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Planning and Permitting Forest Fuel-Reduction Projects on Private Lands in California

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Introduction

Wildfire is a natural part of California's landscape; however, decades of fire suppression, an accumulation of woody fuels, and increased human development in fire-prone locations have exacerbated wildfires' effects on natural and human communities. Fuel-hazard reduction, or the removal or treatment of flammable woody material, is an effective means of decreasing future fire risk and severity.

California's forestlands are owned by a mix of private individuals and concerns, as well as State, federal, and tribal entities. Therefore, affecting fire behavior requires working across ownership boundaries and ownership types. Private landowners, including industrial and nonindustrial landowners, hold about 40 percent of all California's forestland and play an essential role in stewarding that land. Although properties vary in size and location, they all contribute to fire safety, especially those located close to communities known as the wildland-urban interface, or WUI. Fuel reduction in the wildland-urban interface is an essential element of protecting communities and natural resources.

Fuel-hazard reduction primarily involves removing woody fuels that have limited commercial value. The expense incurred to treat these fuels may be offset by the harvest of commercial forest products, by utilizing State and federal incentive programs that support California forest landowners who treat woody fuels, or both. In most cases, some form of environmental review, disclosure, and permit is required before a project is implemented.

Cooperative land management presents many benefits and opportunities, but it also requires a careful understanding of the contracting, funding, and permitting processes that exist in each ownership type, including private land.

This publication presents some key considerations and insights into selecting the appropriate permit to facilitate fuel-reduction projects on private lands—and offers some insights into permitting larger fuel projects that involve multiple owners or multiple funding sources. The publication is organized around projects that take place before or after wildfires. It is intended for foresters, private owners of both small and large parcels of land, natural-resource professionals, and project developers. Cross-jurisdictional project developers should be aware that when private and public ownership or funding sources are included in the same project, the permits and contracts can become more complex. Note that the contents of this publication were written in 2021 and are specific to fuel-reduction projects and permits available in that year. In the future, readers may need to consult a specialist for more current information.

Fuel-hazard reduction projects versus commercial timber harvesting

Although fuel-hazard reduction and commercial timber harvesting can accomplish similar goals and help create more fire-resilient stands, they generally differ in three ways:

Sidebar 1

Definitions

Surface fuels are live and dead grasses, leaves, needles, branches, and logs located on the forest floor; their ignition allows fire to spread.

Ladder fuels are live and dead vegetation that provide a pathway for fire to climb from the surface to the crowns of the trees or shrubs, forming a fuel ladder.

Fuel breaks are areas of intensive fuel reduction designed to modify oncoming fire behavior so that the fire drops from the canopy to the ground, slowing the rate of spread and creating a location for wildfire suppression activities. Fuel breaks are often located along roads or ridgelines where the live and dead vegetation has been modified, but overstory trees are retained. Fuel reduction includes vegetation removal or reduction of vegetation density through mechanical techniques, prescribed fire, grazing, or other techniques.

Shaded fuel breaks are areas where trees are thinned so that the tree canopy or crowns do not touch.

Projects are defined in the following way by Section 15378 of the California Environmental Quality Act Guidelines: "Project" means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is any of the following:

1. An activity directly undertaken by any public agency including but not limited to public works construction and related activities, clearing or grading of land, improvement to existing public structures, enactment and amendment of zoning ordinances, and the adoption and amendment of local General Plans or elements thereof pursuant to Government Code Sections 65100-65700.
2. An activity undertaken by a person which is supported in whole or in part through public agency contacts, grants, subsidies, or other forms of assistance from one or more public agencies.
3. An activity involving the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies.

- **Size of removed fuels.** Fuel hazard–reduction projects are designed specifically around removing small-diameter, nonmerchantable trees and shrubs, whereas timber harvesting removes larger-diameter, merchantable trees (see sidebar 1, on this page, for definitions of *surface fuels*, *ladder fuels*, and *fuel breaks*).
- **Removal methods.** Fuel-hazard reduction can be accomplished using various methods (for example, mechanical or chemical methods, prescribed burning, hand crews, animal grazing, and so on) in either stand-alone treatments or in sequence. In contrast, commercial timber harvesting requires the use of heavy equipment or mechanical methods and may use large-scale broadcast burning and pile burning.
- **Slash management.** Removal or treatment of small-diameter cut materials, also known as slash or noncommercial vegetation, is a primary goal of fuel hazard–reduction projects. In contrast, slash separated from logs (limbs and tops) and other vegetation without commercial value may or may not be removed during commercial timber harvest, though postharvest requirements specify the maximum depth of the remaining slash.

Fuel-reduction projects may stand alone or be incorporated into commercial Timber Harvesting Plans or other forest management projects. An example of a stand-alone fuel-reduction project might be the removal of shrubs and small trees adjacent to a home; this project accomplishes an exclusive goal of fuel reduction. Other projects may blend complementary goals, such as fuel reduction, habitat restoration, and commercial harvesting. Removal of encroaching conifer trees in deciduous oak woodlands could be an example of a project that simultaneously achieves fuel reduction, habitat restoration, and possibly commercial harvesting goals. Fuel-reduction projects often require creative approaches given the low commercial value of the wood products removed and the high treatment costs.

Tips for success

1. **Plan early.** All landowners will benefit from planning ahead and gaining a comprehensive understanding of permit requirements, logistical feasibility, and project costs before finalizing project documents (for example, grant applications, memoranda of understanding, or permit

applications). For more information about planning ahead, see the "Additional resources" section on page 15.

