
PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT(S): University of California Cooperative Extension

PRESCRIBED FIRE NAME: 2019 [REDACTED] YST control demonstration project

PREPARED BY: Phillip Dye – RXB2 (current) **DATE:** 23 May 2019
RXB1, RXB2 (circle appropriate Qual)

CAL FIRE REVIEW: _____ **DATE:** _____
Name and Title/Rank/Position

COMPLEXITY RATING: LOW

APPROVED BY: [REDACTED] **DATE:** _____
Landowner

All elements of the burn plan are as prescribed and are predicted to remain in prescription during the expected life of the burn (day of the burn go/no-go decision).

RXB1, RXB2, RXB3 (circle appropriate qual) Date Time

Date/time lines checked	Who checked	Method (air/ground)
_____	_____	_____
_____	_____	_____
_____	_____	_____

Prescribed burn declared out: _____
RXB1, RXB2, or RXB3 Date Time



Project Name: 2019 [REDACTED] YST control demonstration project

ELEMENT 2: AGENCY ADMINISTRATOR PRE-IGNITION APPROVAL CHECKLIST

Instructions: The Agency Administrator’s Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that should be completed before a prescribed fire can be implemented. The Agency Administrator’s Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator’s intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

YES	NO	KEY ELEMENT QUESTIONS
		Is the Prescribed Fire Plan up to date? <i>Hints: amendments, seasonality.</i>
		Will all compliance requirements be completed? <i>Hints: cultural, threatened and endangered species, smoke management, NEPA.</i>
		Is risk management in place and the residual risk acceptable? <i>Hints: Prescribed Fire Complexity Rating Guide completed with rational and mitigation measures identified and documented?</i>
		Will all elements of the Prescribed Fire Plan be met? <i>Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources</i>
		Will all internal and external notifications and media releases be completed? <i>Hints: Preparedness level restrictions</i>
		Will key agency staff be fully briefed and understand prescribed fire implementation?
		Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
		Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss?
		Other:

Recommended by: Phillip Dye – RXB2 Date: 23 May 2019
(Prescribed Fire Burn Boss Type 2)

Approved by: [REDACTED] Date: _____
(Landowner)

Approval expires (date): 30 June 2019



ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST

<p>A. Has the burn unit experienced unusual drought conditions or contain above normal fuel loadings which were not considered in the prescription development? If <u>NO</u> proceed with checklist., if <u>YES</u> go to item B.</p>	<p>YES</p>	<p>NO X</p>
<p>B. If <u>YES</u> have appropriate changes been made to the Ignition and Holding plan and the Mop Up and Patrol Plans? If <u>YES</u> proceed with checklist below, if <u>NO</u> STOP.</p>	<p>N/A</p>	

YES	NO	QUESTIONS
		Are ALL fire prescription elements met?
		Are ALL smoke management specifications met?
		Has ALL required current and projected fire weather forecast been obtained and are they favorable?
		Are ALL planned operations personnel and equipment on-site, available, and operational?
		Has the availability of ALL contingency resources been checked, and are they available?
		Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?
		Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed?
		Have ALL the required notifications been made?
		Are ALL permits and clearances obtained?
		In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective?

If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results

 Burn Boss

 Date





NWCG Prescribed Fire Summary and Final Complexity Worksheet (PMS 424-1)

This worksheet is supplemental to the *Prescribed Fire Complexity Rating System Guide* (PMS 424). It is designed to enable effective risk management. The *Interagency Prescribed Fire Planning and Implementation Procedures Guide* (PMS 484) provides further explanation. This becomes Element 3 of the prescribed fire plan.

2019 Sellick-Ivens YST control		Quantity	Significance
Values	On-Site	Few	High
	Off-Site	Nominal	Mod
	Public/Political Interest	Nominal	Low

Element	Preliminary Risk	Post-Plan Risk	Technical Difficulty	Calculated Rating
Safety	Low	Low	Low	Low
Fire Behavior	Low	Low	Low	Low
Resistance to Containment	Mod	Mod	Mod	Mod
Ignition Procedures and Methods	Mod	Mod	Low	Mod
Prescribed Fire Duration	Low	Low	Low	Low
Smoke Management	Low	Low	Low	Low
Number and Dependence of Activities	Low	Low	Mod	Mod
Management Organization	Low	Low	Low	Low
Treatment/Resource Objectives	Low	Low	Low	Low
Constraints	Low	Low	Low	Low
Project Logistics	Low	Low	Low	Low

Calculated Summary Prescribed Fire Plan Complexity



Final Complexity Determination	Final Complexity Determination Rationale
Low	This prescribed fire rates Low per the scoring criteria. However, use of a qualified RXB2 is necessary to implement this project safely. There are a number of moderate rating factors, that will require a RXB2. There are a sufficient number of pre- and post-risk factors that move the project toward a moderate complexity.

Signatures	Rx Burn Plan Preparer's Name: _____ X _____ Date: _____ Preparer
	Technical Reviewer's Name: _____ X _____ Date: _____ Technical Reviewer
	Agency Administrator's Name: _____ X _____ Date: _____ Agency Administrator

ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

The [REDACTED] Ranch is a privately held property located in [REDACTED] California. The ranch has been managed for many generations for livestock production. However, the encroachment of Yellow Starthistle (*Centaurea solstitialis*) has gradually degraded the quality of livestock forage and the ranch wishes to explore the use of prescribed fire as a tool to reduce Yellow Starthistle (YST) incidence. The ranch has partnered with the University Of California Cooperative Extension (UCCE) to allow the use of their property to demonstrate the viability of using prescribed fire to control YST. For the purposes of the demonstration, only a small portion of the ranch will be burned.

Directions to the burn unit are:

[REDACTED]
[REDACTED]
[REDACTED]

A. Physical Description

1. Location:

Latitude (middle of burn unit): [REDACTED]
Longitude (middle of burn unit): [REDACTED] (WGS 84)
Quadrangle name(s): Lonoak

Township: [REDACTED]	Range: [REDACTED] Mt Diablo Meridian	Section(s): [REDACTED]
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- 2. **Size:** 2.66 acres
- 3. **Elevation:** 1450 ft.
- 4. **Topography:** Inside unit and to the east of unit, < 5%; to the north and west of the unit, 25 - 35%; to the south of the unit, 20 %
- 5. **Aspect:** Inside the burn unit - flat. To the north, south aspect. To the south, north aspect.
- 6. **Project Boundary:** Burn unit boundaries will be constructed from existing roads on the south and east boundaries. The north and west boundaries will consist of a minimum 10' mow line with a minimum 18" scrape to mineral soil. Black line will be created by firing off mow/scrape line to increase ability of north and west lines to hold fire.
- 7. **Chains of line on burn unit:** Total perimeter 22 chs: mow/hand line 14 chs, dozer 0 chs, creek 0 chs, existing road 8 chs, wet line 0 chs, open line 0 chs, black line 0 chs (*black line can be created by wet line firing along flanks. The mow/handline will also have a hoselay installed.



B. Vegetation/Fuels Description:

1. On site fuels data

a. Overstory: <none>

a. Understory: . Fuel Model 1 (Anderson). Continuous, fine 1-hour fuels. A naturalist survey was completed on the property in April 2019 and the predominant herbaceous species consist of Arroyo Lupine (*Lupinus succulentus*), Valley Tassels (*Castilleja attenuata*), Tomcat Clover (*Trifolium willdenovii*), Great Valley Phacelia (*Phacelia ciliata*), Shining Pepperweed (*Lepidium nitidum*), Purple Owl's Clover (*Castilleja exserta*), Black Mustard (*Brassica nigra*), Pine Bluegrass (*Poa secunda*), Great Brome (*Bromus diandrus*), Wall Barley (*Hordeum murinum*), Smallflower Melicgrass (*Melica imperfecta*), Rat's-tail Fescue (*Vulpia myuros*), Italian Thistle (*Carduus pycnocephalus*), Purple needlegrass (*Stipa pulchra*), and of course, the target species for this project, Yellow Starthistle (*Centaurea solstitialis*). It is interesting to note that YST was the second most abundant herbaceous species noted, indicating the level of YST encroachment on the property.

