Midpeninsula Regional
Open Space District

R-22-117
Meeting 22-25
October 26, 2022

SPECIAL MEETING AGENDA ITEM 1

AGENDA ITEM

Wildland Fire Resiliency Program: Prescribed Fire Plan

GENERAL MANAGER'S RECOMMENDATIONS

1. Receive an overview and provide feedback on refinements of the Wildland Fire Resiliency Program's Prescribed Fire Plan.

2. Authorize the General Manager to amend the multi-year contract with Spatial Informatics Group, LLC of Pleasanton, California, to provide additional fire ecology services in the amount of $27,000 for a new, not-to-exceed contract amount of $367,405.

SUMMARY

The adopted Wildland Fire Resiliency Program (Program) (R-21-58, minutes) addresses the Midpeninsula Regional Open Space District's (District) Board of Directors' (Board) strategic objective to work with wildland fire agencies and surrounding communities within District boundaries to prepare, prevent, and respond to wildland fires. The Program is designed to a) protect natural and cultural resources, b) strengthen landscape-level ecological resilience to changing climate and fire risk conditions, and c) facilitate ecologically sensitive wildfire response and training while enhancing public safety and education. The Program was adopted in May of 2021, with the understanding that staff would develop the details of the Prescribed Fire Plan (PFP) before implementing that portion of the Program. It is anticipated that only minor technical changes or additions to the Final Program Environmental Impact Report (FPEIR) are needed to implement the PFP, requiring only an addendum to the original FPEIR

The District is currently under contract with a consultant to develop the PFP. The General Manager recommends expanding the scope of services to include a pile burning workshop for staff and preparing three burn plans. Burn plans are the site-specific plans that detail the conditions and preparations for conducting a prescribed fire burn. The General Manager recommends amending the contract by an additional $27,000 with Spatial Informatics Group, LLC (SIG) to provide these fire ecology services for a not-to-exceed new contract amount of $367,405 (original contract amount of $340,405). There are sufficient funds in the adopted Fiscal Year 2022-23 (FY23) budget to cover the anticipated scope of services. The cost of this amendment may be reimbursable through the State Coastal Conservancy (SCC) grant.

BACKGROUND

In May 2021, the District's Board certified the Final Program Environmental Impact Report (FPEIR) and adopted the Wildland Fire Resiliency Program (Program). All documentation for the Program can be found on the District's website (R-21-58). The Program directly responds to a growing need for proactive wildland fire management in partnership with sister agencies and constituents. California's fire season is now longer and more intense due in part to dense regrowth of historically logged forests, more than a century of fire suppression, an increase in home construction adjacent to or within wildland areas, and a changing climate with increasingly extreme weather patterns. These factors necessitate additional measures to reduce the risk of a catastrophic fire. Catastrophic fires in wildland areas can severely damage, if not destroy, sensitive habitats and the natural resources that the public has entrusted the District to protect and restore.

Wildland Fire Resiliency Program

The activities under the approved Program apply to all lands managed by the District, which are located in unincorporated portions of San Mateo, Santa Clara, and a small section of Santa Cruz counties and within or near 17 cities. The Program serves as a planning and implementation document that fully describes and integrates the following four plans:

- **Vegetation Management Plan (VMP):** Addresses the creation and maintenance of fuel reduction areas (FRAs) for ecosystem health, as well as fuel breaks and defensible space zones, using vegetation management techniques that include manual and mechanical removal of vegetation, limited use of herbicides, and prescribed herbivory.
- **Prescribed Fire Plan (PFP):** Programmatically addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health. The PFP in the Program description provided a high-level framework for implementing prescribed fire on District lands. A summary of the refined PFP is presented in this board report. Board feedback received at the October 26, 2022 meeting will be incorporated into the PFP before returning to the Board for final approval of the PFP and the associated CEQA analysis.
- **Wildland Fire Pre-Plan/Resource Advisor Maps:** Resource Advisor maps that are prepared for each preserve and other District-managed land (or groups of managed lands) include information on existing conditions, infrastructure, and resource constraints. These maps aid fire suppression activities and identify sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities.
- **Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuel inventories to inform future adaptive management techniques.

Wildland Fire Prevention and Preparation - Work to Date

Each year, the District commits extensive staff time and resources to various land management activities to protect natural resources and facilitate public safety during a wildland fire. These activities include maintaining hundreds of miles of fuel breaks and fire roads within preserves that facilitate fire agency response and management activities, fulfilling defensible space clearance requirements for District-owned structures, and implementing vegetation treatments to protect public open space lands and sensitive habitats. Implementation of the Vegetation Management Plan is ongoing; current and recently completed projects can be found on the District's Wildland Fire Resiliency website.

Community Role and Partnerships

According to the Board of Forestry and Fire Protection, approximately 95% of all fires are human caused. Preventing accidental ignitions remains one of the best ways to minimize wildfire risk. Surrounding communities play a significant role in preventing wildland fire ignitions and protecting private property, including residential homes. Specific actions that local communities and residents can take include:

- Hardening homes and structures against fire, creating defensible space, and having an evacuation plan (see https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/hardening-your-home for home hardening guides);
- Signing up for county emergency alerts;
- Being aware of red flag warning weather when fire danger is greatest and plan accordingly;
- Enjoying open space wildlands safely by adhering to bans on smoking, campfires, and use of firearms, as well as other public safety rules; and
- Avoiding risky activities outdoors to reduce the demand on emergency response resources, so emergency personnel are available to respond to fires if needed, such as: staying cool, carrying and drinking plenty of water, staying within your physical limits, or considering other low-risk activities during fire weather events.

DISCUSSION

Prescribed Fire Plan

Prescribed fire is one of the essential tools used to manage natural resources and fire today. Prescribed fire uses a scientific prescription, prepared in advance, that describes the objectives, fuels, size, the precise environmental conditions under which a fire would be initiated, and conditions under which it would be suppressed. If weather conditions or forecasts vary from the prescribed conditions, then prescribed fire operations cease, and active fire is immediately suppressed. For example, if winds or temperatures exceed the prescription, the prescribed fire is deferred until conditions return within the prescription window.

Prescribed fire can be designed to create a mosaic of diverse habitats for plants and animals. The use of fire allows for the germination of fire-obligated or culturally significant species, control invasive species to help rare and endangered species recover, or reduce fuels and thereby prevent a more destructive fire during adverse weather conditions (e.g., high winds, high temperatures).

PFP Objectives

The proposed PFP includes the following four primary burn objectives beyond the Program Objectives:

- Ecosystem Restoration Burns - restore fire as a natural ecological process;
- Fuel Reduction Burns - reduce dead surface fuels and fine fuels such as litter, duff, branches, and logs;
- Traditional Ecological Knowledge (TEK) Burns - conducted in collaboration with local Tribal Representatives to protect, restore, or facilitate improved production or collection of specific culturally significant plants, trees, or seeds; and
- Training Burns - train Midpen employees and cooperating agencies.

It is important to note that a single burn may include multiple objectives that are not mutually exclusive of one another; in most cases, multiple objectives will be met in a single burn.

Outreach for Further PFP Development
The adopted Program includes a programmatic level PFP. Since the adoption of the Program, the District has met with stakeholders and held multiple public open houses to detail the PFP further. Below is a summary of the outreach effort (see also Attachment 1: Public Input on the Prescribed Fire Program for more information).

The District held stakeholder meetings with local and state fire agencies (e.g., CAL FIRE, Woodside Fire Protection District), Native American tribes, partner agencies, advocacy groups (e.g., Sierra Club, Green Foothills), and regulatory agencies (e.g., California Department of Fish and Wildlife, California Air Board). Three public open houses were held the week of July 18th, in person at the Administrative Office and online.

In general, the idea of using prescribed fire for the outlined objectives was well received. From the outreach, three broad themes emerged:

- **Staffing and Safety during a Prescribed Fire**
  The District considers the use of prescribed fire as a true partnership undertaking. The planning and implementation of prescribed fire will be conducted with CAL FIRE, other local fire agencies, and/or other professional fire staff. Only District staff fully trained and qualified in wildland fire activities are allowed to participate in a prescribed fire. A comprehensive burn plan, which includes a smoke management plan and a weather prescription tailored to the specific site, will be created for each prescribed fire event. The California Air Resource Board reviews and approves all smoke management plans. A certified Burn Boss[1] is the responsible party to develop and approve specific burn plans (typically CAL FIRE).

- **Criteria for the use of Prescribed Fire**
  When reviewing potential areas, District staff will only consider the use of prescribed fire under certain conditions to ensure the safety of personnel, the public, and the environment. With the vast land holdings of the District, staff must prioritize areas to maximize the benefits of prescribed fire. Guidelines for prioritizing include resource benefits, improved resiliency to natural (e.g., lightning fire) or human-made disturbances (e.g., climate change), providing for a training opportunity, and logistical opportunities or constraints. See *Attachment 2: DRAFT Requirements and Potential Criteria* for more details.

- **Communication**
  The District recognizes that it is critical to be forthright in communicating with the public about the use of prescribed fire. The District foresees a multi-pronged approach to maximize public awareness, including preserve visitors, neighbors, and the public at large. See *Attachment 3: DRAFT Public Outreach and Notification* for more details.

[1] A certified burn boss has final authority to approve and amend the a prescribed fire plan and formula applicable to a prescribed burning operation, to determine that the site has been prepared and the crew and equipment are ready to commence the operation, and to supervise the work assignments of crew until the prescribed burning is completed and all fire is declared to be out.

Summary of Prescribed Fire Plan Refinements
The District has refined the PFP and incorporated the feedback from stakeholders and the public, where appropriate, into the PFP. The PFP includes more specifics relevant to burn planning and implementation in the following areas:

- Burn objectives
- Assumed vegetation types
- New control lines (types, widths, and lengths)
- Public notification process
- Annual number of burns
- Pre-treatment activities
- Identification of burn units
- Burn ignition

See Attachment 4: Summary of Prescribed Fire Plan Refinements for further details.

Contract Amendment
The General Manager recommends amending the contract with SIG to provide a 3-day pile burn[2] workshop with a certified Burn Boss and active ignition. Pile burns are approved under the Wildland Fire Resiliency Program and this workshop would provide additional training to and real experience for staff on the use of best management practices to effectively manage a contained pile burn under the guidance and oversight of an experienced fire professional.

Before implementing any prescribed fire, a site-specific burn plan must be created. In addition to providing the pile burn workshop, SIG would develop three burn plans that may be used after adopting the PFP to implement a future prescribed fire (see Attachment 5: Example Burn Plan). This critical, time sensitive step is the final step for implementation of the full Program. The General Manager recommends a contract amendment for $27,000 to complete the described scope of services. The total cost of this amendment may be reimbursable through the SCC grant.

FISCAL IMPACT

The FY23 budget includes sufficient funds to cover project costs for the further development of the Program and California Environmental Quality Act (CEQA) documentation as well as the cost to amend the contract with SIG to provide additional services.

Implementing the PFP will result in additional staff workload impacts in the Land & Facilities, Natural Resources, and Visitor Services Departments. In 2014, the District approved the Financial and Operational Sustainability Model (FOSM). An update to the model is planned for 2023, changes since the original model, including wildland fire resiliency-related programs, will be included as part of the update to address changing demands on the District.

The table below summarizes the adopted FY23 budgets for projects that implement the Wildland Fire Resilience Program, which the Board reviewed and approved as part of the adopted FY23 Budget and Action Plan. Costs for the development of the PFP and CEQA review are budgeted in the Program 80003-10 project since the PFP is a component of the larger Program.

[2] Pile burns, approved as part of the Wildland Fire Resiliency Program in May 2021, is where crews clear debris and branches, then they pile it all up and wait for the wood to dry before burning it (usually in winter).

Project Number	*Project Name*	*FY23 Budget*
61017	Fuel Reduction Implementation	$565,000
61023	Los Gatos Creek Watershed - Wildland Fire Resiliency	$203,000
61028	SCC Forest Health & Wildfire – Wildland Fire Resiliency	$325,000
80003-10	Wildland Fire Resiliency Program	$328,000
80063	Districtwide Vegetation Mapping	$174,000
80072	Irish Ridge Restoration	$85,000
MAA05-010	Restoration Forestry Demonstration Project	$366,224
MAA21-007	Bear Creek Redwoods Preserve Plan: Invasive Weed Treatment and Restoration[3]	$109,642
	Total FY23 Project Budget for Fire Prevention	*$2,155,866**

* Does not include annual fire protection activities not budgeted as part of a project.

Grants

Grants that align well with the Program and that the District has a high likelihood of obtaining will be presented to the Board for consideration as they become available. Below is a summary of grants either received to date or pending.

On June 7, 2021, the District received a State Coastal Conservancy (SCC) grant of $400,000 from the Forest Health and Wildfire Resilience Program to implement Program priority areas in San Mateo County by September 2022. On September 22, 2022, the SCC Board authorized a new $1,080,000 grant to support the development of the prescribed burn plan, acquire equipment for vegetation management, and implement Program priority areas in four District preserves in San Mateo County through March 2025, building on the success of the early action work funded in 2021. This grant agreement allows the partial reimbursement of District funds for the preparation of the Prescribe Fire Plan and associated burn plans as described in this report.

In March 2022, the District was selected for a Community Project Funding Program grant of approximately $748,000 in federal funds requested by Congresswoman Jackie Speier, pending the approval of the federal FY2023 budget. If awarded, the funds will support the implementation of the Program in four District preserves in coordination with the SCC $1.08M grant.

The District is currently a partner in the Los Gatos Creek Watershed Collaborative (LGCWC) Project (R-21-56, Minutes). CAL FIRE made a direct award of $7.5M in Forest Health funding for the LGCWC. Of the $7.5M, approximately $1.6M will support work on District property.

The District secured a Wildlife Conservation Board (WCB) grant for $1.5M in funding on November 18, 2021. This funding will support forest health and vegetation management work in coordination with the CAL FIRE funding for the Los Gatos Creek Watershed Collaborative Project through March 2025.

[3] A criterion for prioritizing invasive species for treatment is its pyrophytic (fire prone) status.

In August 2020, the Board adopted a resolution accepting up to $232,358 in Proposition 68 grant funding from the California Conservation Corps for the Coal Creek Area Fuel Break Project (R-20-94, Minutes). The District completed this project in June 2021.

PRIOR BOARD AND COMMITTEE REVIEW

On June 27, 2018, the Board authorized the General Manager to enter into a contract with SIG to provide fire ecology services (R-18-72, Minutes).

On October 24, 2018, the Board authorized the General Manager to enter into a contract with Panorama to provide environmental review services (R-18-20, Minutes).

On February 13, 2019, District staff presented an informational update on the Program to the Board to address the Board's Fiscal Year 2019-20 (FY20) approved Strategic Plan Objectives (R-19-16, Minutes).

On April 24, 2019, the Board authorized the General Manager to amend the contract with SIG (R-19-52, Minutes).

On May 22, 2019, the Board authorized the General Manager to amend the contract with Panorama (R-19-69, Minutes).

On July 10, 2019, the Board approved the redistribution of treatment actions and estimates within the IPM Program due to multiple fire agencies requesting that the District increase the number and scale of its fuel management projects as soon as possible. The administrative change temporarily redistributed the acreage assigned to underutilized management actions from other IPM management categories analyzed under the IPM Program Final EIR (R-19-90, Minutes).

On September 24, 2019, District staff presented the Program background and development to the Planning and Natural Resources (PNR) Committee. The PNR Committee recommended several Resource Management Policy changes and areas for clarification. The PNR Committee subsequently recommended forwarding the proposed changes to the full Board (R-19-127, Minutes).

On October 28, 2019, District staff presented the VMP for ecosystem resiliency and fire management/public safety to the PNR Committee. During this meeting, the PNR Committee confirmed the recommended sites and prioritization matrix of project locations under the VMP. The PNR Committee recommended forwarding the proposed changes to the full Board (R-19-141, Minutes).

On May 13, 2020, District staff held a CEQA Scoping Session for the Proposed Wildland Fire Resiliency Program meeting with the Board. The Board accepted the Program description for environmental review purposes under the California Environmental Quality Act (R-20-42, Minutes).

At the April 8, 2020, special meeting of the Board, staff conducted a public meeting to review and receive feedback on the proposed Program. No formal Board action was taken (R-20-08, Minutes).

At the July 22, 2020, Board meeting, District staff provided a memorandum with an attached Scoping Report for the Program to the Board. No formal Board action was taken (FYI Memorandum, Minutes).

On February 25, 2021, the District held a public hearing to receive public comment on the *Wildland Fire Resiliency Program Draft Program Environmental Impact Report*. No formal Board action was taken (R-21-32, Minutes).

On May 12, 2021, the Board certified the Program Environmental Impact Report and adopted the Wildland Fire Resiliency Program (R-21-58, Minutes).

On September 28, 2022, the Board adopted a Resolution authorizing the General Manager to enter into a grant funding agreement with the State Coastal Conservancy for up to $1,080,000 in funds from their Wildfire Resilience Program (R-22-108, Draft Minutes).

PUBLIC NOTICE

Public notice was provided as required by the Brown Act. Public notice was sent to interested parties and tenants by postal or electronic mail.

CEQA COMPLIANCE

Board certified Final Program Environmental Impact Report

Pursuant to Section 15168 of the CEQA Guidelines, the District has determined that the vegetation management activities (i.e., pile burning) and preparation of burn plans in the recommended contract amendment is within the scope of the approved Wildland Fire Resiliency Program, and the Final Program Environmental Impact Report (FPEIR) to the Wildland Fire Resiliency Program, adopted by Board Resolution No. 21-14 on May 12, 2021. The project and contract documents will incorporate the mitigation measures and Best Management Practices from the associated Program FPEIR Mitigation Monitoring and Reporting Plan.

Prescribed Fire Plan

As noted above, a FPEIR was prepared for the Wildland Fire Resiliency Program and was certified by the Board in May 2021. The FPEIR analyzed the methods and implementation of prescribed fire including planning and pretreatment, application of prescribed fires (up to 500-acres annually), and rehabilitation of the land after prescribed fires. The Wildland Fire Resiliency Program was adopted with the understanding that staff would provide further details of the PFP related to burn units, methods, locations, and planning prescriptions before implementation of that portion of the Program, and that further environmental analysis under CEQA would be completed as necessary.

Staff anticipates preparation of an Addendum to the FPEIR for the Wildland Fire Resiliency Program based on work to date on development of the PFP. Only minor technical changes to the project are proposed, and no new information, substantial changes, or new impacts have been identified that would warrant preparation of a Subsequent, Supplemental, or Tiered EIR. Per CEQA Guidelines, an addendum need not be circulated for public review but can be included in or attached to the final EIR. The Board would consider the Addendum with the PFP prior to making a decision on the project.

NEXT STEPS

Should the Board authorize the General Manager to amend the contract with Spatial Informatics Group, the General Manager will coordinate a pile burning workshop this fall and winter for staff and authorize the preparation of three burn plans.

Following this study session, staff will incorporate Board feedback into the Prescribed Fire Plan. Staff will return to the Board for consideration of adopting a resolution approving an addendum to the certified Final Environmental Impact Report for the Wildland Fire Resiliency Program and related minor project modifications (to the PFP) if appropriate.

