**National Whitebark Pine Restoration Plan**
**Recommended Work-flow Steps for Responding to Data Call 2B**
**Target Deadline May 15, 2021**

**Data Call 2B requests that the same agency units and tribal governments that responded to Data Call 2A:**

1. Submit proposed restoration treatments and conservation actions for each nominated polygon or combined set of polygons. For a review of treatment types and conservation actions, see attachment *Restoration and Management Treatments for Whitebark Pine Communities*.
2. Estimate implementation costs for restoration actions by polygon or combined set of polygons. See attachment *Whitebark Pine Treatment Pricing List* with estimated treatment and monitoring costs. Use attached Excel worksheet for Data Call 2B.
3. Provide a general outline of a monitoring and adaptive management protocol for each type of restoration treatment. See *Restoration and Management Treatments for Whitebark Pine Communities*, section IV B.

This document provides some guidance for compiling this information.

**Rationale for Data Call 2B**

Data call 2A required submission of nominated core areas representing 20 to 30% of whitebark pine distribution within an administrative unit, criteria for nomination, and health status for each nominated polygon. We now require information on the costs of restoration treatments and conservation actions for nominated core areas so agencies may plan and implement restoration and leverage funding opportunities and partnerships. We anticipate that proposed restoration projects will begin as soon as feasible, with most jurisdictions completing their proposed treatment plans within a 10-to-15-year timeframe.

As restoration treatments and conservation actions are planned, a monitoring and adaptive management component for each restoration project and for some conservation work is important for determining the success of projects and outcomes to improve treatment protocols. The development of a statistically sound monitoring plan and its implementation should be included in the pricing of each project. For each project, clear objectives articulating measurable expectations of treatment are required to evaluate the effectiveness of treatment outcomes over time. Well-designed monitoring is essential not only to determine whether project objectives were met, partly met, or not met, but also to provide clarity as to the reason. Most restoration treatments require an assessment of both treatment implementation and outcome.

A detailed plan for each project is impractical at this stage, but we would like a general plan described for the different treatments to be implemented. This information enables managers to improve treatments and align them better to specific community characteristics for future work, which is the adaptive management component.

We view the proposed restoration and conservation project information that we request from you as a starting point in the process of recovering whitebark pine, so we may begin the hard work of on-the-ground restoration without delay. Core area restoration projects are already funded and underway in some agencies.

**The following is a set of tasks that need to be accomplished for Data Call 2B of the National Whitebark Pine Restoration Plan (NWPRP). These are discussed in greater detail below.**

1. **Determine polygon attributes (may already be completed for Data Call 2A).**
2. **Organize your responses grouping polygons with similar attributes.**
3. **Identify restoration treatments and conservation actions.**
4. **Calculate estimated total treatment areas.**
5. **Calculate estimated costs for restoration and conservation actions.**
6. **Briefly describe plan for monitoring and adaptive management for each treatment and conservation action where appropriate.**

**Task details**

**1. For each polygon, determine the following whitebark pine community attributes and needs:**
**Note: Information on health status by polygon was requested for Data Call 2A, and many agencies have already submitted this information.**

- Successional status, including early, middle, or late, or self-replacing climax or treeline community either dominated or co-dominated by whitebark pine.
- Whitebark pine health status, including level of infection and mortality from white pine blister rust and mountain pine beetles.
- Whether recent burns have occurred within polygons that would be suitable for planting whitebark pine seedlings or sowing seeds.
- Whether additional trees potentially resistant to blister rust should be identified ("plus" trees) for screening for blister rust resistance within a designated polygon (as part of a seed zone) to increase genetic diversity for growing seedlings or for seed sowing.
- Whether additional seed collections may be useful for gene conservation for whitebark pine populations that occur under unique ecological conditions.

Information on community successional status may in some cases be available through agency vegetation layers or monitoring sources. Health status and the locations of burned areas useful for seedling planting or seed sowing are available from national data layers at the following:

- Health status through Blister Rust Infection from Insect and Disease Survey, USFS, Forest Health Protection. https://www.fs.fed.us/foresthealth/applied-sciences/mapping-reporting/detection-surveys.shtml, which characterizes blister rust infection from aerial detection surveys from 1997 – 2019.

- Burn perimeter, severity, and year. Post-burn seedling planting and seed sowing opportunities may be assessed through data from Monitoring Trends and Burn Severity (www.mtbs.gov).

**2. Organize your response:**

- Group polygons that share similar attributes and will thus have the same restoration treatments/conservation actions. These combined polygons can be referenced as a single "super-polygon," but spatial reference information or other identifiers must be provided for each polygon so we can locate each independent polygon (not combined in a super-polygon) or the component polygons of a super-polygon on the maps submitted for Data Call 2A.
- Use the Excel spreadsheet template provided to provide the requested information for Data Call 2B. Identify super-polygons or independent polygons. For each super-polygon, enter its component single polygons, one per row, along with attributes that pertain to restoration, including polygon and super-polygon identifiers, estimated areal extent of the combined polygons, and attributes, such as successional status, blister rust infection levels, and severity of mountain pine beetle mortality (low, moderate, or severe), and when fire most recently has occurred within the polygons or super-polygon.