2. Adjacent fuels data: The areas to the north, south, and west of the unit are best described as Coast Live Oak (*Quercus agrifolia*) and Blue Oak (*Quercus douglasii*) savannahs. To the east of the unit (across Hwy 25) is a grazed area similar in composition to the burn unit.

3. Map of vegetative communities: See Appendix A which provides a map of the predominant vegetation communities at the project site and within a 5-mile radius around the project site.

C. Description of Unique Features: Ranch infrastructure (stock troughs, fence posts) will need to be prepared prior to ignition. Handline around these features will be acceptable.

ELEMENT 5: GOALS AND OBJECTIVES

A. Goals: The ranch owners wish to investigate the possibility of using fire as a tool to reduce YST encroachment. Yellow Star Thistle (*Centaurea solstitialis*) can be effectively controlled by successive years of burning. Three years of burning have proven to be very effective in reducing or eliminating the species in previously infested areas (DiTomaso, 1999¹). Yellow Star Thistle matures later than most desirable plants. The most effective burn timing is in early summer, after desirable plants have matured and their seed has fallen but before viable seed production in Yellow Star Thistle. Livestock grazing in concert with prescribed fire is an accepted means of control for Yellow Star Thistle but is not a standalone control.

¹ DiTomaso, Joseph M.; Kyser, Guy B.; Hastings, Marla S. 1999. Prescribed burning for control of yellow starthistle (*Centaurea solstitialis*) and enhanced native plant diversity. *Weed Science*. 47: 233-242



Project Name: 2019 [REDACTED] YST control demonstration project

In addition, the UC Cooperative Extension service in [REDACTED] wishes to use this project as a demonstration to other landowners in the area.

B. Objective(s): 50% reduction in YST occurrence one year post-burn.

ELEMENT 6: FUNDING:

Cost and funding sources:

A. Cost

The estimated cost for conducting this project are listed in the table below

Item	Cost
Burn unit preparation	\$500
Burn plan	\$1500
Burn boss fee	\$1500
Drip torch mix	\$40
Administrative	\$1000
TOTAL	\$4540

B. Funding

The burn will be funded by grant monies from UCCE as well as the landowner and participating agencies and personnel. Any cost sharing arrangements should be discussed by the involved agencies or personnel as soon as practicable.

ELEMENT 7: PRESCRIPTION

A. Environmental and Fire Behavior Prescription

	Low (cool) end	Desired	High (hot) end
FUEL MODELS (FBPS)	1	1	1
1 HR FUELS %	10	8	6
TEMPERATURE (F)	40	70	80
RELATIVE HUMIDITY %	60	40	30
MIDFLAME WIND SPEED (mph)	0	5	10
MIDFLAME WIND SPEED DIRECTION	Any	Any	E, S
TRANSPORT W/S DIRECTION	Any	Any	N, W, E
MIXING HEIGHT (feet)	500	1500	>1500
PROBABILITY OF IGNITION (%)	30	50	60



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DAYS SINCE RAIN	>7	7	<3
AMOUNT (inches)	None	0.1"	>0.1"
FIRING TECHNIQUE	Flanking, backing	Flanking, backing	Backing
SLOPE (AVERAGE) %	5	5	5
FLAME LENGTH (ft.)	3	2	1
RATE OF SPREAD (chs/hr.)	16	5	3

ELEMENT 8: SCHEDULING

- A. Ignition Time Frames/Season(s):** Any time that burn units are in prescription and when burning is allowable by CAL FIRE and the Monterey Bay Air Resources District - MBARD. Also, when this burn plan has not expired.
- B. Projected Duration:** 1 day
- C. Constraints:** Burning will not occur if meteorological or fire behavior prescription is or is likely to be exceeded. Burning will not occur if open burning is not approved by MBARD or CAL FIRE. Burn Boss should also consider other factors when deciding to implement project.

ELEMENT 9: PRE-BURN CONSIDERATIONS

- A. Considerations:**
 - On Site:** The landowner and/or designee should ensure all infrastructure within or adjacent to the burn unit is protected. This would include such things as fence posts, utility poles, watering troughs, nesting boxes or other features.
 - Off Site:** Notification of affected and potentially affected agencies will occur on the day of the burn. These will include, at a minium, CAL FIRE and MBARD. The landowner and/or Burn Boss should also consider notification of nearby residences as appropriate and practicable. Signs will be placed on [REDACTED]
- B. Method and Frequency for Obtaining Weather and Smoke Management**
 - Forecast(s):** Local weather patterns will be monitored daily from nearby RAWS stations prior to burn day. On site weather will be collected at least every hour during burning and more frequently in weather approaches the upper end of the prescription parameters.

C. Notifications:

Agency Notification	Name	Contact Method	Completion date/whom
	CAL FIRE Monterey ECC	(831) 647-6223	
	Monterey Bay Air Resources District	(831) 647-9411	



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ELEMENT 10: BRIEFING

Briefing Checklist: See Appendix F

ELEMENT 11: ORGANIZATION AND EQUIPMENT

- A. Positions:** Organization Chart will be completed prior to the day of the burn and provided to all resources assigned to project. An Incident Action Plan (IAP) will be distributed to all resources on burn day.
- B. Equipment:** Minimum of one engine, Type 3, 4, 5, or 6 or equivalent. A tactical water tender (Type 2) or support water tender (Type 2 or 3) with portable pump can be substituted in lieu of an engine.
- C. Supplies:** 10 gallons 3:1 (diesel/gas) drip torch mix. Drip torches. 2000' of 1-1/2" hose. 2000' of 1" hose. Sufficient in-line hose "tees". Sufficient nozzles, adapters, and hose clamps. Fireline hand tools. Radios.

ELEMENT 12: COMMUNICATION

A. Radio Frequencies

- 1. Command Frequency(s):** NIFC Tac 2, 168.2000 MHz, Tx/Rx, no tone guard
- 2. Tactical Frequency(s):** <Same as above>
- 3. Air Operations Frequency(s):** N/A

In the event that contingency resources are needed or wildfire declaration is made, CAL FIRE air frequencies may be used as designated in the statewide radio call plan.

B. Telephone Numbers:

- 4. CAL FIRE Monterey ECC:** (831) 647-6223



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ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

See Appendix D, Job Hazard Analysis for general safety hazards and mitigations

A. Safety Hazards specific to burn unit:

- a. Uneven footing due to animal activity, grazing cattle, and earth movement.
- b. Wildlife, particularly snakes and ticks.
- c. Traffic along [REDACTED]

B. Measures Taken to Reduce the Hazards specific to burn unit:

- a. Brief personnel to watch footing, particularly in taller grass.
- b. Brief personnel to watch for snakes. Perform tick checks post burn.
- c. Post lookouts [REDACTED] Provide flaggers if needed.

C. Emergency Medical Procedures:

- a. Immediately notify supervisor or Burn Boss – follow protocol in incident action plan. Designate a person to supervise medical treatment.
- b. If person supervising medical treatment determines that evacuation is needed (air or ground), the Burn Boss will notify EMS and provide number of injured, type of injury, patient condition, location, and contact name and frequency.
- c. Ignition operations will cease unless needed to contain fire.

D. Emergency Evacuation Methods:

- a. Ground: American Medical Response – Hollister or King City.
- b. Air: CALSTAR, Gilroy.

E. Emergency facilities:

- a. Hazel Hawkins Memorial Hospital, Hollister.
- b. Mee Memorial Medical Center, King City.

ELEMENT 14: TEST FIRE

A. Planned location: To be determined on ignition day by Burn Boss. Location will be influenced by environmental and terrain factors. Under typical conditions, unit will be ignited on the uphill and/or downwind side of the unit.

B. Test Fire Documentation: Location and time of test fire will be documented. A Go/No-Go decision will be made by the Burn Boss at the completion of the test fire.

ELEMENT 15: IGNITION PLAN

A. Firing Methods: Firing will be conducted by hand.

B. Devices: Drip torches and/or fusees.

C. Techniques, Sequences and Patterns: To be determined by Burn Boss or by Firing Boss under Burn Boss supervision. Firing techniques should be adjusted to achieve resource management objectives and to ensure that fire behavior remains within prescription parameters.



D. Ignition Staffing: A Firing Boss will supervise ignition team(s). Teams should be led by experienced igniter(s) to maintain span of control and safe oversight of participants.

