The National Whitebark Pine Restoration Plan: Responding to Data Call 2A—

A Work Flow Example for Designating Core Restoration Areas

This example requires coordination with the information presented in Data Call 2A and the supplementary website information at http://whitebarkfound.org/nwprp-data-call-2a/.

The National Whitebark Pine Restoration Plan (NWPRP) leadership team is asking agency jurisdictions to prioritize their own criteria and designate polygons for core whitebark pine restoration areas, but we are happy to assist with this process. The guidelines presented in this document assume that the reader has experience in GIS or access to a GIS professional. We fully recognize that a comprehensive analysis for determining core areas might take too much of limited work time, so we wish to stress that the delineation of the core areas could be as simple as drawing lines on a map or as detailed as conducting a comprehensive top-down GIS analysis using several data layers. Here we present two approaches that could be used to designate core restoration areas within a jurisdiction.

The Quick Method

1. Find a map of your jurisdiction land area or display a digital copy of a map of your land area on the computer in a GIS.
2. Draw polygons around those areas that you know have whitebark pine that you wish to restore. These areas can be recent burns in need of planting with blister rust-resistant seedlings, declining mature whitebark pine stands in need of prescribed burning and planting, or young mixed whitebark pine stands in need of thinning.
3. Decide on which stands you wish to designate as core areas and explain your selections using the criteria at the above URL, and provide the general whitebark pine health status for each polygon. This latter information is available through maps and data referenced below.
4. Save the boundaries of these areas AND the boundary of the entire evaluation area as GIS shape files or a geodatabase containing the relevant files (you may need to digitize these boundaries if you drew lines on a paper map).
5. Email the file along with the criteria used to determine the core areas to Julee Shamhart (julee.shamhart@whitebarkfound.org).

The Suggested Method

1. Delineate the whitebark pine distribution within your jurisdiction

Overview: This step may be accomplished using whitebark pine distributional information from your own jurisdiction if the distributional data are reasonably accurate. If there is missing information, or if there are little distributional data available, you can reference the updated Whitebark Pine Distribution Map that should be available at the end of December 2018.

- The National Whitebark Pine Restoration Plan is currently working on compiling the data submitted in response to Data Call 1 during the summer and fall 2018 to update the whitebark pine distribution map created by Adam Collingwood and Cyndi Smith in 2014 (http://whitebarkfound.org/restoration-plan/). This map provides the known range of WBP based on actual data points (with a buffer added). This is not a model of whitebark pine range, so it is expected to miss areas where no data are available.
- There are distribution models available at a national scale (see Keane, 2012) in the National Whitebark Pine Spatial Data Archive (http://whitebarkfound.org/restoration-plan/): one that identifies habitat that is currently dominated by whitebark pine (Dominant) and one that identifies habitat that has the potential to support whitebark pine (Potential). Additionally, there are finer-scale models available in some areas that could be useful. We recommend using the best available model for locations that do not have accurate or detailed distribution data available.

2. Identify a short list of criteria most relevant to your jurisdiction's role and mission.
- We recommend starting with the list of biological factors influencing whitebark pine, especially whitebark pine health status, that is included in Data Call 2A (http://whitebarkfound.org/nwprp-data-call-2a/)
- Be sure to also include any attributes that are specifically or uniquely important to your agency or jurisdiction.
- Select any attributes from the second list (secondary criteria based on feasibility, local values, or policy) that could help further narrow down whitebark pine stands of interest (also included in Data Call 2A).
- Collaborate with your agency GIS experts to determine which of these attributes are available as a data layer or could be created using available data (e.g., plot data in the Hi5DB).
- Remember that there is a list of potentially important data layers available in the NWPRP Spatial Data Archive on the WPEF website (http://whitebarkfound.org/restoration-plan/).

3. Compile Data Layers and Rank Criteria

Create a geodatabase that includes your jurisdictional whitebark distribution and the data layers you will use for core area designation ranking. Ranking the criteria (from Step #2 above) by importance is recommended to help determine which areas have the highest

relative need for active restoration or protection (i.e., core areas). This could include tiers such as *Essential*, *Important* and *Desired* attributes or some type of numerical rating. We ask that biological criteria be given the highest priority in this process, but secondary criteria such as accessibility can also be included.

- **Note:** The application of the 3 R's, Resiliency, Representation, and Redundancy should provide guidance for polygon selections. Reasonable *connectivity* or proximity among your selected polygons within a region is important (e.g., within 10-15 km of each other), which contributes resilience, especially if polygons do not represent large populations of whitebark pine (e.g., fewer than 1000 trees). However, other values are important as well, including geographic and ecological diversity (representation), which preserves genetic (ecotypic) diversity.
- The Crown of the Continent Ecosystem Hi5 Working Group is currently conducting a pilot study to delineate core restoration areas and would be happy to share a list of data layers included in their model as an example when it is complete.

4. Create a simple model to delineate the areas with the highest ranking.

Work with your GIS professionals to create a model that will delineate the areas with the highest relative ranking for restoration or protection. This step will allow you to visualize different scenarios. Keep in mind that the NWPRP is asking that 20-30% of your whitebark pine habitat be included in your core restoration areas.

5. Consider using a team of agency personnel to nominate your core areas.

Starting with your model outputs from step 4, delineate the core areas to be included in the National Whitebark Pine Restoration Plan. Generally, areas with the highest cumulative criteria ranking will have the highest need for restoration and protection and should be designated as core areas. These areas should be grouped where practical so that core areas are not primarily comprised of scattered individual stands. It would be good to consider connectivity during this step of the process.

6. Submit the core areas to the NWPRP

Save the boundaries of the selected core areas in a shape file or geodatabase, provide information on criteria used and general whitebark pine health status for each polygon and submit to Julee Shamhart (julee.shamhart@whitebarkfound.org).

These are examples of methods that could be used to designate core areas, and we understand that another method may be preferable for your jurisdiction based on the format and availability of data in your area. We ask that you refer to the 3 Rs of resiliency, representation and redundancy (http://whitebarkfound.org/nwprp-data-call-2a) often during this process to ensure that you are meeting the basic requirements for the species to maintain its functional role in high elevation ecosystems.