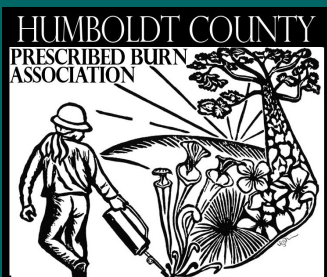




# HUMBOLDT COUNTY PRESCRIBED BURN MANUAL



presented by the  
**Humboldt County Prescribed Burn Association**  
in collaboration with the  
**Humboldt County Fire Safe Council**  
*version 3.2023*  
*current version available on [humcopba.net](http://humcopba.net)*

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*Terms and phrases in italic gray are hyperlinked to their definition in the Glossary at the end of this document.*

Phrases in Underlined Aqua are hyperlinked to web resources.

Photos are hyperlinked to the Photo Credits and Info.

## **Introduction**

Fire has played an essential role in Northern California for eons. Every indigenous species evolved in the company of fire, and adapted to endure, exploit, or even depend on its effects. Early human inhabitants integrated it into their culture and developed the knowledge and skills to use it to adapt their environment.

There have been many changes to the ecosystem since colonization, but experts agree that aside from climate change, the 80-year policy of fire exclusion is one of the dominant factors driving the increasingly devastating wildfires impacting our region. While some members of the fire community have long recognized what the indigenous people hold as self-evident, that fire is an essential part of the landscape, the reintroduction of beneficial fire by land management agencies has fallen short of what is needed to return to a balanced fire regime. In recent years, Northern California tribes such as the Karuk and Yurok have begun to reclaim the right to safely reintroduce fire on their ancestral lands. Joined by neighboring private landowners and supported by developing relationships with public land management agencies, they are leading the way into a new era defined by a shared vision for fire reintegration.



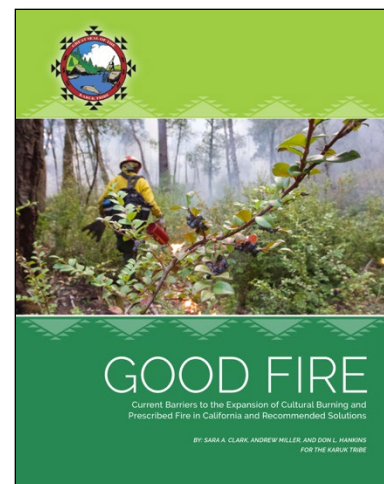
Downstream on the coast, the Humboldt County Prescribed Burn Association has built on this foundation to develop a partnership between a range of stakeholders, from ranchers to homesteaders and environmentalists to heavy equipment operators, with a healthy portion of fire professionals bolstering their numbers. Since 2017 this group has successfully accomplished more than two thousand acres of burning and is developing the capacity to implement landscape-scale

projects in the challenging terrain of the wildland-urban interface zones.

This manual is intended to help landowners, land stewards, and community members navigate the process of planning and implementing safe and effective prescribed burn projects on private property. While the effects and functions of fire are fairly consistent, the social and regulatory structures that exist around its use are constantly changing. Please check the release date of this manual and ensure you are referencing the most recent version, and be aware that rules or regulations may have changed since the last update.

## **Challenges**

There are inherent challenges to implementing beneficial fire, and this Manual is designed to help landowners understand and overcome them. One of the first questions many people have when they consider the prospect is how much liability is incurred by landowners and fire practitioners.





The short answer to this complex question is: *Probably less than you think*. For some time now in California, the perception of liability has been a greater deterrent than the actual legal risk to prudent practitioners. For more information check out the UCCE paper on [Prescribed Fire Liability in California](#), or the extensive [Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions](#) produced by the Karuk Tribe in 2021.

## Goals and Objectives

One of the first things you'll need to determine is what general goals and specific objectives you want to accomplish by reintroducing fire to your property. This will help determine the size, complexity, and timing of your burn. [Some common goals of prescribed fire are:](#)

### *Meadow and Oak Woodland Restoration.*

Over the last century we have lost a significant portion of the prairie and oak woodland in Northern California and throughout the Pacific Northwest. The exclusion of fire has allowed the faster-growing conifers to [overtake and suppress the fire-adapted oaks](#). People in our area have been burning to promote healthy oak groves for thousands of years, and fire has always played an important role in their culture and agriculture.



*Rangeland Improvement.* Ranchers were some of the last to put down their torches when fire suppression policy shifted in the 1920's, and they have been among the first to take them back up in this new era. There are many ways that fire can benefit grazing land, from brush removal to invasive species management, and because it requires minimal preparation, grassland often provides some of the least complex burn projects.

### *Fire Hazard Reduction and Forest Resilience.*

Nearly a century of fire exclusion, combined with a changing climate, has set the stage for our current environment of massive, fast-moving and extremely destructive wildfires, manifesting a tangible atmosphere of apprehension in local communities. It has been said that action is the antidote to fear, and prescribed burning is one of the most effective tools we have to reduce the potential for catastrophic fires.



## Project Area

Once you know what you want to accomplish, we'll look at where it will take place. The location will determine two major factors: topography and *fuel type*. What is the lay of the land, and what vegetation is there? Fuel type, as well as *fuel loading*, will have a large impact on *fire behavior*, and will influence which season will be most suitable for your burn. The *slope* and *aspect* will also heavily influence your planning.

Another major consideration for the burn area is where your *control lines* will be located. Some *fuel types*, such as those found in oak woodlands, can be burned during winter dry spells with minimal, if any, control lines. Most dry season burns require some kind of *fireline* to contain them.



