APPENDIX 1 - Delegation of Authority

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Office of Fire and Aviation
3833 South Development Avenue
Boise, Idaho 83705-5354

In Reply Refer To:
1120 (FA-106)

July 3, 1999

TO: Ed Shepard
FROM: Les Rosenkrance
SUBJECT: Lowden Fire Review

This letter constitutes my delegation of authority for the following designated Fire Review Team: Ed Shepard (Team Leader), John Glenn, Dave Lentz, Alan Hoffmeister, and Stan Palmer. This team and other representatives will conduct an in-depth review of the Lowden Fire, in Northern California. The review team shall follow the procedures outlined in the Bureau of Land Management "Standards for Fire Operations," Chapter 14.

The California State Director has initiated an investigation team that will be working for you during the review. They are responsible for:

- Scheduling and Conducting interviews
- Identifying factual data associated with the circumstances relating to the escape of the prescribed fire.
- Accurately and objectively recording the findings.
- Coordinating with the review team in the documentation and display of the factual information

The review team shall analyze the factual information to determine:

- If the prescribed fire plan was adequate
- If the prescription, actions, and procedures set forth in the plan were followed
- If overall policy, guidance, and procedures relating to prescribed fire operations are adequate and being followed.
- The extent of prescribed training and experience of personnel involved
- Recommended actions that should be implemented immediately to prevent a similar future occurrence.

In addition, the team will conduct a closeout in Redding, California, with appropriate attendees during the week of July 5 and develop and submit a factual report and recommendations to the Director of the Bureau of Land Management within 14 days of the escape. As the result of your report, I will determine if a separate interagency management team will be appointed to develop proposed corrective actions that should be implemented by the agencies to reduce future incidents of this nature.

This delegation shall go into effect at 1400 July 3, 1999.

Les Rosenkrance, Director, Fire & Aviation, for
Tom Fry, Director, Bureau of Land Management

ENVIRONMENTAL ASSESSMENT FACE SHEET

I. Report Title: **Lowden Ranch Prescribed Fire Project**

EA Number: **CA-360-RE-99-18**

II. Writer/Team Leader: Douglas J. Held (Name) — Fire Management Officer (Title)

III.

Participating Staff	Signature/Initials	Resource Specialty
Francis Berg	Francis Berg	Resource Staff Supervisor
Keith Hughes	3/26/99	T&E and S&M Species, Wildlife
Bill Lawhorn	BJ	Wildlife Biologist
Joe Molter	JJM	Botanist/S&M Species, Botanical
Eric Morgan	EJM	Recreation Specialist
Eric Ritter	EWR subject to finish field survey and evaluations	Archaeologist

IV. Team Leader/Writer: Douglas J Held (Signature) — 4/16/99 (Date)

Environmental Coordinator: Eric A Morgan (Signature) — 4/19/99 (Date)

Reviewed by Field Manager: (Signature) — 4/19/99 (Date)

DECISION RECORD/RATIONALE
AND
FINDING OF NO SIGNIFICANT IMPACT

LOWDEN RANCH PRESCRIBED FIRE PROJECT
ENVIRONMENTAL ASSESSMENT NUMBER CA-360-RE-99-18

I. Decision/Rationale

The decision is to conduct a prescribed fire project on approximately 80 acres of Bureau administered land and approximately 20 acres on California Department of Water Resources Land in Section 23 & 24, T. 33 N., R. 9 W., M.D.M. in Trinity County, California.

The prescribed fire project would reduce the encroachment of noxious weeds, reduce hazardous fuel loading which contribute to wildland fire, and restore health, function, and fire to the annual grassland, oak woodland, and riparian ecosystems.

This decision is consistent with resource condition objectives for the Trinity River Management Area as identified in the Redding Resource Management Plan (RMP), June 1993. See Environmental Assessment, Section 1.C. Conformance with Land Use Planning for further details.

II. Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached environmental assessment, there would be no significant impact to threatened or endangered plants or animals, areas of critical concern, cultural or historical resources, flood plains and wetlands, wilderness values, water resources, wild and scenic rivers, or Native American religious concerns. Therefore, no environmental impact statement is required.

Field Manager
Redding Field Office

5/3/99
Date

ENVIRONMENTAL ASSESSMENT

for the

LOWDEN RANCH

PRESCRIBED FIRE PROJECT

CA-360-RE-99-18

Sec. 23 & 24, T. 33 N., R. 9 W., M.D.M.

TRINITY COUNTY

February 23, 1999

Prepared by: Douglas J. Held

U.S.D.I. - Bureau of Land Management
Redding Field Office
355 Hemsted Drive
Redding, CA. 96002

I. INTRODUCTION

A. Background and Need for the Proposed Action

The Bureau of Land Management (BLM) acquired a parcel in Trinity County in August 1994, called the Lowden Ranch. The property was in private holding prior to BLM acquisition and is currently in poor health due to noxious weed encroachment and decadent vegetation buildup.

A prescribed burn conducted in the Spring would greatly enhance the health and vigor of the vegetation component, reduce decadent fuel loads and reduce the encroachment of noxious weeds, in particular, Yellow Starthistle (Centaurea solstitialis).

B. Location of Proposal

The project is located approximately 2 miles southwest of the town of Lewiston, CA in Sections 23 & 24, T. 33 N., R. 9 W., M.D.M., in Trinity County.

C. Conformance with Land Use Planning

As stated in the Redding Resource Management Plan (RMP), June 1993 ("Management Guidance - Fire Management, p.15"), prescribed burns for hazard reduction and vegetative management activities require appropriate environmental analysis for conformance with the National Environmental Policy Act (NEPA). Assessment of environmental consequences is deferred to activity and project planning phase. This proposal is in conformance with that approved direction. This environmental assessment is intended to meet the analysis requirement of NEPA.

The project conforms to resource condition objectives for the Trinity Management Area as stated in the RMP. Resource condition objectives which are applicable to the project include:

1. Enhance recreation opportunities related to use of the Trinity River.
2. Maintain scenic quality along the river corridor.
3. Protect and enhance the anadromous fisheries of the Trinity River.
4. Maintain the riparian habitat in Class 1 and Class II condition.

D. Issue Identification and Public Involvement

There are no major issues identified for this proposed action, although adjacent private landowners will need to be notified of project to mitigate concerns of smoke and fire in general. An adjacent private landowner, California Department of Water Resources, has been notified of the project and has agreed to work with BLM to include 20 acres of property to facilitate logical fire breaks and allow unrestrained access to the project area.

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action - Preferred Alternative

The proposal is to conduct a prescribed fire project, on approximately 80 acres of BLM administered public lands and approximately 20 acres on private property, for a total of 100 acres, to reduce the encroachment of noxious weeds, reduce hazardous fuel loading which contribute to wildland fire, and restore health, function, and fire to the annual grassland, oak woodland, and riparian ecosystems located in the project area.

The prescribed fire would be conducted in late May or early June to coincide with seed development of Yellow Starthistle, destroying the current year's seed crop and reducing the current seed bank. Other project objectives would include:

1. Reduce 0-3 inch diameter (1,10,100 hr) dead and down fuels by 40-90%.
2. Reduce 3+ inch diameter dead and down limbs by 10-30%.
3. Cause 25-75% live brush mortality and consumption.
4. Limit mature hardwood and conifer tree mortality to less than 10%.
5. Limit tree char height to 10 feet and scorch height to 15' feet above ground.
6. Complete prescribed burn in a safe manner and confine the fire to prescribed fire boundaries.

Minimum fire control lines would be expected to contain and control the planned prescribed fire project. Natural barriers would be utilized whenever possible. Approximately 3,000 feet of fire control lines would be constructed to facilitate fire containment. A dozer may be utilized to construct the fire control lines, upon proper archaeological clearance and approval. If mechanical equipment is not allowed, fire control lines would be constructed using handcrews that incorporate hand tools such as shovels, pulaskis and McLeods, to scrape a 3 to 5 foot width to mineral soil. Additional handline may be constructed on the day of the project using water, foam, or hand crews, as identified by the burn boss.

Fire engines would be utilized on the day of the burn and would be required to drive into certain areas of the project. To prevent soil compaction, equipment would not be allowed access during periods of high soil moisture. Furthermore, no operations of vehicles or equipment would be allowed during periods of wet weather.

Identified cultural and historical resources within the project areas would be avoided during all phases of project implementation. Avoidance flagging, briefings, on-site monitoring, and post-fire monitoring would be used to ensure cultural and historical resource protection. Identified sensitive cultural sites may be foamed, sprayed, or hand cleared before project ignition, to ensure cultural resource protection.

B. Alternatives to the Proposed Action

1. Alternative 1 - Herbicide Treatment to Noxious Weeds and Brush Species

This alternative would consist of applying herbicide to eradicate Yellow Starthistle and various brush species. Killing grass and brush with herbicides would not eliminate the thatch or fuels build-up that exists within the project area. Additionally, herbicide use is generally controversial in Trinity County.

2. Alternative 2 - No Action

This alternative would leave the area in its current condition and allow the natural environmental processes to continue. This alternative is acceptable because, in time, the area will burn either by natural or man caused ignition, and there will be sufficient resources available to suppress a wildland fire. However, there could be no guarantees on the success or cost effectiveness of suppressing a large wildland fire compared to conducting a prescribed fire operation within prescription perimeters to achieve the same, if not superior, results.

III. AFFECTED ENVIRONMENT

This section describes the environmental components that would affect or be affected by the proposed action.

A. Vegetation

Vegetation communities within the project area consists of Mediterranean annual grasses, shrubs, oak-woodland and riparian habitat.

Brush species include California buckeye (Aesculus californica), Greenleaf manzanita (Arctostaphylos patula), Whiteleaf manzanita (A. viscida), Wedgeleaf ceanothus (Ceanothus cuneatus), deer brush (Ceanothus integerrimus), Western redbud (Cercis canadensis orbiculata), Toyon (Photinia arbutifolia), California coffeeberry (Rhamnus californica), Pacific poison-oak (Toxicodendron diversilobum), California wild grape (Vitus californica) and native black berries (Rubus spp.).

Woodland species include California black oak (Quercus kelloggii), Valley white oak (Quercus lobata), Interior live oak (Q. wislizenii), scrub interior live oak (Q. wislizennii frutescens) and Ponderosa pine (Pinus ponderosa)

A special status plant species survey has been conducted in May 1999. No special status plant species were identified during the survey Therefore, formal consultation of the Endangered Species Act, Section 7, is not required.

No known sites exist in the proposed project area, nor is their probability of suitable habitat on or adjacent to the proposed project area, for those survey and manage species (Strategy 1 & 2) within the fungi, lichen, bryophyte, and vascular plant groups. See Botanical Pre-field Research Form (attached), May 5, 1999, for determination justification.

B. Wildlife

Wildlife within the project area include black-tailed deer, mountain lion, black bear, bobcat, porcupine, grey fox, skunk, coyote, mountain quail, red-tailed hawk, acorn woodpecker, steller and scrub jay, rufus-sided touhee, band-tailed pigeon and migratory neo-tropical birds.

The project area does not contain threatened or endangered wildlife species. Therefore, formal consultation of the Endangered Species Act, Section 7, is not required.

No survey or manage molluskd or amphibians are known to occur in the proposed project area. Surveys to determine the existence of these species will be conducted as appropriate.

C. Soils

Two soil series, Haploxerolis and Haysum loam, predominate the proposed project area: The Haploxerolis series soils has generally good drainage with moderately rapid permeability. Available water capacity is moderate to low, effective rooting depth is 60 inches or more, runoff is slow, and the hazard of erosion is slight. The Haysum loam series is well drained with permeability moderate. Available water capacity is high, effective rooting is 60 inches or more, runoff is medium and the hazard of water erosion is slight.

D. Cultural and Historical Values

An archaeological record search was first conducted for the project area in January 1990 at the Northeast Information Center of the California Archaeological Inventory at CSUC, Chico for a proposed 9-hole golf course and residential development (The Meadow) initiated by Weaverville Realty, Inc. The record search revealed the presence of several prehistoric and historic archaeological resources within the proposed project area.

An archaeological field survey of the area, for the proposed 9-hole golf course and residential development, was conducted in February 1990. The field survey concentrated on those areas considered of high to moderated sensitivity for prehistorical and historical resources. Although some prehistoric and historical artifacts were identified during the field survey, it was recommended that a professional archaeologist be consulted to assess the potential for subsurface cultural resources in the event of any ground disturbing activities.

See Cultural Resource Reconnaissance Report for Lowden Ranch by Joann Knopf and Eric Ritter for further information regarding the cultural resources within the Lowden Ranch Prescribed Fire Project.

E. Recreation and Wilderness Values

Recreational opportunities are limited within the project area. Bird watching, hiking, fishing, and an occasional visit from rafters are the principal recreational activities which occur in and around the project area. The area is within a component of the National Wild and Scenic River System.