ELEMENT 16: HOLDING PLAN

- A. General Procedures for Holding:** Fire will be contained by personnel and equipment as documented in the IAP. After completion of all ignition operations, mop-up and patrol should commence. Patrol of control lines will be accomplished by crews on foot. Firelines will be checked continuously until the fire is declared out by the Burn Boss. The Burn Boss should develop a patrol schedule, if needed. The area will be monitored for smoke production. If excessive smoke is being produced which is affecting down-wind or down-drain targets, appropriate measures will be taken to reduce smoke impacts.
- B. Critical Holding Points and Actions:** The north and west lines have some critical holding features. To the north and west, the slope increases suddenly and any fire which establishes itself outside the unit may continue to the top of the ridge before containment. In addition, several residences and associated ranch buildings exist just outside the west boundary. To ensure fire does not escape to the north and/or west, hoselays will be installed on those lines.
- C. Minimum Organization or Capabilities Needed:** One engine, Type 3, 4, 5, or 6 or equivalent. 10 total holding personnel. A support or tactical water tender with portable pump may be substituted in lieu of engine. Sufficient 1-1/2" trunk hoseline to go around north and west sides of the burn unit with appropriate 1" lateral hoselines and associated fittings and nozzles.

ELEMENT 17: CONTINGENCY PLAN

- A. Trigger Points:**
- a. Slop-over or spot fire outside burn unit.
 - b. Medical event.
 - c. Environmental conditions which exceed burn prescription parameters.
 - d. Other event(s) as described at pre-fire briefing.
- B. Actions Needed:**
- a. If there is a slop-over or spot fire onto any area outside the burn unit, holding resources in the vicinity will suppress the fire. The first arriving resources shall request additional on site forces as necessary. Once the slop-over or spot fire is suppressed, ignition may continue if the burn unit remains within prescription and the Burn Boss approves. Firing operations will cease until the slop-over or spot fire is contained unless continued firing is needed to keep fire within burn unit. If a slop-over or spot fire occurs, the first priority shall be to contain the slop-over or spot



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fire at the minimum size. The Burn Boss should also pre-plan contingency lines and inquire of the landowner how much fire might be tolerated outside the planned burn unit.

- b. See Element 13. In addition, actions will be listed in the ICS 206 (Medical Plan) contained in the project IAP.
- c. The weather observer (qualified FOBS or FEMO is preferred) should notify the Burn Boss if environmental conditions are exceeding or likely to exceed the burn prescription. Ignition will cease and a decision will be made to suppress the fire and begin mop-up or delay ignition if and when favorable conditions return.
- d. As described in the pre-fire briefing.

C. Additional Resources and Maximum Response Time: The Burn Boss will determine which resources are to be requested. Response times will vary depending on the location of responding resources. CAL FIRE may choose to provide a stand-by fire engine as a contingency resource and if so, deployment of the CAL FIRE engine will not constitute declaration of a wildfire unless the conditions in Element 18 (see below) are met.

ELEMENT 18: WILDFIRE CONVERSION

- A. Wildfire Declared By:** Burn Boss. Monterey ECC will be notified as soon as possible.
- B. Conditions for Wildfire Declaration:**
 - a. Fire escapes burn unit and cannot be readily contained with on scene and contingency resources.
 - b. Fire remains within burn unit but exceeds environmental parameters and decision is made that additional resources are needed to suppress the fire.
- C. IC Assignment:** The Burn Boss will remain IC unless and until a transfer of command is needed due to escalating incident complexity or mutual agreement of responding agencies. Additional overhead assignments to be determined by the IC.
- D. Notifications:** Should a prescribed fire be converted to a wildland fire all resources on the incident will be notified. The IC will make notifications as described above.

ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

- A. Compliance:** State burning Permit and MBARD permissible burn day.
- B. Permits to be obtained:** State burning permit - LE-7/8 issued by local CAL FIRE unit (if required) and smoke permit from MBARD.
- C. Smoke Sensitive Areas/Receptors:**
 - 1. Isolated residences in the area.
 - 2. [REDACTED] – immediately adjacent to east side of burn unit.
 - 3. [REDACTED] School – approximately 1 mile north of burn unit.



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- D. Impacted Areas:** Residents and visitors may experience short duration smoke impacts during ignition operations. Rapid burndown time of 1-hour fuels will negate any extended smoke production.
- E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:** See smoke management plan (Appendix G). Area residents known to be smoke sensitive should be notified. Signs will be posted on [REDACTED]. Monitor smoke column. Patrols will be made during and after burn until there is no more smoke production.

ELEMENT 20: MONITORING

Complete Post Burn Evaluation Appendix I. Monitoring plots should be established pre-burn and visited regularly post-burn to determine if YST reduction objective was met.

ELEMENT 21: POST-BURN ACTIVITIES

Post-burn activities that must be completed:

1. Pick up smoke signs.
2. Rehab Fire lines, if needed.
3. Post Burn Evaluation (Appendix I).
4. Return [REDACTED] Ranch to pre-burn conditions.



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APPENDICES

- A. Maps: Vicinity and Project
- B. Complexity Analysis
- C. Job Hazard Analysis
- D. Fire Behavior Modeling Documentation or Empirical Documentation
- E. Fire Use Briefing & Tailgate Safety Checklist
- F. Organization Chart
- G. Smoke Management Plan
- H. Post Burn Evaluation



Appendix B - Complexity Analysis

2019 [REDACTED]'s YST control demonstration project		Quantity	Significance	Values Description: Describe the identified off-site, on-site and political values
V a l u e s	On-Site	Few	High	The [REDACTED] residence exists just outside the burn unit and will need to be protected. Minor ranch infrastructure (fence posts, etc.) may exist in the unit but these should be easy to protect. A person with the CAL FIRE Initial Archaeological Surveyor training walked the site and interviews with the landowner have determined that there are no known historic or cultural values inside the burn units.
	Off-Site	Nominal	Mod	No known historic or cultural values exist nearby the burn units. The ranch is isolated and the nearest structure is more than 1/4 mile away. [REDACTED] forms the eastern boundary of the burn unit and may require traffic control during ignition.
	Public/Political Interest	Nominal	Low	The burn units are located well away from population centers and are unlikely to generate significant public interest. Pre-burn notification and signage should sufficiently address most public interest. In addition, social media outlets may be utilized to increase public awareness.

Element	Preliminary Risk	Risk Rating Descriptors
Safety	Low	<ul style="list-style-type: none"> • Safety issues and hazards are easily identifiable, addressed in briefings, and managed. • Minimal organization produces little exposure of personnel to hazards. • Adverse impacts to public health and safety are unlikely. • Activities are high frequency/low risk. • Fatigue and exposure to hazards are limited. • Standard safety briefings and attention to Lookouts, Communications, Escape Routes, and Safety Zones (LCES) are sufficient. <p>Safety issues should be easily mitigated through standard safety practices. A minimal organization can safely execute the project. The remote location of the burn is unlikely to cause significant impact to public health. Firing and holding activities are HF/LR except for some participants for whom a pre-ignition training component may be useful. The burn unit is relatively flat. A pre-ignition briefing following the format found in the IRPG will address LCES.</p>
Fire Behavior	Low	<ul style="list-style-type: none"> • Terrain is mostly flat or the slope and aspect are uniform, leading to a relatively unvarying fire. • Winds, fuel moisture, microclimate, and other fire conditions are relatively uniform and are not conducive to active fire spread. • Fire behavior is highly predictable. • Fire spread beyond the immediate ignition area(s) is not likely to occur or contribute to any control problems. <p>Slope and aspect are relatively uniform and environmental factors, such as wind, fuel moisture are predictable. Fuel loading is relatively uniform leading to predictable fire behavior. Well planned holding plan should hold fire within unit boundary.</p>
Resistance to Containment	Mod	<ul style="list-style-type: none"> • Potential for multiple wildfire mechanisms such as spot fires or slopovers that can propagate at moderate rates of spread but can be held by prompt holding actions. • Some fuel concentrations or ladder fuels exist near critical holding points. • Expected fire intensities in the primary fuel type create little potential to challenge standard fire lines. • The probability of ignition in fuels outside of control lines is low to moderate. • Some dependency on natural fuel breaks to hold the prescribed fire. • Local drought and or fire indices are expected to be moderate to high. <p>Containment should be relatively easy but holding forces will need to be prompt with containment actions. Fuel outside unit can be conducive to moderate rates of spread, particularly at hotter end of the prescription and at the base of the slopes on the north and west sides of the burn unit.</p>
Ignition Procedures and Methods	Mod	<ul style="list-style-type: none"> • Multiple firing sequences patterns and timing must be coordinated to meet project objectives and reduce the risk of an unexpected or adverse event. • Specific fire intensities or ROS are somewhat critical for meeting resource objectives but are readily attained by placing local skill sets in firing boss positions. <p>Adverse or unplanned events are not likely to affect project objectives but firing patterns will need to be coordinated to achieve specific fire intensities and ROS to meet YST control objective.</p>

