

City of Austin
Fuel Treatments in Juniper and Juniper-Oak Woodlands
Best Management Practices within the Balcones Canyonlands Preserve

Purpose

The purpose of this document is to provide Best Management Practices (BMPs) for treating and minimizing fuels as needed along the wildland-urban interface of the City of Austin's Balcones Canyonlands Preserve (BCP). The goal is to minimize wildfire risks to adjacent homes and/or commercial structures and habitat of the federally endangered Golden-cheeked Warbler (GCWA). Presence of woodland and forest canopies with diverse species composition helps to reduce fire spread and lower the probability of burn (White et al. 2009). As such, maintaining or promoting closed canopy woodland is critical to the success of these BMPs. These BMPs are designed to further reduce fuels in limited areas associated with habitat for the GCWA while minimizing potential impacts to the GCWA from the effects of the fuel treatment. **Any treatment within GCWA habitat shall only be done during the non-nesting period (September-February). Further, all precautionary measures to prevent the spread of oak wilt (<http://texasoakwilt.org/2011/pruning-guidelines-for-prevention-of-oak-wilt-in-texas/>) will be followed during implementation of the fuels treatments.** A team of City of Austin BCP staff, including the Fire Coordinator and biologists, will be responsible for the wildfire risk assessments and implementation of the BMPs in coordination with the U.S. Fish and Wildlife Service and Travis County BCP.

How to Use the BMPs

This document outlines a progression of tasks for determining wildland fire risk and performing associated treatments to reduce wildland fire risk.

1. Conduct a wildland fire risk assessment. (see Section on Risk Assessments)
2. If a neighboring structure is at risk, begin with improvements to the home and the landscaped area immediately adjacent to the home. Studies show the most effective treatments that reduce wildland fire risk, occur within the area immediately adjacent to a home. (see Section on Home Ignition Zone)
3. If the naturally occurring vegetation (wildland fuels) located outside the landscaped area immediately adjacent to a neighboring home requires treatment, determine if vegetation is suitable GCWA habitat.
(http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0013_golden_cheeked_warbler.pdf)
4. After improvements have been made to the home and adjacent landscaped areas, and if the vegetation is suitable GCWA habitat, BCP staff will follow the BMP strategy outlined in this document that is most appropriate for the site.
5. For structures owned by the City of Austin located within the BCP, these practices shall be applied to provide defensible space where adequate landscaped defensible space is unavailable.

Risk Assessments

Before beginning any fuel treatment, BCP staff will conduct an assessment of wildland fire risk. This risk assessment will focus on three levels of concern: a structure at risk; the landscaped area immediately adjacent to the structure; and wildland fuels located beyond the landscaped area extending outward to approximately 30 meters (100 feet) from the structure. A structure's risk from wildland fire will be evaluated using Firewise standards, which will determine the vulnerability based on factors including: building materials and condition, location on the property, wildland fuels that are close and adjacent to buildings, terrain features, and risks to outbuildings. Available resources to assist with risk assessments include White et al. 2009 and follow-up modeling of fire behavior within and adjacent to the BCP. The individual structure and lots will have risk assessments performed by the responsible jurisdictional fire department. BCP staff will assess the risk to the structure posed by the adjacent wildland and coordinate so an appropriate area is treated to the best management practices.

Home Ignition Zone

Modifications within the home ignition zone are proven to be the most effective treatment to reduce wildland fire risk. Treatments within the Home Ignition Zone that are within a regularly irrigated and maintained landscape will be conducted by the homeowner(s).

The Home Ignition Zone, as described by Firewise standards (<http://www.firewisewiki.org>), includes a house and its immediate surroundings (within 100 feet) or to the property boundary or lot line, whichever is nearer. The condition of the Home Ignition Zone principally determines the potential for home ignitions during a wildfire. A house burns because of its interrelationship with everything in its surrounding Home Ignition Zone. To avoid a home ignition, the homeowner must eliminate a wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes. Flammable items such as dead vegetation must be removed from the area immediately around the house to prevent flames from contacting it. Also, reducing the amount of live vegetation will affect the intensity of the wildfire as it enters the home ignition zone, possibly reducing the intensity.