F. Air Quality

The project is located in Trinity County within the North Coast Unified Air Quality Management District. The District ensures state and federal air quality standards are met in Trinity County. Particle matter (visible smoke) is regulated through an ambient air quality standard. Total Suspended Particles (TSP) cover a large range of particle sizes ranging from 0 to 50 micrometers (um). Particle Matter 10, known as PM-10, is the primary concern to human health and is generally produced by open controlled burning. The North Coast Unified Air Quality Management District is currently not in attainment for PM-10 and ozone by State standards, but are in attainment with Federal standards. Air quality in Trinity County is good.

G. Foreseeable Development

This section is the basis for assessing cumulative impacts. The proposed project area is predominantly annual grassland and oak-woodland and is considered potentially good wildlife habitat and riparian habitat. By conducting a prescribed fire project now, there is a greater opportunity to reduce the risk of wildland fire and the encroachment of noxious weeds, improve wildlife habitat, and restore health, function, and fire resiliency to the environment.

IV. ENVIRONMENTAL CONSEQUENCES

This section describes the probable consequences (impacts, effects) of the proposed action and how it would affect the environmental components discussed above.

A. Impacts of the Proposed Action

1. Vegetation

A properly timed prescribed fire could be an effective tool to control annual noxious weeds with long-lived seed banks. Also, a prescribed fire could improve establishment of previously suppressed native grass species by increasing water availability for the native grass species. Woodland would continue to be productive due to their identified protection status.

2. Wildlife

Wildlife would be temporarily displaced (1-2 days) during project implementation. Anticipated long term habitat improvement, with regard to increased vegetation productivity and nutritional value, should outweigh any short term displacement concerns.

3. Soils

No mechanical equipment is identified to operate within the proposed project area during periods of high soil moisture. The proposed action would not directly cause soil erosion. Barren areas in high erosion areas (roads, stream banks, hills) could be susceptible to subsequent erosion during periods of high rainfall. Identified high erosion areas would be seeded with native grasses to lessen the potential for subsequent erosion, if necessary.

4. Cultural and Historical Values

Fire personnel will make all possible effort to avoid any cultural resources identified for protection within the proposed project area.

5. Recreational Values

Recreation values and uses would not be impacted due to scope and duration of the project. Signing and media announcements will help alert recreational users to the proposed action and, hopefully, reduce the likelihood of impacts to users enjoyment of the area. The project would not affect the outstandingly remarkable values that have led to the designation of the Trinity River as a National Wild and Scenic River.

6. Air Quality

North Coast Unified Air Quality Management District will be consulted before project ignition to inspect project area and issue permits for open controlled burning, if necessary. Wind direction and speed, relative humidity, temperature, atmospheric stability and fuel moisture content would be considered on the day of the burn to reduce the amount of PM-10 released into the air and reduce smoke impact to the residence of Lewiston.

North Coast Unified Air Quality Management District would also be notified on the day of project ignition to determine current air quality conditions and permissive burn day status.

7. Foreseeable Development

Project proposal would reduce the potential of a wildland fire and restore fire, health, and function to the ecosystem. Fire is a natural component of the environment, but current fire suppression philosophy has taken fire from the environment. It is foreseeable that fire will continue to play its role in the natural environment. A wildland fire under extreme meteorological conditions could severely impact the environment and result in possible long term restoration of existing wildlife and riparian habitat. Therefore, a prescribed fire now would lessen the negative impacts of a wildland fire in the future.

B. Impacts of the Alternatives

1. Alternative 1 -Herbicide Treatment to Noxious Weeds and Brush Species

This alternative would require the use of herbicides and would not reduce Yellow Starthistle thatch or the vegetative fuel buildup which has occurred over time. Furthermore, herbicides would likely enter Trinity River, which my not be desirable to aquatic wildlife species. This alternative also has the potential to be controversial in nature.

2. Alternative 2 - No Action

Under this alternative, the values and resources within the project area would remain static. If a wildfire should occur within the project area control would be difficult and expensive and depending upon the fires intensity, impacts to wildlife and riparian habitat could be catastrophic. In the event of a wildland fire, possible long term restoration of existing wildlife and riparian habitat and undesirable impacts to a favorable recreational experi could be expected.

V. AGENCIES AND PERSONS CONSULTED

California Department of Forestry and Fire Protection (CDF), Shasta-Trinity Ranger Unit, Bill Britton - Battalion Chief

California Department of Water Resources, John Elko - Water Resources Engineering Associate

California Department of Fish and Game, Pat McLaughlin - Wildlife Biologist

North Coast Unified Air Quality Management District, Leonard Herr - Air Pollution Inspector

Local Native American Tribes

References Cited

Thomas Miller, Thomas Stokely, Ronald Adams, and Lisa Ballard
May 1992; Draft Environmental Impact Report, The Meadows Specific Unit Development, Lewiston-Trinity County, California; A 9-Hole Golf Course and Residential Development by Weaverville Realty, Inc.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

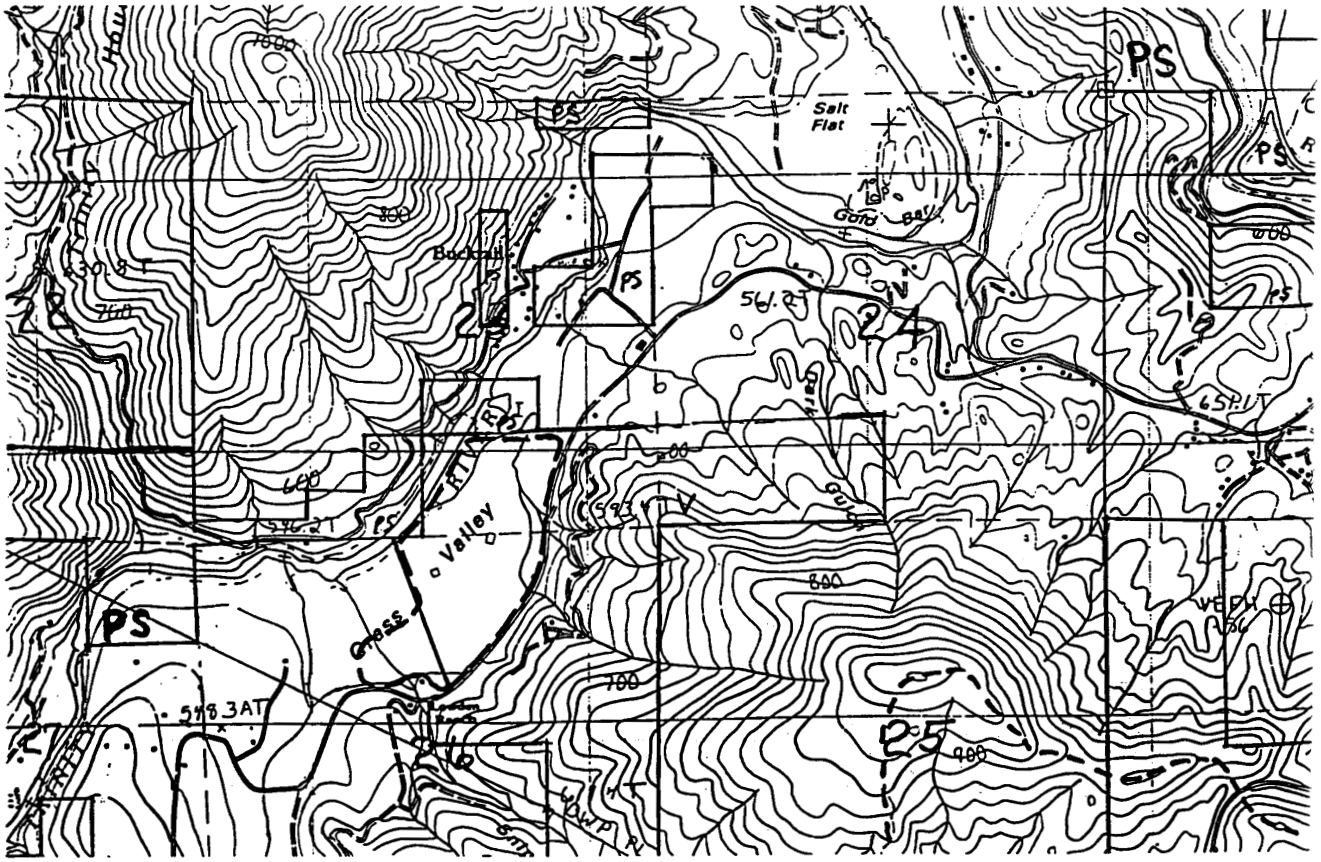
Lowden Ranch
Prescribed Fire
Project

Map
Project Area

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper
Douglas J. Held

Date
02/17/99



SCALE: 1:24,000

LEGEND

- Project Area Boundary
- P Private Land
- V Public Land

Form 5400—1 (May 1971)

BOTANICAL PREFIELD RESEARCH FORM
Bureau of Land Management
Ukiah District
Redding Resource Area

REPORTER: Joe Molter DATE: 4/5/99

PROJECT TITLE: Lowden Ranch Prescribed Fire Project

LEGAL SUBDIVISION: T.33N, R9W, Sec.s 23 & 26

QUAD: Lewiston 7.5 min LOCATION: Old Lowden Ranch lands south of Buctail hole along Trinity River

RECORDS AND INFORMATION RESEARCH:

Data source: California Natural Diversity Data Base, Redding F.O. SSP Files, Surveys & Manage Site Location Data Base

Known species & locations: Cypripedium montanum (S&M) located 4 miles west of this location. No potential for any Special Status Plant Species

Previous surveys: Pre-field cursory Site visit on 4/1/99

Potential habitat types and species: Wooded communities consisting of Douglas Fir with Ponderosa or Sugar Pine.

Probability of occurrence: low

Potential land disturbance: low

Minimum type of reconnaissance needed: Site visit as already conducted

FIELD SURVEY:

Needs: None

Reasons: No habitat - poor conditions due to star thistle & medusa thatch. Site is an open, heavily manipulated pasture.

If no survey is needed because the project area has no potential habitat or if an adequate survey is on record, then further biological evaluation work is not needed.

T & E PLANT COORDINATOR Joe Molter Date reviewed: 4/5/99

Aquatic Mollusk Survey Protocol, Version 2.0 (October 29, 1997)

AQUATIC MOLLUSK SURVEY FORM

REQUIRED AREA DATA

STATE CA COUNTY TRIN DATE 4-28-99 FEDERAL LAND UNIT[1] _____

VISIT NO. 1 SITE (NAME/NO.)[2] Lowden Ranch

T. 33N, R. 9W, S. 23/24, QUARTERS _____

SEARCH TIME: FROM 1215; TO 1235 -- FROM _____; TO _____ TOTAL 20min

S & M SPECIES FOUND? YES (NO) UNCERTAIN (EXAMPLES COLLECTED)___.

SURVEYOR NAME: Keith Hughes _____
PRINT SIGNATURE

REQUIRED DISCOVERY SITE DATA (IF S&M SPECIES FOUND)

T.___, R.___, S.___, ___ 1/4 OF ___ 1/4 OF ___ 1/4.

ACCESS DESCRIPTION: _____

LAT. & LONG. OR UTM _____

SPECIES_____ Number live_____ Number shells_____

SPECIES_____ Number live_____ Number shells_____

SPECIES_____ Number live_____ Number shells_____

[1] BLM Resource Area or National Forest Ranger District.

[2] For example, Big Springs/060397

Survey Record ID: 99-2

Terrestrial Mollusk Survey Form

Survey Data

Admin. Unit: _____

State: _____ County: _____ Date (DD-MON-YYYY) __-___-____

Project Name: Lowden Ranch BURN Visit No. 1

Area (AC) _____

T ____ R ____ S ____ QS ____ SS ____

T ____ R ____ S ____ QS ____ SS ____

Search Time: From 1142 To 1300 From ____ To ____; Total 1hr 18 min

S & M Species Found? Spec. Code: _____ Spec. Code: _____

Spec. Code: _____ Spec. Code: _____

Location Record ID Numbers From _____; To _____.
From _____; To _____.

Weather: partly cloudy, slight wind from SE.

Temperatures (F): Air 59°F Ground _____
-61°F

Observer: KSH Signature: [signature]

Survey Notes: No SM Mollusks detected - Much of the SE portion of site is saturated to the surface such the obligate wetland vegetation is dominating. I intensively searched 5-10 Repr. AREAS within this portion of the site. Small patches of vegetation similar to previous description occurred in the remainder of the area. Representative areas of these were searched. The remainder of the site is unsuitable spring @ center of project site was examined as well. See Accompanying AQ survey form.

APPENDIX 3 - Lowden Ranch Fire Activity Log

Approximate times: (Key times highlighted. Key times denote where people were at critical times during the incident.)