## Control Lines

We start by looking for existing barriers, such as roads, waterways, and rock outcroppings—anything without accessible fuel. If we need to install firelines, some of the key factors are:

- **Location:** Determine where your firelines will be most effective, often on ridges when they're available. *Holding lines* located in the bottom of steep ravines or mid-slope on steep inclines are less likely to be effective barriers to fire escape, especially in heavier fuels.
- **Environmental impact:** Choose a location and type of fireline that will cause the least environmental damage and still satisfy your needs. While ridges are often the best locations to avoid erosion damage, they may also harbor native botanical species, so it is important to consider all factors and evaluate each site individually.
- **Type of Threat:** Pay attention to what types of heat transfer are likely to challenge your line. In heavy fuels on steep slopes for instance, you need to prepare for potential *roll-out* by using a road or installing a *cup trench*. Alternatively, *jackpots* or *snags* located on a ridge are likely to produce wind-borne embers and will have to be mitigated or require a greater distance from the fireline.



- **Fuel Types:** If your project includes multiple fuel types, you may be able to take advantage of this with your holding line location. Grassland burns can often be controlled with a mowed line, which is low-impact and easy to install, so changing the shape of your unit to locate a fireline in light fuels instead of timber may decrease the effort and impact of your line construction.
- **Line Construction:** Hand tools, leaf blowers, mowers, and heavy equipment are all tools that are commonly employed in various



types of line construction. The type and dimensions of your control line will be dictated by your project conditions. In light fuels, the rule of thumb is to make your lines 1.5 times as wide as the height of adjacent fuels. In heavy fuels it is often necessary to clear a path 3'-6' wide, and down to mineral soil.

- **Stacking functions:** Where possible, locate prescribed burn holding lines where they would also be useful to control a wildfire. This may be downslope from a residence, or in the direction of the dominant wind or potential ignition source. Another option is to install them in areas where they will be used for functional or recreational access. Firelines that double as firewood access roads or mountain bike trails are more likely to be regularly maintained, keeping them functional for future use.
- **Project Size:** A bigger burn isn't necessarily harder to accomplish. If there are natural barriers or optimal holding locations that will increase the size of the burn but also make it easier to contain, that may increase your chances for a successful burn.

### Exposures and Hazards

*Exposures* are the valuable features of your property that you don't want to damage with your burn. These include structures and infrastructure, as well as ecological and cultural assets. It is important to explore a potential burn unit early and often, with the goal of identifying high value or sensitive habitats such as elder trees, large snags, wetland and spring areas, Acorn Woodpecker granaries, raptor nest sites, and areas with intact native species of wildflowers and grasses. These surveys will have a large impact on both your planning and preparation.

*Hazards* are anything that may endanger personnel during a burn or make the fire harder to contain. Some common hazards are snags, powerlines, cliffs, rocky slopes, and jackpots. Hazards should be mitigated to the extent feasible and communicated to all personnel involved in burn planning and execution. If powerlines are present on a project site, it is a good idea to contact the utility company well ahead of the burn target date. Not only will they potentially be willing to perform fuel reduction along the lines, but they may also be able to provide a wildland engine during your burn to further protect their infrastructure.

### Burn Season

Timing is one of the greatest challenges in prescribed burning. First you have to identify the weather and fuel conditions that will allow you to effectively accomplish your goals. At its simplest, this boils down to: dry enough that fire will consume the target fuels and move through the project, and not so dry and/or windy that you lose control of it. Then you make an educated guess about when those conditions will appear. This is one of the places that the



“citizen burner” model really shines, because it benefits from the landowners’ knowledge of local weather patterns. There are so many unique microclimates in Humboldt County that nobody knows each one as well as the people living in them.

### Out-of-Season Burning

If you are able to accomplish your objectives outside of fire season, that can simplify the process. Declared fire season in our area typically starts on May 1<sup>st</sup> and extends until CAL FIRE declares it over, often as late as November or even December. Outside of this window, the only legal requirements are that you acquire the necessary permits from the [North Coast Unified Air Quality Management District \(NCUAQMD\)](#), and act prudently in your operations. Unfortunately, there are a limited number of projects that can be burned in the wetter months, but if you are lucky enough to have the right conditions on your property, it pays to take advantage of them. For instance, oak woodlands with good southern exposure [can often be successfully burned](#) in the dry “Juneuary” spells that Humboldt County often experiences in January and February. There are ecological considerations that should guide burn timing as well. For example, burning in the fall may sync better with certain fire adapted native plant species and help avoid smoke impacts to nesting birds, while the beginning of summer is the best window to target invasive species such as medusahead.

### In-Season Burning

Due to our fuels and topography, much of the burning that needs to be accomplished in Humboldt County will have to be done during what are referred to as the “shoulders” of fire season; generally, May-June and September-November. Burning during fire season adds some complexity and regulatory oversight, but the added challenges are far from insurmountable. We are very lucky in our area to have the support of CAL FIRE at every level of leadership, as well as an Air Quality District that recognizes the benefits of prescribed burning and strives to work with us to make it happen. In order to burn during fire season, you will need to acquire a CAL FIRE permit in addition to the NCUAQMD permits.