Attachments

1. Memorandum: Public Input on the Prescribed Fire Plan
2. *DRAFT* Requirements and Potential Criteria
3. *DRAFT* Public Outreach and Notification
4. Summary of Prescribed Fire Plan Refinements
5. Example Burn Plan

Responsible Department Heads:
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Midpeninsula Regional Open Space District

Memorandum

DATE: 10/26/2022

MEMO TO: Board of Directors

THROUGH: Ana Ruiz, General Manager

FROM: Coty Sifuentes-Winter, Senior Resource Management Specialist

SUBJECT: Public input on the Prescribed Fire Plan

BACKGROUND

On May 12, 2021, the Board of Directors (Board) for the Midpeninsula Regional Open Space District (District) adopted the Wildland Fire Resiliency Program (Program), a resolution certifying the Final Program Environmental Impact Report (PEIR), a Findings of Fact, a Statement of Overriding Considerations, and a Mitigation Monitoring and Reporting Program. In partnership with sister agencies and constituents, the Program addresses the growing need for proactive wildland fire management, including using prescribed fire where and when appropriate. The Program includes a Prescribed Fire Plan (PFP) outlining the objectives and conditions for prescribed fire use. With the assistance of outside consultants specializing in fire ecology and environmental analysis, District staff is further developing and refining the PFP to implement the Program's objectives.

DISCUSSION

The District addressed the PFP at a programmatic level concurrent with the Program's adoption. To further communicate the Program objectives, requirements, and safety protocols included in the PFP, the District has conducted extensive public engagement. As part of this effort, the District held stakeholder meetings with local and state fire agencies, including CAL Fire and the Woodside Fire Protection District; Native American tribes; partner agencies; advocacy groups, including the Sierra Club and Green Foothills; and regulatory agencies, including the California Department of Fish and Wildlife and the California Air Resources Board. Additionally, the District held an in-person public open house at the new Administrative Office and two virtual open houses during the week of July 18, 2022. Across all three sessions, approximately 60 people attended the live presentations and breakout sessions. A recording of the outreach presentation is available on the District's website at http://www.openspace.org/fire, and has been viewed seventy-four times (as of October 7, 2022).

Public response to the PFP has been generally favorable. While the idea of using prescribed fire for the outlined objectives is well-received, three themes have emerged from the stakeholder and public meetings: 1) staffing and safety during a prescribed fire, 2) criteria for using prescribed fire, and 3) public communication of a prescribed fire event. The following sections describe the District's plan for addressing public and stakeholder input.

Staffing and Safety During a Prescribed Fire

The District will only implement prescribed fires under the supervision of trained technical experts, including partner fire agencies, a resource advisor (i.e., a District-approved wildland fire certified Resource Management Specialist), and when appropriate, tribal staff. The District will adhere to strict safety protocols throughout the prescribed fire planning and implementation process, which will be described in approved, site-level burn and smoke management plans. Several actions will occur prior to igniting a burn, including evaluating weather conditions and predicted weather trends, burning only on approved burn days, implementing road closures as needed, coordinating with peer agencies, and notifying the public of a burn activity and any potential temporary closures. The burn unit will be monitored regularly until the burn boss declares the prescribed fire out. At the conclusion of active fire on the ground, the District will monitor the burn unit for a range of fire effects, including, but not limited to, fuel consumption, vegetation scorch, and potential impacts on wildlife.

The PEIR for the Wildland Fire Resiliency Program identified a required Mitigation Measure regarding safety around prescribed burns, specifically:

MM Hazards-3: Safety Around Prescribed Burns
Trails and District-Owned or Managed Roads
District-owned or managed roads and trails shall be closed to public recreational and other unaffiliated private vehicle access within at least 500 feet of the outermost edges of a prescribed burn (or less with Burn Boss and District concurrence). District-owned or managed roads and trails shall be posted and blockaded with temporary fencing or the like. Notices of closures shall be posted at the trail heads or road entrances and on the District website. Additional measures, such as staffing trail head closures, can be implemented as needed.

Public Roads
If possible, public roads within 500 feet of the outermost edges of a prescribed burn shall be closed in coordination with the appropriate agency (e.g., Caltrans). In the event this is not feasible due to volume of traffic or lack of alternative routes, a Traffic Control Plan shall be prepared and adopted in coordination with the appropriate agency. The Traffic Control Plan shall be designed to allow safe passage along roads adjacent to a prescribed burn and shall include the following at a minimum:

- Requirement to coordinate with local law enforcement (e.g., County Sheriff, California Highway Patrol).
- Installation of temporary signage at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress.
- Use of flaggers to slow traffic during the burn or stop traffic if wind conditions shift, resulting in smoke crossing the road.

Criteria for Prescribed Fire

When the Program was adopted in May 2021, it stated that, “considerations for prioritization of prescribed burns will be defined in the future, but may include condition of area or burn unit in terms of forest health, presence of invasive species, and extent of fuel loads; location and ability to manage the burn; and type of vegetation with consideration for improvement of ecosystem function through prescribed burning." Since the adoption, the District has further defined the prioritization as described below.

The District will consider an area for a prescribed fire when the following conditions are met:

- A comprehensive burn plan, which includes a smoke management plan, has been created for the specific area;
- Partner fire agencies (or tribal organizations for a TEK burn) whose jurisdiction includes the potential area are available for implementation and/or are supportive;
- Impacts on sensitive natural or cultural resources susceptible to fire can be avoided or minimized;
- A resource advisor is available;
- The area is covered by a United States Fish and Wildlife Biological Opinion, if needed;
- Resources are available and dedicated for post-fire monitoring and potential intervention (i.e., erosion control, invasive species); and
- The area has a moderate or high departure from its historical seral stages, vegetation patterns, and fire regimes

Areas where the District would **not** consider prescribed fire include:

- Areas where burning is prohibited by law/regulation/ordinance; or
- Where topography (e.g., slope, aspect) makes it unsuitable for a prescribed burn.

Additionally, the District must prioritize areas for prescribed fire to maximize benefits and meet the Program's objectives. When reviewing potential areas, the Visitor and Field Services line staff (Land & Facilities, Natural Resources, and Visitor Services Departments) will prioritize sites that:

- *Provide a resource benefit*
  Resource benefits from prescribed fire include enhanced habitat for wildlife or fire-dependent plants (e.g., manzanita and other ethnobotanical species), nutrient cycling within soils, pest management (e.g., susceptible invasive species, ticks), promotion of forest health, or increased vegetation productivity of ecological and ethnobotanical resources.

- *Improve resiliency to a natural or human-caused disturbance*
  Prescribed fire can increase resiliency to climate change by increasing carbon retention in specific habitats, reducing fuels that contribute to catastrophic fires, reducing fire hazards and risk, enhancing and extending other vegetation management areas like shaded fuel breaks, or reducing encroachment of fire-prone species.

- *Provide a training opportunity for wildland fire response*
  Initial burns may focus on re-establishing prescribed fire training areas. These areas will be used for interagency training on live fire and simulated fires, to improve resource coordination between the District and its neighboring local, state, and federal fire agencies that may participate in future burns.

- *Assist in meeting logistical opportunities or constraints*
  Opportunities for logistical efficiency (e.g., need for new control lines or integration with or maintain existing treatment areas) or contributing to the ease and safety of a burn (e.g., access or existing staging areas) can increase the pace and scale of treatment benefits.

Communications to the Public

Before conducting a prescribed burn, the District will disseminate the following information as required from the Program, the specific Burn Plan, and as needed:

- Location (including the preserve and major intersection(s))
- Fire Agency Partner(s) Involved

- Potential Burn Window
- Objective(s) of the Burn

The PEIR for the Wildland Fire Resiliency Program identified a required Mitigation Measure regarding public notification for a prescribed burn, specifically:

MM Air Quality-2: Burn Emission Reduction Techniques
Provide public notification at least 48 hours in advance of a burn less than 50 acres to individuals and jurisdictions within one mile, and at trailheads and access roads leading to an area with piles proposed for burning. For burns in excess of 50 acres, noticing shall extend to a larger region as determined appropriate by the District. The public notification shall include current contact numbers to the appropriate burn coordinator.

Activities Leading up to the Burn Day
During the planning process and once a specific burn unit has been prioritized, the District will begin implementing a communication plan. As part of the burn plan, the District will develop a contact list to be used by the burn coordinator. The contact list will include, at a minimum, local fire agencies, Mountain View dispatch, other nearby partner agencies, FireSafe Council(s), and relevant elected officials. One week prior to the burn window, the District would install signage at the preserve, update the District's webpage, engage with social media, notify the Board, and provide email notifications to specific District's interested parties list depending on the prescribed fire main burn objective(s) or location of the burn:

Prescribed Fire Objective	Interested Parties List
Any prescribed fire objectives	Wildland Fire Resiliency notification list
Ecosystem Restoration	Natural Resource Management notification list
Traditional Ecological Knowledge	Natural Resource Management notification list

The District encourages the public to sign up to stay informed of future PFP activities on the District's website (link).

On a case-by-case basis and under the advisement of the local emergency services and fire agencies, District staff may employ or request assistance from other partner agencies (e.g., Caltrans) for additional outreach leading up to and including the day of a prescribed fire. This may include:

- Road signs on major thoroughfares (day of prescribed fire only);
- District E-News;
- Partners who may amplify the District's messages to their audiences;
- Post Cards to Preserve Neighbors/HOA;
- Alert Wildfire;
- Press Release; or
- Push Notification from San Mateo or Santa Clara Counties (day of prescribed fire only).

###

1.1 Requirements for Identification of Suitable Burn Units

Before initiating the planning of a prescribed burn under the PFP, a critical path item for Midpen is to determine if a Midpen Resource Advisor (also referred to as READ), who has expertise and experience on Midpen resource management goals, policies, and programs, is available to assist in the planning, implementation, and post-prescribed burn activities. The Midpen Resource Advisor(s) will determine which areas on Midpen lands are suitable for prescribed burning in any year by reviewing the following checklist to identify which burn unit(s) meet the minimum criteria for burning.

Table 3-1 Requirement Checklist

Requirement	Requirement Met
Step 1, Midpen determines if:	
A Midpen Resource Advisor is available to assist in the planning, implementation, and post-prescribed burn activities.	☐
Step 2, the Midpen Resource Advisor determines whether:	
Relevant partners (e.g., fire agencies, tribes) are supportive and, as appropriate, able to provide resources for the burn unit(s).	☐
The burn unit(s) are covered by an existing Biological Opinion, if needed, based on species present.	☐
Potential adverse effects from fire on sensitive resources in the burn unit(s) can be avoided or minimized.	☐
Adequate resources are available and can be dedicated to conduct post-fire monitoring and response (e.g., erosion control, invasive species).	☐
The burn unit(s) have a moderate or high departure from its historical seral stages, vegetation patterns, and fire regimes.	☐

1.2 Considerations for Prioritization of Burn Units

The prioritization criteria specified by the Midpen Resource Advisor and fire professionals for a prescribed burns will be defined in the future as part of each individual Burn Plan, but may include condition of area or burn unit in terms of forest health, presence of invasive species, and extent of fuel loads; location and ability to manage the burn; and type of vegetation with consideration for improvement of ecosystem function through prescribed burning. Initial burns may focus on re-establishing prescribed fire training areas. These areas will be used for interagency training on live fire and simulated fires, to improve resource coordination between Midpen and its neighboring local, state, and federal fire agencies that may participate in future burns.

Midpen staff use the multiple factors when prioritizing potential burn units in a given year (Table 3.1). Additional criteria may be considered based on the latest science. Burn units will be identified as important areas based on the primary burn objective. Certain prioritization criteria are associated more closely with a particular primary burn objective. As such, when Midpen identifies a primary burn objective, the associated prioritization criteria shown in Figure 3-1 are likely to be a higher priority than other criteria.

Table 3-2 Potential Burn Unit Prioritization Criteria

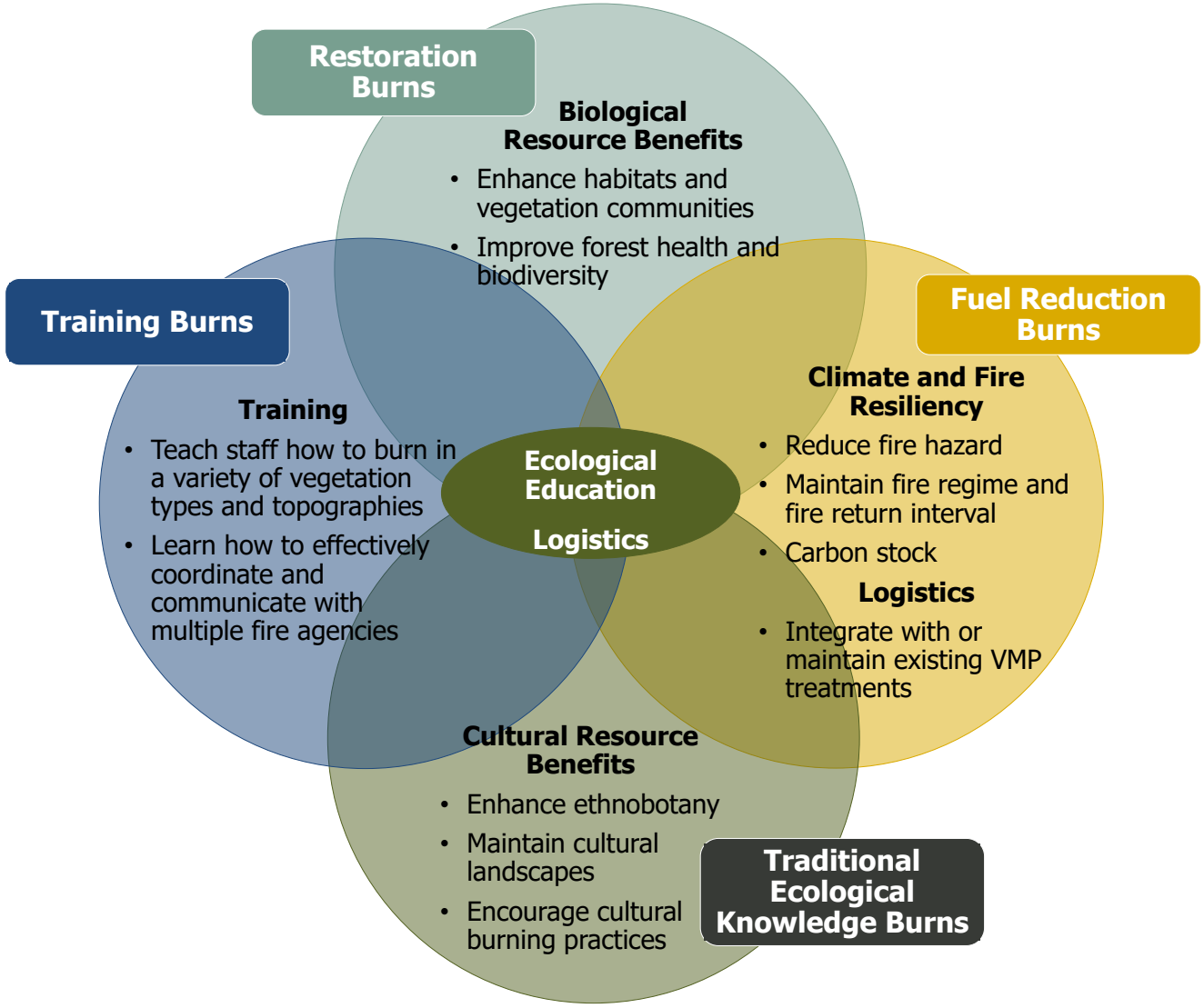
	Criteria
Biological Resource Benefits	• Maintain wildlife connectivity • Enhance habitats and vegetation communities • Create a mosaic of habitats • Prevent vegetation type conversion and succession • Encourage nutrient cycling • Manage pests and forest pathogens • Increase vegetation, wetland, and forage productivity • Improve forest health and biodiversity
Cultural Resource Benefits	• Enhance ethnobotany • Maintain cultural landscape • Encourage cultural burning practices
Climate and Fire Resiliency	• Reduce fire hazard and severity • Maintain appropriate fire regime and fire return interval • Address current vegetation departure from modeled historical vegetation class • Stabilize and retain carbon stock • Improve forest resilience to drought, forest pathogens, and insects
Ecological Education	• Educate the public on the benefits of burning • Increase public knowledge and comfort associated with fire in the landscape
Training	• Teach staff how to burn in a variety of: – Vegetation types – Topographies • Learn how to effectively coordinate and communicate with multiple fire agencies • Provide fire suppression experience with live fire for District and fire agency staff
Logistics	• Ease and safety of a burn with consideration for: – Access – Size – Existing staging areas and control lines – Presence of infrastructure and adjacent uses – Previous treatments

- Vegetation types
- Fuel loads
- Weather
- Time of year, particularly in relation to pre-fire suppression fire season

- Appropriate staffing availability
- Adequacy of spatial data and maps
- Need for new control lines
- Improve connectivity of cross-jurisdiction treatments
- Integrate with or maintain existing treatment areas under the VMP or other Midpen programs
- Ability to:
  - Retain wildlife refugia
  - Maintain adequate buffers around protected areas/resources

Note: Criteria presented are not in a specific hierarchy of importance.

Figure 3-1 Relationship Between Burn Objectives and Potential Prioritization Criteria



1.1 Public Outreach and Notification

1.1.1 Overview

Ensuring the public is educated about prescribed burn goals and objectives, location, and timing is a key component of successful burn implementation. Midpen will determine the extent of the public outreach and notification, depending upon the burn scope and location.

1.1.2 Method and Timing of Outreach

Public outreach for an upcoming prescribed burn will typically be made during the planning process leading up to a burn and directly before the burn. Midpen has identified several notification methods that will be implemented during public outreach and notification for all future burns. Table 3-3 provides a checklist of the required notification methods that will be used to guide Midpen in public outreach and notification of burns. On a case-by-case basis and under the advisement of the local emergency services and fire agencies, Midpen staff may conduct additional notification, shown in Table 3-3. This may involve requesting assistance from other partner agencies (e.g., California Department of Transportation) for additional outreach leading up to and including the day of a prescribed fire. The public is additionally encouraged to sign up for Midpen's mailing list to stay informed of upcoming activities, including prescribed burns.

Table 3-1 Notification Checklist

Notification Method	Completed?
Required Notification	
One Week Leading up to the Burn Day:	
Install signage at the relevant OSP	☐
Update Midpen's webpage with information	☐
Engage with social media	☐
Notify the Midpen Board of Directors	☐
Provide email notifications to: • Local fire agencies • Mountain View dispatch • Nearby partner agencies • FireSafe Council(s) • Relevant elected officialsIndividuals on Midpen's interested parties mailing list	☐
Two Days or More Prior to the Burn Day:	

Notification Method	Completed?
For a less than 50-acre burn: [a] • Notify individuals and jurisdictions within 1 mile, and • Install notices at trailheads and access roads leading to the burn unit For a 50-acre burn or larger: [a] • Notify a larger region, determined by Midpen	☐
As-Needed Notification	
Leading up to the Burn Day:	
Notify via Midpen E-News	☐
Engage with partners who may amplify Midpen's messages to their audiences	☐
Send out postcards to adjacent neighbors/homeowner's associations	☐
Conduct a press release	☐
Day of the Burn:	
Install road signs on adjacent major thoroughfares [b]	☐
Use San Mateo or Santa Clara County push notification	☐

Notes:

[a] Required per Mitigation Measure Air Quality-2 of the Program EIR.