0845-0915	Resources arrive at briefing area, old Lowden Ranch cabin. Parking area at south end of unit
0915	Burn Boss meets with Burn Boss Trainee, Ignition Specialist and Holding Specialist
0900	Scheduled briefing = 0900
0930-0950	*** Briefing at Old Lowden Ranch Cabin**
0950-1045	*** Resources placed into position/frequencies changed, hotshots improve handline between scratch line and DP A, hotshots, contructs handline between scratch line and DP G.**
1000	Fire monitors assigned, first weather obs taken
1030	Second weather obs taken
1045	Go/no go list signed, burn boss/ign spec conferred on decision
1045-1100	*** Test fire conducted, decision made to continue firing at NE corner**
1100	Weather obs #3 taken
1100?	E-32 arrives on scene (need to verify)
1115?	*** Handline construction begins, exclusion area between DP A and B, also treated with water and foam, limited firing out continued as necessary to keep ahead of the main fire along exclusion area hand.**
1130-1200?	*** Tree torches along fireline and numerous spot fires occur on NW corner, north of DP G across fireline.**
1130-1200	Firing along Lewiston Road stopped except for two lighters? E-32, Lewiston water tender bumped to DP G. E-31 only engine left on Lewiston Road.
1200	Weather obs
1215	Just after finishing handline construction and the firing around the exclusion area, small spot fire in the southern end of the exclusion area burning the grass only.
1220	Multiple spots contained on DP G. Simultaneously, firing resumed on Lewiston Road. Fire backing against the wind along riparian area adjacent to the river and getting ahead of the firing operation. Jumpers began firing down the middle scratch line to even out the line of fire in the unit.
1230	Weather obs
1300?	Firing has progressed on east side south to DP B; weather obs.
1250-1300	*** Black berry bushes and pine tree in the exclusion area ignited. Spotfire #1 detected on east side of Old Lewiston Road by traffic controller.**
1250-1300	Firing stopped.
1300-1310	Spot fire #1 contained. Fire Use Module member and E-31 crew member patrol the hillside for spots
1310-1315	*** Fire monitor reported smoke on east side of Old Lewistown Road. Spot fire #2 detected. Hotshot members and Fire Use Module members help with suppression, E-31 puts hose lay into spot fire and contains.**
1320-1330	Weather obs, possibly 2 different obs? We only have records for 1330

1330	*** Spot fire #2 knocked down and spot fire #3 detected directly below spot fire #2. E-31 continues hose lay, knocks down head and one flank and runs out of water.**
1338	*** Call to ECC declared wildfire.**

Where are the People?

Initial placement of resources:

DP G to middle scratch line - 5 Hotshots.
Middle scratch line to DP A - 6 Hotshots.
DP A halfway to DP B - 6 Hotshots.
Between DP G and DP A – Burn Boss trainee
Whiskeytown 4
Burn Boss trainee walking homeowner through middle of field
Lewistown Engines at houses near DP G at the head of the prescribed burn.

DP A / test fire placement:
Burn Boss
Ignition specialist
Fire Use Module (includes fire monitors)
Smoke jumpers
E-31
Need to find out placement of Lewiston engines, traffic controllers, holding spec, water tender.

1115 Resource Placement

Exclusion area / Old Lewiston Road:
Burn Boss
Ignition Spec.
Holding spec.
Whiskeytown Fire use module
E-31
E-32
2 members of Diamond Mtn Hotshots
E-1
Water Tender
Between DP A and G:
2 squads Hotshots
E-4
Burn Boss Trainee
Jumpers
E-5
Pilot car
2 traffic control

Center of Burn Project:
2 fire monitors
Across Trinity River:
E-5

1130-1200? - Multiple Spot fires north of DP G
1 squad Hotshots
E-32 and water tender moving to this location.
Burn Boss trainee
E-4

1250-1300 - Black berry bushes and pine tree in the exclusion area ignited. Spotfire #1 detected on east side of Old Lewiston Road by traffic controller.
E-31
Bill Crothers
Some members of Fire Use Module
Holding specialist

1310-1315: Fire monitor reported smoke on east side of Old Lewiston Road. Spot fire #2 detected. Hotshot members and Fire Use Module members help with suppression, E-31 puts hose lay into spot fire and contains.
Burn Boss
Hotshots
Fire Use Module members
E-31

1330: Spot fire #2 knocked down and spot fire #3 detected directly below spot fire #2. E-31 continues hose lay and knocks down head and one flank and runs out of water.
E-31
Hotshot squad
Fire Use Module members
E-1

1338: Call to ECC declared wildfire.
DP G:
E-32
Water tender
E-4, between DP A and DP G
In middle of prescribed burn - contructing control lines:
Burn boss trainee
Smokejumpers
1 Fire monitor
E-5?
Ignition Specialist

APPENDIX 4 - Preliminary Fire Investigation

STATE OF CALIFORNIA
Department of Forestry and Fire Protection
LE-66 *(Rev. 6/93)*

PRELIMINARY FIRE INVESTIGATION

CONFIDENTIAL

1.Estimated Start	Reported	2.Location	3.Fire ID
Date: 7/2/99	Date: 7/2/99	Address: E. side Lewiston Road	Batt: 6 Inc #: 9SHU-004578
Time: 1030 hours	Time: 1338 hours	City: Lewiston, Trinity County	Fire #: 290
4. What Burned? Timber, 23 homes, + other structures		Acres Burned: ~2000	Fire Name: Lowden
5. Reporting Party: Not listed on Report of Dispatch		Telephone: N/A	

6. Codes: 1. Victim 2. Witness 3. Suspect/Subject 4. Tenant/Owner

Code	Name:	DL#/ID:	Sex:	Hair:	Eyes:	Hgt:	Wt:	DOB/Age
1	Numerous; Not Determined	At This Time						
Address:				City:			Telephone:	

Code:	Name:	DL#/ID:	Sex:	Hair:	Eyes:	Hgt:	Wt:	DOB/Age
3/2	Bureau of Land Management / U.S.D.I.	Douglas J. Held Fire Mgt. Officer						
Address: 355 Hemsted Drive				City: Redding, 96002			Telephone: (530) 224-2100	

Code:	Name:	DL#/ID	Sex:	Hair:	Eyes:	Hgt:	Wt:	DOB/Age
2	Michael Hislop	BLM Range Tech						
Address: Diamond Mountain Hotshots (Kurt Larue, BLM Crew Supervisor)				City: Susanville			Telephone: (530) 257-7601	

Code:	Name:	DL#/ID:	Sex:	Hair:	Eyes:	Hgt:	Wt:	DOB/Age
3/2	Bob Perez	Captain 12						
Address: U.S. Forest Service, Yolla Bolly National Forest				City:			Telephone:	

7. General Remarks (such as statements, observations, license numbers, equipment ID, evidence, etc.):

The damage has not been estimated at the time of this report, however 23 residences are known to be destroyed by the fire.

Project Type Burning Permit No. J60535 was issued on June 6, 1999, by CDF Battalion Chief William Britton. The permit was only issued for the period from June 1 through July 1, 1999. Permit conditions listed the high acceptable wind speed as five (5) mph. Wind speeds of 10 mph were recorded by Trinity River Camp RAWS at 1150 hours on July 2, 1999. The permit had expired and the wind speed exceeded the prescription at the time of the burn on July 2, 1999.

On July 2, 1999, at about 1530 hours, I spoke with Michael Hislop alongside Lewiston Road. Hislop me provided with the prescribed burn location and some basic information.

On July 2, 1999, at about 1550 hours, I spoke with U.S. Forest Service Captain Bob Perez at the prescribed burn site. Perez informed me that Doug Held with BLM was the Burn Boss on the project. Perez stated that the grass fire hit a blackberry patch and spotted over Lewiston Road. Perez stated that they fought the fire between Lewiston Road and the dirt road to the east for about twenty (20) minutes, but could not hold the fire between the roads. Perez stated that he then radioed the ECC and declared that the burn had escaped.

Perez stated that the burn prescription had a high wind speed of 6-10 mph, but they could go as high as 15 miles per hour. Perez stated that the highest wind reading taken at the prescribed burn was 10 miles per hour. The maximum allowable temperature was 90 degrees. Perez stated that they were not out of prescription. The fire hit the berry bushes and jumped the road. Perez stated that the weather was taken every 1/2 hour during the prescribed burn. Perez pointed and showed me the location of the blackberry patch and where the fire had jumped Lewiston Road.

Perez stated that after the fire escaped control, they extinguished the prescribed burn. The prescribed burn was about 50% completed at the time it was extinguished. The crews were just completing the extinguishment of the prescribed burn when I arrived at about 1550 hours.

I was told that various agencies were involved in the prescribed burn. Agencies included BLM, the BLM Diamond Mountain Hot Shots, U.S. Forest Service Engine 31, U. S. Forest Service Engine 32, Whiskeytown National Park Service Prescribed Burn Crew, Douglas City OES Engine, Lewiston Fire District Water Tender, and two engines from Lewiston Fire District.

Later that afternoon on July 2, 1999, I briefly interviewed Douglas Held at the ICP in the church parking lot in Lewiston. Held stated that the maximum wind measured during the prescribed burn was 12 miles per hour. Held stated that they were within

Inc. #: 9SHU004578

the specifications of the prescription. Held stated that they extinguished the initial spot fire on the east side of Lewiston Road. Held stated that some vehicles went by and then there was another fire on the east side of Lewiston Road. Held initially stated that the second fire was a spot fire from the blackberries. After some interviews and pressure by the public and the newsmedia, Held stated that one of the vehicles may have thrown something out and caused the second fire.

I returned to the fire scene on the afternoon of July 3, 1999. I photographed the origin area of the escape, examined burn indicators, and sketched the scene; (See attached sketches/maps). I also met briefly with various members of the initial multi-agency investigation team.

8. Wind Speed/Direction	Temp:	Humidity:	9. Photo? ☒ Yes ☐ No
10-12 mph from West	°	%	Taken by whom? Chris Newton on 7/3/99 @ 1510-1750 hours.
10. Insured? ☐ Yes ☐ No	Company/Agent: U.S. Government		

7540-130-0167

APPENDIX 4 - Preliminary Fire Investigation

Inc #: 9SHU-004578

11. Before fire fighters arrived, what suppression efforts were taken?

Fire fighters were on scene at the time of the prescribed burn escape. They constructed hand lines and took suppression action on escaped fire. B.L.M., U.S. Forest Service, Whiskeytown National Park Service, Lewiston Fire District, and Douglas City Fire District personnel involved in suppresion effort.	By whom?
	What tools?

12. What caused the fire? (State opinions and conclusions)

The Bureau of Land Management was conducting a prescribed burn on the west side of Lewiston Road. The fire burned into some blackberry bushes and spotted across Lewiston Road to the east side. The fire escaped the control of the agencies conducting the prescribed burn.

West winds at 10-12 mph and steep terrain on the east side of Lewiston Road were a factor in the escape.

13. Debris Burning:

Did fire escape control? ☒Yes ☐No	Burning permit? ☐Yes # ☒ No		Permit required? ☒Yes ☐No
☐ Piled debris	Clearance:	Length:	Width:	Height:
☐ Incinerator	Clearance:	Screen: ☐Yes ☐No	Screen mesh size:	

14. Railroad

Train #:	Time Passed:	Direction of Travel:	Mile Post #:

15. Power Line

ID Pole:	☐ +750 volts ☐ -750 volts	Tree Involved? ☐Yes ☐No	Remarks:	Distance of Limbs to Conductor:
Utility Representative: Telephone #:		Conductor/Pole Clearance: ☐Yes ☐ No		

