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Dead Tree Removal Practices

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Introduction

Greenspace – The Cambria Land Trust and the Cambria Forest Committee are grateful to the Fire Safe Council of San Luis Obispo for initiating this $1,816,304 grant, to be supplemented by $85,000 by local partners, to a total of $1,901,304. Per the grant's requirement for widespread community support, Greenspace and the Cambria Forest Committee offer these Best Practices for carrying out the removal of dead and dying trees.

The entire area is designated as Very High or High Fire Hazard Severity Zone and under SRA protection. The project area is in Tier 1 Tree Mortality area identified by Tree Mortality Task Force.

Protecting the forest protects the other habitats fostered within it such as streams, wetlands, riparian corridors and listed species. The ecological risks associated with removing many dead trees at the same time are significant. Removing many trees can disturb soil and understory vegetation, resulting in increased soil erosion and proliferation of invasive plants.

To reduce the adverse effects of the proposed projects, Greenspace and the Cambria Forest Committee recommend use of the practices outlined below.

Project Description

A Registered Professional Forester (RPF) will direct the cutting and disposal of dead trees on 700 acres of Monterey Pine forest, 700 acres of slash disposal, and eradication of 500 acres of French Broom.

Trees that are millable will be used for sawn lumber. Unmillable trees will be left on the ground to decompose. Some trees will be chipped for use in a biomass gasification electric generation facility, should one be available. At this time, no such facility is available locally or likely to become available in the near future.

The project leaders and the Cambria Fire Safe Focus Group will conduct community workshops to provide information on project scope, fire-fuel treatment methods, project timeline, and Cambria's designation as a Firewise Community. Roadside signs identifying the project will be installed.

Timeline

The timeline proposes that during the Fall-Winter 2018, the project will be examined for environmental review and a complete Timber Harvest Plan written, and the timber operator/chipping/hand crew contractor(s) will be selected. The grant includes a Notice of Exemption for roadside work initiated for French Broom eradication to allow that to proceed.

Cambria's Forest Management Plan

The Cambria Forest Management Plan was developed by the Cambria Forest Committee and the consulting firm of Jones and Stokes. Funded by a grant from the California Department of Forestry and Fire Protection, the plan was completed in 2002. The plan provides a guide for well-designed and effective forest management projects. The Forest Management Plan was adopted by the Community Services District, but was never funded.

The total area of existing native Monterey pine forest was estimated to be about 13,500 acres at the time the plan was written in 2002. Monterey pine forest covers approximately 3,500 acres in and around the community of Cambria. About 2,300 acres of the Cambria forest remains undeveloped; an additional 1,200 acres intergrades with developed areas. This grant will remove fuel from about 700 acres, most of which is in Covell Ranch. That land is held under a conservation easement by the Nature Conservancy, funded by TEA-21 (federal Transportation Equity Act) and EEM (Environmental Enhancement Mitigation) grant money.

Effective management of California's native Monterey pine forests is of great concern because it is a unique plant community with a naturally limited distribution. In addition, the ecological conditions that support California's native Monterey pine populations also support several other special-status plant and wildlife species in addition to the coastal live oak. Like Monterey pine, many of these species are restricted to specialized habitats along the coast.

The Plan's goals are:

Goal 1. Improve forest health and maintain biological diversity, consistent with the Forest Management Plan and applicable laws, policies, and regulations.

- Maintain a mix of forest ages.
- Maintain/enhance habitat for native plants and animals in the forest.
- Control invasive nonnative plant species in the forested areas.

Goal 2. Reduce hazards to life and property, consistent with the Cambria Forest Management Plan (CFMP)

- Measure and control fire-hazard materials throughout the forest. Establish and maintain fire-management guidelines.