[b] Mitigation Measure Hazards-3 of the Program EIR has certain stipulations that when met require signage along adjacent roads.

1.1.3 Content of Outreach

Midpen will determine the specific content of the outreach notifications for each burn and will tailor the notification messages to provide information that each audience is the most interested in, as appropriate. The notices that Midpen disseminates will include the following information, at a minimum, in addition to any specifics that Midpen determines relevant or as required per the individual Burn Plan:

- Location (including the OSP and major intersection(s))
- Fire agency partner(s) involved
- Potential burn window
- Objective(s) of the burn
- Current contact number(s) for the appropriate burn coordinator

Summary of Prescribed Fire Plan Refinements

Midpen has refined the PFP to include more specifics relevant to burn planning and implementations. Table 1 below highlights the refinements made to the PFP. Underlined text identifies new or changed information since the approved programmatic PFP.

Table 1 Comparison of Prescribed Fire Plan Refinements

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
Burn Objectives	• Ecosystem Restoration Burns • Traditional Ecological Knowledge Burns • Training Burns • Prescribed Natural Fire	• Ecosystem Restoration Burns • Fuel Reduction Burns • Traditional Ecological Knowledge Burns • Training Burns • Prioritization of Multiple Ignitions (previously referred to as Prescribed Natural Fire)
Annual Number of Burns	First 3 to 5 years • One to two prescribed burns annually After 5 years • Up to three prescribed burns annually	First 3 to 5 years • One to three prescribed burns annually during the first 3 to 5 years • Anticipated to be lower complexity burns of a smaller size (e.g., 10 to 20 acres) with annual burning averaging potentially up to 100 acres, but depending upon crew availability and burn conditions could burn as much as 500 acres After 3 to 5 years • Up to three prescribed burns or more annually

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
		• May be high complexity and larger individual burns, in terms of size (e.g., up to 100 acres) and duration, with up to 500 total acres a year
Maximum Annual Burn Area	500 acres	No change
Assumed Vegetation Types of Annual Burns – San Francisco Bay Area Air Basin (SFBAAB)	*Single Scenario Modeled: 450 acres*[b] • 60 percent grassland communities • 30 percent woodland communities • 10 percent shrub communities	*Multiple Scenarios Modeled: 500 acres*[b] SFBAAB Scenario 1 • 60 percent grassland communities • 30 percent woodland communities • 10 percent shrub communities SFBAAB Scenario 2 • 10 percent grassland communities • 60 percent woodland communities • 30 percent shrub communities SFBAAB Scenario 3 • 45 percent grassland communities • 25 percent woodland communities • 10 percent shrub communities • 20 percent mixed conifer/hardwood communities
Assumed Vegetation Types of Single Day Burn – North Central Coast Air Basin	*Single Scenario Modeled: 50 acres* • 100 percent grassland communities	No change
Pre-Treatment Activities	• Mechanical pre-treatment using heavy equipment, power tools, and hand tools to improve control lines or operational safety • Pile burning may be used for biomass disposal • Pre-treatment to improve existing control lines and for operational safety is quantitatively addressed under the VMP • The total volume of material allowed to be pile burned in a year is quantitatively addressed under the VMP	• Mechanical pre-treatment using heavy equipment, power tools, and hand tools to improve control lines or operational safety • Pile burning may be used for biomass disposal • Pre-treatment to improve existing control lines and for operational safety is quantitatively addressed under the VMP • The total volume of material allowed to be pile burned in a year is quantitatively addressed under the VMP • Pre-treatment to install new control lines is estimated based on delineated

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
	• Pre-treatment to install new control lines was not explicitly addressed due to lack of specifics	potential burn areas and more specific control line parameters
Existing Control Lines	Paved roads, dirt roads, trails, and disclines	No change
New Control Lines - Types	Not specified in the PFP. The WFRP EIR assumed that a new control line may be installed through discing.	A new control line may be installed through mowing, mastication, scraping, or wetting of fuels.
New Control Lines - Width	New control lines would be constructed to standards described in the Burn Plan, but typically would be 1-foot to 6-foot wide, depending on location, vegetation type, and type of equipment used to construct the line.	New control lines will be constructed to standards described in the Burn Plan, but will generally be 1.5 times as wide the height of the fuel which will carry the fire, depending on location, vegetation type, and type of equipment used to construct the line. In grasslands a control line may involve mowing a swath up to 5 to 10 feet wide. Control lines in shrub communities may need to be 20 to 30 feet wide. Forest communities may need a control line of 5 to 10 feet wide.
New Control Lines - Linear Feet	Not quantified in the PFP.	8,000 linear feet of new control lines annually [a,b]
Identification of Burn Units	Not identified in the PFP.	• Potential burn areas are delineated and shown in maps based on topography, similar vegetation types, and existing infrastructure. • Burn units will be identified within the potential burn areas, although not all potential burn areas will be further delineated into burn units. • Specific requirements must be met prior to initiating planning for a burn and for burn unit(s) to be suitable for burning. • If the requirements are met, Midpen will review the burn units with consideration for prioritization criteria to determine which burn units to undertake in a given year.
Public Notification Process	Not specified in the PFP. • Individual approved Burn Plans and Smoke Management Plans will	• Individual approved Burn Plans and Smoke Management Plans will

Component	Approved Programmatic Prescribed Fire Plan	Refined Prescribed Fire Plan
	identify certain outreach requirements. • Mitigation Measure (MM) Air Quality-2 of the WFRP EIR requires notification at least two days prior to a burn day to relevant individuals and jurisdictions, depending upon size of the burn. • MM Hazards-3 of the WFRP EIR requires installation of temporary signage on public roads, if not closed, at intervals ahead of and adjacent to a prescribed burn.	identify certain outreach requirements. • MM Air Quality-2 of the WFRP EIR requires notification at least two days prior to a burn day to relevant individuals and jurisdictions, depending upon size of the burn. • MM Hazards-3 of the WFRP EIR requires installation of temporary signage on public roads, if not closed, at intervals ahead of and adjacent to a prescribed burn. • <u>One week leading up to a burn day, Midpen will:</u> - <u>Install signage at the relevant OSP</u> - <u>Update Midpen's webpage with information</u> - <u>Engage with social media</u> - <u>Notify the Midpen Board of Directors</u> - <u>Provide email notifications to relevant agencies and interested parties</u>
Burn Ignition	• Conducted by hand using a drip torch or hand-held flare.	• Conducted by hand using a drip torch or hand-held flare <u>or potentially aerial ignitions via a helicopter or unmanned aerial vehicle (UAV).</u> • <u>Helicopter use in a maximum year could be for up to 5 days, 8 hours a day.[b]</u>

[a] Estimated based on 10 separate 50-acre burn units with an assumption that 85 percent of the control lines are existing.

[b] These assumptions are for the environmental analysis and are not specifically identified in the PFP.

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Prescribed Fire Burn Plan

The following Prescribed Fire Burn Plan was written for the Agency listed in Element 1 and is intended for use only by this agency on this specific unit(s). Any other use of this burn plan requires approval of the burn plan author and the Agency Administrator.

The format of this burn plan is modeled after the *NWCG Prescribed Fire Plan Template* was developed and maintained by the Fire Use Subcommittee (FUS), under the direction of the Fuels Management Committee (FMC), an entity of the National Wildfire Coordinating Group (NWCG).

Note on burn plan expiration date:

> The burn plan expiration date listed in Element 1 on the following page is designed to trigger the Burn Boss to consider that, if burning past the expiration date, the conditions of the burn unit(s) have been evaluated and that this burn plan is still valid for the conditions present in the burn unit(s). If conditions are still valid, then this date should be updated in consultation with the burn plan author. If conditions on the burn unit(s) have changed significantly since this plan was written, amendments to this burn plan will be necessary prior to implementation. Burning shall not take place until the burn plan accurately reflects the conditions within the burn unit(s) and a new expiration date is issued.
>
> It is incumbent upon the Burn Boss to ensure that the burn can still be implemented within the parameters of this plan. Any significant changes that are recommended by the Burn Boss should be brought to the attention of the burn plan author.

Note on client ignition authorization dates:

> The Agency Administrator ignition authorization dates listed in Element 2A are the dates the Agency Administrator has given authorization to burn provided all other conditions in the burn plan can also be met. Burning outside of these dates require approval from the Agency Administrator and the issuance of the new dates in Element 2A.

Burn plan expiration date and Agency Administrator authorization dates may be different.

Element 1: Signature Page

PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT NAME(S): [redacted]

IGNITION UNIT(S) NAME: McKinnon Hill

PREPARED BY:
Name (print): Phillip Dye Qualification/Currency: RXB2/Current

Signature: _____ Date: 01 February 2022

TECHNICAL REVIEW BY:
Name (print): _____ Qualification/Currency: _____

Signature: _____ Date: _____

COMPLEXITY RATING: Moderate

MINIMUM BURN BOSS QUALIFICATION: RXB2 or agency approved equivalent

APPROVED BY:
Agency Administrator (print): _____

Agency Administrator (signature): _____ Date**:** _____

Expiration date December 31, 2027

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Element 2A: Agency Administrator Ignition Authorization

Instructions: The Agency Administrator Authorization must be completed before a prescribed fire can be implemented. If ignition of the prescribed fire is not initiated prior to expiration date determined by the client, a new authorization will be required.

Prior to signature the Agency Administrator should discuss the following key items with the Burn Boss. Attach any additional instructions or discussion documentation (optional) to this document.

Key Discussion Items

A. Has anything changed since the Prescribed Fire Plan was approved or revalidated? *Such as drought or other climate indicators of increased risk, insect activity, new subdivisions/structures, smoke requirements, Complexity Analysis Rating.*
B. Have compliance requirements and pre-burn considerations been completed? *Such as preparation work, NEPA/CEQA mitigation requirements, cultural, threatened and endangered species, smoke permits, state burn permits/authorizations.*
C. Can all of the elements and conditions specified in Prescribed Fire Plan be met? *Such as weather, scheduling, smoke management conditions, suitable prescription window, correct season, staffing and organization, safety considerations, etc.*
D. Are processes in place to ensure all internal and external notifications and media releases will be completed?
E. Have key stakeholders been fully briefed about the implementation of this prescribed fire?
F. Are there circumstances that could affect the successful implementation of the plan? *Such as preparedness level restrictions, resource availability, other prescribed fire or wildfire activity*
G. Have you communicated your expectations to the Burn Boss regarding if and when you are to be notified that contingency actions are being taken?
H. Have you communicated your expectations to the Burn Boss regarding decisions to declare the prescribed fire a wildfire?

Implementation Recommended by:
Prescribed Fire Burn Boss Signature:_____ Date:_____

I am authorizing ignition of this prescribed fire between the dates of _____ and _____. It is my expectation that the project will be implemented within this time frame and as discussed and documented and attached to this plan. If the conditions we discussed change during this time frame, it is my expectation you will brief me on the circumstances and an updated authorization will be negotiated if necessary.
Additional Instructions or Discussion Documentation attached (Optional): Yes ☐ No☐

Ignition Authorized by:
Agency Administrator (print):_____ Date:_____
(signature)_____

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Element 2B: Prescribed Fire Go/No-Go Checklist

Preliminary Questions	**Circle YES or NO**
A. Have conditions in or adjacent to the ignition unit changed, (for example: drought conditions or fuel loadings), which were not considered in the prescription development? If **NO** proceed with the Go/NO-GO Checklist below, if **YES** go to item B.	YES NO
B. Has the prescribed fire plan been reviewed and an amendment been approved; or has it been determined that no amendment is necessary? If **YES**, proceed with checklist below. If **NO**, **STOP: Implementation is not allowed. An amendment is needed.**	YES NO
GO/NO-GO Checklist	**Circle YES or NO**
Have ALL permits and clearances been obtained?	YES NO
Have ALL the required notifications been made?	YES NO
Have ALL the pre-burn considerations and preparation work identified in the prescribed fire plan been completed or addressed and checked?	YES NO
Have ALL required current and projected fire weather forecast been obtained and are they favorable?	YES NO
Are ALL prescription parameters met?	YES NO
Are ALL smoke management specifications met?	YES NO
Are ALL planned operations personnel and equipment on-site, available and operational?	YES NO
Has the availability of contingency resources applicable to today's implementation been checked and are they available?	YES NO
Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?	YES NO

If all the questions were answered "**YES**" proceed with a test fire. Document the current conditions, location and results. If any questions were answered "**NO**", DO NOT proceed with the test fire: Implementation is not allowed.

After evaluating the test fire, in your judgment can the prescribed fire be carried out according to the prescribed fire plan and will it meet the planned objective? **Circle: YES or NO**

Burn Boss Signature:_____ Date:_____

Element 3: Complexity Analysis Summary and Final Complexity

Site: [redacted]	Unit: McKinnon Hill	State: CA	Date: 01/27/2022
Complexity Score (circle)			
Low (44-80 pts)	*Moderate (81-150 pts)*	*High (151-220 pts)*	

See Appendix C for detailed explanation of complexity rating.

Element 4: Description of Prescribed Fire Area

A. Physical Description

1. **Location:** The project area lies approximately [redacted]. See Appendix A for project and unit maps.

2. **Size:** The project area encompasses 475 acres of various ownerships. There are eighteen burn units within the project area as described below:

Burn unit	Acres	Dominant fuel model(s) and abundance (%)*				
		TU5	GR2	TL3	GS2	NB†
[redacted]	20	86		6		
[redacted]	29	89				5
[redacted]	26	77	18			
[redacted]	27	62	26			
[redacted]	40	80		13		
[redacted]	39	53	30			7
[redacted]	9	38		20		22
[redacted]	7	30		15		33
[redacted]	6	39	18			36
[redacted]	105	45	3	13	10	19
[redacted]	35	74		7		3
[redacted]	24	78				9
[redacted]	21	34	9	24		28
[redacted]	38	85			8	
[redacted]	31	77		6	6	
[redacted]	4	83		10		
[redacted]	6	77		22		
[redacted]	9	69		24		

*Note – percentages do not equal 100% as only the most abundant fuel models are shown
† NB represents non-burnable areas

3. **Topography:** All units have a primarily south aspect with a minor drainage bisecting the Crayton and McKinnon River units. Slopes average 35 - 45%.

B. Vegetation/Fuels Description:

1. On-site fuels data:

The project area contains four dominant vegetation types. The first fuel type is the most commonly occurring and consists of a canopy of Douglas Fir (*Pseudotsuga menziesii*) and mixed hardwood primarily California Black Oak (*Quercus kelloggii*), Pacific Madrone (*Arbutus menziesii*), and California Bay Laurel (*Umbellularia californica*) with an understory composed of various shrubs including Hazel (*Corylus cornuta*), Huckleberry (*Vaccinium ovatum*), and saplings of California Bay Laurel (*Umbellularia californica*). Populations of Himalayan Blackberry (*Rubus armeniacus*) and various herbs are also present. The primary carrier of fire is hardwood and conifer litter as well as understory vegetation.

Using the *Ashland Forest All-Lands Restoration Supplement*[1] to the 2005 *Scott and Burgan Standard Fuel Model Photo Guide*[2], fuel model TU5 (timber-understory) was chosen as the best choice for fire behavior and emissions modeling.

Flame length (ft)		Rate of Spread (ch/hr)		Fuel loading by time lag class (tons/acre)		
Average	**Extreme**	**Average**	**Extreme**	**1-hr**	**10-hr**	**100-hr**
7.0	17.0	9	46	7.0	4.0	3.0

[1] Ashland Forest All-Lands Restoration Supplement to the 2005 Scott and Burgan Standard Fuel Model Photo Guide, July 2020 – draft document - Keith Perchemlides, Kerry L. Metlen, & Pratibha Duwal (The Nature Conservancy)

[2] Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p. Available at: https://www.fs.fed.us/rm/pubs/rmrs_gtr153.pdf

The second fuel type is dominated by a denser canopy of Douglas Fir (*Pseudotsuga menziesii*), with a relatively open understory. Sword Fern (*Polystichum munitum*) and limited herbs are present. The primary carrier of fire is conifer litter.

Fuel model TL3 (timber-litter) was chosen as the best choice for fire behavior and emissions modeling.

Flame length (ft)		Rate of Spread (ch/hr)		Fuel loading by time lag class (tons/acre)		
Average	**Extreme**	**Average**	**Extreme**	**1-hr**	**10-hr**	**100-hr**
1.0	2.0	2	5	0.5	2.2	2.8

The third fuel type is open meadows dominated by various grasses and herbaceous plants. Patches of Himalayan Blackberry (*Rubus armeniacus*) punctuate the meadow systems. Meadow systems are grazed and therefore height of the plant material is relatively short. The primary carrier of fire is grass.

Fuel model GR2 (grass) was chosen as the best choice for fire behavior and emissions modeling.

Flame length (ft)		Rate of Spread (ch/hr)		Fuel loading by time lag class (tons/acre)		
Average	**Extreme**	**Average**	**Extreme**	**1-hr**	**10-hr**	**100-hr**
4.0	12.0	32	244	1.1	0.0	0.0

The fourth fuel type is characterized by mechanical disturbance and man-made openings. Little to no canopy remains. Scotch Broom and Himalayan Blackberry, as well as some grasses, are the dominant vegetation present and are the primary carriers of fire.

Fuel model GS2 (grass-shrub) was chosen as the best choice for fire behavior and emissions modeling.

Flame length (ft)		Rate of Spread (ch/hr)		Fuel loading by time lag class (tons/acre)		
Average	**Extreme**	**Average**	**Extreme**	**1-hr**	**10-hr**	**100-hr**
4.0	15.0	18	188	2.1	0.5	0.0

2. **Adjacent fuels data:** Fuels outside the burn unit are similar to TU5 although this may be modified in areas where thinning of the understory and previous burning has occurred.

C. Description of Unique Features, Natural Resources, Values:

Numerous residences exist within the planning area as well as a community building and a school. Structures will require prep work prior to ignitions to mitigate risk. Mitigation measures during ignitions may include additional control lines, hose lays, and sprinkler systems. [redacted] has a carbon project in the far eastern extent of the project area, as well as upslope of the project. Consultation with the [redacted] may be required to assess impacts of fire to the

carbon project. Highway [redacted] bisects the planning area and is the main thoroughfare in the area. Traffic control and other mitigation measures may be required when conducting prescribed burning adjacent to the highway

D. Maps–Attach in Appendix A

1. Vicinity (Required)
2. Project/Ignition Unit(s) (Required)
3. Values (Optional): ☐ Included ☒ Not Included
4. Significant or Sensitive Features (Optional): ☐ Included ☒ Not Included
5. Fuels or Fuel Model(s)(Optional): ☒ Included ☐ Not Included
6. Smoke Impact Area (Optional): ☐ Included ☐ Not Included (included in Appendix F, if required)

Element 5: Objectives

A. Resource Goals:

1. Enhance natural resources important to the [redacted] people and culture including oak woodland, hazel, and wildlife habitat.
2. Protect homes of community members and community buildings from threat of wildfire.
3. Reduce fuel loading, overstocking of forests, and encroaching vegetation.