16. Sketch the area where the fire originated

Distance measured by: ☐Tape ☐ Pace ☒ Estimate

N

18. Action			
None	☐	Invest. Cont'd.	☒
Criminal	☐	Civil Litigation	☐
Judicial	☐	Administrative	☐

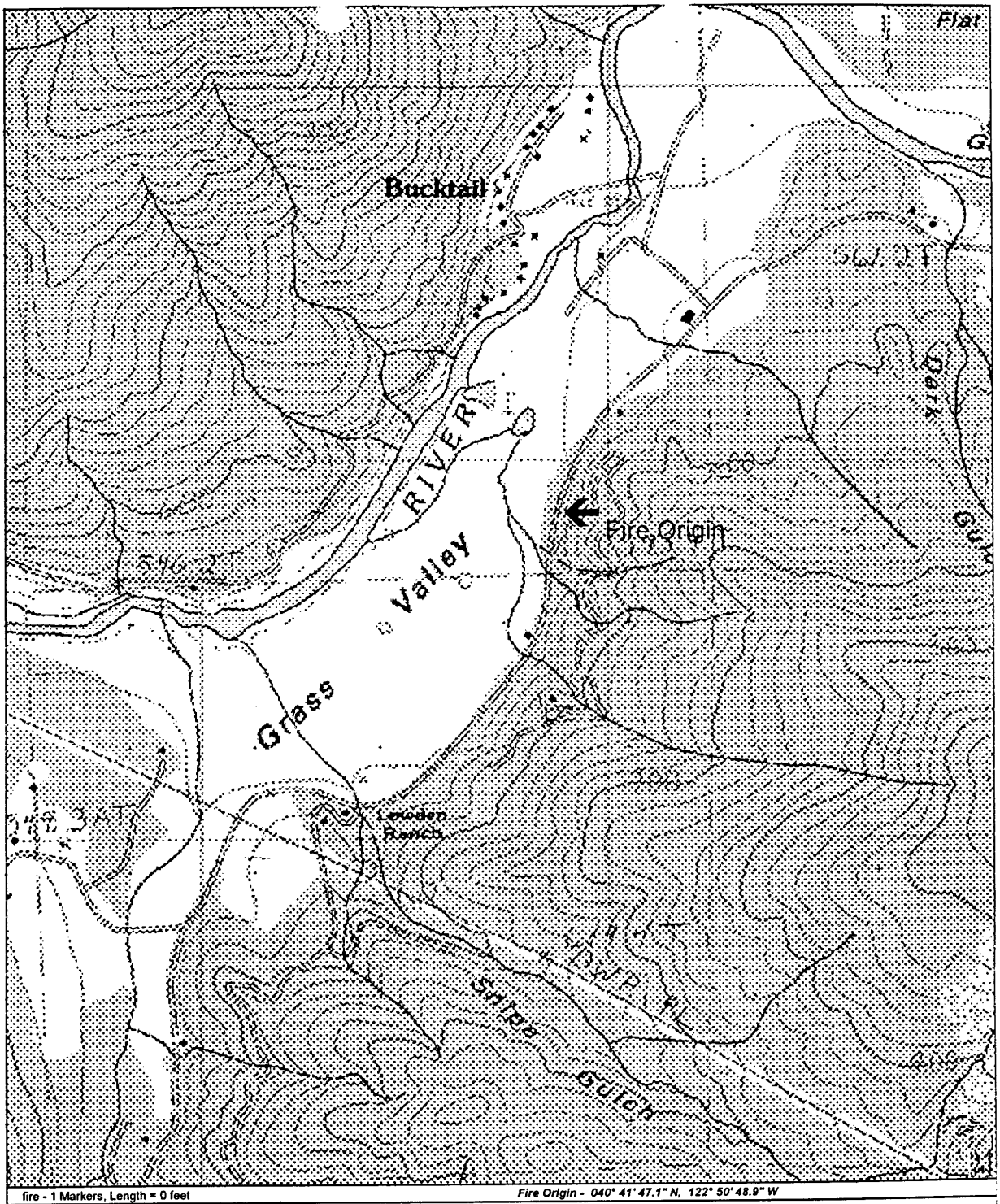
17. Did the fire burn the property of others? ☒Yes ☐No

19. See Supplement? ☒Yes ☐No

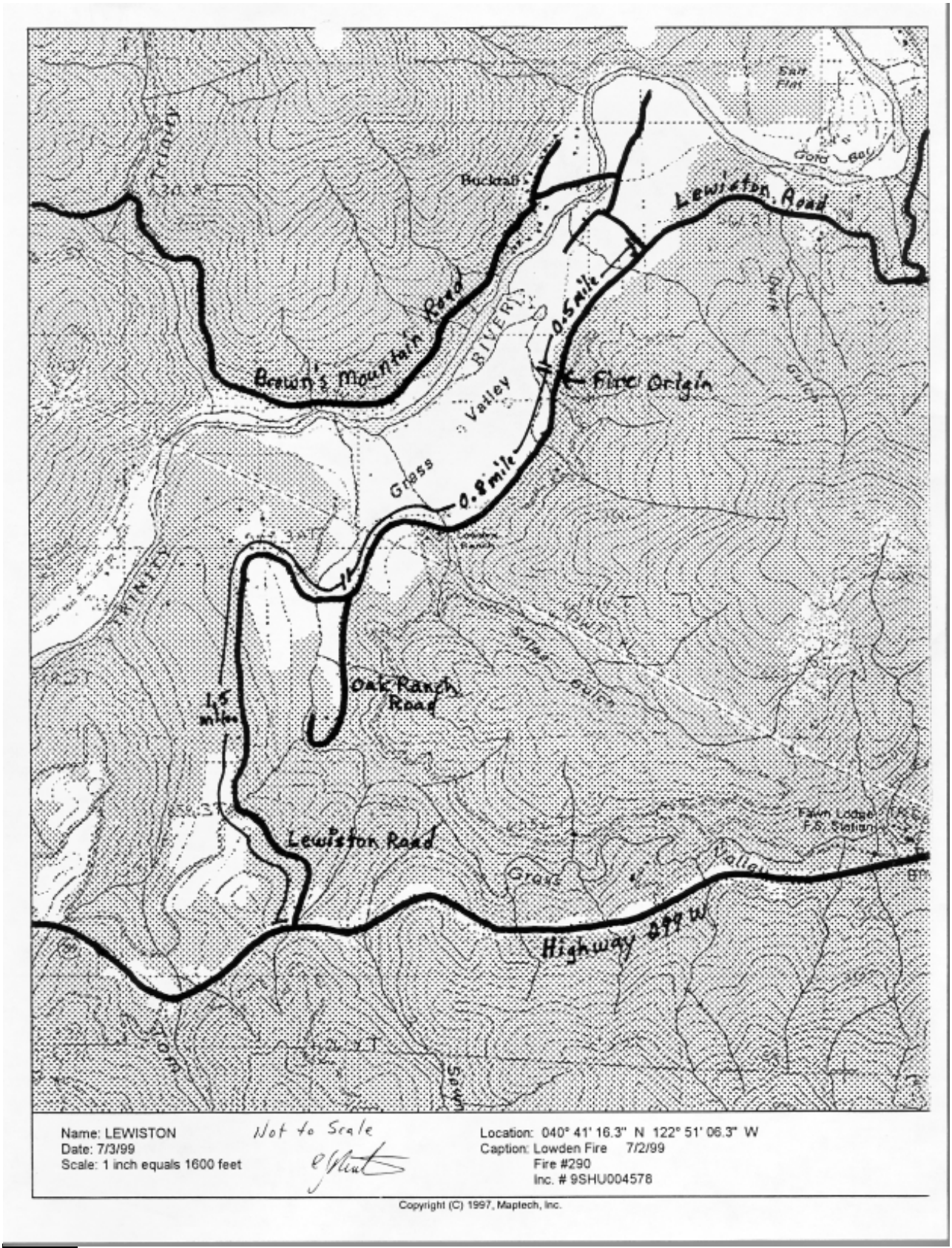
20. Signature	Printed Name:	Title:	Badge #:	Date:
	Christopher J. Newton	Fire Captain Specialist	13	7/4/99