Overview of Golden-Cheeked Warbler Habitat Needs

The GCWA was listed as endangered by the USFWS in 1990, and Texas Parks and Wildlife Department in 1991, due to habitat loss and fragmentation resulting from urban encroachment, widespread clearing of juniper as a range management practice, and other threats such as oak wilt, nest predation and parasitism, and browsing of deciduous species by white-tailed deer. The GCWA breeds in only one location in the world, central Texas. High quality breeding habitat for these birds is characterized by mature woodlands of Ashe Juniper and a mix of oaks and other broad-leaved species with a closed canopy cover (70-100%). However, Golden-cheeked Warblers may also occur in woodlands with canopy cover as low as 35%, especially in proximity to high quality habitat. The closed canopy woodlands (70-100% cover) that are optimal warbler habitat have relatively low risk of fire because the trees' shade limits growth of fine fuels such as grasses. Proper implementation of these BMPs can reduce the risk of fire still further, so long as the closed canopy is retained, which also minimizes (though it does not eliminate) disruption to the warblers' habitat. Additional information on the GCWA and its habitat can be found in the 1992 GCWA recovery plan, the Balcones Canyonlands Conservation Plan, the BCP Tier II-GCWA land management plan, and BCP annual reports. BCP biologists, who are experienced

with respect to GCWA habitat requirements, will also be consulted prior to and during implementation of any fuel treatment.

Best Management Practices

The intent of these BMPs is to offer guidance on how to modify fuels that pose a hazard to private property, as well as reducing the chance of a fire that originates on adjacent private property damaging GCWA habitat. It is not guidance on how to modify GCWA habitat. The strategies and specifications for fuel reduction treatments are intended to reduce the likelihood of tree crown fire initiation and the sustained spread of fire through the tree crown. To reduce the likelihood that a fire occurring on the surface would transition into the tree canopy (crown fire initiation), the surface fire intensity must be reduced, ladder fuels must be removed, and the height to the lowest part of the canopy (canopy base height), must be increased. To reduce the spread of fire through the tree crown, the amount of fuel in the tree canopy (canopy bulk density) must be reduced through a very specific tree thinning and removal process. However, maintaining the extent of canopy closure is important in order to limit growth of fine fuels on the ground. Determining the location of a treatment is critical. Treatments that are not located and implemented correctly can be ineffective and possibly increase the fire risk. Protecting stubs, stumps, and other wounds on oaks from the oak wilt fungus is also critical; introducing oak wilt will cause the death of many trees, which then become fuel. Some locations where treatments are most effective are at the edge of woodlands, along travel corridors, and at the edge of landscaped yards. Locations of necessary treatments should be identified during the risk assessment and should be used after other mitigation measures, including modifications to the structures and landscaping, have been completed. It should be noted that areas, where these specifications are applied, will have to be maintained with periodic re-treatment. The specifications allow for growth of existing and new plants to reach a state where progressively less work will have to be done at each re-treatment.

Fuels Reduction Strategy

1. Reduce the chance of a surface fire transitioning into a crown fire.
 - 1.1. Maintain or promote a shaded canopy to keep grass from growing. Leaf litter and duff that accumulate from a closed canopy woodland burn with less intensity than grass.
 - 1.2. Remove small junipers and the understory to reduce "ladder fuels". Ladder fuels increase the chance that a surface fire transitions into a crown fire.
 - 1.3. Remove dead vegetative material (branches, stumps, landscape debris, trash, etc.). These materials also act as ladder fuels.
 - 1.4. Raise the canopy base height of taller trees by removing lower limbs. Increasing the height to the lowest limb of a tree reduces the chance that a surface fire will ignite lower limbs and initiate a crown fire.
 - 1.5. Immediately seal all wounds on oaks, including stumps and cuts resulting from pruning, to prevent transmission of the oak wilt fungus.
2. Reduce the chance of a sustained crown fire in the canopy.
 - 2.1. Thin woodlands by removing juniper and live oak (< 4" dbh) where these trees are competing for the same canopy space as a deciduous hardwood tree. Deciduous hardwood trees have less canopy bulk density and are less likely to sustain crown fire as compared to juniper and live oak. Cutting of live oaks will result in the re-sprouting of multiple trunks. It may be best to leave them in place.

- 2.2. In areas consisting of mostly juniper, thin subdominant junipers. Removing juniper in the understory will reduce canopy bulk density and increase canopy base height that would otherwise contribute to a sustained crown fire.
- 2.3. In areas consisting of mostly juniper, thin juniper (<4" dbh) in the over-story where trees or branches overlap, while maintaining full canopy closure. Promoting fewer, but larger and taller trees will reduce canopy bulk density near the ground reducing the likelihood of a sustained crown fire.

Fuel Reduction Specifications

Closed Woodland – If the vegetation is closed-canopy woodland, the following specifications shall be followed. Closed-canopy woodland for this purpose is defined as a woodland where canopy closure is sufficient to limit growth of tall grass (18 inches or more tall) to less than 50% of the ground cover. Measurement for the zones defined below begins at the edge of the woodland, moving towards the interior. The beginning of the Edge Zone is defined as the line where continuous grass and other herbaceous cover ends.