### Leadership

The timing and complexity of your burn will help determine what kind of leadership and command structure will be required to safely and effectively accomplish your goals. For a winter oak woodland burn you may just need some guidance from another landowner with burning experience, and a few friends and neighbors with ignition devices. For an in-season



burn you will need an experienced leader and depending on the size and complexity of your project, it may be prudent to hire a certified *Burn Boss* to fill this position. Hiring a Burn Boss will definitely increase the expense to your project, but it can also provide some peace of mind. Not only will they bring training and experience, but they will usually be operating with an insurance

policy which can provide some financial protection. Some contractors, such as cultural practitioners or those qualified as [California State Burn Boss \(CARX\)](#) or federal [Prescribed Fire Burn Boss \(RXB2, RXB1\)](#), will also have access to the [California Prescribed Fire Claims Fund](#), further limiting your exposure. There are only a handful of qualified Burn Bosses currently serving our area, but that is likely to change as the political climate is rapidly adapting to the recognized need for increased burning in California. At this time, you can expect to pay anywhere from \$500 to \$3500 for a *burn plan*, and \$1500 to \$2000 per day for a Burn Boss to lead your burn. It is worth pointing out that there is no law requiring you to hire a Burn Boss; it is your right as a California landowner to implement prescribed fire in a safe manner on your property.

### **Burn Plan**

The purpose of a *burn plan* is to provide details about the project, including: a description of the burn area, target weather conditions, exposures and hazards that may be encountered, personnel safety issues, and notifications that should be made prior to burning. Depending on the season and complexity of your burn, this might be a single page with a basic outline of goals and tactics. During fire season you will need a more robust guiding document, and probably your best bet is to work with the [California Standardized Prescribed Fire Plan template](#). If you have chosen to hire a Burn Boss, they can help you develop the plan. This is the “prescription” part of prescribed burning and is where you identify the specific values and challenges relevant to your project and determine how you intend to accomplish your goals. Your burn plan serves as a roadmap, laying out the conditions that will lead to success, and the amount of support you will need to get there. An additional benefit of having a robust plan is that it is easier to determine whether you have accomplished your objectives when they are clearly defined.

### **Planning Support & Funding Opportunities**

There are several funding options available to Humboldt County residents. The [National Resources Conservation Service \(NRCS\)](#) is probably the most prevalent funder of non-agency burn projects in Humboldt at this time. Their [Environmental Quality Incentives Program \(EQIP\)](#) can fund everything from burn plan development to burn implementation, including fireline construction and fuel reduction. Keep in mind that the original application may take a substantial amount of time and effort to put through. It’s also worth noting that the cost of fuel reduction will generally exceed reimbursement rates, and in steep areas with thick vegetation it may be by a large margin.

[CAL FIRE’s California Forest Improvement Program \(CFIP\)](#) is a cost-share reimbursement program that can help fund a comprehensive forest management plan, precommercial thinning, pruning, and follow-up slash disposal. These forest improvement practices can be used to mechanically reduce fuel loads and prepare timberland for broadcast burning. [The Fire-adapted Landscapes & Safe Homes Program \(FLASH\)](#), offered by the [County of Humboldt](#) in service of the [Humboldt County Fire Safe Council](#) mission, is another option for financial support for fuel reduction work, which may also serve as burn prep. While the contract totals are lower than other funding sources (generally less than \$4500), the required documentation is considerably less than other programs.



[The University of California Cooperative Extension \(UCCE\)](#) is an essential partner in our region’s prescribed fire movement. Not only are they an excellent resource for fire publications and online tools, but their advisors fill key roles in the organizations supporting private burning in our region. Their work helps guide long-range regional planning and influence critical state and federal policy change. With all this in their mission, they still find the time to help individual landowners navigate the road to prescribed fire implementation, providing assistance with everything from planning and permitting to direct fireline support.



## **Permitting**

### **Air Quality Permits**

With the exception of small recreational or ceremonial fires, any time you are open burning in Humboldt County you will need a burn permit from the [North Coast Unified Air Quality Management District \(Air Quality District\)](#), the agency responsible for ensuring that prescribed fire practitioners meet the standards of the [California Smoke Management Guidelines](#).

Fortunately, our District recognizes the benefit of prescribed fire and is very supportive of burn projects in our area. While the air quality regulations may seem burdensome, keep in mind that these people are important allies in our work, and if you treat them with respect, they will do everything in their power to help your project succeed. [Standard](#) permits allow the burning of one 4’x4’ pile at a time, between 6am and 12pm. [Non-Standard](#) permits are renewed annually and allow one 10’x10’ pile at a time, from 6am until one hour before sunset, on declared “Burn Days” only. Costs range from \$40-\$1250 depending on the size of your project.



A [Smoke Management Plan \(SMP\)](#), combined with a Non-Standard Permit, will allow you to conduct broadcast burning, as well as burn multiple piles simultaneously. The SMP is like a Burn Plan for your smoke; it is designed to ensure that the emissions from your project don’t negatively impact your neighbors or at-risk members of your community, or diminish the visibility on nearby thoroughfares. SMPs are good for two years and cost \$65. One element of the SMP that will have a significant effect on your project is the “wind prescription.” In order to avoid negative impacts, you will need to refrain from ignition, or be prepared to control your burn, when the wind blows from specific identified directions. It is worth noting that on the day of your burn, you may be able to get authorization from the Air Quality District to override this prescription if you can provide a compelling argument for why the smoke will not cause a negative impact. For more information, please refer to the [HCPBA SMP Guide](#).

There is currently a grant subsidizing the cost of air quality permits for public benefit burn projects. The application is straightforward and certainly worth pursuing, especially for larger projects. If you are applying for a fee waiver, do not use the online portal to apply for your burn permit; submit the burn permit, SMP, and [Fee Waiver Application](#) directly to [support@ncuaqmd.org](mailto:support@ncuaqmd.org). One other NCUAQMD permit you should be aware of is the [No Burn Day Permit](#), which may be granted in cases where it can be shown that refraining from burning on a particular day will threaten imminent and substantial economic loss.