21. Reviewed by:	Title:	Date:
	Fire Captain Specialist	7/4/99

APPENDIX 4 - Preliminary Fire Investigation



APPENDIX 4 - Preliminary Fire Investigation



APPENDIX 4 - Preliminary Fire Investigation

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

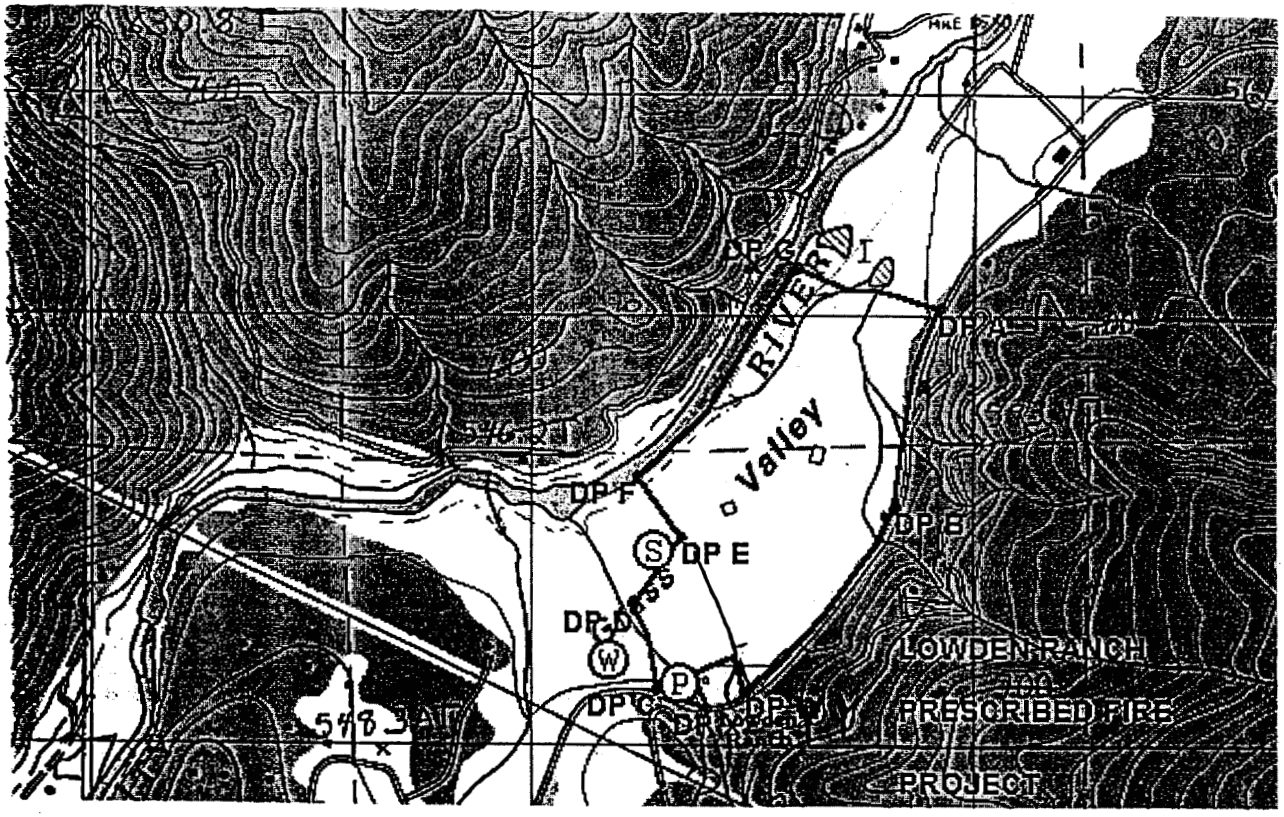
Lowden Ranch Prescribed Fire Project

Map: Project Area

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper: Douglas J. Held

Date: 7/1/99



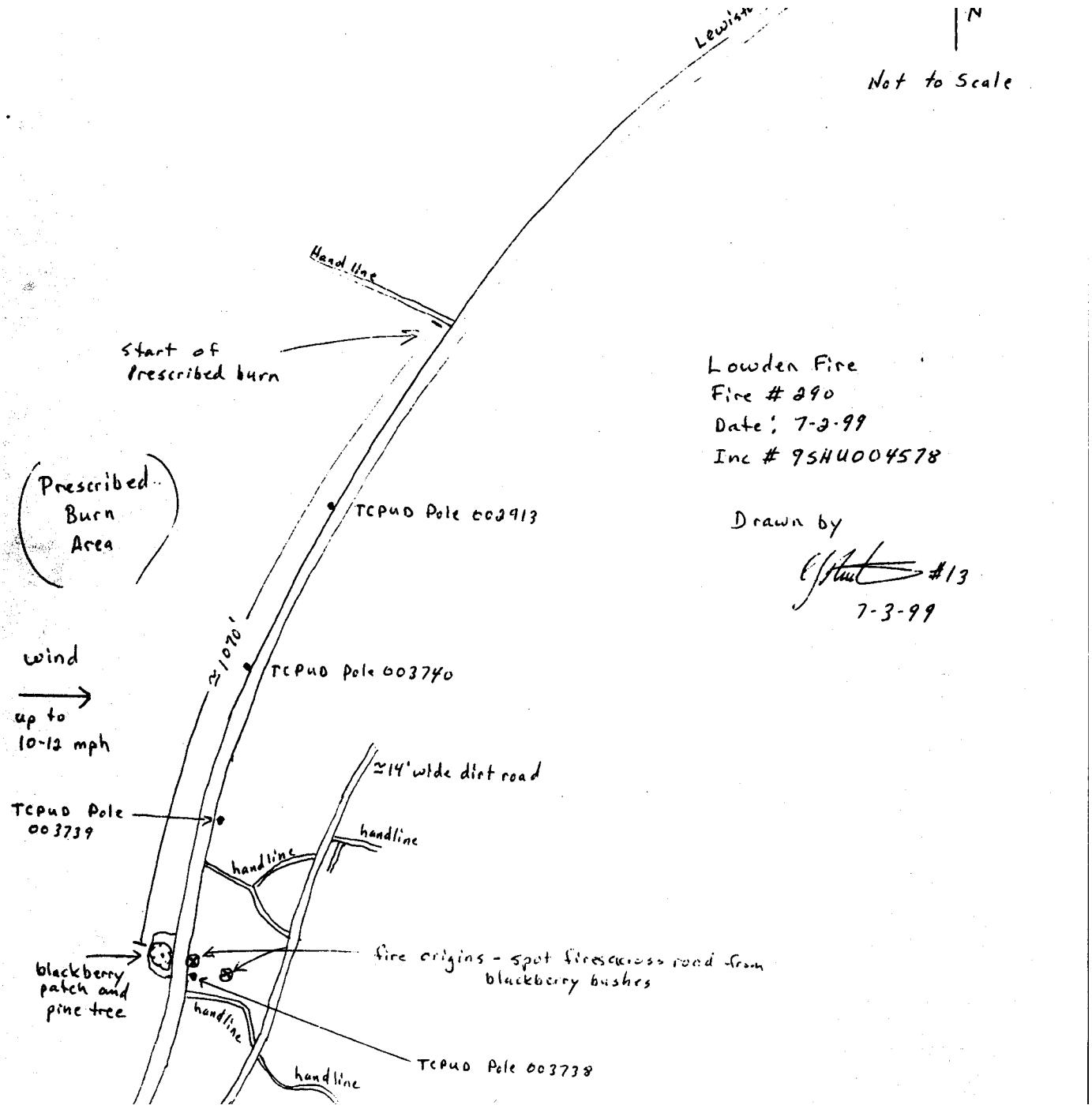
SCALE: 1:24,000

LEGEND

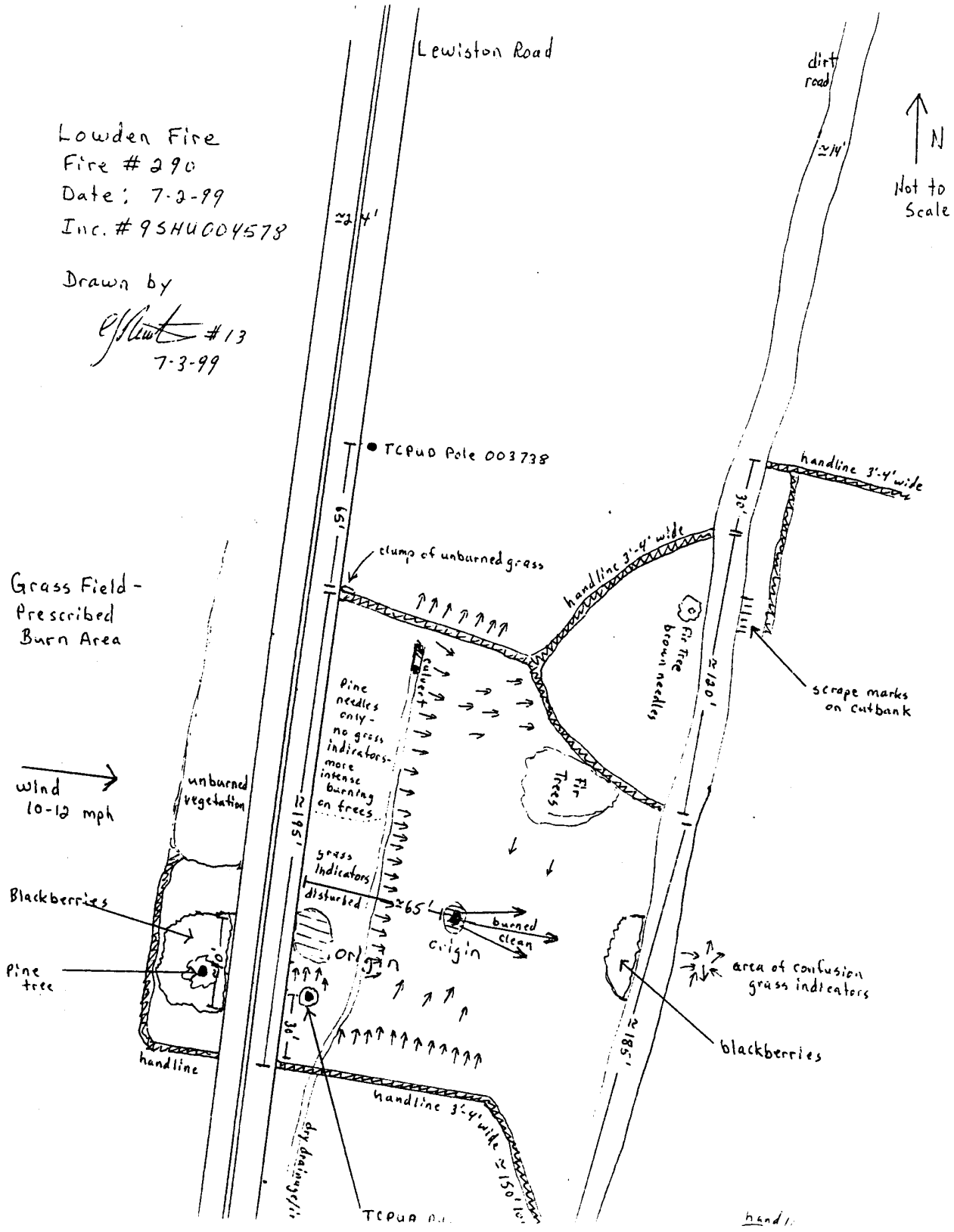
	Project Area Boundary	S	Safety Zone
	Existing Roads	DP A	Drop Point
W	Water Source	Ø	SPOT FIRE - POINT OF ORIGIN
P	Parking Area		

Form 5400—1 (May 1971)

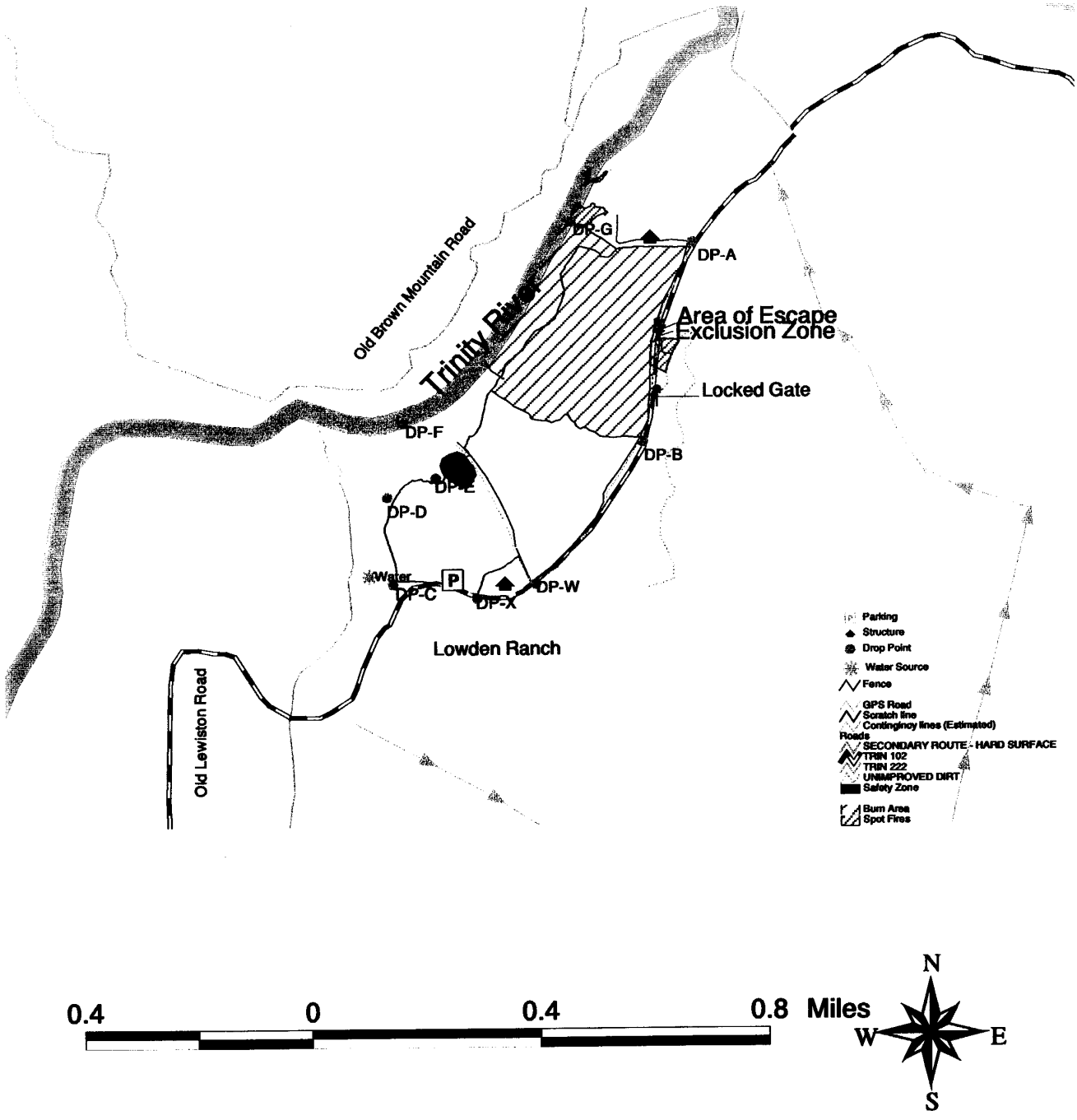
APPENDIX 4 - Preliminary Fire Investigation