Edge Zone, 0-30 feet:

- Remove all dead wood, dead limbs, and dead vegetation.
- For junipers and live oaks, remove (prune) low branches on which all live foliage is within 6 feet of the ground. Do not remove any branch that has foliage above 6 feet (i.e. contributing to canopy layer). Do not prune or remove deciduous hardwood trees.
- Remove or thin branches from multi-stemmed Ashe juniper trees, greater than 4 inches, only if they do not contribute to the canopy.
- Shrubs and small junipers and live oaks less than 4 inches in diameter and less than 10 feet in height should be removed unless, with continued growth, they are likely to close a canopy gap; if the tree is not removed, prune as specified above.
- Immediately seal all wounds on oaks, including stumps, to prevent transmission of the oak wilt fungus.

Near Edge Zone, 30-100 feet:

- Remove fallen trees and dead branches that create ladder fuels to a height of 4 feet. For any standing dead trees, remove branches within 10 feet of the ground. Fallen tree trunks and standing snags (without small branches) are acceptable to leave in place.
- For junipers and live oaks, remove (prune) low branches on which all live foliage is within 4 feet of the ground. Do not remove any branch that has foliage above 4 feet (i.e. contributing to canopy layer).
- Do not prune or remove deciduous hardwood trees.
- Thin juniper and live oak trees less than 4 inches in diameter. Thinning should involve removing the whole tree and not pruning the tree. Focus on trees in the understory and mid-story first. Trees should only be thinned if the thinning does not result in a reduction in canopy cover. Thinning more than this will negatively impact the habitat needs of the GCWA, and will have the potential to increase surface vegetation which will increase the chance of crown fire initiation.

- Remove or thin branches from multi-stemmed Ashe juniper trees, greater than 4 inches, only if they do not contribute to the canopy.
- Immediately seal all wounds on oaks, including stumps, to prevent transmission of the oak wilt fungus.
- If the woodland is narrow, (less than 200 feet), then an Edge Zone treatment should be completed at the perimeter of the closed canopy woodland and the remainder of the woodland treated with Near Edge Zone specifications as needed.

Open Woodland – If the vegetation is characteristic of an open woodland or there are open woodlands leading into closed woodlands the following should apply. An open woodland for this purpose is defined as a woodland where canopy closure **allows tall grass to cover more than 50% of the ground.**

- Remove all dead wood, dead limbs, and dead vegetation.
- Trees should be pruned to a height of 8 feet. Immediately seal all wounds on oaks to prevent transmission of the oak wilt fungus.
- Juniper and live oak crowns can touch but not overlap.
- Deciduous hardwood trees should be left in place but pruned when possible.
- Shrubs need to be removed from within 10 feet of the canopy of a tree.
- Grass needs to be removed from within 10 feet of the canopy of a tree or kept in a mowed condition.

Whenever possible, allow the canopy to close while minimizing fire danger, such as planting Texas red oak and other deciduous trees.

Debris Removal

Since the debris and slash created from the treatments can create an increased fire risk, most or all of the material will be removed and not allowed to accumulate through the duration of the treatment. If the slash cannot be mitigated through one of the listed options, the treatment should not be implemented. Options for removal of the slash, listed in order of preference, are as follows:

- Mulch and remove slash from the treatment site to a staging area to be used for habitat restoration on other areas within the BCP. Allowing the mulch to age and “compost” at the staging area for a period allows for the breakdown of materials and contributes beneficial micro-organisms and nutrients to help protect and enhance soils in areas that currently have little or no soils. Treatments conducted during the fall and winter may also generate mulch that contains hardwood and other native seeds to help create or restore habitat for the Golden-cheeked Warbler and Black-capped Vireo and offset effects of the treatments.
- Chip all slash on site and leave the remaining chips in contour rows not exceeding 1 foot wide and 1 foot in height.

Precautionary Information

Oak wilt – Caused by the fungus *Ceratocystis fagacearum*, oak wilt is the most destructive disease afflicting live oaks and red oaks in Central Texas. Measures to prevent the spread of oak wilt will be followed during implementation of the fuels treatments. For more information visit: <http://texasoakwilt.org/2011/pruning-guidelines-for-prevention-of-oak-wilt-in-texas/>

Safety – Treatment specifications can be altered for areas that are unsafe to treat because of topography or other factors.

References

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Websites

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