2. **When working on private land, consult a Registered Professional Forester.** Many fuel-reduction projects do not require a Registered Professional Forester; however, if a project will be implemented on private forestlands, it is a good idea to consult a Registered Professional Forester. These foresters may help to identify unforeseen issues or considerations. It's worth speaking with someone who can navigate the fine print of the permitting process.
3. **Keep it simple and realistic.** Focus on your primary goal (for example, fuel-hazard reduction). Tacking on management objectives not required for the primary project goal (habitat restoration, road improvements, and so on) can add costs and render a project financially or operationally infeasible.
4. **Understand the relationship between project goals and permit requirements.** The cost of preparing a permit, or permits, is a function of the scale and intensity of the practices proposed in the project. Be aware that some permits (for example, Timber Harvest Plans) require additional work, such as wildlife or botanical surveys, slash removal, and road repairs or upgrades. Some permits (for example, Exemptions) may also have operational or timing limitations such as the maximum diameter of a harvestable tree, maximum acreage of treatment, or seasonal restrictions for operations. It is essential to understand how each aspect of your project affects the permits that are required.
5. **Understand your property limitations.** When designing any fuel-reduction project, take into account ownership size or project area, distance to mills or access to labor, harvestable tree diameter size, road condition, and operating constraints (for example, watercourses and wetlands, steep slopes, unstable areas, sensitive species, and cultural resource sites).
6. **Commercial trees help underwrite overall project costs.** If you are a landowner with merchantable timber, consider a commercial timber sale to generate income to support current or future fuel-reduction projects.
7. **Design longer-term projects with maintenance in mind.** It may be more cost-effective to invest now in a single, longer-term project that entails periodic maintenance than to implement multiple follow-up projects in the future. Thinking long-term, thinking on a large scale, or both will also encourage the project developer to plan and anticipate potential issues. For example, will future maintenance utilize prescribed fire, timber harvesting, or targeted grazing? If so, set up your project to work toward those treatments by developing a suitable road network, strategic fire-control lines, or the infrastructure to provide water and fencing.

Considerations for designing and permitting a fuel-hazard reduction project on private land

There are several important factors to consider when developing a fuel-reduction project suitable for your objectives. These include timeline, landscape, and financial resources. Refer to figure 1 (a decision tree and summary of CAL FIRE permits for fuel reduction) for more information about types of fuel-reduction projects.

When is a permit needed?

A permit is needed whenever a project can create a significant direct or indirect environmental effects. Private landowners in California have the right to cut trees on their property for noncommercial purposes (for example, personal use or disposal of fuels). However, if projects result in barter, sale, or trade arrangements involving logs, chips, or firewood, these projects must be permitted under the California Forest Practice Rules administered by CAL FIRE. In addition, permits are required from multiple agencies when they involve clearing or grading land, operating in or near watercourses or wetlands, generating smoke, or affecting sensitive plant or animal species.

In addition, any project that uses State or federal funding requires environmental review under the California Environmental Quality Act or the National Environmental Policy Act, depending on funding source and ownership jurisdiction (State or federal). A permit is the final record of decision after an environmental review has been conducted, and most projects need some form of environmental assessment (see sidebar 2 on page 5).

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CAL FIRE Permits for Fuel Reduction

(commercial; most trees >12 in diameter at breast height)

Has your property been damaged by a wildfire event in the last year?

YES — This project is in response to a past fire event. Most of the trees on my property are dead or dying.

NO — This project is in preparation for a future fire event. Most of the trees on my property are living.

What will the purpose of your fuel-reduction project be?

Remove dead trees within 300 ft of my permitted structure(s) only to create defensible space.

Post-Fire Recovery Exemption [1038(g)]

Benefits:
- Remove burned trees around a permitted structure
- Reduce remaining ladder and surface fuel loads around a permitted structure
- RPF and CAL not required in some cases

Limitations:
- Harvest area limited to 300 ft around a permitted structure
- May harvest dead and dying trees only (no healthy trees)
- No heavy equipment in WLPZ

Remove dead trees across my property to create a more fire resilient forest, which may include area around my permitted structure(s).

Emergency Notice [1052]

Benefits:
- Inexpensive harvest permit
- No acreage limit on harvest area
- Reforestation not required
- May harvest dead and dying trees of any size
- Road construction allowed
- Harvest allowed in WLPZ
- In Lieu allowable

Limitations:
- RPF, CAL required
- Must complete operations within 1 year

Remove live trees within 150 ft of my permitted structure(s) only to create defensible space.

Structure Protection 0–150 ft Exemption [1038(c)]

Benefits:
- Remove dead and dying and/or healthy trees around a permitted structure
- Create defensible space around a permitted structure (per BOF Tech. Rule Ad. 4 standards)
- Compatible with Structure Protection 150–300 ft Exemption

Limitations:
- Must treat all slash within 45 days
- No timber operations in WLPZ

Remove live trees within 150–300 ft of my permitted structure(s) only to create defensible space.

Structure Protection 150–300 ft Exemption [1038(c)]

Benefits:
- Remove dead and dying and/or healthy trees around a permitted structure
- Compatible with Structure Protection 0–150 ft Exemption

Limitations:
- RPF required
- Single tree selection only
- Must treat all slash within 45 days, piles burned by April 1
- No timber operations in WLPZ

What will the purpose of your fuel-reduction project be?

Remove live trees across my property to create a more fire resilient forest, which may include area around my permitted structure(s).

Do you need to construct or reconstruct temporary road (up to 300+ ft) to make harvesting?

NO, I do not require a permit that includes road construction or reconstruction.

Small Landowner Exemption [1038(f)]

Benefits:
- Less expensive than THP
- Create fuel breaks anywhere within a densely wooded landscape

Limitations:
- Limited to small ownerships (up to 60 or 100 acres)
- Must exceed stocking standards (i.e., leave more trees than NTMP)
- May only harvest trees up to 26 in to 32 in stump diameter (varies by species)
- No timber operations in WLPZ
- RPF, CAL required

YES, I do require a permit that includes road construction or reconstruction.

Emergency Notice for Fuel Hazard Reduction [1052.4]

Benefits:
- Harvest living trees up to 26–30 in stump diameter (varies by species)
- Create fuel breaks along roads, ridges, and vulnerable infrastructure
- May harvest dead and dying trees of any size

Limitations:
- Must reduce slash depth to 9 inches above the ground
- RPF, CAL required

Forest Fire Prevention Exemption [1038.3]

Benefits:
- Harvest trees up to 30 in stump diameter within a 300 acre area
- Construct or reconstruct up to 300–600 ft temporary road

Limitations:
- Must map and treat all sediment sources
- Must treat slash to 18 in
- Must remove sub merchantable trees
- No operations in WLPZ
- RPF, CAL required

Modified Timber Harvest Plan for Fuel Hazard Reduction [1051.3 7]

Benefits:
- Harvest entire forest stands (up to 2,500 acres)
- Reduce ladder and surface fuels
- Construct or reconstruct roads
- Valid for 5 years (with possible 2-year extension)

Limitations:
- Not for steep slopes
- Commercial thinning, rehabilitation, and fuel break/defensible silviculture only
- RPF, CAA required

Key | BOF = Board of Forestry / CAL = Confidential Archaeological Letter / NTMP = Nonindustrial Timber Management Plan
RFP = Registered Professional Forester / THP = Timber Harvesting Plan / WLPZ = Watercourse and Lake Protection Zone

Figure 1. Summary of CAL FIRE permits for fuel-reduction projects.