B. Prescribed Fire Objectives:

1. Reduce fuel loading of down and dead material by 30 to 90% immediately post burn.
2. Reduce competing vegetation 1-6" by 20 to 80% measured 6 months post burn.
3. Limit mortality in hardwood species to ≤20% measured one year post burn.
4. Limit mortality in legacy trees as identified by the landowner and/or tribal resource advisor to ≤20% measured one year post burn.

Element 6: Funding

A. Cost: Target funding cost is a maximum of [redacted]/acre. For the project area, maximum target cost is $[redacted]

B. Funding Source: The project is funded primarily through grant funding. Other funding sources include in-kind donations or gifts

Element 7: Prescription

A. Prescription Narrative:

Environmental variables were selected to allow for the broadest prescription window while maximizing opportunity to achieve objectives and still retain control of the fire. Fuel loading will be reduced using a variety of firing techniques. There may areas of isolated torching in brush and areas of conifer reproduction. There may also be areas where vegetation will be killed by radiant heat without torching. It is important to note that ability to achieve objectives is also, besides burning within prescription, heavily dependent upon skilled leadership and thoughtful application of fire.

The burn prescription is intended to be evaluated as a whole and therefore, exceeding one element will not necessarily put the burn out of prescription. The Burn Boss should consider all environmental variables when nearing the hot or cool end of the prescription and based on an analysis of all elements, determine if ignition should proceed or continue. Exceeding two or more prescription elements should be done with extreme caution and should only proceed if the Burn Boss is confident that resource objectives can be met, and the likelihood of escape is minimal. In addition to the prescription elements, the Burn Boss should consider the season, time of ignition, and weather forecast and trends. All decisions regarding burning near or outside prescription limits should be well documented.

B. Prescription Parameters:

1. Environmental:

Parameter	Low (Cool)	Desired	High (Hot)
Temperature (^{O}F)	45	60 - 70	85
1-hr fuel moisture (%)	12	10 - 8	6
10-hr fuel moisture	14	12 - 10	8
100-hr fuel moisture	25	22 - 18	15
20-ft wind (mph)	0	5 - 10	18

2. Fire Behavior:

TU5

Parameter	Low (Cool)		Desired		High (Hot)	
	Head	Backing	Head	Backing	Head	Backing
Rate of spread (ch/hr)	2.1	0.3	2.8	0.35	3.4	0.4
Flame length (ft)	3.4	1.4	3.8	1.5	4.2	1.6

TL3

Parameter	Low (Cool)		Desired		High (Hot)	
	Head	Backing	Head	Backing	Head	Backing
Rate of spread (ch/hr)	0.5	0.1	0.7	0.1	1.0	0.1
Flame length (ft)	0.6	0.2	0.7	0.25	0.8	0.3

GR2

Parameter	Low (Cool)		Desired		High (Hot)	
	Head	Backing	Head	Backing	Head	Backing
Rate of spread (ch/hr)	8.0	1.2	16	1.8	24.5	2.4
Flame length (ft)	1.9	0.8	2.8	1.1	3.7	1.3

GS2

Parameter	Low (Cool)		Desired		High (Hot)	
	Head	Backing	Head	Backing	Head	Backing
Rate of spread (ch/hr)	1.6	0.2	4.0	0.5	6.5	0.7
Flame length (ft)	0.9	0.4	1.7	0.6	2.6	0.9

For fire modeling empirical documentation see Appendix E.

Element 8: Scheduling

A. **Implementation Schedule:** The project can be implemented anytime prescription parameters can be met and all other conditions of this burn plan can be satisfied such as staffing, unit preparation, and permitting and approvals. Based on previous burns conducted in this area, this will most likely be fall or spring.

B. Projected Duration: Ignition of each unit is expected to last one day with additional days for mop-up and/or patrol as needed until the Burn Boss declares the fire out.

C. Constraints: There are a number of concrete and intangible constraining factors for this project. They include, but are not limited to,

- Environmental and fire behavior prescription – see Element 7
- Adequate resource availability – both onsite and contingency
- Local, regional, and state wildfire activity
- Approval from air quality management district, if required
- Approval from fire authority having jurisdiction
- Agency Administrator approval
- Community activity, such as gatherings and sporting activities
- Community acceptance of prescribed fire which has historically been good

It is incumbent upon the Burn Boss to evaluate factors, both on and off site, when determining implementation dates.

Element 9: Pre-burn Considerations and Weather

A. Considerations:

1. On-site: New control lines should be completed no later than two weeks prior to the burn. Resource values of significance should be noted and flagged with a resource advisor prior to ignition. There are a number of structures and improvements within the project area, and these will need adequate protection prior to ignition. Methods to protect infrastructure could include, but are not limited to, removal/reduction of fuel, wetting down, or pre-positioning of holding resources. The owner of these values should be consulted on the preferred method(s) as long as these methods are effective at reducing the threat.

   Most of the burn unit boundaries will use pre-existing roads or trails. In those areas where new control lines need to be created, this should be done no later than two weeks prior to ignition, as noted above. Control lines can be of any type subject to resource management considerations, Burn Boss concurrence, and effectiveness of control line. Lines should generally be constructed only wide enough to hold any backing or flanking fire that may challenge them. Fire lines should generally not be constructed to resist a fast-moving head fire as this is not the planned ignition technique for the unit and construction of a line of such width would increase resource damage. However, if deemed necessary by the Burn Boss, a wider line may be constructed. Such wide lines should be justified in writing.

   Legacy trees should also be identified and protected appropriately. Snags or suspect trees that pose a safety threat should be removed prior to burn; however, consideration should be given to retaining some snags for habitat. Falling tree hazards may exist along roadways, fire lines and around structures. In places where protection of desired trees cannot be created prior to ignition, immediate mop up may be required, and these must be identified and communicated to holding resources.

2. Off-site: Proper notifications and permits (if required) must be obtained prior to ignition (see C below and Element 12). Contingency lines should be identified ahead of time and communicated during the pre-ignition briefing. Signage should be placed at appropriate locations to alert community members and motorists. Daily weather forecasts must be obtained prior to ignition and expected post-ignition weather should also be gathered. Use of a PIO or similar position should be considered to handle public and media inquiries.

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

Weather observations shall be monitored for at least five days consecutively prior to planned ignition. Several daily weather observations should be collected but if only one observation per day is made, it should be during predicted peak burning conditions, usually early afternoon. Weather shall be collected using a belt weather kit, Kestrel®, portable RAWS, or other weather gathering device. During ignition, on-site weather shall be collected every hour at a minimum during ignition, or more frequently as directed by the Burn Boss, and reported to resources on the burn. During mop-up, weather shall be collected at least twice daily if mop-up extends beyond ignition day. Once the unit is placed in patrol status, weather shall be collected once daily, at a minimum, until the fire is declared out.

It is preferred that on-site weather data be collected. However, if necessary, a nearby representative RAWS or other weather station may be used. If using a RAWS or weather station, care should be

taken that the weather station shares a similar elevation, aspect, fuel shading, and other comparable properties of the burn site(s). On-site weather data should be used for obtaining spot weather forecast from Northern California Interagency Fire Weather Predictive Service at Redding or from the National Weather Service's Spot Weather Forecast web page, https://www.weather.gov/spot/. As an alternative, a geographically specific forecast, such as one available from the internet, may be used.

A smoke management plan, if required, shall be submitted and approved by the local air quality management district and an air pollution permit will be obtained prior to ignition. Prior to ignition each day, the Burn Boss or designee will ensure that it is a permissive burn day, or a permit to burn on a no-burn day is obtained, as described on the North Coast Unified Air Quality Management District's (NCUAQMD) website, http://www.ncuaqmd.org/.

It is important to note that [redacted], a smoke permit may not be required. However, a courtesy notification to NCUAQMD is advisable.

C. Notifications: Community engagement should begin as soon as possible in the planning process. If necessary, public meetings could be held to address community concerns and present the plan to the community. Notifications may be made using local newspapers, electronic media (such as email and/or social media), and postings at local stores, post offices, and other areas of community gathering. Consideration should be given to directly contacting known smoke sensitive members of the community.

Notifications to agencies and organizations is listed in Element 12.

Element 10: Briefing

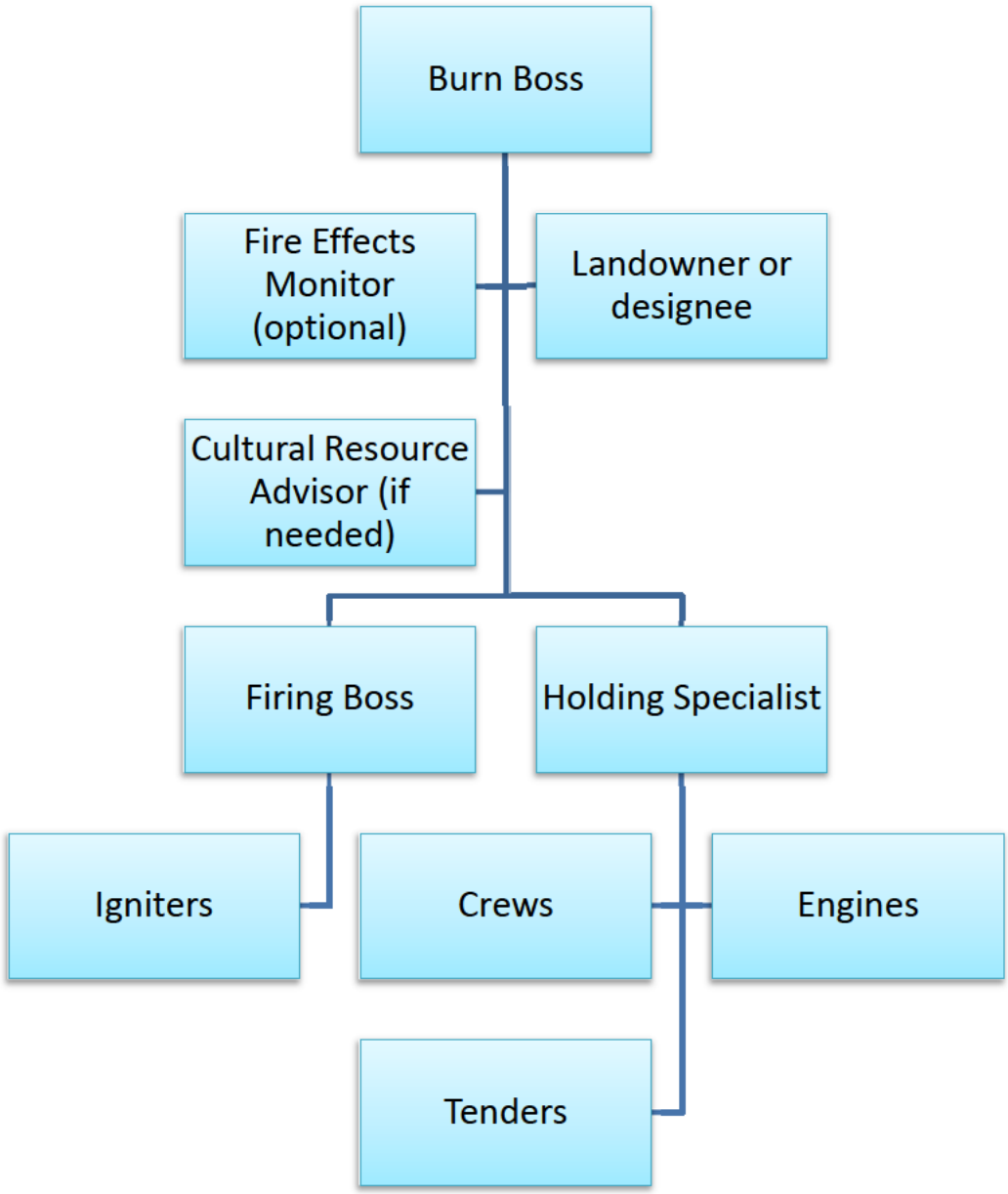
A. Briefing Checklist - The following items must be included; additional items may be added:

- € Burn organization and assignments
- € Prescribed Fire objectives and prescription
- € Description of prescribed fire project area and burn units
- € Expected weather and fire behavior – include predicted weather after ignition
- € Communications
- € Ignition plan (including any planned aerial ignition planned) and test fire location
- € Holding plan
- € Contingency plan and assignments
- € Wildfire declaration
- € Safety and medical plan, including Covid-19 mitigation strategies
- € Smoke management techniques
- € Mop-up and patrol plan

Use of a standard briefing checklist, such as the one found in the Interagency Response Pocket Guide (IRPG), can be used to augment the briefing checklist above.

Element 11: Organization and Equipment

A. Positions: Staffing will vary depending on environmental conditions and whether or not the burn will be conducted under "cool", "desired", or "hot prescriptions. See Element 7. The organizational chart below displays the most likely organizational structure under typical conditions.



Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

The following table is to be used by the Burn Boss as a guideline for staffing the project based on expected environmental and fire behavior conditions. The numbers listed in the table should be considered the minimum number of personnel required.

Item	Quantity	Comments
Minimum Resources for Low (Cool) Burn Conditions		
Firefighters (igniters and holders)	12	Holding Specialist and Firing Boss optional
Type 6 or larger engine (or engine equivalent)	1	
Additional on-site water capacity (e.g., extra engines, water tender, trailer, tanks, or static water source, i.e., ponds, hydrants, pools)	500	
Drip Torches	4	
Backpack pump	2	
Hand-held radio	4	
Minimum Resources for Moderate (Desired) Burn Conditions		
Firefighters (igniters and holders)	18	Holding Specialist and Firing Boss required
Type 6 or larger engine (or engine equivalent)	3	
Additional on-site water capacity (e.g., extra engines, water tender, trailer, tanks, or static water source, i.e., ponds, hydrants, pools)	1000	
Drip Torches	4	
Backpack pump	4	
Hand-held radio	6	
Minimum Resources for High (Hot) Burn Conditions		
Firefighters (igniters and holders)	24	Holding Specialist and Firing Boss required
Type 6 or larger engine (or engine equivalent)	4	
Additional on-site water capacity (e.g., extra engines, water tender, trailer, tanks, or static water source, i.e., ponds, hydrants, pools)	1500	
Drip Torches	4	
Backpack pump	6	
Hand-held radio	10	
Minimum Additional Resources for All Burns		
First aid kit	1	Oxygen and AED capable preferred
Belt weather kit/Kestrel®	1	
Portable pump	1	For drafting from static water source

Element 12: Communication

A. Radio Frequencies:

1. **Tactical frequency(ies):** [redacted] MHz Tx and Rx. No tone guarding.
2. **Contingency frequency(ies):** In the event that outside fire agency support is needed, the CAL FIRE Emergency Command Center can be reached at [redacted] Call sign is "Fortuna". The Burn Boss must receive permission to use this frequency prior to ignition.
3. **Air operations frequency(ies)**: [redacted] MHz Tx and Rx. (Tx/Rx Tone 16 – 192.8). As described above, the Burn Boss must receive permission to use this frequency prior to ignition.
4. **Other frequencies:** If a mutually agreeable frequency is available and authorized and can be used by all resources, these may be used. An example could be the [redacted] Fire frequency(ies).

B. Telephone Numbers:

CAL FIRE Fortuna ECC	[redacted]
North Coast Air Quality Management District	[redacted]
USFS Orleans Ranger District	[redacted]

Element 13: Public and Personnel Safety, Medical

A. Safety Hazards: Every prescribed fire comes with a number of safety hazards. The hazards associated with this project include such items as personnel exposure to smoke and heat, rapid changes in fire intensity, snags, uneven and steep ground, animal encounters, dehydration, fatigue, working with power equipment, and driving. See Appendix D, Job Hazard Analysis (JHA), for more detailed information.

B. Mitigation: Measures Taken to Reduce the Hazards: The JHA (see Appendix D) for this project shall be reviewed with resources prior to ignition and the mitigation that will be used shall also be reviewed. In addition, a thorough pre-ignition briefing shall address safety concerns and mitigations. Any unique hazards not identified during a standard briefing should be covered by the Burn Boss.

C. Emergency Medical Procedures: If a medical incident occurs, an announcement shall occur over the radio. At a minimum, the announcement should include the nature of the emergency, the location, and any additional resources needed. If not already done, the Burn Boss shall assign a person to supervise the medical incident ("incident within an incident") and this person shall be responsible for coordinating the appropriate medical care.

The Burn Boss shall be informed if medical transportation is required and shall be responsible for notifying EMS and determining must appropriate level of transport (i.e., ground ambulance versus helicopter). If practicable, ignition should cease until the medical emergency is mitigated unless the Burn Boss determines that continued ignition is needed to maintain control of the fire.

Detailed emergency medical procedures will be listed in the Medical Plan (ICS 206) of the Incident Action Plan (IAP) created for each day of active ignition.

D. Emergency Evacuation Methods: It is imperative that, prior to ignition, the Burn Boss give careful and deliberate thought to evacuation methods. Given the very remote nature of the project area, ground ambulance response and transport times will be long and helicopter evacuation will be challenged by the limited number of suitable landing zones.

If an injury is minor, available personnel on the project can transport the injured person to the closest appropriate medical facility. If the injury is more serious, ground ambulance or helicopter will be required. The closest ground ambulance, if in quarters, will likely be responding from [redacted] (60-minute response) or [redacted] (90-minute response). A helicopter could come from a number of locations. The closest helicopter bases are in [redacted] with varying travel times. **Helicopter landing zones must be identified, and their locations given to resources during the pre-ignition briefing.** A helicopter capable of air rescue is stationed at the [redacted] helitack base. If needed, the [redacted] team can be requested with an approximate 2-hour ETA from [redacted].

E. Emergency Facilities:

1. For minor injuries, personnel can be transported to the following community clinics:
   a. [redacted]
   b. [redacted]
2. For more serious injuries, personnel should be transported to the following facilities:
   a. Mad River Community Hospital, 3800 Janes Rd, Arcata, CA, 95521
   b. UC Davis Regional Burn Center, 2315 Stockton Blvd, Sacramento, CA, (916) 734-3636

Element 14: Test Fire

A. Planned Location: To be determined by the Burn Boss. The test fire shall be conducted in a location that is representative of the fuels within the unit and along control lines with equipment standing by in the event that the test fire needs to be suppressed. Under typical conditions, this will most likely be on the uphill and/or downwind sides of the burn unit. The test fire is intended to give the Burn Boss a chance to evaluate fire behavior and whether or not prescribed fire objectives can be achieved. If objectives are likely to be achieved and fire behavior is within acceptable limits, then ignition can proceed. However, if evaluation of the test fire determines that probability of achieving objectives is low and/or fire behavior is unacceptable, the test fire should be suppressed, and ignition delayed or postponed until more favorable conditions occur.

B. Test Fire Documentation:

1. **Weather conditions on-site**: Weather shall be taken and recorded before test fire ignition. Weather observations shall become part of the final burn documentation.

2. **Test fire results:** A Go/No-Go checklist (Element 2B) shall be completed prior to initiating the test fire. Any decision to continue firing or cease firing after the test fire should include documentation of the test fire results to support the decision.

