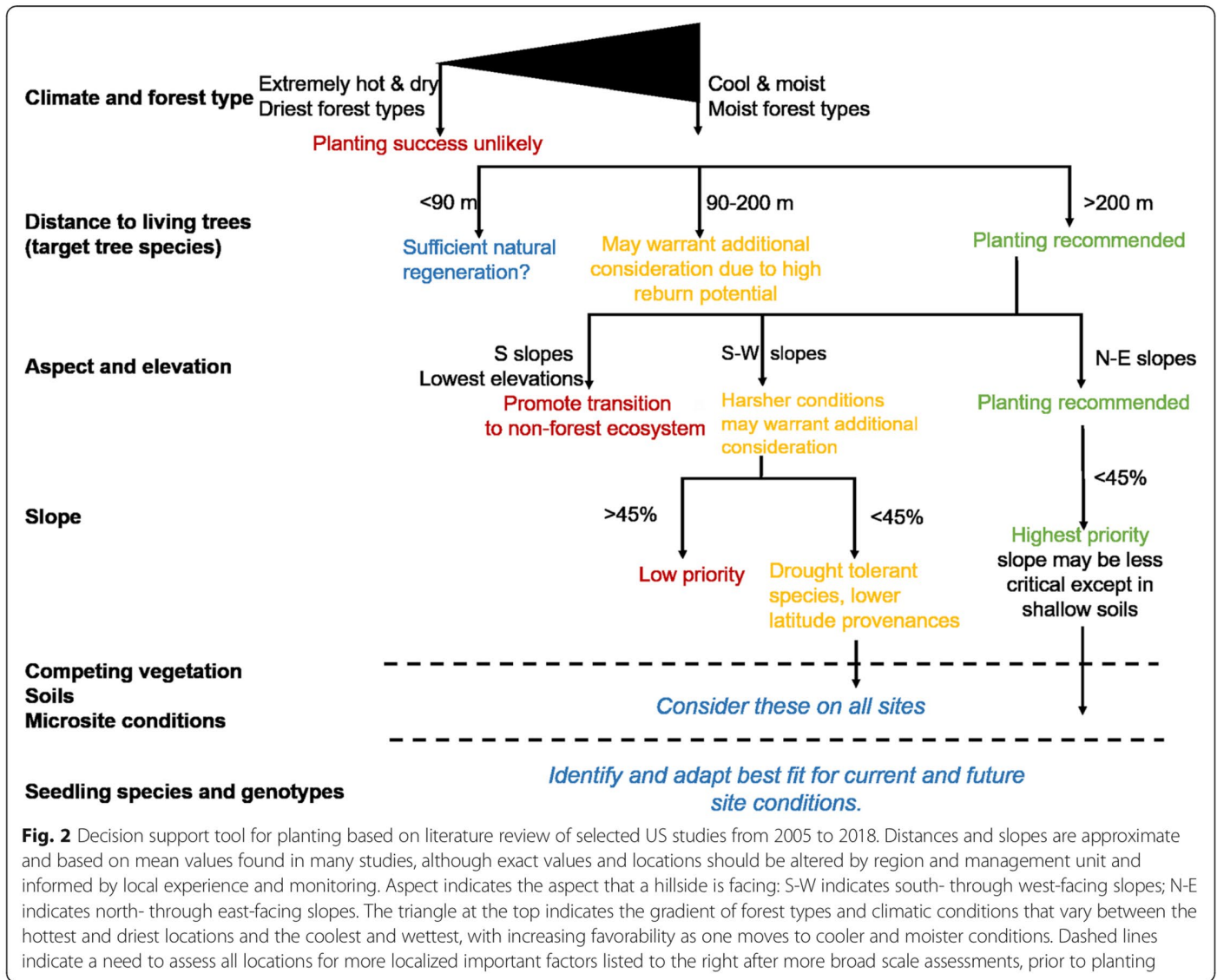


Fig. 2 Decision support tool for planting based on literature review of selected US studies from 2005 to 2018. Distances and slopes are approximate and based on mean values found in many studies, although exact values and locations should be altered by region and management unit and informed by local experience and monitoring. Aspect indicates the aspect that a hillside is facing: S-W indicates south- through west-facing slopes; N-E indicates north- through east-facing slopes. The triangle at the top indicates the gradient of forest types and climatic conditions that vary between the hottest and driest locations and the coolest and wettest, with increasing favorability as one moves to cooler and moister conditions. Dashed lines indicate a need to assess all locations for more localized important factors listed to the right after more broad scale assessments, prior to planting

Example tool: decision tree for post-fire planting

The decision tree shown above is an example of a tool presented in a journal article. We used this tool to create the **RAD: Topographic characteristics** map layer showing where natural regeneration or post-fire planting may be more versus less likely to succeed based on landscape position (elevation, slope, and aspect) in the Blue Mountains. Source: Stevens-Rumann, C.S., Morgan, P. **Tree regeneration following wildfires** in the western US: a review. *Fire ecology* **15**, 15 (2019). <https://doi.org/10.1186/s42408-019-0032-1>