Element	Preliminary Risk	Risk Rating Descriptors
Prescribed Fire Duration	Low	<ul style="list-style-type: none"> • Ignition operations should be accomplished within one operational period. • Burn unit is small in size and residual burning is not expected after primary burn out of the unit. • Decrease in seasonal severity is expected. • Short time frame does not require special logistical support. • Mop-up is minimal or none is anticipated/planned. <p>The burn unit can be completed within one operational period. The burn unit is small in size and the 1-hr fuels within the unit are likely to consume almost completely and therefore are not expected to produce much residual smoldering. Resources are able to provide their own logistical support. Mop-up can likely be performed in the same operational period as ignition.</p>
Smoke Management	Low	<ul style="list-style-type: none"> • Smoke concerns are generally few or easily mitigated. • Smoke will be short-lived or inconspicuous. • Exposure to smoke by firefighters and the public will be minimal. • Few concerns exist about smoke from nearby communities. <p>The remote location of this unit is unlikely to produce significant smoke impacts. However, smoke impacts to [REDACTED] will need to be continuously monitored. Burn-down time will be short, thereby lessening smoke exposure to the public and firefighters. Signing and pre-burn notifications should suffice in moderating concerns about smoke.</p>
Number and Dependence of Activities	Low	<ul style="list-style-type: none"> • Activities are mostly independent from each other. • Coordination of activities is simple and straightforward. • The project does not involve another land management agency or jurisdiction. <p>Firing and holding will need to be coordinated to minimize chances of escape. Communication should be routine but will need to be explicit to ensure all resources are coordinated. The adjacent landowners are supportive of the project.</p>
Management Organization	Low	<ul style="list-style-type: none"> • A small number of qualified people are required to implement the prescribed fire. • A single level of supervision is all that is needed (i.e. Burn Boss plus lighters and holders). <p>A relatively simple organization (RXB2, one engine, 10 personnel) is all that is required for project implementation.</p>

Element	Preliminary Risk	Risk Rating Descriptors
Treatment/Resource Objectives	Low	<ul style="list-style-type: none"> • Few if any issues are present that hamper meeting treatment resource objectives. • Few or no adverse impacts are expected if resource objectives are not met. • No critical holding points. <p>No critical holding points have been identified, with the exception of the home on the south side of the burn unit. Since this burn is a demonstration project, not meeting resource objectives should not result in significant impacts.</p>

Element	Preliminary Risk	Risk Rating Descriptors
Constraints	Low	<ul style="list-style-type: none"> • Constraints exist with little impact on implementing the prescribed fire or achieving objectives. <p>Weather conditions will need to be favorable to achieve resource objectives. Required permits from CALFIRE and NCUAQMD will be necessary. Resource commitment will need to be sufficient.</p>
Project Logistics	Low	<ul style="list-style-type: none"> • Minimal logistical support is needed to safely meet prescribed fire objectives. • No special equipment, support or communications needs are required. <p>The project requires minimal logistical support. Resources can provide for their own needs.</p>

Element	Preliminary Risk	Post-Plan Risk	Risk Rating Descriptors	Elements and Actions in the RX Fire Plan that Address Risk Mitigation
Safety	Low	Low	<ul style="list-style-type: none"> • Safety issues and hazards are easily identifiable, addressed in briefings, and managed. • Minimal organization produces little exposure of personnel to hazards. • Adverse impacts to public health and safety are unlikely. • Activities are high frequency/low risk. • Fatigue and exposure to hazards are limited. • Standard safety briefings and attention to Lookouts, Communications, Escape Routes, and Safety Zones (LCES) are sufficient. No change.	Hazard mitigation will be accomplished by a pre-fire briefing and JHA. Medical resources will be identified prior to the burn as listed in the IAP. Rapid burndown time of 1-hr fuels will result in reduced smoke exposure. In addition, rapid burndown will result in quick access to safety zones ("the black").
Fire Behavior	Low	Low	<ul style="list-style-type: none"> • Terrain is mostly flat or the slope and aspect are uniform, leading to a relatively unvarying fire. • Winds, fuel moisture, microclimate, and other fire conditions are relatively uniform and are not conducive to active fire spread. • Fire behavior is highly predictable. • Fire spread beyond the immediate ignition area(s) is not likely to occur or contribute to any control problems. No change.	With predicted weather, fire behavior should be easy to control as mostly backing fire will keep flame lengths and ROS low.
Resistance to Containment	Mod	Mod	<ul style="list-style-type: none"> • Potential for multiple wildfire mechanisms such as spot fires or slopovers that can propagate at moderate rates of spread but can be held by prompt holding actions. • Some fuel concentrations or ladder fuels exist near critical holding points. • Expected fire intensities in the primary fuel type create little potential to challenge standard fire lines. • The probability of ignition in fuels outside of control lines is low to moderate. • Some dependency on natural fuel breaks to hold the prescribed fire. • Local drought and or fire indices are expected to be moderate to high. Holding resources will need to be alert for spot fires, particularly at the base of the slopes to the north and west of the burn unit.	10' mow lines, with an 18" scrape to mineral soil and hoselays should result in good containment on the north and west lines. However, if fire establishes outside the north or west lines, a rapid transition to uphill fire might be resistant to containment. The south and east lines will be held by existing roads (paved and gravel).
Ignition Procedures and Methods	Mod	Mod	<ul style="list-style-type: none"> • Multiple firing sequences patterns and timing must be coordinated to meet project objectives and reduce the risk of an unexpected or adverse event. • Specific fire intensities or ROS are somewhat critical for meeting resource objectives but are readily attained by placing local skill sets in firing boss positions. No change.	Firing needs to be coordinated with holding so that holding resources are able to contain fire within unit. YST control requires a slow moving, backing fire to achieve resource management objective.

Element	Preliminary Risk	Post-Plan Risk	Risk Rating Descriptors	Elements and Actions in the RX Fire Plan that Address Risk Mitigation
Prescribed Fire Duration	Low	Low	<ul style="list-style-type: none"> • Ignition operations should be accomplished within one operational period. • Burn unit is small in size and residual burning is not expected after primary burn out of the unit. • Decrease in seasonal severity is expected. • Short time frame does not require special logistical support. • Mop-up is minimal or none is anticipated/planned. <p>No change.</p>	Due to the small size of the burn unit, the project should be completed in several hours.
Smoke Management	Low	Low	<ul style="list-style-type: none"> • Smoke concerns are generally few or easily mitigated. • Smoke will be short-lived or inconspicuous. • Exposure to smoke by firefighters and the public will be minimal. • Few concerns exist about smoke from nearby communities. <p>Smoke impacts to [REDACTED] will need to be mitigated with signage and possibly traffic control.</p>	Rapid burndown time of 1-hr fuels will result in minimal residual smoke production. Smoke observers will be posted along [REDACTED] to ensure minimal impact to visibility.
Number and Dependence of Activities	Low	Low	<ul style="list-style-type: none"> • Activities are mostly independent from each other. • Coordination of activities is simple and straightforward. • The project does not involve another land management agency or jurisdiction. <p>No change.</p>	Other than coordination of firing and holding, coordination of activities is relatively easy to accomplish.
Management Organization	Low	Low	<ul style="list-style-type: none"> • A small number of qualified people are required to implement the prescribed fire. • A single level of supervision is all that is needed (i.e. Burn Boss plus lighters and holders). <p>No change.</p>	A simple organization is all that is required for project completion.