**3. Identify restoration treatments and conservation actions that are appropriate for the community status and health conditions in each polygon, referring to the supporting information, *Restoration and Management Treatments for Whitebark Pine Communities*. For each polygon or super-polygon, list the highest priority management actions.**

**Examples of appropriate restoration treatments or conservation actions:**

- High infection levels from white pine blister rust indicate the need to increase rust resistance within a population. This is accomplished by planting seedlings with putative resistance to blister rust, or sowing seeds from seed sources with resistance. Recent burns, or canopy openings from mountain pine beetle mortality provide planting opportunities.
- Where natural resistance to blister rust is moderate to high, whitebark pine productivity and natural regeneration may be increased through a number of silvicultural techniques, including thinning, daylighting, or nutcracker openings.
- Where succession is advanced and the remaining whitebark pine highly infected with blister rust, judicious application of prescribed fire will reset succession and provide planting and seed sowing opportunities.
- Where whitebark pine health is generally good, and blister rust infection at low levels, there is opportunity to plant putatively resistant seedlings or sow seeds in recent burns or in open, climax (self-replacing) whitebark pine communities. This treatment potentially increases the representation of resistant genes within the population, building resilience to future spread of white pine blister rust.

**Enter information in spreadsheet:**

- For each independent polygon and for an entire super-polygon, enter the selected conservation actions (e.g., number of additional "plus" trees, or number of trees for seed collections) and restoration projects in the Excel worksheet.
- In many cases, more than one restoration treatment and/or conservation action may be appropriate for a given polygon. For example, in addition to thinning or planting, plus tree identification or seed collections for gene conservation may be indicated within a given polygon or super-polygon. (There are worksheet spaces for up to three restoration treatments, but respondents may add more row headings if they opt for more restoration treatments.)

**4. Calculate the estimated total treatment area for each restoration treatment noted above or number of trees for each conservation action. Treatment often will be conducted in only part of a polygon or super-polygon. Here are some common treatment options (see *Restoration and Management Treatments for Whitebark Pine Communities*):**

- Seed collections for gene conservation (number of trees).
- Identification of plus trees and seedling screening for blister rust resistance (number of trees for collection).
- Seedling planting/seed sowing (see planting recommendations per acre).
- Silvicultural treatments.
    - *Nutcracker openings* (patch clearcuts,1 to 30 acres).
    - *Group or individual tree selection cuts*.
    - *Thinning or "weeding."*
    - *Thinning ("daylighting*).
    - *Girdling.*
- Prescribed fire.
- Enter estimated information in the Excel spreadsheet.

**5. Calculate the estimated costs for the different restoration actions by area across the polygon or super-polygon. Refer to *Whitebark Pine Treatment Pricing List*.**

- Estimate the various treatment costs for each independent polygon or super-polygon and enter this on the spreadsheet.
- For plus tree collection, include the costs for resistance screening.
- There may be more than one restoration treatment or conservation action per super-polygon or polygon. If this is the case, please provide the requested information for each action on the worksheet.
- Provide total costs for each independent polygon or super-polygon.

**6. In a separate Word document, briefly describe the plan for monitoring and adaptive management for each type of restoration treatment or conservation action that you have identified for #5. Costs for monitoring are important to include for restoration and**

**conservation actions. Although a given treatment type, e.g., planting, may be applied to several different polygons or super-polygons, only provide this description once for a given treatment type or action. Please refer to the attachment *Restoration and Management Treatments for Whitebark Pine Communities* sec. IVB, for specific suggestions about designing monitoring protocols and how monitoring information can lead to changes to restoration and conservation protocols (adaptive management). The estimated cost of monitoring for each project is also requested in #5.**

- It is of paramount importance to identify clear and measurable restoration objectives for each project when it is developed.
- Well-designed monitoring is essential not only to determine whether project objectives were met, partly met, or not met, but also to provide clarity as to the reason.
- Consider important design components including whether the treatment requires pre-treatment, implementation, efficacy, and/or effects monitoring, and whether outcomes need to be compared to control areas or reference areas.
- Many of the protocols recommend monitoring for as long as 10 to 20 years after treatments to determine if treatments achieved restoration objectives in the short and long term. It may be reasonable to include costs for the first decade of monitoring plus some increment for inflation.
- If monitoring determines that objectives are not met, treatments need to be reapplied, modified and reapplied, or a different treatment identified and applied.

**For technical questions or support for Data Call 2B, please contact Julee Shamhart at Julee.Shamhart@whitebarkfound.org or 406-925-9545, or Diana Tomback at Diana.Tomback@whitebarkfound.org**