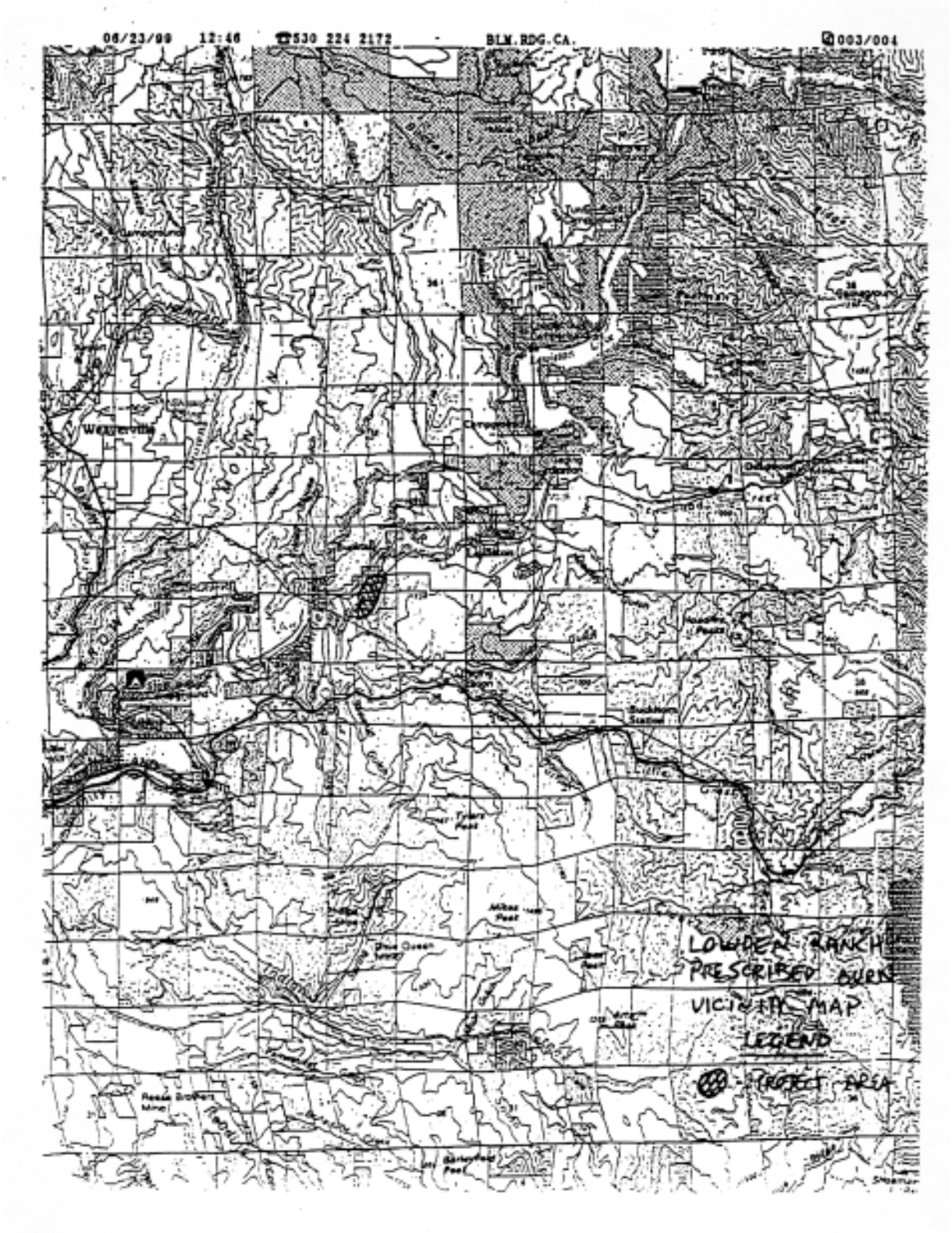


APPENDIX 4 - Preliminary Fire Investigation

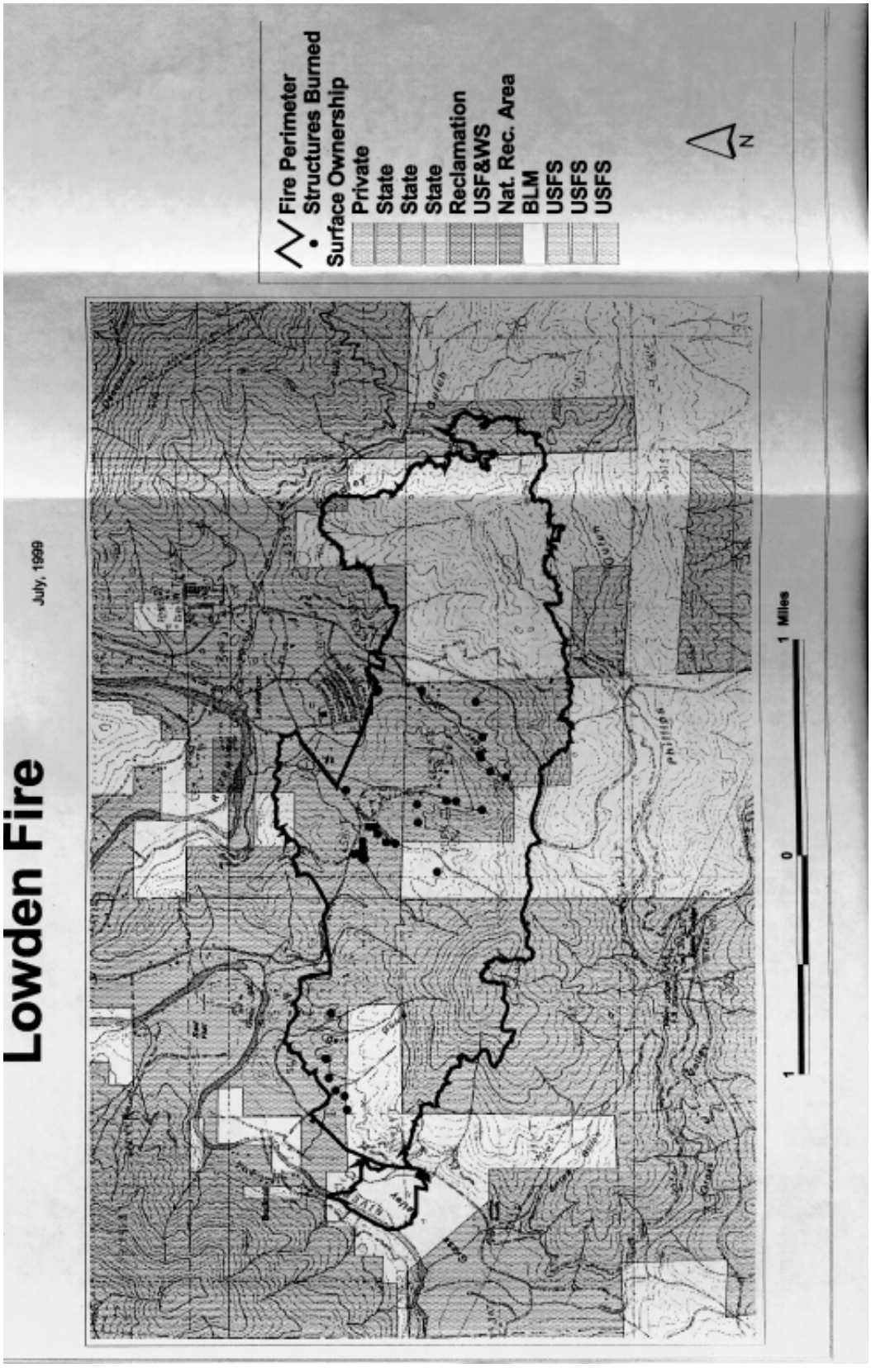


LOWDEN RANCH
PRESCRIBED BURN




06/23/99 12:46 ☎530 224 2172 BLM.RDG.CA. 003/004
Weaverville
LOWDEN RANCH
PRESCRIBED BURN
VICINITY MAP
LEGEND
PROJECT AREA

APPENDIX 5 - Lowden Ranch Fire Map



H-9214-1 - PRESCRIBED FIRE MANAGEMENT

PRESCRIBED FIRE PLAN

Project Name: **Lowden Ranch Prescribed Fire Project**

Field Office: Redding

Prepared By: Robert Perez Date: 03-03-99

Technical Review By: Douglas J Hall Date: 04/19/99

Reviewed By: _____ Date: _____

Reviewed By: _____ Date: _____

The approved Prescribed Fire Plan constitutes the authority to burn. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported. Personnel will be held accountable for actions taken which are not in compliance with elements of the approved plan regarding execution in a safe and cost-effective manner. The complexity of the project is:

HIGH MODERATE **LOW**

Estimated Cost Per Acre:

Benefitting Activity(s): CA-360-6650-00, Jobs in the Woods

Approved By: _____ 4/27/99
NORCAL Fire Management Officer: Date:

Approved By: _____ 5/3/99
Redding Field Manager: Date:

APPENDIX 6 - Prescribed Fire Plan and Map

I. MANAGEMENT SUMMARY AND RISK ASSESSMENT

A. Burn Area Description

1. Legal Description: Sec. 23,&,24, T. 33 N., R. 9 W., M.D.M.
2. Lat./Long: 40 Degrees 41 minutes / 122 Degrees 51 Minutes
3. Size (Acres): 100
4. County: Trinity
5. Elevation: Top: 1738', Bottom: 1,640, Aspect: Flat, Drainage: Trinity River
6. Environmental Assessment No.: CA-360-RE-99-18

B. Description of Fuels On Site and Adjacent

1. Fuel Description: NFFL 1 - Short grass, continuous herbaceous fuels that have cured or are nearly cured. Very little scrubs or timber present.

2. Fuel Model(s): 1 - Short grass (2.5 feet)

3. Fuel Arrangement:
   Within Project Area: Fuel is cured native grasses, Yellow Starthistle, scattered brush and standing oaks. Riparian habitat on 2/3 of project boundary.
   Outside Project Area: Similar vegetation on all sides.

4. Fuel Continuity: Continuous valley grass land type.

C. Size Class & Tons/Acre

1. Total Dead: .74
2. Duff Depth: 1/8 - 3"
3. Surface Fuel Depth: 1-2 feet
4. Herbaceous:
5. Shrubs: .5
6. Total Fuel Loading (Live to Dead Ratio):
   0 - 1": 0 .74
   1" - 3":
   3" - 9":
7. Total Tons/Acre by Size Class: 1 ton per acre

8. Total Estimated Project Tons: 1 ton per acre

0" to 1/4"	1 Hour	0.74 Tons/Acre
1/4" to 1"	10 Hour	
1" to 3"	100 Hour	
3" to 10"	1000 Hour	

9. General description of the fuels adjacent to the project area: Fuels adjacent to the project is grasslands with scattered brush and oak woodlands. Riparian vegetation is found along the Trinity River.

II. RESOURCE AND PRESCRIBED FIRE OBJECTIVES

A. Resource Objectives: The objective is to conduct a prescribed fire project on approximately 80 acres of BLM administered lands and 20 acres of private to reduce hazardous fuel loading which contribute to wildland fires, reduce the encroachment of noxious weeds and restore health, function, and fire to the annual grassland, oak woodland, and riparian ecosystem.

B. Prescribed Fire Objectives:

1. Reduce 0-3 inch diameter (1,10,100 hr) dead and down fuels by 40-90%.
2. Reduce 3+ inch diameter dead and down limbs by 20-50%.
3. Cause 25-75% live brush mortality and consumption.
4. Limit mature hardwood tree mortality to less than 10%.
5. Limit tree char height to 10 feet and scorch height to 15' feet above ground.
6. Complete prescribed burn in a safe manner and confine the fire to prescribed fire boundaries.

III. DESIRED EFFECTS AND TOLERABLE DEVIATIONS

Tolerable deviation is reduce 0-3 inch diameter material by 20 to 99%, brush mortality between 20 to 80%, and live hardwood mortality 5 to 10%. Also eliminate Yellow Starthistle, decadent overstory brush, and minimize oak woodland mortality.

IV. SITE PREPARATION REQUIREMENTS

A. Fuel Pretreatment and Distribution

Fuels will not be pre-treated nor modified prior to project implementation. The prescribed fire is being conducted in late May or late June to coincide with seed production, of Yellow Starthistle.

B. Line construction And Pretreatment

Minimum fire control lines would be constructed to contain and control the prescribed fire project. Approximately 2200 feet of handline will be constructed to facilitate fire containment. Fireline will be constructed using hand tools. A 3 to 5 foot width to mineral soil would be required. Flag and identify, prior to fireline construction, all vegetation, cultural resources, or riparian habitat identified for protection which is located in the project area.

C. Assignment Responsibilities

Assignment responsibilities will be identified specifically in the Incident Action Plan completed prior to project implementation.

V. WEATHER

1. Instrument Location(s), Including Elevation: Belt Weather kit on location, 1,790 feet.

2. Data Collection: Relative humidity, temperature, fuel moisture, precipitation, wind speed and direction.

3. Sampling Period: Two weeks prior to tentative start date

4. Prescribed Fire Weather Forecasts: On duty meteorologist

5. Forecast Center: National Weather Service, Redding, CA

6. Forecast Specification: Spot weather forecast

VI. WEATHER AND FUEL PARAMETERS

	ACCEPTABLE PRESCRIPTION RANGE			
	LOW	HIGH	DESIRED	
Temperature	70	90	80	Outside Area at Critical Holding Point Minimum Acceptable Moisture
Relative Humidity	40	14	25	
Wind Speed (MF)	2	5	3	
Wind Direction	180	0	270	
Slope	0	30	15	
1 hour Fuel Moisture	10	6	8	4
10 hour Fuel Moisture	0	0	0	0
100 hour Fuel Moisture	0	0	0	0
1000 hour Fuel Moisture	0	0	0	0
Live Fuel Moisture	60	100	75	50
Duff Moisture (%)	N/A	N/A	N/A	N/A
Soil Moisture (%)	N/A	N/A	N/A	N/A

	ACCEPTABLE FIRE BEHAVIOR RANGE			Outside Area At Critical Holding Point
	LOW	HIGH	DESIRED	
Rate of Spread (Ch/hr)	1	5	5	5
Heat Per Unit Area	59	91	84	96
Fireline Intensity	2	8	8	10
Flame Length (ft)	0.6	1.2	1.1	1.3
Reaction Intensity	538	826	764	874
Scorch Height (ft)	0	2	1	2
Spotting Distance (Miles)	0	0.1	0	0.1
Probability of Ignition (%)	30	60	40	60

VII. SMOKE MANAGEMENT

A. Dispersion Specification

1. Venting Height: 4000 feet
2. Stability Factors: Moderately unstable to unstable
3. Emission Limitations: As determined by North Coast Air Quality District
4. Transport Wind Speed: 5-15
5. Visibility: At least 3 mile

B. Transport Wind Direction

1. Burn Site: Omni-Directional
2. At Venting Height: Omni-Directional
3. During Burnout: Omni-Directional

C. Smoke Sensitive Areas - Distance and Direction The closest large community is Lewiston which is located approximately 3 air miles northeast of the project.

D. Visibility Hazard(s): (e.g. roads, airports, schools, etc.) Due to the burning of light fuels, there should be not be a concern of a visibility hazard if smoke crosses the road.

E. Actions to Reduce Visibility Hazard(s): Signing and traffic control, as necessary.

F. Permits

1. Burning Permit:

Permitting Agency: California Department of Forestry and Fire Protection
Box 1296 Weaverville, CA 93003 (530) 623-4201

2. Smoke Management Permit:

Permitting Agency: North Coast Unified Air Quality Management District
2389 Myrtle Ave., Eureka, CA 95501 (707) 443-3093

G. Can Residual Smoke Be a Problem? Residual smoke should not be a problem due to the short duration of burning in light fuels.