Element	Preliminary Risk	Post-Plan Risk	Risk Rating Descriptors	Elements and Actions in the RX Fire Plan that Address Risk Mitigation
Treatment/Resource Objectives	Low	Low	<ul style="list-style-type: none"> • Few if any issues are present that hamper meeting treatment resource objectives. • Few or no adverse impacts are expected if resource objectives are not met. • No critical holding points. <hr/> No change.	Since this burn is a demonstration only for YST control, failure to meet resource objectives is unlikely to result in significant impacts.

Element	Preliminary Risk	Post-Plan Risk	Risk Rating Descriptors	Elements and Actions in the RX Fire Plan that Address Risk Mitigation
Constraints	Low	Low	<ul style="list-style-type: none"> • Constraints exist with little impact on implementing the prescribed fire or achieving objectives. No change.	The only constraints to project implementation are permitting from CAL FIRE and MBARD, as well as availability of resources to conduct burn.
Project Logistics	Low	Low	<ul style="list-style-type: none"> • Minimal logistical support is needed to safely meet prescribed fire objectives. • No special equipment, support or communications needs are required. No change.	The short duration of this project requires no special logistical support.

Element	Post-Plan Risk	Technical Difficulty	Rating Descriptors
Safety	Low	Low	<ul style="list-style-type: none"> • No special actions are required to mitigate potential minor accidents or injuries identified in the risk assessment/Job Hazard Analysis (JHA). • Safety concerns can be easily mitigated through LCES. • No preparation work or special project design features are required. <p>Safety issues can be addressed through use of standard briefing formats, such as the Briefing Checklist in the IRPG.</p>
Fire Behavior	Low	Low	<ul style="list-style-type: none"> • Standard fire safety precautions are adequate to ensure personnel safety. • No fire behavior variations are expected and numerous barriers to fire spread exist. • The number, size or likelihood of spot fires and slopovers is minimal and do not require additional suppression resources. • Fire behavior is such that holding forces can easily control possible spot fires and slopovers using direct attack tactics. • No on-site operational fire behavior specialists are required. <p>Lighters under the supervision of a skilled Firing Boss should be able to manipulate fire behavior to achieve resource objectives. Holding resources may be needed to moderate fire intensity in some areas.</p>
Resistance to Containment	Mod	Mod	<ul style="list-style-type: none"> • Several types of resources are involved in the holding operation. • Some portions of the burn unit and project area are not easily accessible to the holding resources. • Expected fire behavior outside the unit may require developing indirect attack options. • Areas outside of the project area have specific suppression action constraints or are on other jurisdictional lands that may limit containment efforts. • Some site prep is required. • Expected fire behavior outside of the unit requires moderate contingency planning. <p>Site prep will be needed to keep fire within containment boundaries. If fire makes a serious run outside the unit, holding resources may need to switch to indirect tactics.</p>
Ignition Procedures and Methods	Mod	Low	<ul style="list-style-type: none"> • There is no need for special firing equipment, techniques, or patterns. • Firing procedures are simple and ignition team is small. • Use of only one type of ignition device is planned. • The ignition pattern requires minimal supervision of the lighters to achieve project objectives and manage safety concerns. • Communications are easily maintained with a single tactical frequency. • The entire project area is readily visible to the Firing/Burn Boss. <p>Firing techniques are simple and involve only one type of device. Small firing teams are sufficient. The Burn Boss will be able to view the entire project area.</p>

Element	Post-Plan Risk	Technical Difficulty	Rating Descriptors
Prescribed Fire Duration	Low	Low	<ul style="list-style-type: none"> • Ignition and mop-up operations are usually completed in 1 to 2 operational periods. • Mop-up and patrol is typical with minimal resource and equipment needs. • Standard press release is sufficient for public notification. <hr/> Ignition and mop-up should completed in one operation period.
Smoke Management	Low	Low	<ul style="list-style-type: none"> • ERTs and SMTs are simple, routine and straightforward to achieve and will provide desirable smoke management outcomes. • Some limitations may be present in the plan. • Wind and dispersion parameters are not constrained. • No sensitive receptors exist. • Minimal coordination with air quality officials is required. <hr/> The Burn Boss will be able to direct firing technique to minimize smoke impacts. Burn window opportunities are constrained by seasonality and permitting. A CAL FIRE burn permit smoke management plan will need to be submitted to MBARD for approval.
Number and Dependence of Activities	Low	Mod	<ul style="list-style-type: none"> • Holding and lighting require close coordination and are dependent on each other to prevent spots or slopovers. • Continuous communication is necessary for successful project completion. • Some pre-burn considerations are required before ignition. <hr/> Holding and lighting will need to be coordinated to keep fire within unit boundary. Sufficient control lines will need to be established prior to burning and hoselays may be necessary for burn unit.
Management Organization	Low	Low	<ul style="list-style-type: none"> • All team members are available within the local unit and are familiar with local factors affecting project implementation. • Several qualified personnel are available. • The operation is carried out employing a small burn crew. • There is no special pre-burn preparation organization is required. <hr/> If inexperienced personnel are used on this burn, they must be supervised adequately with experienced personnel.

Element	Post-Plan Risk	Technical Difficulty	Rating Descriptors
Treatment/Resource Objectives	Low	Low	<ul style="list-style-type: none"> • There are few resource objectives to meet. • Measures to achieve the objectives are easy to complete and there are few or no restrictions on techniques. • There are few or no restrictions on techniques and prescription parameters. • Basic monitoring of fire behavior and weather is needed to determine if prescribed fire objectives are being met. • Many other opportunities will exist to meet objectives in a given year. • Pre-burn site preparation is not required to meet resource objectives. <p>The use of monitoring is encouraged to ensure resource objectives are being met. Use of a FEMO is encouraged. There may be other times of the year to meet objectives but these</p>
Constraints	Low	Low	<ul style="list-style-type: none"> • Constraints are easily accommodated and do not increase the difficulty of completing the project or achieving objectives. • Required weather and fuel conditions are locally very common. <p>Weather required to achieve resource objectives are common to the project area.</p>
Project Logistics	Low	Low	<ul style="list-style-type: none"> • No specific logistic function is required and the local unit will handle their own support needs. • Project is nearby and easily accessible. • Local cache can supply the needs of the prescribed fire. <p>Logistical support (food, fuel, water, etc.) is easy to obtain and/or readily available.</p>

APPENDIX C: JOB HAZARD ANALYSIS

1. WORK PROJECT/ACTIVITY		2. LOCATION		3. UNIT	
Prescribed Fire		██████████ CA		██████████ Family Ranch	
4. NAME OF ANALYST		5. JOB TITLE		6. DATE PREPARED	
Phillip Dye		Prescribed Fire Burn Boss Type 2		May 24, 2019	
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.	
Qualifications for assigned position		Lack of experience, injuries		Workers recruited for burn assignments shall should be honest about health and physical requirements for performing tasks. If unable to initiate or complete assignment, alternative assignments should be provided. Burn Boss shall be qualified per NWCG or CIGCS standards.	
Briefing		Lack of communications		Provide project briefing before burning. Clarify firing order, organization responsibilities, communications, hazards, weather, and expected fire behavior.	
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.	



Project Name: 2019 [REDACTED] YST control demonstration project

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. Hand held radios should be provided to all lighters or at a minimum, to each lighting team. Do not fill drip torches near ignition sources. 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.
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. Identify hazards in work area. 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.
10. AGENCY REPRESENTATIVE SIGNATURE		
11. TITLE		12. DATE



Appendix D - Fire Behavior Modeling Documentation

BehavePlus 6.0.0 (Build 626 Beta 3)

2019 5/24/2019 5:18:18 PM - backing fire

Backing Fire

Fri, May 24, 2019 at 17:24:18

Input Worksheet

Inputs: SURFACE, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		1
Fuel Moisture		
1-h Fuel Moisture	%	4, 5, 6, 7, 8, 9, 10
10-h Fuel Moisture	%	
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	
Weather		
Midflame Wind Speed (upslope)	mi/h	0, 2, 4, 6, 8, 10, 12
Air Temperature	oF	80
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	5
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].