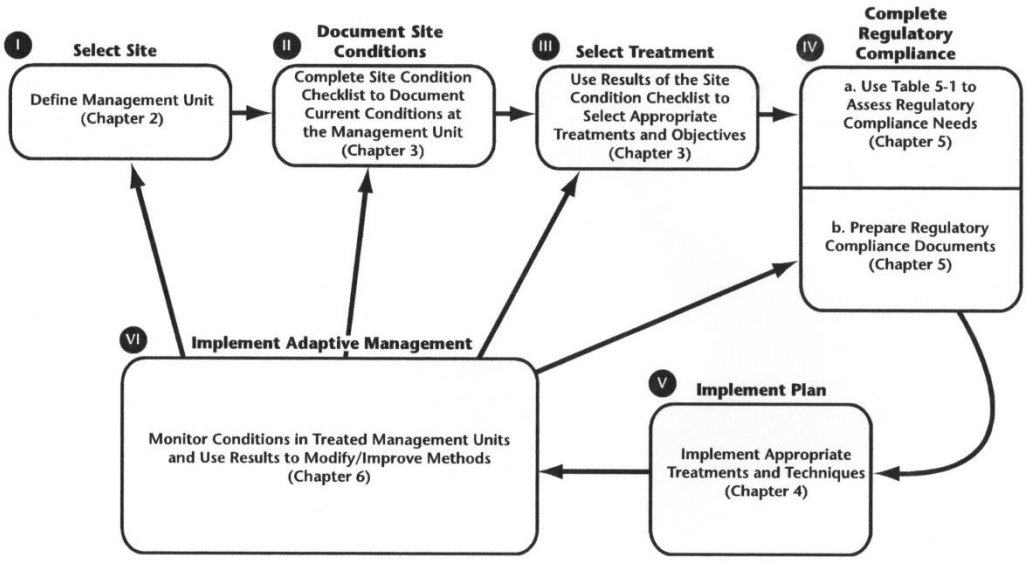
- Develop criteria for identifying hazardous trees and implement a trimming/removal program.

Goal 3. Maintain and enhance aesthetic values of the forest, consistent with the Forest Management Plan.

- Maintain native-forest aesthetic values within residential neighborhoods; ensure that criteria for tree removal and replacement support maintenance of these values.

In the end, removal of dead trees in order to reset succession in a way that prepares the management unit to support new Monterey pine and native oak trees and recover should govern fuel removal.

To remove fuel while attending to those goals, tree removal should observe the following practices:



Jones & Stokes

Figure 1-3
Overview of the Cambria Forest Management Plan

The Registered Professional Forester should determine how many management units are

included in the 700 acres covered by the grant. “Management to provide a diverse mix of forest stand compositions and structures will result in a forest that is more resistant to disease and disturbance, has reduced fuel hazards, and supports a greater diversity of habitats for wildlife and understory plant species. By addressing a variety of reproductive settings for Monterey pine (such as small canopy gaps, sites with thick duff and litter, sites with mineral soil, and larger cleared patches), the CFMP will provide much of the range and variety of selective pressures that naturally affect Monterey pine evolution. This approach will function to retain the inherent genetic diversity and distinctiveness of the Cambria forest.”

The CFMP provides a Checklist that the RPF can use to determine management areas. It will help him or her explain the decisions to the community in the proposed meetings.

Before and After photos will be helpful in documenting the work.

It will be helpful to rely on the accepted definitions of key terms, as cited in the CFMP:

Following are definitions of key terms as they are used in this document. Additional terms are defined in the Glossary of Selected Technical Terms, which follows chapter 7.

☐ **Diseased tree** – A Monterey pine infected with pitch canker or an oak affected by sudden oak death. ☐

Dying tree – A Monterey pine, oak, or other tree that is succumbing to age, disease, or other natural processes. This term usually applies to trees in which >30% of standing biomass (plant tissue) is dry and nonfunctional. ☐

Hazard tree – A tree that has the potential to fall or to lose a limb or limbs and thus poses a risk to life or property. Hazard trees include dead, dying, and severely leaning trees, as well as trees that lack root support. ☐

Leaning tree – A tree growing at an angle, or a tree in which a large proportion of the mass is on 1 side of the tree. Leaning trees that are in danger of falling are considered hazard trees.

Guidelines to Reduce Soil Erosion

The removal of dead trees has the potential to result in disturbance of site soils and understory vegetation. Precautions should be taken to reduce the risks of accelerated erosion caused by heavy equipment and vehicle traffic to minimize soil disturbance and contamination of water resources, and to ensure that treatment does not contribute to the spread of invasive exotic plant species.

Healthy trees should be left intact to provide a source of seeds for regeneration. This stock will contribute healthy, uninfected seeds to the seed bank. Moreover, seed stock from healthy trees in areas where pitch canker is present may be genetically resistant to pitch canker.

If possible, at least 8 healthy trees with a dbh >20 inches per acre should be left standing. If larger, healthy individuals are represented in the patch, then as few as 4 trees with a dbh >24 inches can be retained per acre, as long as the spacing requirements are met. The optimal maximum horizontal spacing between retained trees, or between retained trees and the edge of the treatment patch, is ~120 feet.

Certain designated areas require specialized fire fuel removal techniques. These areas include wetland and wetland buffer zones, areas preserved by recorded Conservation Easement, and environmentally sensitive areas specified in CA State Code Section 51184.