Sidebar 2

Projects led by community groups or other entities

Fuel-hazard reduction often involves multilandowner cooperative efforts on a landscape scale. Organizations that serve local communities can seek funds to implement multiownership projects that benefit private and governmental landowners (for example, resource conservation districts, nonprofit organizations, fire districts, volunteer fire departments, and road or neighborhood associations). These types of projects require transparency and a high degree of communication between stakeholders. It is a good idea for project proponents to work with a Registered Professional Forester when developing forest management projects to ensure the final project design includes explicit consideration of permitting feasibility.

Benefits

- Shared costs alleviate individual financial strain.
- Cooperative projects can lead to more effective fuel-reduction treatments on a landscape scale and more significant impact in affecting wildfire behavior.
- Coordinated actions yield long-term strategic planning.
- Better landowner communication helps achieve mutual interests.
- One of the stakeholders can also be a nongovernmental organization.
- Collaborative projects may access grant funds that individual landowners may not, such as grants from California Climate Investments.

Drawbacks

- Cooperation can be challenging to achieve and agreement challenging to reach, especially when trying to integrate multiple stakeholders' objectives.
- Larger projects are often more complicated.

Lead agency

Each collaborative project requires a lead agency to oversee the environmental review and permit process. Some permits require a specific lead agency, while others offer a choice of lead agency, depending on project logistics. Possible lead agencies may include CAL FIRE, the California Department of Fish and Wildlife, Regional Water Quality Control Boards, the U.S. Forest Service, or a county.

The review process, necessary surveys, and required professionals and consultants

Projects are subject to review under the California Environmental Quality Act, the National Environmental Policy Act, or both if State and federal lands or funds are involved.

- State projects, using funds such as grants from California Climate Investments, require California Environmental Quality Act review and special surveys (for example, wildlife, botany, and archaeological surveys).
- Permits specific to CAL FIRE (for example, Exemptions, Emergency Notices, Timber Harvesting Plans, or Nonindustrial Timber Management Plans), as well as programmatic Environmental Impact Reports (California's Vegetation Treatment Program) and Categorical Exemptions, must meet the environmental review requirements of the California Environmental Quality Act.
- Federal funding sources (such as the Environmental Quality Incentives Program) or projects conducted on federal lands require environmental and cultural review specific to the National Environmental Policy Act process. For example, the process requires a cultural resource survey by a federally licensed archaeologist (Section 106). In comparison, CAL FIRE allows Registered Professional Foresters with current archeological training to evaluate cultural resources for CAL FIRE permits.
- If the project involves both State and federal funding or lands, a coordinated approach to permitting for the California Environmental Quality Act and the National Environmental Policy Act will be required.

Lessons learned from collaborative projects

The environmental permit(s) required to carry out a project should be identified prior to or along with the development of the grant application(s) to carry out the project. In general, developing a project so that it fits within an existing State or federal categorical Exemption will dramatically streamline the permitting process. Projects that fit within categorical Exemptions typically 1) do not operate in sensitive areas or at sensitive times of year; 2) entail minimal ground disturbance; and 3) focus on small trees and brush. Projects that include heavy equipment operations in or near watercourses, the use of helicopters, or road construction may not be eligible for a categorical Exemption to the California

Environmental Quality Act or a Categorical Exclusion to the National Environmental Policy Act.

Mixing the need for permitting for both the California Environmental Quality Act and the National Environmental Policy Act leads to increased complexity. Projects that require only permitting for the California Environmental Quality Act or the National Environmental Policy Act, but not both, are the simplest to permit and carry out. Despite many efforts to streamline permitting pathways for combined State and federal projects, many organizations have found that obtaining the necessary permits for mixed-jurisdictional projects requires customization and special procedures.

Developing environmental permits is expensive and takes time. When landscape-scale projects are developed, the time and expense required to complete the permitting process are often underestimated. Community organizations often focus on compiling numerous funding sources to operate on multiple parcels that can have a variety of owners to produce an environmentally effective project. While this focus is laudable, be prepared to spend 1 to 3 years navigating the permitting process and to spend 10 to 30 percent of the project's total budget on permitting.

Projects that are easier to permit have the following characteristics:

- They are located in less sensitive areas (for example, away from watercourses or culturally sensitive areas).
- They focus on removing smaller-diameter trees (less than 12 inches in diameter at breast height) and brush species.
- They do not require road upgrades.
- They are conducted outside the breeding season for sensitive species.
- They involve fewer landowners.
- They include private or federal ownerships, but do not mix ownership types.
- They involve removing dead or dying trees from privately owned forestlands after an emergency (for example, fire, drought, and pest outbreaks).

Projects that are more difficult to permit have the following characteristics:

- They occur within 100 feet of watercourses.
- They involve helicopters.
- They involve road construction.
- They include geologically unstable slopes.
- They involve cultural resource sites.
- They occur in areas with sensitive species nearby.
- They occur within the Coastal Zone.
- They lie close to State or national parks (within 200 feet).
- They involve removal of large trees (more than 48 inches in diameter at breast height).

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What permit is needed?

Deciding which permit best matches a project's goals and objectives is not always straightforward. Projects that occur on private land in California or are funded by State agencies require an environmental-impacts analysis under the California Environmental Quality Act. Registered Professional Foresters are experts in understanding how the Act applies to timber harvesting and which type of permit (if any) is required for which type of project. In general, if the project involves work on private forestland in California, it is best to talk with a Registered Professional Forester (to help guide permitting and evaluate the operational and financial feasibility of the project).