Backing Fire

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

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	2.2	3.0	5.0	6.7	8.1	8.7	8.7
5	2.1	2.7	4.6	6.2	7.5	7.9	7.9
6	1.9	2.6	4.4	5.9	7.1	7.4	7.4
7	1.8	2.5	4.1	5.6	6.7	6.8	6.8
8	1.7	2.2	3.8	5.1	6.1	6.1	6.1
9	1.4	1.9	3.3	4.4	4.8	4.8	4.8
10	1.1	1.5	2.5	3.2	3.2	3.2	3.2

Backing Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	0.8	1.0	1.2	1.4	1.5	1.6	1.6
5	0.8	0.9	1.2	1.3	1.5	1.5	1.5
6	0.8	0.9	1.1	1.3	1.4	1.4	1.4
7	0.7	0.8	1.1	1.2	1.3	1.4	1.4
8	0.7	0.8	1.0	1.2	1.3	1.3	1.3
9	0.6	0.7	0.9	1.0	1.1	1.1	1.1
10	0.5	0.6	0.7	0.8	0.8	0.8	0.8

Backing Fire

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

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	75	75	75	75	75	75	75
5	66	66	66	66	66	66	66
6	57	57	57	57	57	57	57

7	50	50	50	50	50	50	50
8	43	43	43	43	43	43	43
9	37	37	37	37	37	37	37
10	32	32	32	32	32	32	32

End

Input Worksheet

Inputs: SURFACE, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		1
Fuel Moisture		
1-h Fuel Moisture	%	4, 5, 6, 7, 8, 9, 10
10-h Fuel Moisture	%	
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	
Weather		
Midflame Wind Speed (upslope)	mi/h	0, 2, 4, 6, 8, 10, 12
Air Temperature	oF	80
Fuel Shading from the Sun	%	0
Terrain		
Slope Steepness	%	5
Notes		

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the FLANKING 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].

Flanking Fire

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

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	3.4	7.8	18.6	32.2	47.3	54.7	54.7
5	3.2	7.2	17.3	29.9	43.9	48.4	48.4
6	3.0	6.9	16.3	28.2	41.5	44.6	44.6
7	2.8	6.5	15.4	26.6	39.1	40.7	40.7
8	2.6	5.9	14.1	24.4	34.7	34.7	34.7
9	2.2	5.1	12.2	21.0	25.6	25.6	25.6
10	1.7	3.9	9.3	14.3	14.3	14.3	14.3

Flanking Fire

Results for: Surface Fire Flame Length (ft)

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	1.0	1.5	2.2	2.9	3.4	3.7	3.7
5	1.0	1.4	2.1	2.7	3.3	3.4	3.4
6	0.9	1.4	2.1	2.6	3.2	3.3	3.3
7	0.9	1.3	2.0	2.5	3.0	3.1	3.1
8	0.8	1.2	1.9	2.4	2.8	2.8	2.8
9	0.8	1.1	1.6	2.1	2.3	2.3	2.3
10	0.6	0.9	1.3	1.6	1.6	1.6	1.6

Flanking Fire

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

1-h Fuel	Midflame Wind Speed (upslope)						
Moisture	mi/h						
%	0	2	4	6	8	10	12
4	75	75	75	75	75	75	75
5	66	66	66	66	66	66	66
6	57	57	57	57	57	57	57

7	50	50	50	50	50	50	50
8	43	43	43	43	43	43	43
9	37	37	37	37	37	37	37
10	32	32	32	32	32	32	32

End

Project Name: 2019 ██████████ YST control demonstration project

Appendix E: FIRE USE BRIEFING & TAILGATE SAFETY CHECKLIST

Briefing conducted by: _____

Date: _____ Time: _____

Attendees: _____

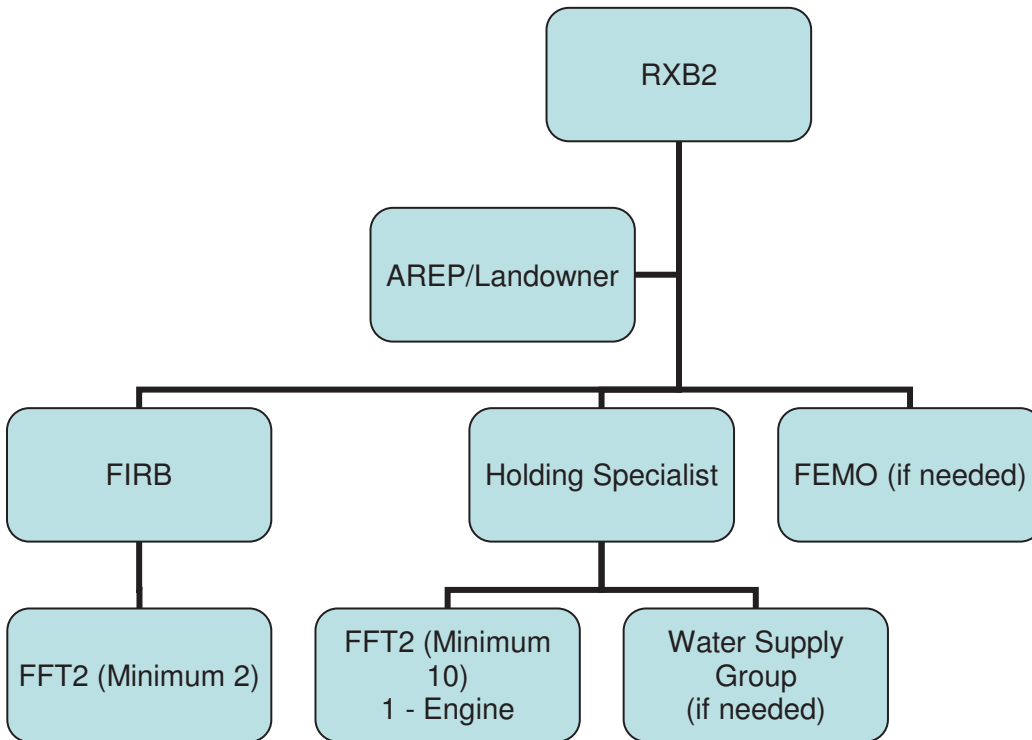
Items discussed (* appropriate categories)

___ A. Objectives	___ I. Monitoring needs
___ B. Contingencies	___ J. Aviation operations
___ C. Boundary locations/types	___ K. Escape routes, safety zones
___ D. Special considerations	___ L. Topography
___ E. Organization-responsibilities protocols	___ M. Communications-freqs-
___ F. Weather forecast	___ N. Risk assessment
___ G. Fuels	___ O. Tactics/firing/hold/patrol
___ H. Expected fire behavior mitigation	___ P. Smoke sensitive targets-
___ I. Safety (firefighter & public) legend/scale	___ Q. Maps, control points-

Remarks: **Briefing will be conducted using Briefing Checklist in IRPG.**



Appendix F: Organization Chart



Appendix G - Smoke Management

2019-

Land Manager Information

Field Contact Person:	Phillip Dye	Phone:	(408) 807-1963	24 Hour Phone:	(408) 807-1963
Land Manager Name:		Email:	phil@prometheusfireconsulting.com	Address:	

Landowner Information

Address:	
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Project Specifics

Project Acres:	3	Overnight Burn?:	No	Burn Start:	06-2019	Burn Goal:	Range Improvement
Duration (days):	1	Preferred Season:	Spring	Burn End:	06-2019	Primary Air District:	Monterey Bay Air Resources District

Broadcast and/or Understory Units

25 unit							
General Information							
Acres:	3	Fuel Arrangement:	Natural	General Fuel Moisture:	Dry	Min 1000 hr Fuel Moisture:	6
Tons per Acre:	2.15	Fuel Density:	Abundant	Cover Type:	COAST LIVE OAK WOODLAND	Max 1000 hr Fuel Moisture:	10
General Description:	3 acres of natural standing 1-hr fuels. Robust fuel crop this year due to abundant winter and spring rains. Fuel height 2 - 3 feet						
Emissions Calculation Method:	USFS Blue-Sky Playground		Estimated Emissions:			0.06	
Location Information							
County:		District:	Monterey Bay Air Resources District	Air Basin:		Crossroads:	
Meridian:	Mt Diablo	Township:		Range:		Section:	
Latitude:		Longitude:		Slope:	5	Aspect:	
Min Elev:	1450	Max Elev:	1460	Mean Elev:	1455		
Ignition Prescription							
Source of meteorological information:		NOAA website					
Other considerations to ensure adequate smoke dispersion:		On-site visual monitoring; smoke observers from greater distance, if needed					
Surface Wind							
Ideal Direction:	N	Min:	ANY	Max:	ANY	Ideal Speed:	5
		Min:	0	Max:	10		
Transport Wind Direction							
Ideal:	N	Min:	ANY	Max:	ANY		
Relative Humidity							
Ideal:	40	Min:	30	Max:	60		
Temperature							
Ideal:		Min:	40	Max:	80		
Target Mixing Height:	1500						

Pile Units

- No Pile units were included in this SMP.