Streams, ephemeral streams and areas with seasonally wet soils should be protected with special treatment. Legally, the Local Coastal Plan allows only limited development within 100 feet of identified streams and wetlands. Generally, dead tree removal should take care not to disturb habitat within the 100-foot required buffer zone from stream and wetlands.

For areas more than 100 feet from residential structures, and areas in wetland buffer zones, the following guidelines should be used.

Areas more than 100 feet from residential structures:

- Remove combustible construction materials and trash from the property.
- Trim tall grass areas to approximately 4 inches in height.
- Do not trim other live groundcover vegetation.
- Avoid exposing bare soil or creating a situation that would encourage erosion.
- Make every effort to protect seedlings, young native trees, ferns and bushes by marking them prior to cutting.
- All downed trees 12 inches in diameter or greater may remain on the parcel. However, the entire trunk must be completely on the ground.
- Downed trees and branches less than 12 inches in diameter shall be chipped and dispersed on site or removed from the property. Make every effort to minimize damage to the surrounding groundcover vegetation.
- All French Broom and similar broom plants, Pampas Grass, Jubata Grass and Italian Thistle shall be removed by hand to the extent practical. To minimize seed dispersion, it is best to remove these plants before seeds have formed or dropped off.

Felling and removing trees

Log landings have the potential to damage soil resources and understory vegetation substantially; log landing areas should thus be selected with care. To minimize disturbance, log landings should be restricted to sites with the following characteristics.

- Slope <20%, and/or location on ridge top or other drainage divide. ☐
- Low existing soil erosion condition. ☐
- Low erosion hazard. ☐
- Low soil productivity. ☐
- Duff layer of moderate to average or above-average thickness. ☐
- Moderate to thick soil cover.

When possible, log landings should be located on existing roads or in other disturbed areas so that skidding across streams, wetlands, or other sensitive areas is not required. If logs must be hauled overland in undisturbed areas, only low-pressure vehicles should be used.

Following log removal, the landing site, travel routes, and skid area should be blocked from future vehicle access by retaining downed logs or other hindrances, and should be covered with chips created onsite so that vehicle tracks are no longer visible. All temporary landing sites should be replanted with Monterey pine and/or native oaks, consistent with pretreatment species distribution on the site. If possible, log landing and the processing of pitch canker–infected logs should be conducted in the same area to limit the area of forest floor and understory vegetation disturbed.

Use of Heavy Equipment

Heavy equipment should be used sparingly and with great caution. Mechanical equipment has the potential to cause substantial damage to a treatment area and to slow post-treatment regeneration of Monterey pines by disturbing soils and crushing vegetation. Hand clearing will have less impact on soil resources; however, it may not be feasible in larger management units or for more intensive treatments.

If heavy equipment is required to fell and remove logs from a treatment area, a low-pressure vehicle (such as a feller-buncher harvester) should be used in potentially sensitive areas, if possible. Sensitive areas are considered to including those with any of the following characteristics.

- No road access. ☐
- Slope >20%. ☐
- Active or dormant landslides. ☐
- Moderate to high existing soil erosion condition. ☐

- Moderate to high erosion hazard. ☐
- High soil productivity. ☐
- Duff layer of below-average thickness. ☐
- Thin soil cover.

Additional measures that may be used to protect sensitive resources from heavy equipment include the following:

- Restricting the use of heavy equipment to dry periods (May 1–November 1, or at least 1 week after precipitation events). ☐
- To the extent feasible, running equipment parallel to topographic contours, limiting turns, and minimizing the number of access points and routes. In some cases, lack of direct access to a site via roads or fire roads may preclude the use of heavy equipment because of the potential for damage to the forest. ☐
- Limiting operating periods to minimize disturbance of special-status wildlife species (for example, avoiding songbird nesting periods in the spring). ☐
- Flagging or fencing sensitive resources (such as populations of special-status plants, cultural resources, large oak trees, and habitat for sensitive wildlife species) so equipment operators can avoid them. ☐
- Informing all equipment operators of the sensitivity of various areas and the operating restrictions imposed to protect them. ☐
- Retaining a qualified biologist to monitor construction activities to ensure avoidance of sensitive areas. ☐
- Restricting creek crossings to existing roads; if no roads exist, constructing temporary bridges over creeks to allow crossings that minimize erosion and siltation in aquatic habitats.

In addition, treatment plans that incorporate the use of heavy equipment should provide for post-treatment monitoring in the areas in which heavy equipment is used. Immediate remedial action should be taken if signs of accelerated erosion, creek siltation, spread of invasive exotic plants, or other adverse effects are detected.