In the sections below, guidance is given about various permits that are administered by CAL FIRE, the lead agency for projects that occur on private timberland in California. Be aware that some projects require additional permits from other local, State, or federal agencies.

A Timber Harvest Plan is a formal environmental review document prepared by a Registered Professional Forester and approved by CAL FIRE and other State agencies. A Nonindustrial Timber Management Plan is similar to a Timber Harvest Plan but has limitations on the total acreage each landowner can own (that is, no more than 2,500 acres of forestland). These types of "permits" are common for projects focused on commercial timber harvest and typically require 2 or more years to prepare and cost upward of $40,000 (in 2021 dollars).

A Notice of Exemption (an "Exemption") and a Notice of Emergency Timber Operations (an "Emergency Notice") allow landowners to harvest and sell timber for a specific purpose (for example, harvesting Christmas trees, harvesting dead and dying trees, reducing local fire risks, promoting small-scale stewardship activities, or protecting a structure) without preparing a Timber Harvest Plan or Nonindustrial Timber Management Plan—if the activities stay

within specified prescriptions. Keep in mind that the rules and regulations that govern timber harvest, road construction, reforestation, and environmental protections all still apply, but the paperwork and the review process are streamlined. While Exemptions can be less expensive to develop, they typically involve a trade-off—much lower operational flexibility in exchange for streamlined environmental review. Not all Exemptions require a Registered Professional Forester, but it is highly recommended to consult one because some requirements are easy to miss. For a more detailed summary of the options for Exemptions and Emergency Notices, refer to table 1.

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Table 1. Guide to CAL FIRE permits used for fuel-reduction projects on private timberlands

	Postwildfire project (for harvesting dead and dying trees)		Prewildfire project (for harvesting both dead and dying and living trees)					
Permit name (CA Public Resources Code reference)	Post-Fire Recovery Exemption [1038(g)]	Emergency Notice [1052]	Fuel Hazard Reduction Emergency [1052.4]	Modified Timber Harvest Plan for Fuel Hazard Reduction [1051.3-7]	Structure Protection 0–150 feet Exemption [1038(c)]	Structure Protection 150–300 feet Exemption [1038(c)(6)]	Small Timberland Owner Exemption [1038(f)]	Forest Fire Prevention Exemption [1038.3]
Harvest area/ acreage limits	only permitted within 300 feet of an existing or destroyed permitted structure	no maximum harvest area limit	only permitted within ¼ mile of a permitted structure, and/or within 500 feet of roads, ridges, and infrastructure	maximum of 2,500-acre harvest area	only permitted within 150 feet of a permitted structure	only permitted within 150–300 feet of a permitted structure	only permitted on ownerships up to 60 acres (Coast District) or up to 100 acres (North and South Districts)	maximum of 300-acre harvest within areas with moderate to very high fire threat
RPF needed?	no	yes	yes	yes	no	yes	yes	yes
Additional permits/ documents required?	• CAL • CDFW LSAA	• CAL • CDFW LSAA	• CAL • CDFW LSAA	• CAL • CDFW LSAA	none	• CDFW LSAA	• CAL • CDFW LSAA	• CAL • CDFW LSAA
Tree diameter limits by species and age	when tree originated before 1800, can cut up to 60-inch SD for redwood; up to 48-inch SD for other species	no limits	• up to 26-inch SD for Quercus species • up to 30-inch SD for other species (no limit for dead and dying trees)	• up to 60-inch SD for redwood • up to 48-inch SD for other species	• when tree pre-1800, can cut up to 60-inch SD for redwood • up to 48-inch SD for other species	• when tree pre-1800, can cut up to 60-inch SD for redwood • up to 48-inch SD for other species	• up to 26-inch SD for Quercus species • up to 32-inch SD for other species	• up to 30-inch SD for all species • up to 36-inch SD within a temporary road prism
Harvesting method limits and stocking standards	no harvesting method limits; does not need to meet stocking standards	can only cut dead and dying trees (with some exceptions)	no even-aged harvesting methods; must meet minimum stocking standards (912.7)	commercial thinning, rehabilitation (up to 10% of total area), and fuel break/defensible space harvesting methods only; must meet stocking standards specific to the harvesting method selected	no even-aged harvesting methods	must meet selection stocking standards (913.2)	single tree selection harvesting only; must exceed selection stocking standards (i.e., 50–150 square feet/ acre; varies by site)	no even-aged methods; must increase QMD in the harvest area (i.e., remove more smaller trees than larger trees); just retain 75–100 square feet basal area

Table 1. Guide to CAL FIRE permits used for fuel-reduction projects on private timberlands (continued)