Element 15: Ignition Plan

A. Firing Methods: Hand firing using mostly backing and flanking techniques will be the preferred firing method. Head fire may be applied to the unit once sufficient "black" is built around the burn unit and the head fire will not exceed the prescription parameters. Head fire may be necessary under a cooler prescription to achieve the resource objectives of the burn. Before applying head fire, the Burn Boss must determine that control lines are capable of holding head fire or delaying fire spread long enough for resources to pick up any and all slopovers or spot fires.

Other techniques that could be used including ring, chevron, or spot firing. The Firing Boss shall ensure that any method(s) used results in desirable fire behavior.

Igniters must coordinate with holders to ensure that they are not putting down more fire than holders can keep pace with.

B. Devices: Primarily drip torches. Under a cooler prescription, use of propane fired devices may be necessary to build sufficient fire intensity, especially in heavier concentrations of fuels. While unlikely to be needed, other ignition devices may be used (e.g., Firequick® flare launcher) but the Firing Boss must ensure the use of such devices does not result in undesirable fire behavior or result in accidental ignition outside the burn unit.

C. Minimum Ignition Staffing: Flexible depending on conditions – see Element 11. Under low conditions, this may only require several lighters. Under moderate and high conditions, a Firing Boss (or equivalent) is required with an adequate number of lighters. If needed, igniters should be broken into modules or squads to maintain adequate span of control.

Element 16: Holding Plan

A. General Procedures for Holding: Holders shall coordinate with igniters and should generally set the pace of ignition so that holders can maintain control of the fire. Holders may use any number of techniques to ensure fire stays within the burn boundaries. This can include use of water (engines or backpack pumps), hoselays, hand tools, or fire (if coordinated with igniters). Holders may also need to use water to reduce fire intensity as needed. Patrol should also occur at regular intervals to ensure that portions of the unit ignited earlier during the operational period and appearing "cold" do not become active without awareness.

B. Critical Holding Points and Actions: Corners or sharp changes of direction in the burn unit should receive special attention as these are locations where prescribed fires typically escape. In addition, any areas of the burn unit where fire intensity may be greater, such as near slash piles, should receive additional attention. Infrastructure and legacy trees may also need greater vigilance. Holders can use a variety of actions to protect these areas such as widening control lines, use of water or dirt, or removal of fuel around assets such as fence posts and wooden structures.

C. Minimum Organization or Capabilities Needed: Flexible depending on conditions – see Element 11. Under low conditions, this may only require regular patrol. Under moderate and high conditions, a Holding Specialist is required with an adequate number of holders. If needed, holders should be broken into modules or squads to maintain adequate span of control.

The number of fire engines, water tenders, and other water conveyance apparatus as well as onsite water requirements will depend upon burning conditions – see Element 11. It is recommended that holders on foot are paired with water deliver equipment to maximize effectiveness.

Element 17: Contingency Plan

A. Management Action Points or Limits:

Management Action Point–Documentation Element	Management Action Point Narrative
Designator and Description:	**MAP #1**
Condition:	**Injury requiring medical evacuation**
Management Intent:	**Ensure injured personnel receive prompt medical attention while keeping fire within burn unit boundary**
Recommended Action(s) to Consider:	**Request resources through Fortuna Interagency Dispatch. Determine if ground or air ambulance is required. Closest EMT shall be assigned to supervise care of the injured. Burn Boss shall designate an "Incident within an Incident (IWI)" IC.**
Recommended Resources:	**EMT. IWI IC. Additional contingency personnel as needed to assist in IWI or maintain control of the fire**
Time Frame:	**Immediately upon determination of need for contingency resources**
Describe the consequences of not taking the recommended action(s) (Optional):	**The remote nature of this project will result in delay of definitive medical care if there is a serious injury. This delay may result in increased morbidity of injured personnel. Prompt action is essential.**
Responsibility:	**EMT to supervise patient care. IWI IC to manage medical event. Burn Boss to request additional resources and continue to manage prescribed fire.**
Date and time this MAP was initiated:	

Management Action Point–Documentation Element	Management Action Point Narrative
Designator and Description:	**MAP #2**
Condition:	**Excessive smoke production**
Management Intent:	**Smoke production must be continuously monitored to ensure impacts to public are not excessive.**
Recommended Action(s) to Consider:	**Ignition can be delayed until fuels burn down. Smaller areas of burn unit could be ignited and allowed to burn down before igniting additional areas. Large woody piles can be pulled apart if safe to do so. As a last resort, suppression can be initiated.**
Recommended Resources:	**Additional personnel and/or engines. Can be requested through local VFD or Fortuna Interagency Dispatch.**
Time Frame:	**Within 1 – 2 hours of excessive smoke production**
Describe the consequences of not taking the recommended action(s) (Optional):	**Excessive smoke production may produce unwanted public exposure. In addition to health concerns, impacts to roadways may occur. Public acceptance of prescribed fire may be impacted. Air quality district penalties may occur.**
Responsibility:	**Burn Boss**
Date and time this MAP was initiated:	

Management Action Point–Documentation Element	Management Action Point Narrative
Designator and Description:	**MAP #3**
Condition:	**Fire behavior and fire effects exceed prescription parameters**
Management Intent:	**For successful implementation of this project, specific fire behavior and effects are required. Effects outside of those desired may not meet project objectives.**
Recommended Action(s) to Consider:	**Constant monitoring of fire behavior and fire effects are ideal. If possible, designate a FEMO or equivalent person to monitor these. Firing and holding techniques may need to be modified to increase or decrease fire behavior. If possible, ignition can be delayed until fire behavior returns to desired parameters. As a last resort, ignition may need to stop, and mop-up and patrol should begin.**
Recommended Resources:	**Additional personnel and/or engines if required. Can be requested through local VFD or Fortuna Interagency Dispatch.**
Time Frame:	**Within 30 minutes of determining that fire is not meeting and is not likely to meet resource objectives.**
Describe the consequences of not taking the recommended action(s) (Optional):	**Failure to meet resource objectives may cause financial hardship for the landowner. In addition, it may make meeting those objectives in the near future difficult to achieve. Fire behavior higher than desired may cause unwanted resource damage.**
Responsibility:	**Burn Boss**
Date and time this MAP was initiated:	

Management Action Point–Documentation Element	Management Action Point Narrative
Designator and Description:	**MAP #4**
Condition:	**Fire escapes burn unit and cannot be contained with on-site resources**
Management Intent:	**To ensure the prescribed fire does not cause unwanted damage to property or infrastructure outside the burn unit or threaten lives**
Recommended Action(s) to Consider:	**The Burn Boss must decide if suppression efforts with on-site resources are likely to succeed. If not, contingency resources should be ordered promptly. If additional contingency resources cannot or are not likely to succeed in containing an escaped fire, a wildfire declaration should be made by the Burn Boss (see Element 18)**
Recommended Resources:	**Additional personnel and/or engines if required. Can be requested through local VFD or Fortuna Interagency Dispatch**
Time Frame:	**Upon determination that additional resources are needed to contain fire**
Describe the consequences of not taking the recommended action(s) (Optional):	**A fire which leaves burn unit boundaries may threaten nearby homes, communities, and infrastructure as well as result in unwanted resource damage. Potential criminal and civil consequences could occur. Public acceptance of prescribed fire may decrease significantly, possibly for many years**
Responsibility:	**Burn Boss**
Date and time this MAP was initiated:	

B. Minimum Contingency Resources and Maximum Response Time(s):

Burn prescription	Engines	Personnel	Maximum response time
Low	None	None	N/A
Preferred	(1) – Type 3, 4, 5, or 6	10	30 minutes
High	(2) – Type 3, 4, 5, or 6	15	1 hour

Note that the above table relates the terms “low”, “preferred” and “high” to the burn prescription so that the Burn Boss can determine contingency resource requirement based on burning conditions. It is recognized that these terms are subjective. However, this is done deliberately so that the Burn Boss can use his/her professional judgement to determine appropriate contingency resource requirement. Any decision regarding contingency resource staffing which deviates significantly from the recommendations above should be documented in writing by the Burn Boss.

In addition, the Burn Boss or designee should monitor fire activity within the local and regional areas to determine if there is a significant resource commitment to other events. If local and regional fire activity is high, then the Burn Boss should determine whether it is appropriate to continue since contingency resources may be unavailable or responding from long distances. Particular attention should be paid to alarm activity for the nearby [redacted] Unit fire agencies as well as the [redacted] National Forests

Element 18: Wildfire Declaration

A. **Wildfire Declared By:** Burn Boss

B. **Conditions for Wildfire Declaration:** A wildfire declaration should be made if any of the following conditions exist:

a. The fire leaves the project area or is likely to escape the project area and cannot be contained with contingency actions or contingency actions are likely to fail.
b. The fire remains in the project area but needs additional resources beyond contingency resources to regain control of the fire.

It is important to note the difference between project area and burn unit. If fire escapes the burn unit but remains within the project area this will not necessarily result in a wildfire declaration. In this case, the Burn Boss will have to determine if a wildfire declaration is necessary to regain control of the fire. There are a number of burn units in the area that are slated for future ignition, some of which may have already been prepped. Prior to ignition, the Burn Boss shall determine where neighboring burn units are located and if fire can be tolerated in these areas. If any doubt exists in the Burn Boss' mind, a wildfire declaration should be made

C. IC Assignment: The Burn Boss shall assume the IC role until and if a transfer of command is necessary.

D. Notifications: Notification to the Fortuna Interagency Emergency Command Center (ECC) shall take place as soon as possible upon wildfire declaration. The IC should be prepared to provide the following information to the ECC:

- Fire name and location
- Terrain (slope, aspect, elevation) and position of fire on the slope
- Size of fire
- Fuel type, anticipated control problems, and spread potential
- Values threatened
- Need for public evacuation
- Weather conditions (including wind speed and direction)
- Fire behavior – current and expected
- Resources on the fire and those needed
- Need for additional radio frequencies

The IC should also be prepared to provide the above information to resources upon arrival.

E. Extended Attack Actions and Opportunities to Aid in Fire Suppression: Direct attack is the preferred method of suppression wherever possible. Indirect attack may be used if required. The Burn Boss is encouraged to develop secondary containment lines during the reconnaissance and planning of this project and locations of these secondary lines should be provided during the pre-ignition briefing. Access to adjacent lands should be agreed upon by those landowners ahead of time and may include things such as having gate codes or leaving them unlocked. In addition, as noted in (B) above, if the fire burns into a neighboring burn unit(s), the Burn Boss should determine if the fire can be tolerated in that unit(s) and held within that unit(s).

Element 19: Smoke Management and Air Quality

Note – [redacted], a smoke management permit may not be required. If it is, the necessary procedures are outlined below. If not, it is recommended that a courtesy notice be provided to the air quality management district.

A. Compliance: A smoke management plan for this project may be required by North Coast Unified Air Quality Management District (NCUAQMD). Determination if a smoke management plan is required should be made well ahead of planned ignition.

If required, the plan should be submitted to the District at least 14 days in advance of planned ignition to give the District time to review the plan, ask questions, or to make changes to the plan if required by the District. All ignition units planned for the upcoming year should be included in the permit application to eliminate the cost of filing separate plans for each individual project.

B. Permits to be obtained: An approved smoke management plan from NCUAQMD will also contain a burn authorization number which shall be recorded. Approval must be received for each day of active ignition. See Element 9 for additional details.

C. Smoke-Sensitive Receptors: Smoke sensitive receptors shall be identified in the smoke management plan application from NCUAQMD. Nearby neighbors should be notified to the extent practicable, particularly those with known smoke sensitivity due to health issues. [redacted] could be a good resource to obtain a list of smoke sensitive individuals.

D. Potential Impacted Areas: In addition to neighboring residents, roadways and down-drainage areas may be impacted. The Burn Boss should be alert to the fact that down-drainage smoke can travel long distances and impact roadways and communities far outside the project area.

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts: Ignition can be delayed or diluted over time to reduce smoke impacts. Project implementation may need to be delayed if excessive smoke impacts are anticipated. As a last resort, fire may need to be suppressed if smoke production is significant and cannot be reduced by any other means. See MAP #2 in Element 17 above.

Smoke sensitive individuals should be given ample advance warning of burn implementation to give them time to temporarily leave the area or prepare accordingly. In the past, the [redacted] has provided smoke filtration units to those individuals who must or choose to shelter-in-place.

For roadways, placement of appropriate signs shall be required. In addition, if smoke drift is likely to obscure roadway visibility, flaggers and/or pilot cars may be necessary to alert motorists.
Special consideration must be given to down-drainage receptors. Smoke can travel a long way down the [redacted] valley at night and the Burn Boss must plan for these impacts, particularly if ample fuels are left smoldering. In the event of possible significant overnight smoke production, suppression of smoldering fuels may be required.

Element 20: Monitoring

A. Fuels Information Required and Procedures: One-hour fuel moisture will be determined before and during ignition using fine dead fuel moisture tables. 10-hour fuel moisture sticks will be placed in or near the unit at least two weeks before the burning and the moisture level recorded daily, including the day of burn.

B. Weather Monitoring (Forecasted and Observed) Required and Procedures: Weather forecasts shall be obtained every day at least one week prior to planned ignition. Special attention should be paid to environmental conditions that favor smoke dispersion as well as conditions that might result in poor smoke dispersion (e.g., inversions) or weather conditions that could present control issues such as cold front passage or red flag conditions.

During the burning period, weather shall be taken at least every hour or more frequently if requested by the Burn Boss. Weather readings shall be obtained with a Kestrel® or similar weather recording device or a belt weather kit with sling psychrometer. The following weather observations are required, at a minimum, during ignition:

- Location and time of weather observation, including elevation and aspect
- Dry bulb and wet bulb temperatures
- Relative humidity and dew point
- Wind speed and direction including average and max gusts over a one-minute period
- Fine dead fuel moisture
- Probability of ignition
- Sky cover and weather conditions (percent cloud cover, rain, etc.)

C. Fire Behavior Monitoring Required and Procedures: Fire behavior shall be monitored continuously to ensure it remains within prescription parameters. At a minimum, rate of spread and flame length shall be noted and recorded. Scorch height on trees should be recorded also if appropriate. The fire behavior observer should establish regular communication with the Burn Boss to provide feedback on fire behavior.

If available, use of a Fire Effects Monitor (FEMO) or person with commensurate training is encouraged.

D. Monitoring Required to Ensure that Prescribed Fire Plan Objectives are Met: The Burn Boss, or designee, should continuously monitor prescription parameters and compare them to current environmental conditions and fire behavior to ensure that prescribed fire objectives are being met. The Burn Boss should use the information provided from this monitoring to adjust firing and/or holding techniques.

E. Smoke Dispersal Monitoring Required and Procedures: Smoke dispersal shall be monitored continuously to ensure that smoke production is within desired range. At a minimum, smoke height and direction of travel should be noted. If possible, use of a remote smoke observer who can see the smoke plume and the larger geographic area are desired. Any unwanted smoke impacts should be reported to the Burn Boss.

Element 21: Post-burn Activities

A. Post-Burn Activities that must be completed:

- Notify Fortuna Interagency ECC once active ignition is completed. Provide information if burn has been declared out or is in patrol status and if the latter, appropriate contact information in the event the ECC needs to make contact.
- Mop-up and patrol as necessary. Prior to leaving the burn unit, the Burn Boss shall ensure that the landowner is equipped and prepared to continue these tasks if necessary. A written document detailing mop-up and patrol tasks is encouraged.
- Rehabilitate fireline. This does not have to necessarily occur immediately post-ignition and in fact, should occur only after fire has been declared out.
- Rehabilitate damaged infrastructure if possible. If not, establish agreement with landowner to ensure these are completed and determine responsibilities.
- Fell any hazard trees if required. Consult with landowner prior to felling. Ensure competent fallers are used.
- Return equipment to their owners. This includes hand tools, hose, appliances, etc.
- Ensure personnel are in adequate condition for return travel to home unit. Consider having personnel remain overnight if excessive fatigue is present.
- Remove prescribed fire signs
- Gather and complete documentation including weather and fire behavior observations. If desired, collect ICS 214 (Unit Log) from resources. Burn Boss should submit post-fire report within 30 days following project completion and submit to landowner.

B. Post-burn Evaluation

In order to ensure that prescribed fire objectives are met, a post-burn evaluation report is required. See Appendix G for details. In lieu of Appendix G, the Yurok Tribe may request a different report to be completed. The Burn Boss should determine the appropriate post-burn evaluation form to be used.

Prescribed Fire Plan Appendices

Appendix A: Maps: Vicinity, Project and Ignition Units

Appendix B: Technical Reviewer Checklist

Appendix C: Complexity Analysis

Appendix D: Job Hazard Analysis or Risk Assessment

Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation

Appendix F: Smoke Management Plan and Smoke Modeling Documentation, if required

Appendix G: COVID-19 Checklist for [redacted] Fire Management Activities

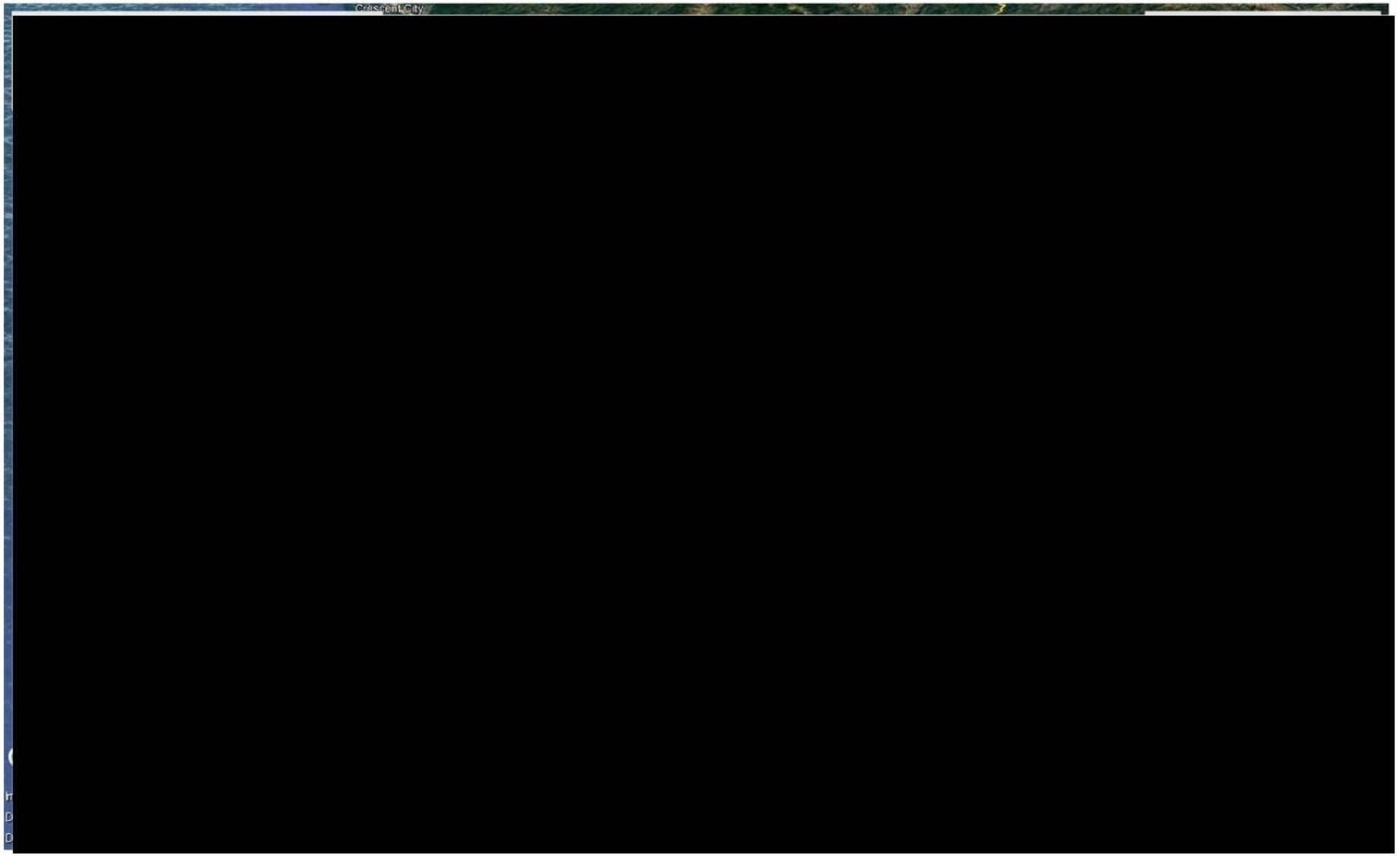
Appendix H: [redacted] Consequence Analysis