Smoke Sensitive Areas

SSA Elevation:	1450 ft	Direction:		Distance:	miles
Most likely time of potential impacts:	Afternoon				
SSA Description:	Wind direction will be monitored to ensure there are minimal to no smoke impacts to highway. "Prescribed Fire Ahead" or similar signs will be placed on highway. Traffic control will be initiated if needed. If smoke impacts become significant, ignition will cease.				
Has prescribed burning occurred in this area before?	No				
If yes, did smoke impact the area?:	No				
If yes, please describe impacts:	No documented smoke impacts.				

School					
SSA Elevation:	1450 ft	Direction:		Distance:	miles
Most likely time of potential impacts:	Afternoon				
SSA Description:	School will not be in session at time of burn. Dismissal for summer will occur in late May.				
Has prescribed burning occurred in this area before?	No				
If yes, did smoke impact the area?:	No				
If yes, please describe impacts:	No previously documented smoke impacts				

Public Contact Methods

Television	Radio	Newspaper	Signs/Flyers	Telephone	Email	Website
No	No	No	Yes	Yes	Yes	Yes
Description of	Nearby neighbors will be notified by phone or flyer or face-to-face visit. Signs will be placed on			Notification of the burn will be distributed via e-mail		

Contact Method(s):	and/or website as needed. CAL FIRE Monterey ECC will be notified prior to ignition and once fire has been declared out.	
Signage Description:	"Prescribed Fire Ahead - Do Not Report" or similar signs will be placed on area.	Signs will be placed approximately 1/4 mile north and south of project area.

Alternatives to Burning

Alternative Name:	Herbivory, chemical, mechanical	
Description:	Grazing with bovines; chemical application; hand removal.	
Did you use this alternative?	No	
Estimated emissions and fuel reduction, or reasons for not using this alternative:	The primary purpose of this burn is for Yellow Starthistle (<i>Centaurea solstitialis</i>) control. DiTomaso, et al (1999) have documented good results in YST control if burning is conducted once a year for three years consecutively. Herbivory can be effective in combination with burning but is not as effective as a stand alone treatment. Chemical treatment is not desired by the landowner due to costs and environmental concerns. Mechanical removal is impracticable due to presence of sharp awns at the basal rosette.	
Additional Comments:		

Smoke Mitigation

Contingency Name:	Delay and/or dilution	
Contingency Measure?	Yes	
Smoke Minimization Measure?	Yes	
Description:	If smoke impacts become greater than expected, ignition can be delayed or diluted over time to reduce smoke impacts.	
Contingency Name:	Suppression	
Contingency Measure?	Yes	
Smoke Minimization Measure?	Yes	
Description:	If serious smoke impacts occur, fire will be suppressed.	

SMP Comments

Land Manager Comments:	As noted earlier, this project is a demonstration in the use of prescribed fire as a control measure for YST. It is being funded by UCCE and is part of a two-day workshop of using Rx fire as a resource management tool for private landowners.	
Air District Comments:	None	

Project Maps



Home » My Emissions » 2019 » (Broadcast)

- Size and Location
- Fuels
- Moisture
- Consumption
- Timing
- Emissions
- Notes

Click the 'Add a Section' link to add multiple sections (or phases) for one day. The acreage of all added sections will be deducted from Section 1 for that day.

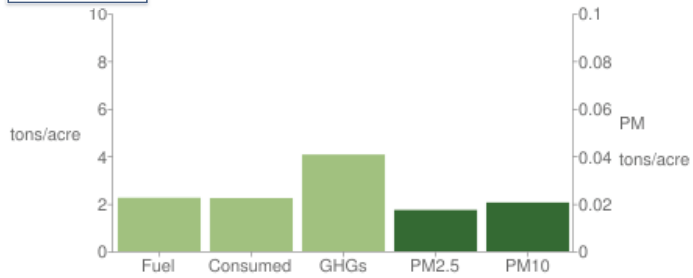
Timing Inputs

Day 1 (Total acres: 3)

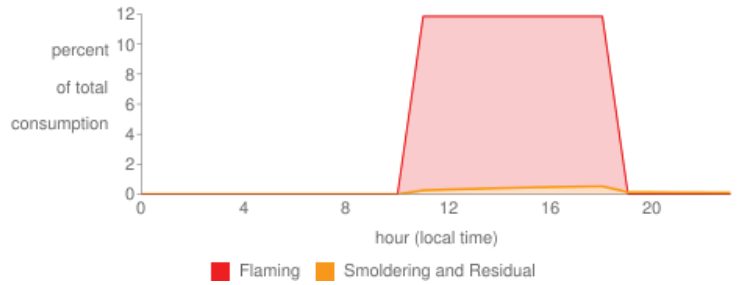
Section	Acres	Start Ignition
1	3	10 AM ▼

[Add a Section](#)

Fuels and Emissions per Acre



Diurnal Profile of % Total Consumption Day 1 ▼





Home » My Emissions » 2019 (Broadcast)

- Size and Location
- Fuels
- Moisture
- Consumption
- Timing
- Emissions
- Notes

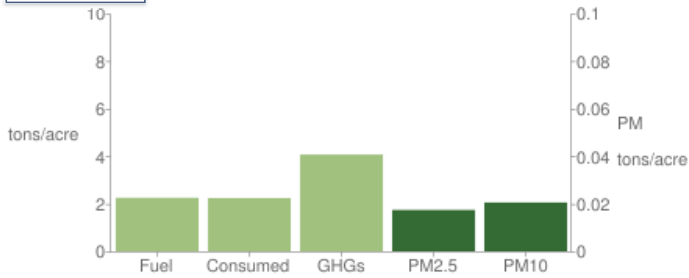
Use Fuels From

- FCCS Fuelbed #51 From Map
- FCCS Fuelbeds
- LANDFIRE Fuel Loading Models
- Custom Fuel Loading

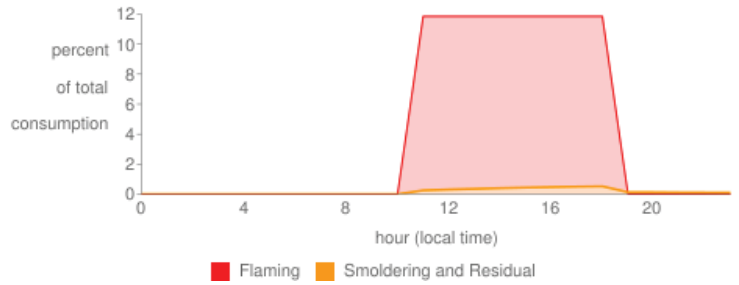
Fuel Loading Results

1-hr	<input type="text" value="2.15"/> tons/acre	Canopy	<input type="text" value="0"/> tons/acre
10-hr	<input type="text" value="0.1"/> tons/acre	Shrubs	<input type="text" value="0"/> tons/acre
100-hr	<input type="text" value="0"/> tons/acre	Grasses	<input type="text" value="0"/> tons/acre
1,000-hr	<input type="text" value="0"/> tons/acre	Litter	<input type="text" value="0"/> tons/acre
10,000-hr	<input type="text" value="0"/> tons/acre	Rotten	<input type="text" value="0"/> tons/acre
>10,000-hr	<input type="text" value="0"/> tons/acre	Total Above Ground	0.00 tons/acre
Total Sound Woody	2.25 tons/acre	Total Fuel Loading	2.25 tons/acre
Duff Depth	<input type="text" value="0"/> inches		

Fuels and Emissions per Acre



Diurnal Profile of % Total Consumption Day 1





Home » My Emissions » 2019 (Broadcast)

- Size and Location
- Fuels
- Moisture
- Consumption
- Timing
- Emissions
- Notes

Fuel Moisture Conditions

Dry

Fuel Moisture Results (Percent)