	Postwildfire project (for harvesting dead and dying trees)		Prewildfire project (for harvesting both dead and dying and living trees)					
Permit name (CA Public Resources Code reference)	Post-Fire Recovery Exemption [1038(g)]	Emergency Notice [1052]	Fuel Hazard Reduction Emergency [1052.4]	Modified Timber Harvest Plan for Fuel Hazard Reduction [1051.3-7]	Structure Protection 0–150 feet Exemption [1038(c)]	Structure Protection 150–300 feet Exemption [1038(c)(6)]	Small Timberland Owner Exemption [1038(f)]	Forest Fire Prevention Exemption [1038.3]
Postharvest timber stand requirements	may retain few (if any) trees	may only remove trees that will not survive for at least 1 year	must retain 30–40% canopy closure in well-distributed healthy dominant and codominant trees	must retain at least 40% total canopy; must increase QMD in the harvest area (i.e., remove more smaller trees than larger trees); posttreatment total surface fuel loading shall not exceed 25 bone-dry tons per acre	must retain few, very widely spaced, healthy dominant trees	must retain well-distributed healthy dominant and codominant trees; must increase QMD in the harvest area (i.e., remove more smaller trees than larger trees)	must retain 40–60% canopy cover of well-distributed, healthy dominant and codominant trees with a minimum of 8 feet of vertical spacing between fuels and live crowns; must increase QMD in the harvest area (i.e., remove more smaller trees than larger trees)	Cannot leave >200 trees/acre with >3 inches DBH; must retain 40–60% canopy cover of well-distributed, healthy, dominant and codominant trees with a minimum of 8 feet of vertical spacing between fuels and live crowns
Project duration and time limits	1 year for ops; 45 days for all slash treatment (pile burning completed by next April 1)	1 year for ops; no specified slash treatment requirements	1 year for ops and slash treatment (pile burning completed in 2 years); 45 days for slash treatment within 150 feet of any permitted structure	5 years for ops and slash treatment (with possible 2-year extension)	1 year for ops and slash treatment (pile burning in 2 years); 45 days for slash treatment within 150 feet of any permitted structure	1 year for ops and slash treatment (pile burning in 2 years); 45 days for slash treatment within 150 feet of any permitted structure	1 year for ops and slash treatment (pile burning in 2 years)	1 year for ops and slash treatment (pile burning in 2 years); 45 days for slash treatment within 150 feet of any permitted structure
Other specific limits or considerations	may apply for this permit any time within 3 years of a fire event	can use this permit for other types of emergencies (e.g., drought, insects, disease, etc.)	may harvest tree of any size necessary to meet fuel hazard objectives; must reduce slash depth to 9 inches	must include a plan for pre- and post-treatment photo point monitoring to characterize treatment effects; must retain specific habitat elements	ops must comply with city and/or county ordinance(s) and defensible space standards (BOF Tech. Rule Ad. 4)	ops must comply with city and/or county ordinance(s)	may submit permit only once every 10 years; only 3 permits per landowner lifetime; must reduce slash depth to 18 inches; must retain 6 largest trees per acre.	must reduce slash depth to 18 inches; must inventory and map sediment sources on project and appurtenant roads

Key

CAL = Confidential Archaeological Letter

CDFW LSAA = California Department of Fish and Wildlife Lake and Streambed Alteration Agreement (1660)

DBH = diameter at breast height, 4.5 feet from the ground

ops = timber operations

QMD = quadratic mean diameter, tree of mean basal area

Quercus spp. = true oak species (e.g., California black oak, Oregon white oak, coast live oak, canyon live oak, and so on)

RPF = Registered Professional Forester

SD = diameter at stump height, i.e., 8 inches from the ground

stocking standards = Public Resources Code stocking standards

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The list below introduces a few of the available permits, issued by CAL FIRE, that are commonly used for fuel-hazard reduction projects or used after wildfire:

- Post-Fire Recovery Exemption [1038(g)]
- Emergency Notice [1052]
- Structure Protection 0–150 ft Exemption [1038(c)]
- Structure Protection 150–300 ft Exemption [1038(c)(6)]
- Small Timberland Owner Exemption [1038(f)]
- Emergency Notice for Fuel Hazard Reduction [1052.4]
- Forest Fire Prevention Exemption [1038.3]
- Modified Timber Harvest Plan for Fuel Hazard Reduction [1051.3-7]
- Fuel Hazard Reduction Emergency [1052.4]

Note that the bracketed numbers in the list above refer to the California Code of Regulations Rule citation number. Forestry falls under Title 14 for natural resources. Additional permits may be needed from other agencies when implementing a CAL FIRE timber harvesting permit. For example, a separate permit from an Air Quality Management District will be required for smoke emissions; or, depending on the time of year, from CAL FIRE to facilitate pile or broadcast burning. A separate permit will be needed from the California Department of Fish and Wildlife, the U.S. Army Corps of Engineers, or both for any work in watercourses (such as culvert installation).

Project types by site characteristics and conditions

The following summary organizes potential projects by activities before or after wildfire and offers tips and guidance for permitting and funding these projects.

Prefire nonmerchantable fuel reduction

These projects are designed for immediate implementation to effectively reduce fuel loads and subsequent fire risk. Fuel-reduction goals may include improving defensible space or modifying fuels to prevent a fire from burning to a structure or other strategic location; fuel breaks along roads, ridgelines, or other critical areas; and landscape-wide reduction of fuel ladders and surface fuels (figs. 2A and 2B). These projects typically focus on removing smaller, nonmerchantable trees and shrubs and often cost between $1,000 and $3,000 per acre. Costs depend on the size of the project area, removal method, and treatment prescription.

- **Ideal for:** Densely stocked timber stands of smaller trees (less than 14 inches in diameter at breast height), high–fire risk areas, and parcels with shared road networks or several adjacent neighbors.

Figure 2. Before (A) and after (B) photographs from a fuel-reduction project in Humboldt County, CA.

- **Tip:** Supplementing the immediate fuel-reduction project with other objectives that can help landowners qualify for State or federal incentive programs—for example, habitat restoration projects, road upgrades, and reforestation—can be attractive and beneficial, but be aware of the added costs that these efforts can entail. These objectives may require extra contractors and permits, involve longer timelines, and increase project complexity.
- **Suggested permits:** If the project does not generate commercial products and is paid for by the landowner, a permit is generally not needed. If State or federal funding is used to help pay for the project, an analysis under the California Environmental Quality Act or the National Environmental Policy Act will be required.
- **Possible funding resources:** State or federal incentive programs may be available to help with costs. For example, individual private landowners may seek State funding through the California Forest Improvement Program. Organizations and agencies may seek State funding from California Climate Investment grants. Federal funding sources for landowners and larger entities include the U.S. Department of Agriculture's Natural Resources Conservation Service, which administers the Environmental Quality Incentives Program. With some creativity, and when projects provide certain environmental benefits, the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program may help when other environmental benefits are included in the project.
- **What to watch out for:** This approach may not reduce overstory tree-crown density and the risk of high-severity canopy fire due to its focus on smaller trees and understory fuels.

Prefire merchantable timber harvest and fuel reduction

If the goal is to generate revenue to pay for fuel-hazard reduction, consider a project that produces commercial timber as a component of fuel reduction. Fuel reduction during a commercial harvest can be more effective and less expensive (per acre) than a stand-alone, noncommercial fuel-hazard reduction project. Unlike nonmerchantable fuel-reduction projects, timber sale projects require a permit from CAL FIRE and may not be eligible for some State or federal financial assistance.