### CAL FIRE Permits

Once you have the appropriate air quality permits in hand, if you're planning a burn outside of fire season, you're good to go. For in-season burns within the [State Responsibility Area](#), you will also need to [go online](#) to acquire an LE-5 Burning Permit for small pile burning or an LE-7 Project Type Burning Permit for your broadcast burning. Keep in mind that CAL FIRE will often be busy during the height of fire season, so get your application submitted as early as you can. For a fall burn it is a good idea to secure your CAL FIRE permit in the spring or early summer. If your application is approved, you will be issued an LE-8 in addition to the permit, which lays out the Minimum Precautions for Project Type Burning. This will often stipulate a minimum number of personnel, number and type of fire engines, water requirements, and preparation such as fuel reduction, line improvement, and possibly operational details such as which sections need to be "pre-plumbed" with fire hose before ignition.

### Site Preparation

Depending on the fuel type, site preparation may turn out to be the bulk of your workload. In timber areas with a dense understory, it can take a large amount of strategic fuel reduction before you'll be able to safely execute a burn. Referring to your list of exposures and hazards, you can develop a plan to protect and mitigate them. You may choose to strategically reduce the fuel around an exposure; for instance, healthy mature trees will generally fare well during a well-timed burn, but if there is an abundance of heavy fuel, excessive *ladder fuels*, or a jackpot under a tree that you have an attachment to, it is a good idea to remove them before your burn.

The question is often asked, "how much preparation do I need to do?" While it may not be necessary to do any fuel reduction, generally speaking the better prepared your project is, the wider the range of conditions you can burn in, and the greater the number of potential burn days you will see. Reducing the *horizontal and vertical continuity* 20'-30' on either side of your control lines is a great way to increase the size of your *burn windows*. Similarly, reducing the fuel loading around a structure not only supports your burn





project, but increases its *defensibility* against wildfire as well. Another approach that can be used in conjunction with this is *home hardening*, which makes the structure less susceptible to fire damage.

Depending on the exposure, you may be able to temporarily remove it from the project area. One common challenge we encounter when burning in Southern Humboldt, is the prevalence of above-ground water pipes. Underground waterlines are of course more resistant to wildfire and other damage, so if burying them is an option, the prescribed burn may be a good excuse to do so. Sometimes it is the underbrush that has impeded undergrounding the systems, and the preferred solution would be to remove the pipes, conduct the burn, and then take advantage of the reduced understory to trench the line. Alternatively, you may decide to exclude a given area from your burn project, but keep in mind that this solution leaves these exposures vulnerable to wildfire.

There are a number of tactics that can be employed to accomplish your fuel reduction goals. During the wet season it is often most cost effective to use chainsaws and pile-burning to reduce the ground and ladder fuels adjacent to your holding lines. During fire season, brush chippers or *masticators* may be employed. Depending on the fuel loading, *lop & scatter* may be an effective technique, either on its own or combined with one of the other fuel reduction methods. The [Living with Wildfire](#) publication is an indispensable resource for fuel reduction and home hardening information, as well as many other relevant subjects.

There is a saying in prescribed fire that “every day is a burn day” because regardless of the weather, there is always some work to be done to further the goals of beneficial fire: When it’s unsafe to burn we work on preparing our units, and when it’s too wet to prep we stay busy with planning and permitting.





## **Operational Support**

### **Humboldt County Prescribed Burn Association**

The lead organization providing logistical and planning support for the non-agency prescribed burn community in Humboldt County is the [Humboldt County Prescribed Burn Association \(HCPBA\)](#). They supply their members with tools such as *drip torches*, hand tools, backpack sprayers, leaf blowers, and even “slip-in units,” which transform a pickup truck into a small fire engine. The nature of the organization is that each member is expected to help out on a couple of burns, after which they are eligible to receive the support of the rest of the membership on their own project. Not only can the membership provide much of the personnel for a burn, but the HCPBA can also provide technical support, such as assistance in planning and permit applications, and they can act as a liaison to CAL FIRE and the local Volunteer Fire Departments (VFDs). The HCPBA is supported by grant funding, as well as [membership dues of \\$25/year](#).

### **Volunteer Fire Departments**

The bulk of the operational support on landowner burns in Humboldt County is provided by the Volunteer Fire Departments. Refer to the [Humboldt County Fire Protection Services](#) page for more information, such as the Fire Services Web Map and the Humboldt County Fire Chiefs’ Annual Report, which includes VFD contact information. If there is a fire department serving your area, they will likely be familiar with your local conditions and able to offer cost-effective service. Most fire departments recognize the value of supporting prescribed burn efforts, both for the training potential as well as the benefit in terms of fire hazard reduction. It is common to see volunteer fire crews traveling an hour or two to take part in a burn, and costs are often in the neighborhood of \$250-\$300/day.



### **Burn Boss Contractors**

In addition to their role in planning support and operational leadership, [Burn Boss contractors](#) often have the ability to provide *holding and suppression resources*. While it can be easier to get a commitment to a set date from a contractor than from a VFD, it comes at a price; you can expect to pay somewhere around \$3000 a day for each wildland engine.

### **CAL FIRE**

The Humboldt/Del Norte CAL FIRE Unit is very supportive of safe landowner-led burn projects. While they can’t usually commit *resources* to a burn, they will often send an engine

or two to as *contingency* resources when they are available. Also, if your burn is identified as a high priority for public safety, it is possible that either CAL FIRE or the [California Conservation Corps](#) may be able to provide a hand crew to help prep your burn site.