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Appendix A: Maps

Vicinity Map



Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Project Map – Aerial imagery

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

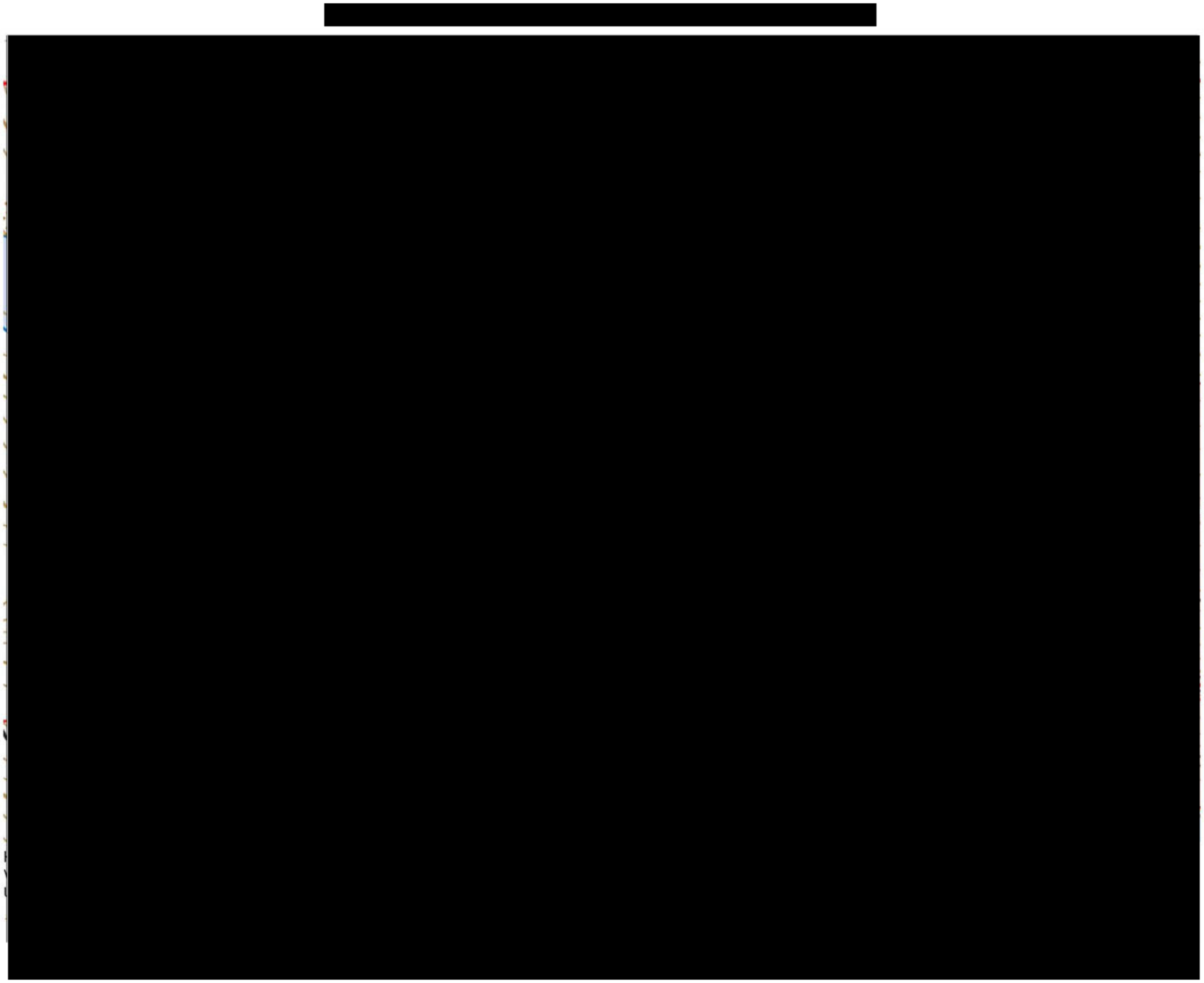
ATTACHMENT 5

Project Map – topographical

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Ignition unit maps:



Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

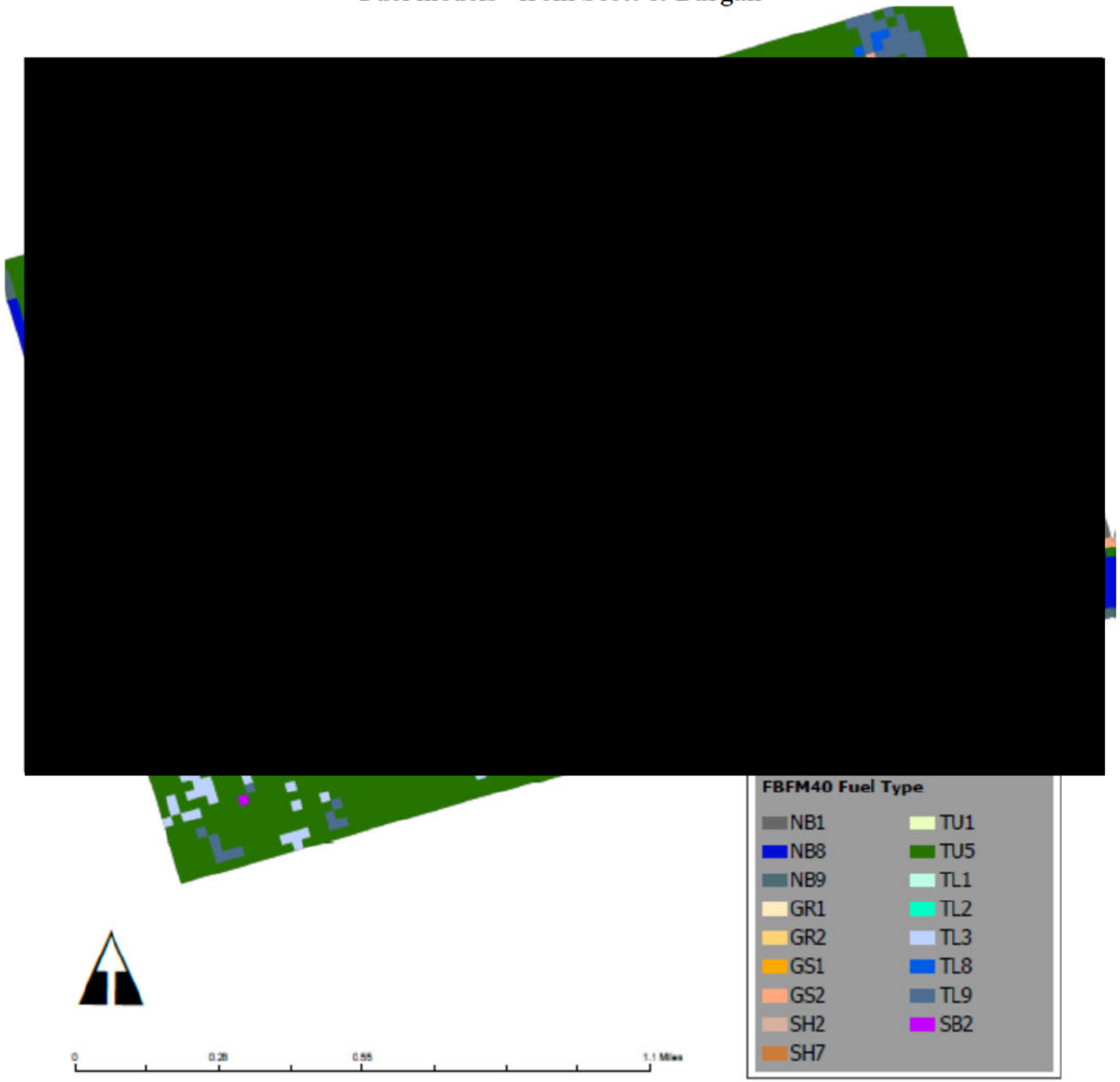
[redacted]

River

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Fuel models - from Scott & Burgan



Appendix B: Technical Reviewer Checklist

Rate each element in the following table with an "S" for Satisfactory or "U" for Unsatisfactory. Use Comment field as needed to support the element rating.

PRESCRIBED FIRE PLAN ELEMENTS	RATING	COMMENTS
1. Signature Page		
2. A. Agency Administrator Ignition Authorization		
2. B. Prescribed Fire GO/NO-GO Checklist		
3. Complexity Analysis Summary		
4. Description of Prescribed Fire Area		
5. Objectives		
6. Funding		
7. Prescription: Prescription Narrative and Prescription Parameters		
8. Scheduling		
9. Pre-Burn Considerations and Weather		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Declaration		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-Burn Activities		
Appendix A: Maps		
Appendix C: Complexity Analysis		
Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment		
Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation		
Appendix F: Smoke Management Plan and Smoke Modeling Documentation (if required)		
Appendix G: COVID-19 Checklist for TNC Fire Management Activities		
Appendix H: TNC Consequence Analysis		
Other		

☐ **Approval is recommended** subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

☐ **Recommendation for approval is not granted**. Prescribed Fire Plan should be re-submitted for technical review subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

Technical Reviewer Signature: _____

Qualification and Currency: _____ Date Signed: _____

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Appendix C: Complexity Analysis

Site: [redacted]	**Unit:** McKinnon Hill	**State:** CA	**Date:** 01/27/2022
Complexity Score (circle)			
Low (44-80 pts)	***Moderate (81-150 pts)***	High (151-220 pts)	

Weighting Factor x Complexity Value = Total points. Sum of Total points = Complexity Score

Complexity Element	Weighting Factor	Complexity Value (1-5)	Total Points	Section 1 Rationale and/or Mitigation Procedures (Use for clarification of rationale and/or actions.)
1. Safety	5	3	15	Steep terrain, rolling material, traffic control, drought awareness and local weather influences on fire behavior are all factors to consider. In addition, Covid-19 mitigation measures will need to be considered for every aspect of this project. Certain parts of the terrain for the burn units can be moderately complex, while other areas will present lower risk due to previous multiple burn entries. With the exception of rolling material igniting fuels below prescribed fire practitioners, the units are relatively straightforward, well-prepared and feasible for single shift operations. Things to consider (low frequency/high risk): steep/rugged terrain coupled with a potential slopover or spot fire aligning with slope and wind. Standard briefing formats located in the burn plan, IRPG and existing JHA's or risk assessments should be used to help formulate elements of a thorough safety and operational briefing. It is recommended that safety be emphasized, and specific safety concerns be addressed during resource on-boarding and prior to operational engagement. Appointing a Safety Officer to the IMT may help ease span of control and allow for more focused briefings and daily risk assessment. Promoting an environment of transparency and open communication may help to alleviate communication barriers and raise safety awareness throughout subsequent shifts.
2. Difficulty of Containment	5	3	15	Some units have been previously and successfully treated with fire, some with multiple entries while other have never had fire or history of recent fire (wildfire or prescribed). Adjacent values include homes surrounded by meadows or other control features. Homes will still need to be assessed as part of the pre-burn considerations of holding staff. Fuels in the surrounding area are continuous and of varied composition. Under certain circumstances there is a risk of an ignition from rolling material, which may or may not stay within the unit. In the rare event that material rolls out at a pace that impacts igniters on steep terrain, it could influence tactical pacing and cadence. Overall, because of the diversity of the units and their composition, firing patterns should be tactically adjusted to promote backing fire with adequate residence time to accomplish specific burn objectives. Given the mosaic of treatment areas, indirect attack utilizing old burns, ridges, roads, and the [redacted] is possible, however, direct attack is the preferred option. Where feasible and logical, hoselays should be considered where water delivery isn't available.

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

3. Fuels and Fire Behavior	5	4	20	Units are comprised of a diversity of fuel types which will result in variable fire behavior. Obviously, in areas where understory shrub vegetation density is high, fires will exhibit longer flame length. Slopes can be steep and head fire is generally not an effective behavior to meet resource and safety objectives in most cases. Some units meet or exceed 50% slope. Fire behavior will need to be regulated, in areas, due to fuel loading, composition and slope to reduce head fire. Many units have been previously burned and are expected to have low/moderate fire intensity.
4. Wildland / Urban Interface	5	3	15	Many of the units have a least one, and it some cases several, values at risk including structures (homes and outbuildings). Therefore, thoughtful consideration must be given to unit preparation, firing techniques and patterns, and assignment of holding resources. Fortunately, most of these structures have adequate defensible space such as well-watered vegetation and fuel reduction zones. However, the Burn Boss must also give consideration to structural factors which increase the susceptibility to firebrands and the resilience of structure to ember cast and plan accordingly.
5. Objectives	4	3	12	Goals of the prescribed fire project are varied and include enhancement of natural resources important to the [redacted] and culture, protection of homes and community buildings from threat of wildfire, and to reduction of fuel loading, overstocking of forests, and encroaching vegetation. The prescribed fire objectives will help to achieve those goals and are relatively straightforward to achieve. Barriers to success on this project include balancing cultural and ecological objectives with those of private landowners, which might include conflicting goals. It will be necessary to communicate an accurate picture of anticipated and desired fire effects to landowners. It is recommended that some form of both pre and post-fire monitoring occur to aid in future decision making. Units are well-prepared, with few critical holding points. Treatment and resource objectives will be identified in the Burn Plan, IAP and morning briefing. A Resource Advisor should be considered to speak more explicitly about specific objectives.
Sub Total (Section 1)			77	

Complexity Element	**Weighting Factor**	**Complexity Value (1-5)**	**Total Points**	**Section 2** **Rationale and/or Mitigation Procedures**
6. Management Organization	4	3	12	Management should be tiered utilizing the ICS. It is anticipated that management organizations per unit will require two levels of supervision. RXB2's are required to lead and facilitate individual burns, where second levels of supervision are necessary to mitigate span-of-control. Second level supervision could include an Ignition Specialist and Holding Specialist or simply a "Line Boss" for each flank being burned. The management organization could vary between a small number of local resources to a more robust organization utilizing personnel from other regions. Personnel could range between 12 and 40. Some pre-burn preparation of handlines, hoselays, hazard tree felling, legacy tree protection, lookout locations, and critical holding points may be necessary. Mop and patrol are recommended to reduce threats to control lines and mop-up expectations should be communicated in the Burn Plan, the IAP and in the morning briefing.

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

7. Contingency Planning and Resources	4	5	20	The remote location of the project area requires that contingency planning and resources be carefully considered prior to ignition. Travel times along Hwy [redacted] and Hwy [redacted] are long and the road is narrow and winding along most of its course. Even travel by air resources is at least 30 minutes from the nearest airbase. It is recommended that contingency resources be staged in the vicinity during burn operations or at the very least, availability confirmed prior to ignition.
8. Natural, Cultural, Social Values	3	3	9	Resource goals and are varied but align with [redacted] cultural and social values. Other cultural and natural objectives may exist with respect to specific flora and fauna that benefit from repeated low/moderate intensity prescribed fires. Prescribed fire has been a long-denied resource management and cultural tool available to tribal people and this project, in part, strives to restore fire use to the tribe.
9. Air Quality Values	3	2	6	Smoke-Sensitive Receptors, other than homes, include the [redacted]. Additional considerations may need to be made with respect to COVID-19. All in all, prescribed fire and wildland fire smoke is well-accepted and prevalent during certain times of the year along the Highway [redacted] corridor. The [redacted] likely has diurnal wind shifts that could impact operations and smoke dispersal. It is recommended that the Burn Boss integrate with local personnel to identify any other weather nuance in the area. Wildfire smoke can be prevalent during the summer months so wildfire risk reduction using prescribed fire is seen as a high priority. With the exception of new COVID-19 guidance, smoke management is straightforward, and spring/fall prescribed fire smoke is commonplace.
10. Logistics	3	3	9	Logistics are straightforward but will require some on-site tactical decision making. Depending on the scale of the organization, logistics should be able to scale commensurately utilizing the ICS system. Given the scope of the overall project, strong logistical support is going to be critical in maintaining operational pace and tempo, while also maintaining a safe, healthy environment for up to 40 firefighters/practitioners. An assigned logistics function will help ease span-of-control while also accommodating the many needs of the organization. Logistics can be scaled-up easily to meet varying organizational needs. In the past, burns along the Highway [redacted] corridor sometimes occurred during the [redacted] TREX, where a Logistics Section Chief is assigned to navigate the diverse needs of a moderately sized organization.
11. Tactical Operations	2	4	8	The units can be steep and uphill runs would adversely affect the burn units. So, backing and flanking fire should be considered as the primary ignition tactic. Due to the steepness of slopes, the use of pistol flare launchers or drones to ignite interiors should be considered to reduce firefighter exposure. There is strong local knowledge and promotion of positive fire effects along the [redacted] corridor among the [redacted] people and other miscellaneous land ownerships. Because of the [redacted] long-standing relationship with wildfire and, more specifically, prescribed fire, local practices and tactics are available to help guide on-the-ground decisions. Backing fire with varying flame-lengths and some isolated torching is tolerable, and any slope/wind alignment is undesirable if unit perimeters haven't already been treated.