- **Ideal for:** Densely stocked timber stands with larger trees (more than 14 inches in diameter at breast height), areas at high risk of fire, parcels with shared road networks or with several adjacent neighbors, and parcels in proximity to a sawmill.
- **Tip:** Conditions for a financially successful timber harvest vary widely, and the costs of treating fuels can add up quickly. Be aware of the slash-treatment and road-upgrade requirements of this CAL FIRE permit.
- **Suggested permits:** Forest Fire Prevention Exemption [1038.3], Structure Protection Exemptions [1038(c), 1038(c)(6)], Small Timberland Owner Exemption [1038(f)], Fuel Hazard Reduction Emergency [1052.4], or Modified Timber Harvest Plan for Fuel Hazard Reduction [1051.3-7] (see fig. 1).
- **Possible funding resources:** Funded by landowner.
- **What to watch out for:** Costs for permits, road improvements, and noncommercial fuel management may be significant, and not all tree species have merchantable value to sawmills. Additionally, if hauling to a sawmill involves long distances, trucking can be very expensive. As a result, a project may not break even.

Postfire harvest of merchantable timber to generate revenue

After a property experiences wildfire, the property may contain dead or dying trees that still have commercial value and can be salvaged before they die or decompose in the stand. An Emergency Notice is the permit most commonly used for salvage following wildfire. As with regular commercial timber harvest, it is possible to utilize the labor and equipment on site to reduce fuel loading while harvesting commercial trees, but there can be additional costs.

- **Ideal for:** Wildfire-damaged timber stands with larger trees (more than 14 inches).
- **Tip:** Although Emergency Notices are designed for swift harvest of viable standing timber, they require adherence to all Forest Practice Rules and preparation of a Confidential Archaeological Letter before operations. In some situations, landowners with smaller parcels may benefit from working with a forester to coordinate actions such as selling burned or damaged trees, hiring a licensed timber operator, and reforestation activities.
- **Suggested permits:** Post-Fire Recovery Exemption [1038(g)] or Emergency Notice [1052] (see fig. 1).

- **Possible funding resources:** Funded by the landowner.
- **What to watch out for:** After wildfire, many native plants respond quickly to fire and compete with planted seedlings. Growth of woody plants such as Ceanothus, manzanita, or chamise can result in high fuel loading. Reestablishing trees and controlling these types of woody shrubs will likely be required and can take a decade to implement successfully.

Accomplish multiple objectives over time

Managing complex landscapes can involve several compatible goals (for example, oak woodland restoration, road maintenance, commercial thinning, and prescribed burning). If periodically reducing fuels over time is only one of several long-term goals, consider implementing a forest management plan with a timeline of more than 30 years to help schedule and coordinate goals. Also, consider working with the Natural Resources Conservation Service, the U.S. Fish and Wildlife Service, or CAL FIRE to design and implement a project that utilizes the incentive funds that these entities offer.

- **Ideal for:** Properties with varied timber stand characteristics and conditions.
- **Tip:** There is a bit of an alphabet soup of management plans available to private landowners. Some "plans" have permits associated with them, such as a Nonindustrial Timber Management Plan or Timber Harvest Plan. Others, such as the California Cooperative Forest Management Plan, help educate landowners about their properties and guide long-term management objectives but do not permit any activities. A Nonindustrial Timber Management Plan is a long-term plan for periodic, selective commercial harvests, and also serves as the permit, compliant with the California Environmental Quality Act, to conduct harvests. In contrast, California Cooperative Forest Management Plans are commonly funded through CAL FIRE's California Forest Improvement Program or the Natural Resource Conservation Service's Environmental Quality Improvement Program. These programs provide a plan for property stewardship and can help facilitate funding the costs of noncommercial treatments such as fuel reduction, habitat enhancement, reforestation, and road upgrades.
- Keep in mind that these forest management plans set a timeline for treatments, enabling the funders to know the proposed schedule, but do not serve as permits to conduct these activities.
- **Possible projects:** Start with developing a property-wide plan such as a California Cooperative Forest Management Plan, funded by the California Forest Improvement Program or the Environmental Quality Incentives Program, or a Nonindustrial Timber Management Plan (plan and permit administered through CAL FIRE)
- **Possible funding resources:** California Cooperative Forest Management Plans can be funded by one or more sources, including the landowner, timber revenues, and State or federal incentive programs (see fig. 3).
- **What to watch out for:** If the project includes multiple stakeholders, landowners, or agencies, watch for extended time frames and unanticipated expenses. Also, be aware that mitigations required by environmental permits (for example, road upgrades) may make the project ineligible for some grant-funding opportunities.

Maintaining fire-resilient forest conditions

Although implementing immediate fuel-reduction projects can effectively mitigate fire risk today, these conditions are only temporary. As living organisms, plants grow each year and densify quickly, depending on species and site conditions. Periodic fuel treatment will be necessary to ensure a long-term fire-resilient landscape. Long-term plans can also incorporate different types of fuel-reduction methods over time.

- **Ideal for:** Properties where woody shrubs are common.
- **Tip:** Using shade from established overstory trees is the least expensive way to control the development of shrubs and young trees that create fuel ladders. Prescribed fire, grazing, mechanical equipment, and herbicides are also options that can help maintain reduced fuel conditions. For each approach, incorporate the road, unit, or water infrastructure needed to facilitate these treatments in the future.
- **Suggested permits:** A Nonindustrial Timber Management Plan can facilitate repeated entries into forested areas to remove commercial timber, and the revenue can be used to manage noncommercial vegetation development. Permits are generally not required for noncommercial vegetation

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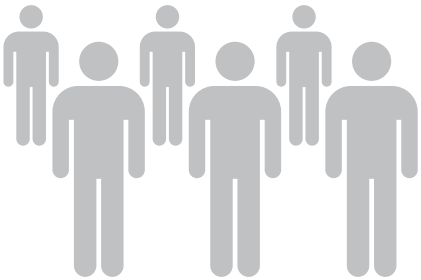
Nonmerchantable fuel-reduction projects

Grant or financial assistance;
most trees < 12" DBH or noncommercial species



What type of land management entity do you represent?