### Training & PPE

While most fire suppression agencies engaged in prescribed burning share the same standard for *Personal Protective Equipment* and [wildland fire training](#), there is no regulation mandating that private fire practitioners follow suit. The Humboldt County PBA requires its members to wear long sleeved shirts and pants made of either natural fibers such as cotton or a fire-resistant material, and leather boots and gloves. Additional equipment such as a hardhat with fire shroud may be advisable, but keep in mind that no safety gear will do as much to protect you as training, experience, humility, and prudent decision-making.

While not required for private burners, wildland fire training can help increase your safety and effectiveness as a prescribed burn participant. Some useful courses can be found online such as [Wildland Fire Behavior](#) and [Firefighter Training](#), and live trainings are occasionally available through the Humboldt County Prescribed Burn Association.

### Public Outreach & Notifications

One of the most essential elements of a successful burn is adequate public outreach. Engage your neighbors early in the process and keep them informed as the plan evolves. One of the best ways to ensure the support of adjacent landowners is to collaborate with them, if they're willing. This might mean planning a project that includes multiple properties, or it may be as simple as recognizing that one completed project will make the next one easier to accomplish. A common example is that when the top of a ridge is burned, it becomes much easier and safer to burn the areas downslope. Your Burn Plan and SMP will outline how your outreach will be implemented and which specific entities must be notified directly, but the bottom line is this: the more communication the better. You will be expected to make direct contact with fire agencies, as well as nearby schools, hospitals, and any other *sensitive receptors* who could potentially be impacted by your smoke. For your public outreach, radio, news blogs, and social media are all effective methods to spread the good word. For members of the HCPBA, their Public Information Officer will help get your information out.





## **Burn Scheduling & Timeline**

As mentioned above, one of the biggest challenges in prescribed burning is determining ahead of time when your project will come into prescription. For small or out-of-season projects, with limited resource needs, you may be able to keep your timing flexible. This allows you to monitor site conditions and wait for the best possible window to conduct your burn. When you recognize that weather and fuel conditions are coming into alignment, you'll contact a few neighbors, fuel up the drip torches, and get out there!

However, for most in-season burning you will need to set a target date well in advance, in order to ensure that the required personnel and apparatus will be available when you need them. You may want to consult with local firefighters and longtime residents to estimate the most likely window to meet your prescription. Once you have a ballpark idea of your timing, you'll work with your support resources to establish a target date that everyone can commit to. It's often a good idea to set this date on the earlier side of your predicted window, because you may need to adjust it when you get closer, and it's usually easier to push a date back than to move it up. If your burn has a variety of aspects and fuel types, with established unit breaks, it will increase the potential that somewhere on the project will be in prescription on your target date. Another possibility is to coordinate with neighboring projects to accomplish the same versatility.



## **One Month Out**

By this time, you should have all of your permits in hand, a tentative date set for your project, and commitments from at least the minimum resources your project requires.

## **Week of Burn**

As your target date approaches, you'll be keeping a close eye on the site conditions and weather forecasts. It is worth spending some time getting to know what resources are available on websites such as the [National Weather Service](#). In addition to the standard forecasts, they also have features like the [User Defined Area Forecast](#), which gives detailed predictions for specific areas, and [Forecast Discussion](#), which includes regional Fire Weather information. Apps such as [Windy](#) may also provide valuable planning information.

Your ability to burn will also be dependent on the availability of suppression resources in case of an escape. Even if conditions are mild in our coastal county, events in other parts of the state may create a drawdown on local resources. It's a good idea to reach out to your CAL FIRE Battalion Chief or local VFD a few days before the burn and get an idea of how many suppression resources are available within the Humboldt/Del Norte Unit.



It is important that everyone on the burn knows their roles and responsibilities. On a complex project, the Burn Boss will likely implement the *Incident Command System*, to ensure personnel accountability, efficiency, and cohesion. While this system may not be necessary on a simpler project, it is essential that everyone knows what is expected of them, and that you know where your people are at all times during the burn.

You'll also put together an [Incident Action Plan](#) (IAP), which will be either a verbal or written operational briefing, informing all participants about the goals and objectives for the burn, as well as potential safety hazards and the emergency plans in case there is an accident or injury, or an escape.

One important component of the IAP is communications. If you will be using radios, it is important to identify what frequencies will be used and ensure that they are accessible to your crews. If you are not familiar with radio usage, it's a good idea to find someone who is and assign them to a communications leadership role. For HCPBA members, there are radios that can be checked out of the cache, which are preprogrammed with appropriate channels.

Finally, consider being prepared to feed your team! Not only do firefighters and burners work better on a full stomach, but they're also more likely to come out for your next burn if you take good care of them. Make sure that you're clear in your outreach about what to expect. If you're not serving food, or if you expect people to bring their own lunches but you plan to provide a meal after the burn, ensure that this is clearly communicated. At a minimum, ensure that you have drinking water available onsite.



### 1-3 Days Out

Establish your final headcount, and if everything is a go, make the final purchase of perishable food.

Contact the Air Quality District and request a burn authorization number. Be prepared to give a report on weather conditions and predictions and ensure that they meet the prescription in your Smoke Management Plan. If your burn will be on a weekend, make sure you call on Friday to acquire approval and your number. Check the [Burn Day Forecast](#), and if it's looking likely that your target date will be on a No Burn Day either postpone your burn or submit an application for a No Burn Day Permit. The Burn Day Status is typically updated after 5pm for the following day.