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

12. Cooperator Coordination	1	2	2	To the extent that the burn organization utilizes [redacted] resources, there may be some minor interagency coordination issues to address. An example might be if the unit is burned as part of a TREX organization. In this case, validation of training and experience by each of the participants will be necessary. However, if the burn is executed solely with tribal resources, then cooperator coordination will not be an issue.
Sub Total		**Part 2**	68	**Additional Comments:** Prescribed fire is a widely accepted and traditional tool utilized by the indigenous [redacted] people and other private and federal land ownerships along the Highway [redacted] corridor. Fuels are comprised of mixed-conifer, oak, and meadows on predominantly south facing with shrub/brush such as madrone. Units are well-prepared, and some have already been previously burned. Higher flame-lengths may make direct attack challenging under the fire behavior parameters and models at the hot end of the prescription. Weather in the area is influenced by the [redacted] as well as complex topography contributing to diurnal winds. Unit sizes vary, dispersed among varying fuel types and topography, with some units receiving multiple fire entries over the course of several years. Direct and indirect containment options exist with a complex network of roads, ridges, rivers, and fuel breaks. Prescribed fire smoke is well-accepted and will require nominal additional mitigations.
		Part 1	77	
Complexity Score		145		**Rated by:** Phillip Dye – RXB2, current

Appendix D: Job Hazard Analysis or Risk Assessment

1. WORK PROJECT/ACTIVITY	**2. LOCATION**	**3. UNIT**
Prescribed Fire	[redacted]	Hwy [redacted] project
4. NAME OF ANALYST	**5. JOB TITLE**	**6. DATE PREPARED**
Phillip Dye	Prescribed Fire Burn Boss Type 2	July 19, 2020 – rev. January 2022
7. TASKS/PROCEDURES	**8. HAZARDS**	**9. ABATEMENT ACTIONS** **Engineering Controls * Substitution * Administrative Controls * PPE**
Travel to, from, and on project	Motor vehicle accidents, slippery road surfaces, soft shoulders, unimproved narrow roadways weather, darkness, smoke	Driving defensively. Use seat belts. Identify road conditions during briefings. Post road guards. Mark hazards. Use headlights. Perform pre-use inspections on equipment. Scout roads and identify turnouts before ignition of project. Maintain communications. Provide road system map for project. Use backers and chock vehicle tires. Have vehicles facing out.
Experience for assigned position	Lack of experience, injuries	Workers recruited for burn assignments shall be honest about experience in managing fire and with their health and physical abilities for performing tasks. If unable to initiate or complete assignment, alternative assignments should be provided. Burn Boss should be qualified to lead burn.
Briefing	Lack of communications	Provide project briefing before burning. Clarify firing order, organization responsibilities, communications, hazards, weather, and expected fire behavior.

7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE
Protective clothing and equipment	Injuries, burns, and death	Wear hard hat with chin strap, safety glasses, and fire-resistant shirt and pants. Keep sleeves rolled down. Wear leather, lace type, boots with skid resistant soles, and tops at least 8 inches high. Carry drinking water. Wear leather gloves. Wear hearing protection when working around equipment where noise level exceeds 90 dba. Wear additional protective equipment as dictated by local conditions and exposure to special equipment.
Lighters	Injuries and death, falls, smoke, burns	Always have an escape route. Maintain LCES. Follow the Standard Fire Orders and Watch Out Situations. Maintain communications with other lighters, adjacent resources, and Firing Boss. Handheld radios should be provided to all lighters or at a minimum, to each lighting team. Do not fill drip torches near ignition sources and be alert for fuel geysering. Do not spill burn mix on clothing. Be aware of dangerous wildlife.
Fuel Mixing	Burns, spills, fuel saturated clothing and boots	No smoking within 25 feet of mixing and filling area. Do not fill or mix in pick up beds with bed liners. Avoid the use of cellular telephones in and around fill or mixing area. Avoid fuel contact with bare hands, clothing and boots. Provide pour spouts. Use only approved fuel containers. Follow acceptable fuel mixture ratios. Be alert for fuel geysering.

7. TASKS/PROCEDURES	**8. HAZARDS**	**9. ABATEMENT ACTIONS** **Engineering Controls * Substitution * Administrative Controls * PPE**
Wildlife	Snakes and ticks	Brief personnel to be alert for snakes. Have personnel perform tick checks post burn. Consider use of chemical agent (i.e., permetherin).
Holding/Mop Up/Patrol Crews	Smoke, burns, falls, back injuries, rolling material, eye injuries, heat stress. dehydration, CO poisoning	Wear PPE listed above. LCES, follow Standard Fire Orders and Watch out Situations. Receive briefing from Holding Specialist. Flag hazards for others. Use warning lights and provide traffic control on roadways during smoky and nights operations. Maintaining a high level of aerobic fitness is one of the best ways to protect yourself against heat stress. Drink lots of fluids before, during and after work. Periodically rotate crews from work sites with high smoke levels to areas of less smoke or smoke free areas.
Covid-19	Person to person transmission	Follow current CDC practices. This includes, but not is limited to, use of face masks, social distancing, washing of hands when possible, and avoiding riding together in vehicles when possible. Temperature checks are encouraged if available. Personnel who feel ill and/or have been exposed to persons with Covid-19 should avoid participation. Tools should not be shared. Personnel should provide their own food and water. Also, see Appendix G.

10. BURN BOSS SIGNATURE	**11. DATE:** 19 July 2020

ATTACHMENT 5

BehavePlus 6.0.0 (Build 626 Beta 3)

TU5 - head fire

Head Fire

Mon, Jan 31, 2022 at 14:06:33

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tu5
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	8
Mortality Tree Species		ARME
Spot Tree Species		PSME
D.B.H.	in	16
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	80
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Head Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2.4	2.6	2.8	3.1	3.4	3.7	4.0
8	2.3	2.4	2.7	2.9	3.2	3.4	3.7

10	2.2	2.3	2.5	2.8	3.0	3.2	3.5
12	2.1	2.2	2.4	2.6	2.9	3.1	3.4

Head Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	104	112	122	133	145	157	170
8	93	100	109	119	130	141	152
10	86	93	101	110	120	130	140
12	81	87	95	103	112	122	132

Head Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	3.8	3.9	4.1	4.3	4.4	4.6	4.8
8	3.6	3.7	3.9	4.1	4.2	4.4	4.5
10	3.5	3.6	3.8	3.9	4.1	4.2	4.4
12	3.4	3.5	3.6	3.8	3.9	4.1	4.2

Head Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.56	0.61	0.66	0.72	0.78	0.85	0.92
8	0.50	0.54	0.59	0.64	0.70	0.76	0.82
10	0.46	0.50	0.54	0.59	0.65	0.70	0.76

12	0.43	0.47	0.51	0.56	0.61	0.66	0.71

Head Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Head Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Head Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1

Head Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Head Fire

Results for: Time from Report (h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
8	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12	0.2	0.3	0.3	0.3	0.3	0.3	0.3

Head Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
8	0.6	0.6	0.6	0.6	0.7	0.7	0.7
10	0.6	0.6	0.6	0.6	0.6	0.7	0.7
12	0.5	0.6	0.6	0.6	0.6	0.7	0.7

Head Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	8.7	8.9	9.1	9.3	9.6	9.8	10.2
8	8.5	8.7	8.8	9.1	9.3	9.5	9.8
10	8.4	8.5	8.7	8.9	9.1	9.3	9.6
12	8.3	8.4	8.6	8.7	8.9	9.2	9.4

Head Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.3
8	0.0	0.0	0.1	0.1	0.2	0.2	0.3
10	0.0	0.0	0.1	0.1	0.2	0.2	0.3
12	0.0	0.0	0.1	0.1	0.2	0.2	0.3

Head Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	19	20	21	22	23	24	25
8	17	18	19	20	21	23	24
10	16	17	18	19	20	21	22
12	16	16	17	18	19	20	21

Head Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	22	25	27	31	35	39	43
8	20	22	24	26	29	33	36
10	18	20	22	24	26	29	32
12	17	19	20	22	24	27	29

Head Fire

Results for: Probability of Ignition from a Firebrand (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	50	50	50	50	50	50	50
8	37	37	37	37	37	37	37
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

BehavePlus 6.0.0 (Build 626 Beta 3)

TU5 - backing fire

Backing Fire

Mon, Jan 31, 2022 at 14:07:40

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tu5
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	8
Mortality Tree Species		ARME
Spot Tree Species		PSME
D.B.H.	in	16
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	80
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the BACKING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Backing Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.4	0.4	0.4	0.4	0.4	0.4	0.4
8	0.4	0.4	0.4	0.4	0.4	0.4	0.4

10	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Backing Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	17	17	17	16	16	16	16
8	15	15	15	15	15	15	15
10	14	14	14	14	14	14	13
12	13	13	13	13	13	13	13

Backing Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
8	1.6	1.6	1.6	1.6	1.5	1.5	1.5
10	1.5	1.5	1.5	1.5	1.5	1.5	1.5
12	1.5	1.5	1.5	1.5	1.4	1.4	1.4

Backing Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.09	0.09	0.09	0.09	0.09	0.09	0.09
8	0.08	0.08	0.08	0.08	0.08	0.08	0.08
10	0.07	0.07	0.07	0.07	0.07	0.07	0.07

12	0.07	0.07	0.07	0.07	0.07	0.07	0.07

Backing Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Backing Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Backing Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1

Backing Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Backing Fire

Results for: Time from Report (h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
8	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12	0.2	0.3	0.3	0.3	0.3	0.3	0.3

Backing Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.6	0.6	0.6	0.7	0.7	0.8	0.8
8	0.6	0.6	0.6	0.6	0.7	0.7	0.7
10	0.6	0.6	0.6	0.6	0.6	0.7	0.7
12	0.5	0.6	0.6	0.6	0.6	0.7	0.7

Backing Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	8.7	8.9	9.1	9.3	9.6	9.8	10.2
8	8.5	8.7	8.8	9.1	9.3	9.5	9.8
10	8.4	8.5	8.7	8.9	9.1	9.3	9.6
12	8.3	8.4	8.6	8.7	8.9	9.2	9.4

Backing Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.3
8	0.0	0.0	0.1	0.1	0.2	0.2	0.3
10	0.0	0.0	0.1	0.1	0.2	0.2	0.3
12	0.0	0.0	0.1	0.1	0.2	0.2	0.3

Backing Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	5	5	5	5	5	5	5
8	5	5	5	5	5	5	4
10	5	5	5	5	5	4	4
12	5	5	5	4	4	4	4

Backing Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	12	12	12	12	12	12	12
8	12	12	12	12	12	12	12
10	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12

Backing Fire

Results for: Probability of Ignition from a Firebrand (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	50	50	50	50	50	50	50
8	37	37	37	37	37	37	37
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

BehavePlus 6.0.0 (Build 626 Beta 3)

TL3 - head fire

Head Fire

Thu, Jan 27, 2022 at 11:28:04

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tl3
Fuel/Vegetation, Overstory		
Canopy Cover	%	60
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	10
Mortality Tree Species		PSME
Spot Tree Species		PSME
D.B.H.	in	12
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	60
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Head Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.6	0.7	0.7	0.8	0.9	0.9	1.0
8	0.6	0.6	0.7	0.7	0.8	0.9	1.0

10	0.5	0.6	0.6	0.7	0.7	0.8	0.9
12	0.5	0.5	0.6	0.6	0.7	0.7	0.8

Head Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2	2	3	3	3	3	4
8	2	2	2	2	3	3	3
10	2	2	2	2	2	3	3
12	2	2	2	2	2	2	3

Head Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.6	0.7	0.7	0.7	0.7	0.8	0.8
8	0.6	0.6	0.7	0.7	0.7	0.7	0.8
10	0.6	0.6	0.6	0.7	0.7	0.7	0.7
12	0.6	0.6	0.6	0.6	0.6	0.7	0.7

Head Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.01	0.01	0.01	0.01	0.01	0.01	0.01
8	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01

12	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Head Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Head Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Head Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0

Head Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Head Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.4	0.4	0.4	0.4	0.4	0.4	0.4
8	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10	0.4	0.4	0.4	0.4	0.4	0.4	0.4
12	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Head Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	6.8	6.8	6.8	6.9	6.9	7.0	7.0
8	6.7	6.8	6.8	6.8	6.9	6.9	7.0
10	6.7	6.7	6.7	6.8	6.8	6.9	6.9
12	6.7	6.7	6.7	6.7	6.8	6.8	6.8

Head Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.2
8	0.0	0.0	0.1	0.1	0.2	0.2	0.2
10	0.0	0.0	0.1	0.1	0.2	0.2	0.2
12	0.0	0.0	0.1	0.1	0.2	0.2	0.2

Head Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1

Head Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	12	12	12	12	12	12	12
8	12	12	12	12	12	12	12
10	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12

Head Fire

Results for: Probability of Ignition from a Firebrand (%)

ATTACHMENT 5

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	51	51	51	51	51	51	51
8	38	38	38	38	38	38	38
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

BehavePlus 6.0.0 (Build 626 Beta 3)

TL3 - backing fire

Backing Fire

Thu, Jan 27, 2022 at 11:28:44

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tl3
Fuel/Vegetation, Overstory		
Canopy Cover	%	60
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	10
Mortality Tree Species		PSME
Spot Tree Species		PSME
D.B.H.	in	12
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	60
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the BACKING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Backing Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.1	0.1	0.1	0.1	0.1	0.1	0.1
8	0.1	0.1	0.1	0.1	0.1	0.1	0.1

10	0.1	0.1	0.1	0.1	0.1	0.1	0.1
12	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Backing Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0

Backing Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.3	0.3	0.3	0.3	0.3	0.3	0.3
8	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	0.2	0.2	0.2	0.2	0.2	0.2	0.2
12	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Backing Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

12	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Backing Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Backing Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Backing Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0

Backing Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Backing Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.4	0.4	0.4	0.4	0.4	0.4	0.4
8	0.4	0.4	0.4	0.4	0.4	0.4	0.4
10	0.4	0.4	0.4	0.4	0.4	0.4	0.4
12	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Backing Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	6.8	6.8	6.8	6.9	6.9	7.0	7.0
8	6.7	6.8	6.8	6.8	6.9	6.9	7.0
10	6.7	6.7	6.7	6.8	6.8	6.9	6.9
12	6.7	6.7	6.7	6.7	6.8	6.8	6.8

Backing Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.2
8	0.0	0.0	0.1	0.1	0.2	0.2	0.2
10	0.0	0.0	0.1	0.1	0.2	0.2	0.2
12	0.0	0.0	0.1	0.1	0.2	0.2	0.2

Backing Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0

Backing Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	12	12	12	12	12	12	12
8	12	12	12	12	12	12	12
10	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12

Backing Fire

Results for: Probability of Ignition from a Firebrand (%)

ATTACHMENT 5

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	51	51	51	51	51	51	51
8	38	38	38	38	38	38	38
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

BehavePlus 6.0.0 (Build 626 Beta 3)

GR2 - head fire

Head Fire

Thu, Jan 27, 2022 at 11:45:09

Input Worksheet

Inputs: SURFACE, SIZE, CONTAIN, SPOT, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr2
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	40
Downwind Canopy Height	ft	40
Downwind Canopy Cover		Closed
Crown Ratio	fraction	0.8
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	30
Live Woody Fuel Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	75
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	40
Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW
Fire		
Elapsed Time	h	0.1
Suppression		

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Head Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel	20-ft Wind Speed (upslope)						
Moisture	mi/h						
%	0	3	6	9	12	15	18
6	13.6	14.4	15.8	17.6	19.6	22.0	24.5
8	12.3	13.1	14.3	15.9	17.8	19.8	22.1
10	10.8	11.4	12.5	13.9	15.5	17.3	19.3
12	8.0	8.5	9.3	10.3	11.6	12.9	14.4

Head Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel	20-ft Wind Speed (upslope)
Moisture	mi/h

%	0	3	6	9	12	15	18
6	55	58	64	71	79	89	99
8	48	51	56	62	69	77	86
10	39	41	45	51	56	63	70
12	23	24	27	30	33	37	41

Head Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2.8	2.9	3.0	3.2	3.4	3.5	3.7
8	2.7	2.7	2.9	3.0	3.2	3.3	3.5
10	2.4	2.5	2.6	2.7	2.9	3.0	3.2
12	1.9	2.0	2.0	2.1	2.3	2.4	2.5

Head Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.1	0.1	0.2	0.2	0.2	0.3	0.3
8	0.1	0.1	0.1	0.2	0.2	0.2	0.3
10	0.1	0.1	0.1	0.1	0.1	0.2	0.2
12	0.0	0.0	0.1	0.1	0.1	0.1	0.1

Head Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18

6	4	4	5	5	6	6	7
8	4	4	4	5	5	6	6
10	3	3	4	4	4	5	5
12	2	3	3	3	3	4	4

Head Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Head Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	6.8	7.6	9.3	11.8	15.5	21.1	29.8
8	5.4	6.0	7.2	8.9	11.5	15.1	20.5
10	4.0	4.4	5.2	6.4	8.0	10.2	13.3
12	2.3	2.5	2.8	3.3	4.0	4.9	6.1

Head Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	30.5	32.5	36.2	41.4	48.4	57.9	71.0

ATTACHMENT 5

8	27.0	28.6	31.6	35.7	41.1	48.2	57.5
10	23.2	24.5	26.8	29.9	33.9	38.9	45.3
12	17.3	18.0	19.4	21.3	23.6	26.4	29.7

Head Fire

Results for: Spot Dist from a Wind Driven Surface Fire (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.1	0.1	0.1
8	0.0	0.0	0.1	0.1	0.1	0.1	0.1
10	0.0	0.0	0.0	0.1	0.1	0.1	0.1
12	0.0	0.0	0.0	0.1	0.1	0.1	0.1

Head Fire

Results for: Probability of Ignition from a Firebrand (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	56	56	56	56	56	56	56
8	42	42	42	42	42	42	42
10	31	31	31	31	31	31	31
12	23	23	23	23	23	23	23

End

BehavePlus 6.0.0 (Build 626 Beta 3)

GR2 - backing fire

Backing Fire

Thu, Jan 27, 2022 at 11:46:09

Input Worksheet

Inputs: SURFACE, SIZE, CONTAIN, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gr2
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	40
Crown Ratio	fraction	0.8
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	30
Live Woody Fuel Moisture	%	
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	75
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	40
Fire		
Elapsed Time	h	0.1
Suppression		
Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5

Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the BACKING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Backing Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2.1	2.1	2.2	2.2	2.3	2.4	2.4
8	1.9	1.9	2.0	2.0	2.1	2.1	2.2
10	1.6	1.7	1.7	1.8	1.8	1.9	1.9
12	1.2	1.2	1.3	1.3	1.4	1.4	1.4

Backing Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	8	9	9	9	9	10	10
8	7	7	8	8	8	8	9
10	6	6	6	6	7	7	7
12	4	4	4	4	4	4	4

Backing Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1.2	1.2	1.2	1.2	1.3	1.3	1.3
8	1.1	1.1	1.1	1.2	1.2	1.2	1.2
10	1.0	1.0	1.0	1.1	1.1	1.1	1.1
12	0.8	0.8	0.8	0.8	0.8	0.9	0.9

Backing Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.1	0.1	0.2	0.2	0.2	0.3	0.3
8	0.1	0.1	0.1	0.2	0.2	0.2	0.3
10	0.1	0.1	0.1	0.1	0.1	0.2	0.2
12	0.0	0.0	0.1	0.1	0.1	0.1	0.1

Backing Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	4	4	5	5	6	6	7
8	4	4	4	5	5	6	6
10	3	3	4	4	4	5	5
12	2	3	3	3	3	4	4

Backing Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Backing Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	6.8	7.6	9.3	11.8	15.5	21.1	29.8
8	5.4	6.0	7.2	8.9	11.5	15.1	20.5
10	4.0	4.4	5.2	6.4	8.0	10.2	13.3
12	2.3	2.5	2.8	3.3	4.0	4.9	6.1

Backing Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	30.5	32.5	36.2	41.4	48.4	57.9	71.0
8	27.0	28.6	31.6	35.7	41.1	48.2	57.5
10	23.2	24.5	26.8	29.9	33.9	38.9	45.3
12	17.3	18.0	19.4	21.3	23.6	26.4	29.7