A land-owning local, state, or federal agency; Tribal Nation; university; special district; or 501(c)(3)non profit

A private non-industrial landowner

California Climate Investments (CCI) Grants
CAL FIRE

Fire prevention goals:
- Hazardous fuel reduction
- Fire prevention education
- Fire prevention planning

Forest health improvement goals:
- Forest fuel reduction
- Prescribed burning
- Pest management
- Reforestation
- Biomass utilization
- Conservation easements and/or land acquisition through the Forest Legacy Program

Considerations:
- Often prefer projects with multiple landowners or stakeholders
- Project proponent must develop permits

www.fire.ca.gov

Partners for Fish and Wildlife Program
U.S. Fish and Wildlife Service

Goals:
- Oak woodland restoration
- Any nonstate and nonfederal landowner is eligible
- Implement wildlife habitat improvements on working landscapes (e.g., forests, farms, ranches, etc.)
- Promote private landowner stewardship
- Improve water resources (e.g., off-site watering, riparian planting, aquatic habitat restoration)
- Plant native grasses and forbs
- USFWS manages NEPA review

Considerations:
- Smaller funding pot (<$25,000/project)

www.fws.gov/partners

Environmental Quality Incentive Program (EQIP)
Natural Resource Conservation Service

Goals:
- Fuel reduction, fuel breaks
- Forest management plan
- Forest stand improvement
- Conduct prescribed burning
- Enhance wildlife habitat
- Brush management
- Fencing
- Reforestation and site preparation
- NRCS manages NEPA review

Considerations:
- An individual with a lease or other agreement can use these funds for permitted BLM or USFS grazing improvements
- Not for a university or special district

www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/

California Vegetation Management Program (VMP)
CAL FIRE

Goals:
- Conduct prescribed burns
- Remove surface and ladder fuels mechanically, chemically, by hand, or with herbivory across a densely wooded landscape
- Create fuel breaks in strategic locations
- Ecological restoration
- Includes streamlined, programmatic permit

Considerations:
- Does not fund precommercial thinning projects
- Easier to permit if in brush, grass, or oak woodland fuel types
- Requires an RPF

www.bof.fire.ca.gov/projects-and-programs/calvtp/

California Forest Improvement Program (CFIP)
CAL FIRE

Goals:
- Develop a Forest Management Plan
- Remove surface and ladder fuels across a densely wooded landscape
- Erosion control on existing roads and streams
- Reforestation and site preparation
- Forest stand improvement (precommercial thinning, pruning, herbicide application, etc.)
- Enhance wildlife habitat
- Includes streamlined, programmatic permit

Considerations
- For ownerships in 20- to 5000-acre range
- Requires an RPF

https://www.fire.ca.gov/grants/california-forest-improvement-program-cfip

Key
BLM = Bureau of Land Management
DBH = Diameter at breast height (4.5' from the ground)
RPF = Registered Professional Forester
USFS = U.S. Forest Service

Figure 3. Summary of funding for nonmerchantable fuel-reduction projects

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treatments that use mechanical, grazing, or hand labor techniques. Smoke management plans are required for prescribed fire; during the declared fire season, burn permits from CAL FIRE are required as well (for example, LE-62a, LE-5, LE-6/7).

- **Possible funding resources:** Funded by one or more sources, including the landowner and State or federal incentive programs (see fig. 3).
- **What to watch out for:** Removing too many mature trees can reduce the shade needed to control understory vegetation growth and development of dense surface fuels.

Funding the project

Fuel-reduction projects vary in cost according to type. While some projects must be funded solely by the landowner, others are eligible for grant funds and financial assistance through State or federal agencies. Others still can be financed by a combination of these funding sources. Before implementing a fuel-reduction project, a landowner should understand how much the project will cost and whether the project needs to generate revenue to pay for the fuel-reduction activities.

Revenue from a commercial timber sale

Reducing fuel loading is typically a net cost to landowners. Some landowners utilize Exemptions to produce revenue from commercial timber sales to pay for desired noncommercial fuel-reduction or slash-treatment activities. Exemptions can be desirable because the cost to prepare these permits is less than the cost to develop a Timber Harvest Plan or nonindustrial timber-management plan. As a rule of thumb, harvests conducted using Exemptions are only profitable when stands include merchantable conifers (14 to 28 inches in diameter at breast height) and are within a 1- or 2-hour drive from a mill.

- **Tip:** Exemptions within the California Forest Practice Rules (14 California Code of Regulations, or CCR, 1038) can be useful for quickly and cost-effectively generating revenue. However, most Exemptions require retention of larger-diameter conifer and hardwood trees and prohibit operations in sensitive areas (for example, watercourse buffers, cultural resource sites, and unstable areas). They also require intensive slash treatment within 1 to 2 years following operations. Developing a solid understanding of these costs is recommended.
- **Possible permits:** Exemptions, Timber Harvest Plan, or Nonindustrial Timber Management Plan (see fig. 1).
- **Possible funding resources:** Funded by the landowner and timber harvest revenues.

Grant funding or financial assistance programs for individuals and community projects

Both State and federal financial assistance programs are available to private landowners. Still, each source requires a different application, review process, and standard of environmental compliance and operational restrictions. Under some incentive programs, such as the California Forest Improvement Program, CAL FIRE organizes and manages the landowners' environmental compliance; others, such as California Climate Investments, require that the landowner or sponsoring organization shoulder the responsibility of the environmental review process and permit development. While it is possible to utilize both State and federal funding sources on the same project, keep in mind that doing so increases the complexity of the environmental analyses, requiring additional time and planning.

- **Tip:** For organizations seeking grant funding to implement large-scale projects that yield public benefits, there can be considerable complexities involved. Applying for funding, administering environmental permits, hiring suitable contractors, and coordinating the project can take multiple years and likely will require specialized skills, administrative expertise, and a financing mechanism to cover payments while waiting for reimbursements. Be aware that if a CAL FIRE permit (that is, a Timber Harvest Plan, Nonindustrial Timber Management Plan, Exemption, or Emergency Notice) is not used to meet the requirements of the environmental compliance process, and upgrades to stream crossings are required, it will be necessary to go through permitting with the U.S. Army Corps of Engineers (404 "Waters of the United States" Permit), the Regional Water Quality Control Board (401 Permit), and the California Department of Fish and Wildlife (Lake and Streambed Alteration Agreement).