Confirm that all of your resources know where and when they will be meeting, and what they are expected to bring.

### Day of Burn

The big day is finally here! Your plan will be dependent on the project size and complexity, but this order of operations is fairly standard for in-season burns.

1. You or your designated leader will conduct an operational and safety briefing, ensuring that everyone involved understands the Incident Action Plan, including any hazards onsite, and knows what to do if things go sideways. Take this opportunity to confirm that everyone is planning to stay for the duration of the operational period, and if anyone needs to leave early that they will check in first to maintain accountability. This is also when you'll be performing final checks on site and weather conditions to make sure you're within prescription on your burn and smoke plans, and if you're utilizing a [Go/No-Go Checklist](#) this is when you'll review it.
2. If everything checks out, you'll inform the CAL FIRE Emergency Command Center that you're beginning ignition. Then you'll initiate a *test burn*, in an area that is representative of the rest of the unit, and where you're confident you'll be able to control the fire. If the fire behavior is consistent with your goals, you can move on with the ignition plan laid out in your Incident Action Plan.
3. Every project will be approached differently, but the firing plan will often have you begin by igniting the top or downwind side and allowing a *backing fire* to work its way through the unit. Once enough of the fuel has been consumed adjacent to your holding lines, you will be able to introduce *head fires* in specific areas, if more heat is needed to accomplish your goals.
4. If there are multiple burn units, the bulk of your resources will move across the landscape along with the fire, leaving appropriate suppression resources in each unit to manage residual burning.
5. Once ignition is complete, all resources will move into a *patrol* and management stage. If the fire is in light fuels, there may not be active fire at this point, and it may be time to feed the crew and begin the "demob" or *demobilization* process. On timber projects, there will be more work to be done, but you might be able to cycle crews through a mess station or deliver food to the line.
6. Before your team starts to depart, you'll want to hold a *Debriefing*, including an *After-Action Review*. This is an important opportunity to have a quick roundtable discussion about how the project went. Try to keep this positive but honest, and include any lessons learned that could benefit future burns.
7. The final patrol stage will continue for several days. Regardless of whether you're *mopping up* or allowing the fire to consume the interior of the unit, your permit will require you to continue monitoring the project until you have gone at least three days without discovering a single smoke. You will also need to acquire daily Burn Authorization Numbers (and potentially No Burn Day Exemptions) for any day where you have the equivalent of at least a quarter acre of fuel still being consumed.





### Our Future

If this all sounds like a daunting process, keep in mind that the first burn is the hardest. Much of the work that you'll do to prepare, from burn planning to fireline installation, can be "freshened up" and used again in subsequent burns. Your neighbors will have already experienced a successful burn and hopefully recognized its benefits, as well as the limitations of the risk you're collectively assuming. The bottom line is that prescribed burning plays a critical role in reducing the catastrophic damage of

wildfires. We have the ability to restore beneficial fire to our ecosystem and protect our homes and families in the process. While this may seem like a challenging objective, it is one that can be achieved by a community with enough cohesion, determination, and willingness to put the work in. If you're planning a burn, you're taking the first step towards supporting this lofty goal.

### Author

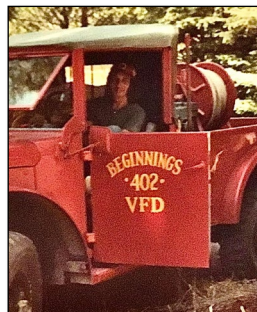
Kai Ostrow is a Fire Captain with the Briceland Volunteer Fire Department, Southern Humboldt Chapter President of the Humboldt County Prescribed Burn Association, member of the Humboldt County Fire Safe Council, and looking forward to your successful prescribed burn!



### Acknowledgements

Thanks to Tanner Speas, Julia Cavalli, and Cybelle Immitt for their invaluable contributions; Diana Totten for inspiring a generation of professional volunteers; Lenya Quinn-Davidson for leading the way into this new era of community-based fire management; and all of our friends and neighbors who are taking up the torch to support the return of good fire!

***This manual is dedicated to Tao Ryce, Tony Mengual, and Tim Olsen,  
whose memory lives on in our work.***





## **Resources**

[Living with Wildfire in Northern California](#)

[Cultural Fire Management Council](#)

[Humboldt County Community Wildfire Protection Plan](#)

[CAL FIRE Prescribed Fire Guidebook](#)

[California's Strategic Plan for Expanding the Use of Beneficial Fire](#)

## **Glossary**

**Aspect:** Cardinal direction toward which a slope faces, influencing fuel type and conditions.

**Backing fire:** That portion of the fire with slower rates of fire spread and lower intensity, normally moving into the wind and/or down slope.

**Burn Boss:** Individuals that are qualified to plan, organize, and execute prescribed burns. Highest position in the prescribed fire command structure, sometimes referred to during implementation as Incident Commander. May hold certifications such as the federal Prescribed Fire Burn Boss Type 1 or 2 (RXB1, RXB2) or state certification such as the California Burn Boss (CARX).

**Burn complexity:** Interconnectedness and dependence of the individual elements as they relate to the planning and implementation of the prescribed fire. Higher complexity projects often require more robust plans and preparation, and more resources to accomplish.

**Burn plan:** A written prescription for the prescribed fire including critical elements such as the weather conditions under which the burn will be conducted, number of personnel and duties of each, and the type, amount and placement of equipment needed to safely conduct the burn.