H. Special Constraints and Considerations Project will be conducted on a permissive burn day.

VIII. SCHEDULING AND NOTIFICATION

A. Ignition Scheduling

1. Season: Late Spring
2. Approximate Date: Late May/late June
3. Time of Day: Any
4. Limitation on Days of Week for Burning: Sat.& Sun.
5. Type of Burn: Hand Ignition
6. Length of Ignition Phase: 1-3 Hours
7. Length of Burnout Phase: 30 min.- 1 Hour

B. Public Information (When, How, By Whom)

A press release will issued to local newspapers and radio stations by the NORCAL Public Affairs Officer prior to project implementation. The press release will also be posted at local post offices, stores, and common public gathering establishments.

C. Pre-burn & Burn Contacts

WHEN	CONTACT	HOW	WHO WILL DO
72-96 Hrs.	Public	Local Radio & Newspaper	BLM-Public Affairs Officer
72-96 Hrs.	ARB	Telephone	Burn Boss
12-24 Hrs.	ECC	Radio/Phone	Burn Boss
12-24 Hrs.	Command Center	Radio/Phone	Burn Boss
12-24 Hrs.	Local CDF	Phone	Burn Boss

Notification will be made to the Shasta CDF Command Center Duty Officer at (530)225-2476 or 225-2411 prior to and on the day of the burn.

IX. IGNITION AND HOLDING PLANS

A. Firing Plan

1. Assignments: One (1) qualified Ignition Specialist to coordinate firing operations.

2. Test Burn: One to five acres near edge of unit (within the project), which can readily be controlled, will be used for the test burn. If results are favorable, burn will be continued.

3. Firing Techniques: Backing fire is favorable by the use of lateral strips

4. Ignition Method and Equipment: 1-5 drip torches and fuel mix will be provided by BLM.

5. Narrative: The GO/NO Checklist will be completed prior to any project ignition.

B. Potential Holding Problems: There are no known holding problems identified.

C. Location of Holding Forces and Instructions

Fire Crew Personnel and equipment will be positioned at the direction of the Holding Specialist. Fire Crews will hold line at the direction of the Holding Specialist. The number of personnel and amount of equipment may vary during the course of the burn at the Holding Specialist discretion and Burn Boss approval. The engines will be kept mobile and not commit to a hose lay, unless otherwise directed.

D. Water Sources A holding pond adjacent to the project area and the Trinity River Along the West boundary are known water sources.

E. Counter Measures for Slop-overs Handcrews and engines will remain mobile, patrol project perimeters and constantly be attentive to any wind shifts or hot embers crossing the fire control lines.

F. Public Safety Provisions Public safety should not be compromised at any time during project implementation. Patrols should be on alert for public users in the area.

G. Night Holding Plan

1. Equipment and Personnel: One Type IV engine and compliment of crew, as necessary.

2. Placement of Forces: Project perimeters, as determined by Burn Boss and Holding Specialist.

H. Mop-up and Patrol Procedures

When the firing operations are completed the Mop-up/Patrol Boss will take charge of all holding and firing personnel. The Mop-up/Patrol Boss will implement the following:

1. Inspect all control lines and either mop-up or monitor areas that pose a risk to escape.

2. Have all control lines inspected for hazard trees, green trees with fire in them, and snags on fire threatening control lines and/or public safety (trees burning down and falling across the roads). Any hazard trees found will be extinguished and/or put on the ground.

3. The Burn Boss, with the advice of the Holding Boss, will determine when the burn is put into Patrol Status. Additional mop-up may be required if a wind event is predicted during the burn down phase.

   Equipment Needs: 2 Engines (Type 3 or 6) with at least 3 people per engine.

4. Patrol Procedures: Once the burn is put into patrol status, it will be patrolled at intervals set by the Burn Boss until the unit is declared out. The intervals are normally at least once a day for the first 3 days following the burn and staggered further apart there after. All control lines will be checked for the first 3 days after the burn.. During the patrol period, any hot-spots that have the potential to spot outside the line will either be extinguished or monitored until the threat has abated. Any hazard trees found during the patrol phase, will be either extinguished and/or put on the ground. The Patrol Boss will immediately notify the Burn Boss or Prescribed Fire Manager of any spot fires, or other threats of escape, and take action to contain and secure the threat. The Burn Boss or the Prescribed Fire Manager will make the determination of what, if any, additional resources will be sent to assist.

   The Patrol Boss will have all road side culverts inspected and (if necessary) cleaned out to reduce the risk of becoming blocked during the winter.

   The Patrol Boss will have all hand-lines water barred.

   Equipment Needs: 1 Patrol with at least 2 people for the first 3 days.

   CDF SHU will be notified when patrol operations cease and the fire is un-staffed and declared out.

X. WORKFORCE & EQUIPMENT NEEDS FOR IGNITION & HOLDING

Prescribed Fire Burn Boss: One qualified, TBA in IAP Resource Advisor: TBA
Ignition Specialist: One qualified, TBA in IAP Holding Specialist: One qualified, TBA in IAP

	Amount Supplied By		
Personnel	BLM/NPS/USFS	City/County/State	Total Amount
Type I/II Hand Crew		CDF 1-3	1-3
Ignition Crew	6-10		6-10 person
Equipment, Ignition			
Drip Torches	3-6		3-6
Fuel Mix	25-50 Gallons		25-50 Gallons
Engines			
Type III	1-2	3-4	4-6
Water Tenders/Other			
Fitting/Hoses/Etc..			
Hose and Hardware	As Needed		As Needed
Pumps and Accessories			
Float-A-Pump		1	1
Other (Radios, Belt Wx, etc)			
Belt Weather Kit	1		1

XI. DAILY MOP-UP AND PATROL PLAN

Burn Date: TBA Shift Plan Date: TBA

Predicted Weather Next 24 Hours		
	Minimum	Maximum
Temperature		
Relative Humidity		
Wind Speed (20 ft)		
Wind Direction		

Weather Trend Narrative : See Spot Weather Forecast
Shift Plan Objectives:
Special Considerations and Hazards:

Mop Up IC: One qualified, TBA in IAP Patrol Coordinator: One qualified, TBA in IAP

	Amount Supplied By:			
Personnel	BLM	CDF/NPS	USFS	Total Amount
Equipment				
Engines	1			1
Hose				
Pumps				
Other				

APPENDIX 6 - Prescribed Fire Plan and Map

XII. MEDICAL AND SAFETY PLAN

INCIDENT MEDICAL AID STATIONS

Medical	Location	Paramedics	
		Yes	No
To Be Announced	On-Site		X

HOSPITALS

Name	Address	Travel Time		Phone	Helipad		Burn Center	
		Air	Grnd		Yes	No	Yes	No
Mercy Medical	Clairmont Height Redding, CA			(530)224-1234	X			
Redding Medical Center	1100 Butte St. Reeding, Ca			(530)244-5353	X			
U.C. Davis Medical Center	2315 Stockton Sacramento, CA 95817	1 hr		(916)734-3636 (916)734-3581 (916)734-2011	X*		X	

* Landing Instructions:
Latitude: 40 degrees - 41 minutes
Longitude: 122 degrees - 51 minutes

A. Medical Emergency Procedures

Notify Prescribed Fire Burn Boss of serious accidents or injuries. The Prescribed Fire Burn Boss will initiate on site response and coordinate additional needs through the local Command Center. The first option is to transport injured to a hospital listed above using an air ambulance. The second option is to transport injured to a hospital listed above using a ground ambulance. Transportation type will depend upon the severity of the injury. Send someone to meet with the ambulance at a known location, e.g. highway, junction, or known landmark.

B. Safety Equipment

Personal Protective Equipment (PPE) will be worn by all fire fighting personnel. Full nomex or 100% cotton turnouts will be worn throughout the project operation period.

C. Safety Considerations

1. Escape Routes: To be determined by Burn Boss, identified in the Incident Action Plan, and made known to all individuals on the project.

2. Safety Zones: To be determined by Burn Boss and identified in the Incident Action Plan.

XIII. COMMUNICATION PLAN

Function	Assignment	Frequency	
		RX	TX
Command	Overhead	166.375	166.975
Tac. 1	Ignition	168.050	168.050
Tac 2	Holding	168.200	168.200
Air to Ground	Air Operations	170.000	170.000
CDF Command	Escaped Fire Contingency	151.160	159.270

A. Dispatcher Notification Requirements

BLM will notify Shasta CDF Emergency Command Center prior to, during, and after project implementation.

XIV. PROPOSED COSTS

These cost could all be in the 2823 subactivity or could be spread across several sub-activities, estimate the cost for each area.

A. Site Preparation:

B. Ignition & Holding:

C. Mop-up & Patrol:

D. Supplies:

These costs could be in one or more sub-activities; estimate the cost and show sub-activity for each area.

A. Planning:

B. Clearances:

C. Plan Preparation:

D. Other:

XV. COMPLEXITY ELEMENTS WORK SHEET AND SUMMARY

ELEMENTS	RISK	POTENTIAL CONSEQUENCE	TECHNICAL DIFFICULTY
1. Potential for escape	L	L	L
2. The number & dependence of activities	M	L	L
3. Values at risk	M	L	L
4. Fuels/Fire behavior	L	L	L
5. Size of prescribed fire team	M	L	L
6. Magnitude of oversight/political activities	L	L	L
7. Fire treatment objectives	L	L	L
8. Environmental constraints	L	M	L
9. Safety	M	M	M
10. Ignition procedures/methods	L	L	L
11. Interagency problems	L	L	L
12. Project logistics	M	M	M
13. Special features inside fire area	L	L	L
14. Smoke management	L	L	L
15. Other	N/A	N/A	N/A
SUMMARY	L	L	L

A. Prescribed Fire Summary:

1. Risk - Overall Rating: **Low**
2. Potential Consequences - Overall Rating: **Low**
3. Technical Difficulty - Overall Rating: **Low**

B. Summary Complexity Determination: **Low**

C. Rationale: No elements have high ratings for any categories. This Prescribed fire project is in a remote location with light fuel loadings and minimal hazards. The complexity of this project should be low, although caution should be taken at all times and safety the Number 1 priority.

XVI. ESCAPED FIRE CONTINGENCY PLAN

A. Escaped Fires

1. Definition of Escaped Prescribed Fire

If a prescribed fire is not meeting the identified management objectives or otherwise meets the criteria below, the prescribed fire becomes a wildland fire. Once a prescribed fire becomes a wildland fire it cannot be returned to prescribed fire status.

A Prescribed Fire becomes a wildland fire when the Prescribe Burn Boss and/or the CDF (Escaped Fire Contingency) Incident Commander (IC) determines that an escape has, or is likely to occur, or environmental conditions and/or fire behavior exceeds the parameters in the prescribed fire plan and as such, the fire is no longer meeting the identified management objectives. Fire outside of the planned perimeter that cannot be contained with the holding forces identified in the prescribed fire plan is an escape and will be declared a wildland fire. This is not a "slop over" that crosses the fire line but which can be contained by resources on site (no suppression charges will be used).

Should an escape occur, the Prescribed Fire Burn Boss (or other designated person) will act as IC until relieved by the CDF Incident Commander who will assume Command and order the resources deemed necessary to control the situation. The CDF IC will organize all on site resources for an aggressive response. All resources on the fire will perform under the supervision of the CDF IC until the fire is declared under control.

B. Escaped Prescribed Fire Action

When a prescribed fire is declared a wildland fire, managers still have the full range of suppression options available under the concept of the "Appropriate Management Response." If a prescribed fire is declared a wildfire a "Fire Number" will be assigned and all suppression costs will be charged to the 2821 sub-activity.

The following actions will be taken on all Bureau prescribed fires that escape and are declared wildland fires.

1. Take prompt and reasonable action to control and suppress the fire. This could include the development of a "Wild Fire Situation Analysis" to determine what suppression action will be.

2. Notify local CDF Command Center to initiate local CDF Battalion Chief responsible for the area to assume command of the situation/incident.

3. Notify other Agency Administrator(s), and/or other landowners that may be affected, of the escaped fire. Coordinate suppression actions with the other affected parties.

4. Document the time and environmental conditions that existed when the escape occurred.

5. Document the incident, including all actions prior to and after the escape. Set up a file that includes all pertinent information, i.e., the prescribed fire plan, a chronology of events including the prescribed fire report and unit logs or individual statements, the fire investigation report, weather forecasts including any spot forecasts, Remote Automated Weather Station data and National Fire Danger Rating System data for the day of the escape for the nearest weather stations, photos, and any appraisal of damages. Special attention to documentation is critical.

C. Off-Site Suppression Resources Available (CDF)

The Following Contingency Resources shall be staged/available for response in the event of an escaped (wildland) fire:

RESOURCE	NO.	TYPE	LOCATION	TIME TO SCENE
ENGINE	1	III	Weaverville	30-60 MINUTES
ENGINE	2	III	Fawn Lodge	30-45 MINUTES
ENGINE	1	III	Hayfork	60-90 MINUTES
CREW	2	Type I	Trinity River	30-45 MINUTES
DOZER	1	D-4/6	Redding	60-90 MINUTES

D. Suppression Strategy and Resource Concerns If Escape Fire

1. If an emergency/escape is declared, CDF by agreement will be the lead agency for suppression, specific strategy development, and ordering of additional resources.