- **Possible permits:** Projects carried out on private lands or using State of California funding will need to comply with the California Environmental Quality Act through one of several pathways [for example, Negative Declaration, Mitigated Negative Declaration, Categorical Exemption, Programmatic Environmental Impact Report (for example, California Vegetation Treatment Program), or the Forest Practice Rules' Categorical Exemptions (for example, 14 CCR 1038.3)]. Projects carried out on federal lands or using federal funding will need to comply with the National Environmental Policy Act (for example, Categorical Exclusion, Environmental Impact Assessment, or Environmental Assessment).
- **Possible funding sources:** Funded by one or more sources, including the landowner and State or federal incentive programs.

Project size and location

Consider your property size, project area, and project location when selecting a project. What permits are suitable for the property size, proposed project size, and location? Some permits are designed specifically for smaller ownerships.

Smaller ownerships or project areas (less than 500 acres)

Some fuel-reduction permits restrict eligibility based on the total size of your property or parcel, or the total size of your harvest area. For example, several permits in the California Forest Practice Rules are specific to owners of small parcels. The Small Timberland Owner Exemption (1038(f)) is limited to those who own 60 to 100 acres, depending on location; however, the Forest Fire Prevention Exemption (1038.3) is available to those who propose harvest areas smaller than 300 acres (with no restrictions on total acreage or ownership).

Although landowners of all property sizes face land management challenges, fuel reduction on small properties can be expensive because owners of smaller parcels must pay the same fixed costs as owners of larger parcels (for example, for hauling heavy equipment) without the benefit of spreading out the cost among various projects.

- **Tip:** Read the fine print. It's imperative to know the difference between total acreage and ownership versus project area and understand the requirements of potential permits or government incentive programs.
- **Possible permits:** Many Exemptions apply (e.g., 1038(f), 1038.3, and so on; see fig. 1).
- **Possible funding sources:** Funded by one or more sources, including the landowner and State or federal incentive programs (see fig. 3).

Larger ownerships or project areas (more than 500 acres)

Owners of larger parcels face challenges of their own when selecting a fuel-reduction project; however, these landowners can also spread fixed costs over more land and thereby create lower marginal cost in treating each acre. They may also utilize some smaller-scale projects (that is, Exemptions) to target portions of their properties with heavy fuel loads.

- **Tip:** Although treating the entire property may be tempting, be sure to break up the project into realistic and manageable areas. For example, if using an Exemption or Emergency Notice, be sure to select a harvest area that can be feasibly completed in 1 year (including the harvest, road upgrades, and slash treatment).
- **Possible permits:** All Exemptions are available except 1038(f).
- **Possible funding sources:** Funded by the landowner or State (California Forest Improvement Program or California Climate Investments) or federal incentive programs (Environmental Quality Incentives Program).

Project budgets and viability

Several aspects of a fuel-reduction project can add additional or unforeseen costs.

- **Distance to mill or processing facility.** If the project requires hauling materials—whether commercial logs or biomass (that is, chips)—the costs to cover the distance from the project site to the processing facility will add up quickly. Generally, projects should aim to haul materials no more than 2 hours in each direction.
- **Tree species value.** There is a different market and price for each commercial tree species, and the commercial value by species can change over time. Removing lower-value species (for example, white fir and grand fir) generates less revenue than higher-value species (for example, coast redwood, cedar, and Douglas-fir). Hardwoods generally have little to no commercial value in California.

- **Timing activities.** Some permits limit activities to a particular time of year, an issue that should be addressed early in the permitting process. For example, Exemptions are only valid for 1 year, with an additional 6 months to 1 year for pile burning. Fuel-reduction activities can disrupt wildlife species as well, and activities may be restricted until after breeding and nesting season, usually after July 31, depending on species and location.
- **Roads.** Before preparing a permit, be sure to assess and understand the condition of the roads needed to conduct the work and if any upgrades are required. Legacy road issues, such as poorly sized culverts, washouts, and alignments are liabilities, and these fixes can be expensive. Most grant and incentive programs generally do not fund road maintenance as part of fuel-reduction projects. The permit review process usually includes the identification of controllable sediment discharge sources along roads. Actions to control these sediment sources are typically considered "mitigations" under the California Environmental Quality Act and may not be funded by grant programs. Therefore, it is crucial to estimate the potential expense of road upgrades before developing fuel-hazard reduction projects; in this way, grant funding can be used to upgrade sediment sources proactively before they become required "mitigations" associated with the permitting process.

Conclusion

Increasing the pace and scale of fuel management can help achieve wildfire resiliency while also protecting cultural and environmental resources identified through the environmental review process. California's regulatory system has an array of streamlined permitting pathways (for example, Exemptions and Emergency Notices) that recognize the urgency and the lower risk of environmental impacts inherent to these activities. For the novice, the range of permits can be daunting, and it will be helpful to consult with a Registered Professional Forester to navigate the rules. Keep in mind that when developing a project, permitting feasibility needs to be a key consideration from the start. Fuel-reduction activities are increasing in California because many landowners are utilizing streamlined fuel-reduction permits, government incentive programs, and multiownership agreements to improve landscape-scale fuel-reduction effectiveness.

Additional resources

For additional information, and resources about private forest management, please see the following:

- UC ANR Publication 8249. Laws and Regulations Affecting Forests, Part I: Timber Harvesting. Learn about commercial timber harvesting projects, anrcatalog.ucanr.edu/pdf/8249.pdf
- UC ANR Publication 8245. Wildfire and Fuel Management. Learn about fuel-reduction strategies, anrcatalog.ucanr.edu/pdf/8245.pdf
- UC ANR Publication 8386. Recovering from Wildfire: A Guide for California's Forest Landowners. Learn about forestland and property restoration and recovery after a wildfire, anrcatalog.ucanr.edu/pdf/8386.pdf
- UC ANR Publication 8250. Laws and Regulations Affecting Forests, Part II: Activities Other Than Timber Harvesting. Learn about other permitting requirements that may influence your project, anrcatalog.ucanr.edu/pdf/8250.pdf

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