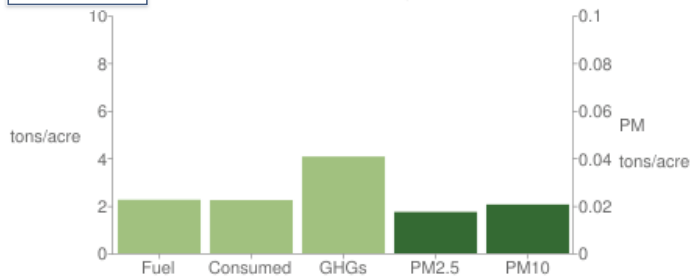
10-hr	8	%
1,000-hr	12	%
Duff	40	%

Discard Changes

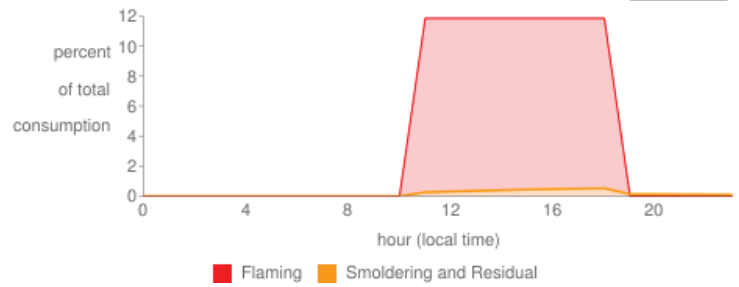
Apply

View Totals

Fuels and Emissions per Acre



Diurnal Profile of % Total Consumption Day 1





Home » My Emissions » 2019 (Broadcast)

- Size and Location
- Fuels
- Moisture
- Consumption
- Timing
- Emissions
- Notes

Consumption Model

Consume 3

Canopy Consumed %

Consumption Results

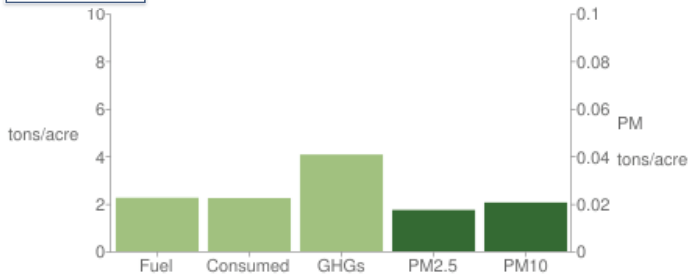
Flaming	2.12 tons/acre	Duff	0.00 tons/acre
Smoldering	<input type="text" value="0.12"/> tons/acre		
Residual	<input type="text" value="0.00"/> tons/acre		
Total	2.24 tons/acre		

Discard Changes

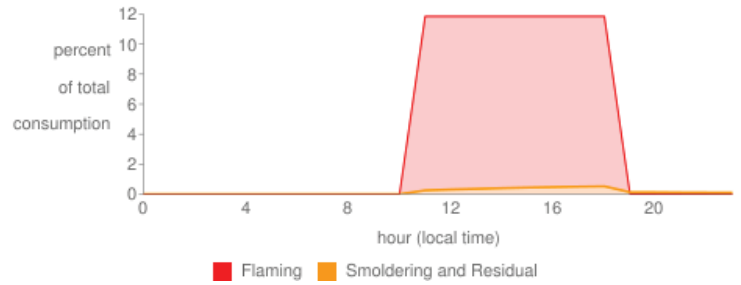
Apply

View Totals

Fuels and Emissions per Acre



Diurnal Profile of % Total Consumption Day 1





Home » My Emissions » 2019 : (Broadcast)

- Size and Location
- Fuels
- Moisture
- Consumption
- Timing
- Emissions
- Notes

Emissions Model

FEPS

Emissions Results

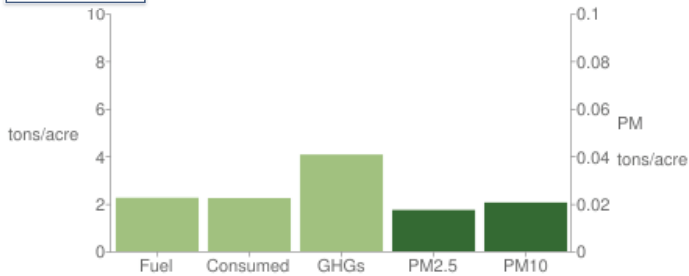
PM _{2.5}	<input type="text" value="0.05"/>	tons	CH ₄	<input type="text" value="0.03"/>	tons
PM ₁₀	<input type="text" value="0.06"/>	tons	NO _x	<input type="text" value="0.02"/>	tons
CO	<input type="text" value="0.53"/>	tons	VOCs	<input type="text" value="0.13"/>	tons
CO ₂	<input type="text" value="10.98"/>	tons	NH ₃	<input type="text" value="0.01"/>	tons
GHGs	<input type="text" value="12.20"/>	tons CO ₂ e	SO ₂	<input type="text" value="0.01"/>	tons
			Heat	<input type="text" value="11.20"/>	BTU/ft ²

Discard Changes

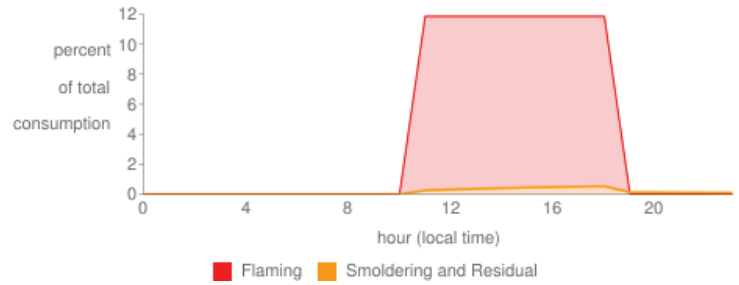
Apply

View Totals

Fuels and Emissions per Acre



Diurnal Profile of % Total Consumption Day 1



Consume 4.2 Emissions by Pollutant Report

Report date: May 25, 2019
Unit Name: 2019
Units of measure: lbs/acre
Unit size: 3
Fire type: Prescribed
Permit#:

Fuelbed	Filename	CH4	CO	CO2	NMHC	PM	PM10	PM25
36	FB_0036_FCCS.xml	69.09	1325.39	19917.71	56.73	185.89	120.68	107.42



Home » My Dispersions » 2019 :

(VSMOKE)

Settings Results Notes

Stability Class: Moderately Unstable ▾
Mixing Height: 1500 m
Background PM_{2.5}: 0 µg/m³
Wind Speed: 1.5 m/sec
Wind Direction: N ▾

Surface Temperature: 70 °F
Surface Pressure: 1015 mb
Surface Relative Humidity: 40 %

Fire started before Sunset?

- Yes
- No

Discard Changes Apply

Appendix H: Post-Burn Evaluation

1. Date: _____ Date: _____
(Immediately after Burn) (Later date as needed)

2. *Amount Litter Left: _____
(Inches)

3. Understory Vegetation Consumed (%): _____
(Estimate % consumed)

4. Scorch: % of Area with Crown Scorch of <1/3 _____ 1/3-2/3 _____
2/3+ _____ (Estimate % of crown scorch and % of area affected)

5. *Spotting/Slopovers: _____
(Document any spots or jumpovers)

6. Tree Damage (insects, disease, mortality): _____
(For Later Evaluation)

7. Understory Kill of Undesired Vegetation (%): _____
(Estimate % Top-Killed)

8. * Any Smoke Management violations: _____

(Highway or communities smoked-in; visibility standards exceeded)

9. Any Escape: _____

(Significant escapes that required considerable effort to contain or declared wildfire)

10. *Any Complaints (Explain): _____
(From Whomever)

11. Adverse Effects: _____
(Undesirable resource damage occurred)

12. Restoration Needed: _____
(Erosion Control or Replanting)

13. Objectives Met (results): _____
(Described in enough detail to determine fire was effective/efficient) (% of objectives met/or numerical score entered here)

Evaluation By: _____
(Immediately After Burn) (DD/MM/YY)

14. Recommendation for future evaluation: _____

(Identify specific needs or resources affected) (Date)

Evaluation By: _____
(Name) (DD/MM/YY)

*Evaluate Immediately After Burn