**Burn windows:** When the environmental variables such as fuel moisture and weather conditions are balanced so that the fire will accomplish its objectives (reducing fuels, modifying wildlife habitat, restoring ecological function) while remaining under control.

**Control lines:** An inclusive term for all constructed or natural barriers and treated fire edges used to control a fire.

**Contingency:** A provision for an unforeseen future event or circumstance which is possible but cannot be predicted with certainty.

**Cup trench:** A fireline trench on the downhill side of fire burning on steep slopes that is designed to catch rolling firebrands that could otherwise start fire below the fireline. A high berm on the outermost downhill side of the trench helps the cup trench catch material. May need to be “rehabbed” following the burn to prevent erosion.

**Defensibility:** The extent or quality of which something can be protected from the damages of fire.

**Demobilization:** The orderly, safe, and efficient return of an incident resource to its original location and status.

**Drip torch:** Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

**Exposures:** Property or other values that may be endangered by a fire.

**Fire behavior:** The manner in which a fire reacts to the influences of fuel, weather, and topography.

**Fire hazard reduction:** The abatement of a fire hazard by methods that include but are not limited to separation, removal, scattering, lopping, crushing, piling and burning, broadcast burning, burying, or chipping.

**Fireline (or Firebreak):** The part of a containment or control line that is scraped or dug to mineral soil.

**Firing Group Supervisor:** Individual responsible for firing resources. Generally, answers directly to Burn Boss or IC.

**Firing Resources:** Personnel assigned to ignition activities.

**Flanking Fire:** a line of fire that parallels the wind direction. The duration, amount of fuel consumed, and temperature achieved are in between those experienced with backing and head fire.

**Forest resilience:** the ability of a forest to absorb disturbances and re-organize under change to maintain similar functioning and structure

**Fuel loading:** The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight.

**Fuel type:** An identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions.

**Hazards:** Any real or potential condition that can cause injury, illness or death of personnel, or damage to, or loss of equipment or property. The root cause of an unwanted outcome.

**Head fire:** A fire spreading or set to spread with the wind or slope, generally burning hotter and moving faster than a backing or flanking fire.

**Holding Group Supervisor:** Individual responsible for holding resources. Generally, answers directly to Burn Boss or IC.

**Holding lines:** The control lines or fireline used to “hold” the fire in the desired containment area.

**Holding resources:** Suppression resources that assigned to keep the prescribed fire inside the containment area and manage fire intensity.

**Home hardening:** Using fire-resistant materials to defend your home against windblown embers and fire.

**Horizontal continuity:** The degree or extent of uninterrupted distribution of fuel thus affecting a fire's ability to sustain combustion and spread laterally across the landscape.

**Incident Commander:** Highest position in the prescribed fire command structure. Alternative term for “Burn Boss,” often encountered on prescribed burn projects lead by organizations that also have fire suppression responsibilities.

**Incident Command System:** A standardized approach to the command, control, and coordination of on-scene incident management, providing a common structure within which personnel from multiple organizations can be effective. It is used for all kinds of incidents and is scalable to fit the full range of incident sizes and complexity levels, including planned events.

**Iship:** Extinguishing or removing burning material near control lines, felling snags, and trenching logs to prevent rolling after an area has burned, to make a fire safe, or to reduce residual smoke. Traditional Karuk alternative to the term “mop up.”

**Jackpots:** Natural or modified concentrations of vegetative or wildland fuels.

**Ladder fuels:** Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

**Lop & Scatter:** A hand method of removing the vegetative ladder fuels with saws and spreading the fuels out, to increase the decomposition rate, to lower the fire hazard or as a pretreatment prior to burning.

**Masticator:** Similar to a woodchipper, it is mounted on a piece of equipment which moves through the forest to grind or chip trees and brush, leaving the chips behind.

**Meadow restoration:** The process of removing unwanted non-meadow type vegetation and allowing meadow type native species to be reintroduced as the dominate species.

**Mop up:** Extinguishing or removing burning material, felling snags, and trenching logs to prevent rolling after an area has burned, to make a fire safe, or to reduce residual smoke. Due to its militaristic origin, and the negative connotations for indigenous people, this is one of the common fire terms that are being revised in some circles. For example, the Karuk use their traditional term “iship” to describe the same operational principle.

**Oak woodland restoration:** The process of removing unwanted non-oak woodland type vegetation and allowing native oak species to be reintroduced as the dominate species.

**Patrol:** To go back and forth vigilantly over a length of control line during and/or after construction to prevent breakovers, suppress spot fires, and extinguish overlooked hotspots. A person or group of persons who carries out patrol actions.

**Personal Protective Equipment (PPE):** That equipment and clothing required to mitigate the risk of injury from, or exposure to, hazardous conditions encountered during the performance of duty. PPE includes but is not limited to: fire resistant clothing, boots, hard hat, shroud, goggles, gloves, hearing protection, chainsaw chaps, and shelter.

**Rangeland improvement:** Improvement of the grazing value of rangeland, measured through the output of the range in terms of animal production, or by the measured increase of grazing primary production, in qualitative and quantitative terms.

**Rehabilitation (rehab):** Return to natural or operational state. Often used referencing post-fire efforts to mitigate or eliminate environmental resource impacts caused by burn activities. Also used to refer to the process of returning apparatus or equipment to readiness.

**Resources:** General term for the personnel, equipment, services and supplies available, or potentially available, for assignment. Personnel and equipment are described by kind and type, and may be used in tactical, support or overhead capacities.