Backing Fire

Results for: Probability of Ignition from a Firebrand (%)

ATTACHMENT 5

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	56	56	56	56	56	56	56
8	42	42	42	42	42	42	42
10	31	31	31	31	31	31	31
12	23	23	23	23	23	23	23

End

BehavePlus 6.0.0 (Build 626 Beta 3)

GS2 head fire

Head Fire

Mon, Jan 31, 2022 at 14:16:32

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gs2
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	8
Mortality Tree Species		ARME
Spot Tree Species		PSME
D.B.H.	in	16
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	50
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	80
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Head Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	4.0	4.2	4.5	4.9	5.4	5.9	6.5
8	2.2	2.3	2.4	2.7	2.9	3.2	3.5

10	2.0	2.1	2.3	2.5	2.7	3.0	3.3
12	1.6	1.6	1.8	1.9	2.1	2.3	2.5

Head Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	27	29	31	34	37	40	44
8	8	9	9	10	11	12	13
10	7	7	8	9	9	10	11
12	4	5	5	5	6	6	7

Head Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2.1	2.1	2.2	2.3	2.4	2.5	2.6
8	1.2	1.2	1.3	1.3	1.4	1.4	1.5
10	1.1	1.1	1.2	1.2	1.3	1.3	1.4
12	0.9	0.9	0.9	1.0	1.0	1.1	1.1

Head Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.15	0.15	0.17	0.18	0.20	0.22	0.24
8	0.04	0.05	0.05	0.05	0.06	0.07	0.07
10	0.04	0.04	0.04	0.05	0.05	0.06	0.06

12	0.02	0.02	0.03	0.03	0.03	0.03	0.04

Head Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Head Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Head Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1	1	1	1	2	2	2
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	0	0	1	1	1	1	1

Head Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Head Fire

Results for: Time from Report (h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.3	0.3	0.3	0.3	0.3	0.3	0.4
8	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	0.2	0.2	0.2	0.3	0.3	0.3	0.3
12	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Head Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.9	0.9	1.0	1.1	1.2	1.3	1.4
8	0.6	0.6	0.6	0.6	0.6	0.7	0.7
10	0.5	0.5	0.6	0.6	0.6	0.6	0.7
12	0.5	0.5	0.5	0.5	0.5	0.5	0.6

Head Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	10.7	10.9	11.3	11.8	12.3	13.0	13.7
8	8.4	8.4	8.6	8.8	9.1	9.4	9.7
10	8.2	8.2	8.4	8.6	8.8	9.0	9.3
12	7.7	7.8	7.9	8.0	8.1	8.3	8.5

Head Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.3
8	0.0	0.0	0.1	0.1	0.2	0.2	0.3
10	0.0	0.0	0.1	0.1	0.2	0.2	0.3
12	0.0	0.0	0.1	0.1	0.2	0.2	0.3

Head Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	8	8	8	9	9	10	10
8	3	4	4	4	4	4	4
10	3	3	3	3	4	4	4
12	2	2	2	2	2	2	2

Head Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	12	12	12	12	12	13	13
8	12	12	12	12	12	12	12
10	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12

Head Fire

Results for: Probability of Ignition from a Firebrand (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	50	50	50	50	50	50	50
8	37	37	37	37	37	37	37
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

BehavePlus 6.0.0 (Build 626 Beta 3)

GS2 backing fire

Backing Fire

Mon, Jan 31, 2022 at 14:17:23

Input Worksheet

Inputs: SURFACE, CROWN, SIZE, CONTAIN, SPOT, SCORCH, MORTALITY, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		gs2
Fuel/Vegetation, Overstory		
Canopy Cover	%	80
Canopy Height	ft	60
Downwind Canopy Height	ft	60
Downwind Canopy Cover		Closed
Torching Tree Height	ft	20
Canopy Base Height	ft	8
Mortality Tree Species		ARME
Spot Tree Species		PSME
D.B.H.	in	16
Fuel Moisture		
1-h Fuel Moisture	%	6, 8, 10, 12
10-h Fuel Moisture	%	13
100-h Fuel Moisture	%	20
Live Herbaceous Fuel Moisture	%	50
Live Woody Fuel Moisture	%	150
Foliar Moisture	%	100
Weather		
20-ft Wind Speed (upslope)	mi/h	0, 3, 6, 9, 12, 15, 18
Air Temperature	oF	65
Fuel Shading from the Sun	%	80
Terrain		
Slope Steepness	%	40

Ridge-to-Valley Elevation Difference	ft	500
Ridge-to-Valley Horizontal Distance	mi	.15
Spotting Source Location		MW

Fire

Number of Torching Trees		2
Elapsed Time	h	0.1

Suppression

Suppression Tactic		Rear
Line Construction Offset	ch	1
Resource Name		Crew, Crew, Crew, Engine, Engine
Resource Line Production Rate	ch/h	15, 15, 15, 20, 20
Resource Arrival Time	h	0.1, 0.2, 0.3, 0.3, 0.5
Resource Duration	h	10, 10, 10, 10, 20

Notes

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the BACKING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Crown fire method uses Rothermel (1991) [CROWN].

Suppression input is for multiple resources [CONTAIN]; for each resource, identified by a Resource Name, a single value is specified for each resource item (line production rates, etc).

Backing Fire

Results for: Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
8	0.3	0.3	0.3	0.3	0.4	0.4	0.4

10	0.3	0.3	0.3	0.3	0.3	0.3	0.3
12	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Backing Fire

Results for: Surface Fireline Intensity (Btu/ft/s)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	4	4	4	4	4	4	5
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1

Backing Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.9	0.9	0.9	0.9	0.9	0.9	0.9
8	0.5	0.5	0.5	0.5	0.5	0.5	0.5
10	0.5	0.5	0.5	0.5	0.5	0.5	0.5
12	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Backing Fire

Results for: Transition Ratio ()

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.02	0.02	0.02	0.02	0.02	0.02	0.02
8	0.01	0.01	0.01	0.01	0.01	0.01	0.01
10	0.01	0.01	0.01	0.01	0.01	0.01	0.01

12	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Backing Fire

Results for: Transition to Crown Fire ?

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	No	No	No	No	No	No	No
8	No	No	No	No	No	No	No
10	No	No	No	No	No	No	No
12	No	No	No	No	No	No	No

Backing Fire

Results for: Surface Fire Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Backing Fire

Results for: Surface Fire Perimeter (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	1	1	1	1	2	2	2
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1
12	0	0	1	1	1	1	1

Backing Fire

Results for: Contain Status

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	Contained	Contained	Contained	Contained	Contained	Contained	Contained
8	Contained	Contained	Contained	Contained	Contained	Contained	Contained
10	Contained	Contained	Contained	Contained	Contained	Contained	Contained
12	Contained	Contained	Contained	Contained	Contained	Contained	Contained

Backing Fire

Results for: Time from Report (h)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.3	0.3	0.3	0.3	0.3	0.3	0.4
8	0.3	0.3	0.3	0.3	0.3	0.3	0.3
10	0.2	0.2	0.2	0.3	0.3	0.3	0.3
12	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Backing Fire

Results for: Contained Area (ac)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.9	0.9	1.0	1.1	1.2	1.3	1.4
8	0.6	0.6	0.6	0.6	0.6	0.7	0.7
10	0.5	0.5	0.6	0.6	0.6	0.6	0.7
12	0.5	0.5	0.5	0.5	0.5	0.5	0.6

Backing Fire

Results for: Fireline Constructed (ch)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	10.7	10.9	11.3	11.8	12.3	13.0	13.7
8	8.4	8.4	8.6	8.8	9.1	9.4	9.7
10	8.2	8.2	8.4	8.6	8.8	9.0	9.3
12	7.7	7.8	7.9	8.0	8.1	8.3	8.5

Backing Fire

Results for: Spot Dist from Torching Trees (mi)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	0.0	0.0	0.1	0.1	0.2	0.2	0.3
8	0.0	0.0	0.1	0.1	0.2	0.2	0.3
10	0.0	0.0	0.1	0.1	0.2	0.2	0.3
12	0.0	0.0	0.1	0.1	0.2	0.2	0.3

Backing Fire

Results for: Scorch Height (ft)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	2	2	2	2	2	2	2
8	1	1	1	1	1	1	1
10	1	1	1	1	1	1	0
12	1	1	1	0	0	0	0

Backing Fire

Results for: Probability of Mortality (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	12	12	12	12	12	12	12
8	12	12	12	12	12	12	12
10	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12

Backing Fire

Results for: Probability of Ignition from a Firebrand (%)

1-h Fuel Moisture	20-ft Wind Speed (upslope) mi/h						
%	0	3	6	9	12	15	18
6	50	50	50	50	50	50	50
8	37	37	37	37	37	37	37
10	28	28	28	28	28	28	28
12	20	20	20	20	20	20	20

End

Appendix F: Smoke Management Plan and Smoke Modeling Documentation (if required)

If required, a smoke management plan will be drafted by [redacted] personnel, or designee, and appended here to this burn plan.

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Appendix G - COVID-19 Checklist for [redacted] Fire Management Activities

Burn unit (BU) staff, typically a designated Fire Manager, must complete this checklist before any [redacted] staff or volunteers engage in any Fire Management related activities. The BU must retain a completed copy of this checklist, along with all other required documentation for [redacted] Fire Management activities. This screening does not replace other [redacted] safety requirements for fire management or COVID-19 fieldwork. Any "No" answer to the questions below, and without an approved exception, means that the activity is not allowed.

Project: [redacted] Hwy [redacted]	**State:** CA	**County:** Humboldt
Activity: ☐ [redacted] burning ☒ Burn Assist ☒ Training ☐ Wildfire assist	**Dates of activities:** TBD	

For all activities

Q. Is the activity approved as "Essential" by the BU Director?

☒ Yes - Date approved _____ by _____

☐ No - The activity is not allowed while BU offices are under a "soft close."

Q. Is the activity allowed under government restrictions on travel, open burning, number of assigned personnel assembled, or other issues?

☒ Yes ☐ No - The activity is not allowed

For [redacted]-led burning

Q. Can all elements of the [redacted] Fire COVID-19 Go/No-Go Checklist (attached) be met?

☐ Yes – Note, The Burn Boss must complete and sign a COVID-19 Go/No-Go Checklist for every day of work activity, including days of post-burn monitoring and patrol

☐ No - The activity is not allowed (exceptions approved by the Dir Fire Management)

☐ Exception Dir. Fire Management approval date _____

Q. Can smoke be kept away from all Smoke Sensitive Areas with people?

E.g., residences, schools, hospitals, nursing facilities, open businesses, etc.

☐ Yes - Fire Manager review and approval, by _____ Date _____

☐ No - The activity is not allowed (exceptions approved by the Dir Fire Management)

☐ Exception Dir. Fire Management approval date _____

Q. Can all elements and conditions of the prescribed burn plan be met while implementing COVID-19 safety measures?

☐ Yes ☐ No - The activity is not allowed

Note- the Fire Manager approves exceptions in the form of Prescribed Burn Plan modifications

Q. Can personnel be protected from prolonged smoke exposure during the burn? Burn Boss must discuss specific mitigations for potentially problematic operational aspects with their Fire Manager.

☐ Yes ☐ No - (exceptions approved by the Burn Boss after discussion with assigned crews)

For fire activities where [redacted] is helping others

Q. Does the third-party host follow COVID-19 safety protocols reasonably similar to [redacted]s?

☒ Yes ☐ No - The activity is not allowed

Q. Can TNC personnel meet all elements of the [redacted] Fire COVID-19 Go/No-Go Checklist?

☒ Yes ☐ No - The activity is not allowed

Note- [redacted] Chief of Party must complete and sign a checklist for each operating period

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

[redacted] Fire COVID-19 Go/No-Go Checklist

Project: [redacted] Hwy [redacted]	**State:** CA
Activity: ☐ [redacted] burning ☒ Burn Assist ☒ Training ☐ Wildfire assist	**Date:** TBD

Daily Health screening

All [redacted] personnel must complete the CDC COVID-19 Screening form at the start of the work shift.
https://www.cdc.gov/screening/paper-version.pdf

Q. Are all [redacted] personnel clear for work, answering "No" to all questions on the screening form?

☐ Yes ☐ No – individuals not cleared for participation are sent home

Daily local COVID-19 risk level

Q. What is the Risk Level for the county of the day's activity?

Verify the latest county-level COVID-19 risk from the Harvard Global Health Institute U.S. map within 24 hours of the fieldwork.
https://globalepidemics.org/key-metrics-for-covid-suppression/

State _____ County name _____ Risk Map date _____

☐ Green ☐ Yellow ☐ Orange ☐ Red

Daily COVID-19 Safety Briefing

[redacted], the burn boss/crew lead, must brief all [redacted] personnel on the daily local COVID-19 risk level and the specific items below before the start of fire-related activities.

☐ **Assume an unknown person in the day's work operations is asymptomatic and contagious.**
Avoid being exposed to SARS-CoV-2, the virus that causes COVID-19, through these measures:

☐ [redacted] personnel have masks or cloth face coverings suitable for fireline work (Nomex or natural fibers)

☐ [redacted] personnel properly wear masks or cloth face coverings, except when working away from others

☐ [redacted] personnel have hand sanitizer and/or sanitizing wipes

☐ [redacted] personnel wipe or sanitize hands before and after discrete activities, e.g., ATV line patrol, lunch, etc.

☐ Identify frequent touch surfaces on vehicles, tools, and equipment for regular cleaning

☐ Wipe/sanitize frequent touch areas of vehicles and tools between their uses by different people

☐ Maintain a minimum six feet distance between all personnel (list known issue points)

☐ Hold open-air briefings and AARs

☐ Use existing work teams as modules in org charts and crew assignments whenever possible

☐ Avoid mixing individuals from different locations or employers in enclosed vehicles

☐ Assign tools and vehicles to individuals for the day whenever possible

☐ Individuals bring their own food and drink

☐ Spare drinking water is available in individual bottles or containers, avoid communal water sources

☐ Identify crew assignments or locations with the potential for prolonged smoke exposure

☐ Identify crew member physical fatigue as a watch-out situation to report

Q. Are all personnel willing and able to comply with all required safety measures?

☐ Yes ☐ No - [redacted] Burn Boss or crew lead must respectfully manage all issues and concerns, including removing personnel from duties and respecting an individual's refusal of assignments.

Briefing Signature_____ Date _____

References
CDC FAQs for Wildland Firefighters
https://www.cdc.gov/coronavirus/2019-ncov/community/wildland-firefighters-faq.html

[redacted] Preserve and Fieldwork Guidance
[redacted]

Decision Tree for [redacted] Preserve and Other Field-Based Activities during COVID-19 Pandemic
[redacted]

From the [redacted] Fire Management Manual - Additional COVID-19 PPE measure:

[redacted] *fireline personnel must use facemasks or cloth face coverings made of natural or fire protective fibers. Face coverings must be worn properly at all times on the fireline and when in vehicles with others. Exceptions to wearing face coverings include when traveling alone in a vehicle, eating or drinking, and when working away from possible close contact with others.*

Appendix H: [redacted] Consequence Analysis

State: California	Site: [redacted] Highway [redacted]
Date: 08/23/2021	Approved by:
☐ High Consequence ☒ Not High Consequence	

Overview:
The Consequence Analysis, *a required element of* [redacted] *Prescribed Burn Unit Plans*, evaluates the potential for financial loss or significant harm to [redacted] reputation or partnerships, should damage to third parties occur from escaped fire or from smoke. As part of the burn planning process, the Consequence Analysis identifies burns with characteristics that may result in a high level of exposure to financial or reputational loss from an adverse unexpected event. These *"High Consequence" burns will require the BU Director to be briefed on the burn prior to implementation.*

For more information on filling in this element, see [redacted] *document "*[redacted] *Complexity Analysis Guidance".*

Factor identified for planned burn areas		CONSEQUENCE ANALYSIS FACTORS		
YES	NO	DESCRIPTION	EXAMPLE	SITE CONDITIONS
	X	Offsite values: High potential for significant damage claims due to risk to improvements or other fire sensitive resources in the area	Highly flammable wildland fuels contiguous to high value (>$1,000,000) improvements, such as housing developments, historic buildings, high public use recreation areas, or commercial or industrial developments.	Remote, low-population density, strong social license for prescribed fire application. Some adjacent values/private residences and smoke sensitive receptors are several miles from the location of proposed burns.
	X	Smoke sensitive areas: Burn plan identifies one or more highly smoke sensitive areas that are not easily mitigated	Hospitals, schools, major roads, airports or factories, each with low tolerance for smoke intrusion, nearby on multiple sides of a burn unit	Prescribed fire smoke is widely accepted. Impacts to local receptors are expected to be nominal, however considerations need to be taken to prevent negative impacts especially with respect to COVID-19.
	X	Public/Political sensitivity: Burn is likely to attract significant negative public, political, or media attention; significantly aggravated by any unexpected or adverse event	Burn to be conducted in area that has been impacted recently by damaging wildfire or escaped prescribed fire; or in an area with frequent hostile political/ community response to planned burning	Wildfires are prevalent during summer months and are a widely accepted ecosystem service by many residents. Prescribed fire is common during the fall and spring with little to no political or local hostility.

Project Name: Hwy 169
Ignition Unit(s) Name: McKinnon Hill

ATTACHMENT 5

Factor identified for planned burn areas YES	NO	Secondary Factors		
	X	Burn Complexity: A high degree of technical difficulty or the possibility for multiple adverse operational events or situations to occur	Complexity Rating of High, after mitigation measures incorporated into planning	Complexity rating is "Moderate" after mitigating measures have been incorporated.
	X	Escape Containment: Contingency planning identifies high degree of difficulty in initial attack and containment of escaped fire	Contiguous wildland fuels outside burn unit extend into neighboring lands with potential for rapidly moving wind-driven escaped fires and limited avenues for secondary containment or indirect attack of escaped fire; or Burn objectives Require burning under drought or other conditions typically regulated by burn bans or public burn safety warnings	Fuels are continuous in spots and comprised of mixed conifer, oak, and understory fuels. Behave Plus 6.0.0 Contain models in TU5 indicate effective/adequate suppression actions even when steep slope and wind align in TU5. Adequate indirect opportunities exist as well, using natural fire breaks, old burns, ridges, rivers and roads. Water is abundant throughout the units. Homes will be re-assessed as a part of the in-brief process and mitigated with permission from owners.
	X	Residual Burning Fuels: Burn unit contains fuels with potential for prolonged smoldering combustion, resulting in extended potential for fire escape or smoke intrusions	Burn unit contains peat, heavy slash, or other fuels that will likely ignite and burn for many days, weeks or even months	Some units contain mixed conifer that is primarily comprised of Douglas fir. Residual burning will occur in thicker timber stands, and precautions will be taken to mitigate any potential fire perimeter breach through adjusted mop-up/patrol standards.

	X	Third Party Lands: [redacted] burn on third party lands where landowner is unwilling to provide liability waiver, indemnification to the [redacted] against third party claims, or possess adequate insurance	[redacted] to burn on a farm as part of an ongoing private-lands conservation project, but landowner does not have insurance and/or is unwilling to indemnify the [redacted] from potential damage claims resulting from the burn	While there is an element of private lands burning, liability, indemnification and insurance are all covered between a specific agreement framework. Local residents advocate for prescribed fire use.