End-Lining

End-lining refers to winching downed logs directly out of a treated area with a cable operated from outside the immediate treatment area. The use of end-lining allows the removal of logs while avoiding the potential impacts of heavy equipment on sensitive resources. Areas appropriate for end-lining include the following:

- Areas adjacent to existing roads. ☐
- Buffer zones around streams or wetlands
- Landslide features. ☐
- Areas with a high degree of existing soil erosion or high soil erosion hazard. ☐
- Areas considered at risk of excessive soil compaction. ☐
- Areas where soil productivity is high and could be substantially reduced by the effects of heavy equipment.

Felling to the Lead

Felling to the lead involves felling trees toward a central, predetermined location for skid removal. This practice minimizes heavy equipment operations within a treatment patch, and thus minimizes impacts on soil resources and understory vegetation.

Removing Understory Fuels

Reduction or removal of understory fuels can be accomplished with several treatments used alone or in combination: ladder fuel removal, removal of woody debris, and duff removal. The removal of fuels can be beneficial to Monterey pines by preparing the forest floor for germination and growth of seedlings and saplings. However, care must be taken not to disturb the seed bank or nutrient-rich topsoil or that has accumulated over time. Other benefits include onsite treatment and/or aging of infected woody material, which may help to control the spread of pitch canker in the forest as a whole

Mechanical vegetation clearing using tracked or wheeled vehicles may not be appropriate at all in the Cambria forest because of the potential for excessive damage to dirt roads, increased sedimentation, and soil erosion and compaction. The Covell Ranch fuel break done using a masticator several years ago has regrown in invasive French broom, creating a more flammable site rather than the intended fire break.

Clear Vegetation by Hand

Handwork includes cutting vegetation with axes, pulaskis, brush hooks, hoes, weed eaters, chainsaws, and other handheld tools and equipment. Handwork may be conducted during any season and, unlike some mechanical techniques, may be used in close proximity to structures. Handwork is also used to avoid impacts on environmentally sensitive areas such as wetlands and

riparian or special-status species habitats, areas at risk of soil erosion, and other potentially sensitive sites.

Buffer Zones around streams and wetland areas

Buffer zones are established next to streams and wetlands to protect these areas. The size of the buffer zone can vary depending on the ground slope. A 75 foot wide buffer zone, measured from the uphill edge of the stream bank, should be used unless otherwise specified.

Vegetation removal within streams and wetland areas

Vegetation removal within stream banks or wetland areas requires permitting and should be avoided if possible. Refer to Techniques for Avoiding Undesirable Corollary Effects in Chapter 4 of the Forest Management Plan, Forest Treatment Prescriptions and Techniques, for specific requirements for protecting streams and wetlands by using avoidance areas or buffer zones.

Adaptive Management

This grant is an opportunity to monitor the effects of fuel removal on these sections of the forest, and apply adaptive management to continuing forest management. "Adaptive management is typically incremental in that it uses information from monitoring and research to continually evaluate and modify management practices. It promotes long-term objectives for ecosystem management and recognizes that the ability to predict results is limited by knowledge of the system. Adaptive management uses information gained from past management experiences to evaluate both success and failure, and to explore new management options."

The RPF should create a checklist or other guide or form to standardize collection of data and facilitate collection of appropriate data for comparison of Before and After fuel removal, as well as five years and longer into the future.

Successful completion

This project will reduce fire fuels and reduce greenhouse gas concentrations in several ways. Dead downed trees left on site will decay and the carbon they contain will be absorbed into the soil to support future growth. New Monterey Pine growth, the fastest growing pine species, will absorb carbon dioxide out of the air and release oxygen into the air. Millable wood will be removed and used as lumber. Wood chips will be removed and used as practical.

Greenspace and the Cambria Forest Committee are available to answer any questions about our recommendations and to assist in getting information about the project out to the community.

References:

Monterey Pine Tree Mortality Project. Project Tracking Number: 17-FP-SLU-2042

Cambria forest Management Plan, available at http://cambriaforestcommittee.org/documents-2/

CA State Code Section 51184:
https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=51184

San Luis Obispo County Local Coastal Plan,
https://www.slocounty.ca.gov/Departments/Planning-Building/Forms-Documents/Ordinances/Coastal-Land-Use-Ordinance-(Title-23).aspx
Wetlands: 23.07.172

Cambria Community Services District Fire Prevention & Safety advice,
https://www.cambriacsd.org/fire-prevention-safety