**Roll-out:** When ignited fuels roll downhill and out of the holding line, potentially causing the fire to escape.

**Sensitive receptors:** Areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants such as smoke.

**Slope:** Steepness of the terrain, expressed as a percent change in the elevation of over a certain distance.

**Snag:** A standing dead tree or part of a dead tree from which at least the leaves and smaller branches have fallen.

**State Responsibility Area (SRA):** The area where the State has financial responsibility for wildfire protection.

**Suppression resources:** All resources capable of providing wildfire suppression services.

**Test burn:** A fire that is started in an area that is representative of the rest of the unit and where you're confident you'll be able to control the fire, in order to test that the behavior is consistent with your goals and that it is safe to proceed with the prescribed burn operation.

**Vertical continuity:** The fuels that connect the forest floor (litter and duff) to top of canopy trees. Also referred to as ladder fuels.

[And more...](#)

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**Image 2, Cover:** HCPBA & VFD members practice cutting fireline at the Southern Humboldt Wildland Fire Academy, May 2022. Photo Credit: Kai Ostrow

**Image 3, Cover:** HCPBA member Dave Cocking tends fireline on the HCPBA Lancaster project, June 2019. Photo Credit: Valerie Hanson

**Image 4, Cover:** HCPBA member conducts ignitions on the HCPBA Lancaster project, June 2019. Photo Credit: Lenya Quinn-Davidson

**Image 5, Cover:** Aurora Studebaker & Ingrid Leon of Briceland Fire conduct ignitions on the HCPBA Old Briceland Project, January 2022. Photo Credit: Kai Ostrow

**Image 6, Page 1:** Cultural Fire Management Council members conduct ignition ceremony during the Yurok TREX October 2022

**Image 7, Page 1:** [Current Barriers to the Expansion of Cultural Burning and Prescribed Fire in California and Recommended Solutions](#)

**Image 8, Page 2:** HCPBA member Mark Chapman monitors conditions on the HCPBA Silva Project, January 2022. Photo Credit: Camilo Stevenson

**Image 9, Page 2:** Landowner Bob Stansberry & fellow HCPBA members prepare torch fuel on the Save the Redwoods, Redwoods to the Sea project, June 2019. Photo Credit: Kai Ostrow

**Image 10, Page 2:** Aurora Studebaker and Rheanna Campbell of Briceland Fire conduct ignitions on the HCPBA Old Briceland Project, January 2022. Photo Credit: Kai Ostrow

**Image 11, Page 3:** Redway Firefighter Brittany Tonks conducts ignitions on HCPBA Old Briceland Project, June 2022 Photo Credit: Kai Ostrow

**Image 12, Page 3:** Briceland Firefighter Mason Wansick and other TREX participants install fireline at Klamath TREX, October 2021. Photo Credit: Kai Ostrow

**Image 13, Page 4:** Landowner Dustin Silva and Briceland Fire members conduct ignitions on the HCPBA Silva Project, January 2022. Photo Credit: Kai Ostrow

**Image 14, Page 5:** Briceland Fire Battalion Chief Diana Totten conducts operations briefing, with Fire Chiefs DJ Felt and Nick Pape on HCPBA Oak Knoll Project, February 2022. Photo Credit: Kai Ostrow.

**Image 15, Page 7:** UCCE Advisors Lenya Quinn-Davidson and Jeff Stackhouse complete ignitions on HCPBA Old Briceland Spring Burn, April 2019. Photo Credit: Lenya Quinn-Davidson

**Image 16, Page 7:** Smoke activity on HCPBA Old Briceland Project, October 2022. Photo Credit: Lenya Quinn-Davidson

**Image 17, Page 8:** Kai Ostrow and Teal Cyrek conduct pile burning to prepare fireline on the HCPBA Old Briceland Project, November 2020. Photo Credit: Kai Ostrow

**Image 18, Page 9:** HCPBA & VFD members patrol the lower fireline on the HCPBA Old Briceland Project, October 2020. Photo Credit: Kai Ostrow

**Image 19, Page 10:** Briceland Fire Officers Tao Ryce and Kai Ostrow and Redway Firefighter Jazper Strange post-ignition on Save the Redwoods, Redwoods to the Sea project, June 2019. Photo Credit: Lenya Quinn-Davidson

**Image 20, Page 10:** Burn Boss Phil Dye supervises burn activity on the HCPBA Lancaster project, June 2019. Photo Credit: Valerie Hanson

**Image 21, Page 11:** HCPBA member and retired Briceland Fire Captain Bill Eastwood prepares for ignition on HCPBA Phelps Project, June 2019. Photo Credit: Kai Ostrow

**Image 22, Page 11:** Redheaded Blackbelt coverage of HCPBA Project, June 2022

**Image 23, Page 12:** Landowners & HCPBA members Penny & Mathew Cocking during ignitions on HCPBA Cocking Project, November 2017. Photo Credit: Lenya Quinn-Davidson

**Image 24, Page 12:** Briceland Fire Officer Chris McCoy feeds the crew on the HCPBA Old Briceland Project February 2022. Photo Credit: Kai Ostrow

**Image 25, Page 13:** Briceland Fire Officers Diana Totten and Kai Ostrow and landowner Dustin Silva conduct operations briefing on HCPBA Silva Project, January 2022. Photo Credit: Camilo Stevenson

**Image 26, Page 14:** Rowan Engber tends fireline on the HCPBA Cocking Project, November 2017. Photo Credit: Lenya Quinn-Davidson

**Image 27, Page 14:** Briceland Fire Captain Kai Ostrow completes ignitions on the HCPBA Old Briceland Project, Oct 2022. Photo Credit: Carlos Roye