PRESCRIBED FIRE PRIORITIZATION MEMORANDUM

Dinkey Collaborative

Recommended on January 16, 2014

Purpose of this Memo

Prescribed fire constitutes one of the foremost ecological restoration tools for the Dinkey Landscape Restoration Project. However, given interrelated administrative constraints (e.g., budgeting, staffing), regulatory constraints (e.g., burn permits, burn windows), and geographic scale (e.g., 154,000 acres), the need to prioritize where limited prescribed fire resources are applied is critical. This memo identifies the criteria upon which the Dinkey Collaborative will base its recommendation of priority areas for the application of prescribed fire, as well as the administrative criteria that Sierra National Forest must also consider when designing its fire program.

Administrative Criteria (in no particular order)

1. Available staffing
2. Available budget
3. External funding contributions
4. Part of research project

Geography and Ecology-Related Criteria (in no particular order)

1. Ecological value of treated area (i.e., fisher habitat, PAC habitat, cultural prescribed fire and traditionally important species, other)
   a. Rationale: Hierarchical land allocations often limit restoration treatments in certain habitats to prescribed fire only. Restoration treatments for these habitat types are more critical when they occur on drier sites and when they occur in Fire Regime Class 1, (low intensity high frequency fire occurrence) and in Condition Class 2 or 3 (where fire regimes have been moderately or severely altered from their historical range [RMRS-GTR-87 http://www.fs.fed.us/rm/pubs/rmrs_gtr087.html ; Hardy et al 2001]). Those habitats that are in Condition Class 3 (severely altered) in Fire Regime 1 would receive higher priority. Those that are in Condition Class 2 (moderately altered) in mixed severity fire regimes (Fire Regime 3) would be the next priority.

Table 1—Historical natural fire regimes

Code	Description
I	0–35-year frequency a, low severity b
II	0–35-year frequency, stand-replacement severity
III	35–100+ year frequency, mixed severity
IV	35–100+ year frequency, stand-replacement severity
V	200+ year frequency, stand-replacement severity

a Fire frequency is the average number of years between fires.

b Severity is the effect of the fire on the dominant overstory vegetation.

Table 2—Fire Regime Current Condition Class descriptions.

Condition class	**Fire Regime**	**Example Management Option**
Condition Class 1	Fire regimes are within an historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within an historical range.	Where appropriate, these areas can be maintained within the historical fire regime by treatments such as fire use.
Condition Class 2	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.	Where appropriate, these areas may need moderate levels of restoration treatments, such as fire use and hand or mechanical treatments, to be restored to the historical fire regime.
Condition Class 3	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range	Where appropriate, these areas may need high levels of restoration treatments, such as hand or mechanical treatments, before fire can be used to restore the historical fire regime.

a Fire Regime Current Condition Classes are a qualitative measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, introduced insects or disease, or other management activities.

b. Limited Operating Periods (LOPs) and presence of species within a burn boundary can restrict when burns can be initiated. As an example: when field surveys find nesting owls within a burn boundary, we either work with specialists to minimize impacts and place a no activity buffer around nest or we wait until after the LOP has passed to initiate the burn.
c. Cultural Burning and Traditionally Important Species: cultural prescribed fire is an all-inclusive concept describing managed fire, control burn, anthropogenic burning and cultural burning. Cultural burning relates to species, type or resource, specific style of burning and the burning for a result affecting the outcome of resource species.

2. Status of burn project: continuation of existing burn project, or establishment of new burn project
    a. Rationale: The district has over 20,000 acres in existing and on-going prescribed burn projects; several are currently on-going and need further ignition to complete a full entry. New projects are proposed or have recently signed Decisions to proceed with ignition. Priority may be given to projects that have been partially ignited over ignition of new projects.
3. Total number of entries required for project completion
    a. Rationale: Natural stands that have not had any pre-fire mechanical treatments generally take two to three prescribed fire entries over 15-20 years to reach a desired condition, Pre-treated stands generally require 1 entry of prescribed fire to reach a desired condition. Priority is generally given to the pretreated areas due to ease of completion and reduced cost to reach the desired condition.As new environmental documentation for projects is finalized and more burning is proposed, the number of projects to be considered increases annually.
4. Total number of entries already completed (applies only to existing projects)
    a. Rationale: Burn units that have received one or two entries and are moving toward a desired condition may receive higher prioritization for a third entry. The time and costs to complete (generally) three entries in a 15 – 20 year period would increase the priority of these projects as they are close to reaching a more fire resilient condition. If left incomplete – should these projects return to a pre-treatment condition, it would be considered a setback in money and effort expended to date.
5. Acreage to be treated
    a. Rationale: Using acreage as part of the prioritization process may be two fold. Smaller units may be easier to ignite and get into a post-ignition patrol status, so may be completed more rapidly. Smaller projects may also be given higher priority during marginal air quality windows as they would produce less tonnage of particulate matter and tend to be given permission to ignite by the Air Pollution Control District over a large- longer duration projects. Smaller projects also take less suppression resources and so may be given a higher priority if suppression resources are a limiting factor.
6. Contribution to adaptive management efforts

a. Rationale: Burn projects that are tied to adaptive management may be given a higher priority if burn results will lead to getting answers or adapting prescriptions or benefit on-going research projects.

7. Availability of LiDAR data
    a. Rationale: *We have not yet determined how use of LiDAR may have benefits for prescribed fire. LiDAR does not do well assessing surface fuel loading. This may be part of adaptive management. We will have to assess before and after LiDAR flights to see what outcomes may be useful.*
8. Geography (i.e., slope, ridge, canyon)
    a. Rationale: The topology of prescribed burn units affects how well they burn (the ignition prescription). As seasons change the geographic position of a burn unit has a strong influence on how well a unit may ignite and burn. Cooler slopes (canyons, north and east facing slopes) need to be burned under drier conditions to get fire to carry. Hot slopes and ridge tops can be ignited under cooler temperatures during fall and early winter and would have the same results as burning cooler slopes during late summer and early fall. Geography affects what is in prescription (temperature, relative humidity and fuel moisture and site) during different times of the year.
9. Elevation (i.e., high, mid, low)
    a. Rationale: Prescribed burn units range in elevation from approximately 3000 feet to up to 8000 feet in elevation. High elevation units come into prescription later in spring and summer than low elevation units. They also go out of prescription (too wet and cold) earlier in the fall. Prioritization of projects is then shifted as seasons and weather changes and units that were wet may dry out and other hotter/drier units may get too dry to burn. Seasonality shifts up and down in elevation as the seasons change and with weather.
10. Wildland Urban Intermix (i.e. presence or not)

    Rationale: Direction under the National Fire Plan and the Sierra Nevada Forest Plan Amendment (2004) is that projects in the Wildland Urban Intermix (WUI) have priority over non-WUI projects to increase public and firefighter safety.
11. Fuel Type (i.e. timber, brush)

    Different fuel types have different environmental needs and objectives. Heavy fuel loading in timber stands may limit ignition to cooler wetter periods to reduce initial burn intensity and flame lengths while burning brush is limited to the dry season as green brush with a high moisture content will not readily burn in spring and early summer. Choosing appropriate moisture conditions and seasonality of ignition can affect accomplishment of objectives.