2. If the fire crosses established control lines around the perimeter of the project area, e.g. slope over, suppression action will be required. A slope over would not be considered an escape fire unless the IC (BLM) determines resources on site can not contain the slope over and it has potential to threaten structures, high value resources, or non-consenting private land ownership.

3. Secondary lines include dozer lines which are strategically located on ridge tops surrounding the project area. See Escape Fire Contingency Map for complete primary and secondary control line locations.

4. There are cultural values identified to protect within the project area. Fire personnel will make all possible efforts to avoid any cultural resources identified.

5. Rehabilitate temporary campsites, staging areas, and control lines to as natural a state as possible. Install waterbars on new control lines on slopes exceeding 10 percent.

E. Escape Fire Contingency Plan Action Items

1. Should an escape occur, the Prescribed Fire Burn Boss (or other designated person) will act as IC until relieved by the local CDF Battalion Chief. Until relieved by CDF, the IC will organize all on site resources for an aggressive response.

2. The IC will notify the local CDF Command Center of the situation and order the local CDF Battalion Chief responsible for the area, who will then assume command of the incident. Field Office personnel will notify landowners, as needed. The Field Manager will assign an environmental specialist, as necessary.

3. The FMO and/or IC and the environmental specialist will develop a WFSA. This document will determine what the suppression effort will be.

4. Upon an escape, all key personnel will initiate a unit log to document all actions taken. After the incident is contained, the Prescribed Fire Burn Boss will submit a report documenting weather, resources on site, ignition sequence, suppression actions, and other pertinent data.

5. The strategy for an escaped fire will include flanking the fire until forward rate of spread is stopped and/or burning out from roads and/or natural barriers is complete.

F. Analysis of On-Site Resources

Line Building Rate: Chains per hour over an extended period. A higher rate can be expected during the first hour.

1. Light Engine - 200 Gallon: Type IV or V - 1
   24 Ch/hr.

2. Heavy Engine - 800 gallons +: Type III, 1 - 3
   24 - 72 Ch/hr.

3. Hand Crew - (Type & Number): Type I/II, 1-3
   18 - 30 Ch/hr.

4. Other - (List)
   Ch/hr.

5. On-site Resources: 1-3 heavy engines and 1 light engines.

6. Total on-site line building capabilities: 18 - 72 Ch/hr.

The line building rate of on-site equipment WILL NOT exceed excepted fire spread rate or increase perimeter during initial escape. If the escape occurs at wind speeds over 15 MPH, additional resources will be required. In some cases, fire intensity or flame length could limit the effectiveness of engines in suppressing an escape. Topography is not a significant factor limiting access. A contingency area has not been identified. Any escape into the contingency area will be treated as an escaped fire unless it exceeds the 'escape burn area target". The escape burn area target is 10 acres. If the target is exceeded, an escape will be declared. At this point, efforts to burn will cease and all resources will be committed to containment efforts.

APPENDIX 6 - Prescribed Fire Plan and Map

G. DETERMINATION OF ESCAPED FIRE CONTINGENCY RANGES

	ACCEPTABLE PRESCRIPTION RANGE			
	LOW	HIGH	DESIRED	
Temperature	70	90		Outside Area at Critical Holding Point Minimum Acceptable Moisture
Relative Humidity	40	14		
Wind Speed (Mid Flame)	2	5		
Wind Direction	180	0	270	
Slope	0	30	15	
1 hour Fuel Moisture	10	6	8	4
10 hour Fuel Moisture	0	0	0	0
100 hour Fuel Moisture	0	0	0	0
1000 hour Fuel Moisture	0	0	0	0
Live Fuel Moisture	60	100	75	50
Duff Moisture (%)	N/A	N/A	N/A	N/A
Soil Moisture (%)	N/A	N/A	N/A	N/A

	ACCEPTABLE FIRE BEHAVIOR RANGE			Outside Area At Critical Holding Point
	LOW	HIGH	DESIRED	
Rate of Spread (Ch/hr)	10	78	31	89
Heat Per Unit Area	59	91	84	96
Fireline Intensity	11	130	47	157
Flame Length (ft)	1.3	4.2	2.6	4.6
Reaction Intensity	538	826	764	874
Scorch Height (ft)	3	26	12	30
Spotting Distance (Miles)	0	.1	0	.1
Probability of Ignition (%)	30	60	40	60

XVII. PRESCRIBED FIRE CREW CHECKLIST **Lowden Ranch Prescribed Fire Project**

A. Incident Statistics
1. Location: Three miles northwest of Lewiston City, Ca.
2. Size: 80 acres
3. Objectives: Restore function and structure to plant communities, and improve forest health in a fire-adapted ecosystem.
4. Jurisdiction: CDF
5. Hazards: As specified in the JHA's
6. Drop Points:

B. Incident Site
1. Forest, Grassland, etc..: Grassland
2. General Health: Fair to Good
3. Terrain: Flat to 15 % slope

C. Fuel Conditions
1. Live Fuels:
2. 1-hr.:
3. 10-hr.:
4. 1,00 hr.:
5. Important Indices:

D. Weather Conditions
1. Current Weather (WS, Direction, AT, RH):
2. Forecast Weather: See Spot Weather Forecast

E. Command/Control
1. Incident Commander: Doug Held or One qualified
2. Communications: See Incident Action Plan
3. Key Radio Frequencies: Overhead- 166.375
4. Firing/Holding Assignments: Firing- 168.050,
5. Contingency:
6. Reporting Procedures:

F. Fire Behavior
1. Spread Rate: 1 - 5 chains/hour
2. Spread Direction: TBA
3. Flame Length: 0.6 - 1.2 feet

G. Aviation
1. Aircraft: N/A
2. Hazards:
3. Restrictions:

H. Safety
1. JHA:
2. Known Hazards:
3. Public Safety:
4. Traffic Control:

XVIII. GO/NO GO CHECKLIST (A "NO" response to any item means stop!)

A. Are all fire prescription specifications met? YES 7/2/99

B. Are all smoke management prescription specifications met and or has smoke management clearance been given for the project, e.g. Air Quality Permit? YES 7/2/99

C. Is the area fire weather forecast favorable? YES 7/2/99

D. Are all required personnel in the prescribed burn plan on-site? YES 7/2/99

E. Is all of the required equipment in the Prescribed Fire Plan in place and functional? YES 7/2/99

F. Have all personnel been briefed on the project objectives and their assignments? YES 7/2/99

G. Have all personnel been briefed on safety hazards, escape routes and safety zones? YES 7/2/99

H. Have all required notifications been made? YES 7/2/99

I. Are the "contingency resources" adequate for containment of escapes under expected and worst-case conditions? YES 7/2/99

J. In your opinion, can the burn be carrier out according to plan and will it meet the planned objectives? YES YES 7/2/99

==========

If all questions above have been answered "YES", you may proceed with ignition. Document the conditions, location, and results. Good Luck!

==========

CERTIFICATION:

Prescribed Fire Burn Boss Approval: [signature] 7/2/99

Date Approved: 7/2/99 10:45

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**		**Date:** April 16, 1999	___X_ **New** _____ **Revised**
		Page: 1 **Of:** 1	**Reviewed by: (Safety manager)**
Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** FOOT TRAVEL	
Personal Protective Equipment: Personal Protective Equipment (PPE) Eye Protection			

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
When hiking be ready physically and mentally. Hike at a constant pace with little or no stopping. When hiking upslope don't use tool as a cane. Watch for rolling material. Make rolling debris known to people below you. When hiking downhill watch rolling material. Try to contour or switchback to save stress on knees. When contouring slope, keep tool on the downhill side of slope.	1. Twisting ankles & knees 2. Tick bites 3. Bees, wasps, hornets, snakes 4. Poison Oak 5. Vehicle traffic 6. Injuries to eyes, crashing brush or tree limbs 7. Falling branches	1. Wear proper PPE & foot wear. Maintain physical fitness. Be heads up for holes, ground depressions, logs, etc... 2. Check for ticks in hair, clothing, etc... 3. Keep proper distance to see potential hazards 4. Wear sleeves down. 5. Be aware of traffic areas. Look both ways when crossing roads. 6. Wear eye protection 7. Wear hardhat AT ALL TIMES. 8. Wear sleeves down to protect arms. Wear gloves.

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**	**Date:** April 16, 1999	__X__ New _____ Revised
	Page: 1 **Of:** 1	**Reviewed by: (Safety manager)**

Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** HANDLINE CONSTRUCTION

Personal Protective Equipment: All PPE plus Eye Protection, Chaps, Ear Plugs

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
To begin handline construction, ensure proper spacing of individuals. Have good grip on the tool when swinging and hiking. Have good footing to prevent falling accidents. Keep a safe working distance (15 feet) between crew members. Look & listen for other crews or individuals walking by, as to not swing tool when they are in your area. Communicate between each crew member as to all events. If you swing over your head say "Swinging" and look around to be sure your area is clear of people and overhanging branches. Any accidents that occur contact your squad boss or supervisor directly. Use only good fire tools and keep it sharp at all times. Inspect tools before leaving truck and inspect after shift. Be heads up for rolling material. Let it be known if you kick something down the hill. Be aware of poison oak, bees, snakes, etc.. in your area. Be cautious of heat exhaustion and fatigue. Prevent pulled muscle and sore backs by being physically fit for the job. Make sure all stubs are down to at least 3" in height.	1. Hiking into area to begin handline construction. 2. Inadequate spacing. 3. Tool grip slips from hands. 4. Crews walking through while cutting line. 5. lack of communication. 6. swinging tool over your head with others in the area. 7. Cuts, lacerations 8. Loose heads on tools. 9. Dull tools. 10. Snakes, bees, environmental hazards, poison oak. 11. Heat exhaustion, fatigue 12. Pulled muscles, sore backs 13. Rolling rocks, logs, and other material.	1. Get firm footing. Wear 8" high boots with vibram sole. 2. When hiking be 10 feet apart. 3. When working be 15 feet apart. 4. Have firm grip on tools, wear gloves, sharpen tools carefully. 5. Halt line construction until crew has fully passed by. 6. Ensure communication and messages are passed to all personnel. 7. Let members know you are swinging the tool (over your head) and look around your area to be sure area is clear of people and overhanging limbs. 8. Avoid cuts and lacerations to yourself and others by paying attention and being physically and mentally fit. 9. Inspect tools before you go on shift. inspect tools periodically and after handline construction. 10. Be aware of rolling material. 11. Stay alert of environmental hazards. Flags hazards and let them be known by all. 12. Drink plenty of fluids and take a break when necessary.

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**	**Date:** April 16, 1999	__X__ **New** _____ **Revised**
	Page: 1 **Of:** 1	**Reviewed by: (Safety manager)**

Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** FELLING AND BUCKING

Personal Protective Equipment:
PERSONAL PROTECTIVE EQUIPMENT (PPE), EYE PROTECTION, EAR PROTECTION, CHAPS

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
Have only qualified sawyers running saws. Walking with saw from tree to tree. Use fire hose as cover for bar. When felling or bucking use swamper as spotter. When felling use the 10 factors for size up. Bucking use the 12 guidelines for bucking & limbing. Felling look for widow makers and snags. Have cuts line up. use wedges. Let others know where tree is falling. When bucking stand up slope of tree. Watch for compression, kick back and bind. When refueling, let saw cool down. Refill saw on mineral soil.	Footing, Loose rocks, Pine needles Slope percent Tree, dead or live (rotten) Widow makers Direction of lean, Heavy branches Lopsided crown Wind direction/Velocity Nearby hazards, people, power lines, vehicles Escape routes Size of tree compared to size of bar Kick back Uphill while bucking Saw binds or traps	1. All personnel running chainsaws will have at least a Class A certification. Personnel without certification will be under direct supervision. 2. Don't work alone. 3. Wear all PPE 4. Follow all guidelines for felling and bucking as it is stated in the Health and Safety Code Handbook (Title 6709 II)

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**	**Date:** April 16, 1999	___X_ New _____ Revised
	Page: 1 **Of:** 1	**Reviewed by: (Safety manager)**

Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** HOSE LAYS

Personal Protective Equipment:
ALL PERSONAL PROTECTIVE EQUIPMENT (PPE)

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
Lifting hose off the engine or off the ground. Rolling hose out and attaching various fittings to hose. Walking hose lay, direct fires edge or indirect. Using proper footing and spacing. Watching for hazards associated with walking. Being aware of environmental hazards, bees, snakes, poison oak.	Tripping over hose(s) Heavy lifting Tripping over staubs/rocks Slippery surfaces Uneven terrain Heat stress Thick brush Poison oak, Snakes, Bees	Wear all PPE, safety first, follow 10 standard fire orders and 18 situations 1. Watch your step around hoses. Do not cut hose with hand tool or saws. 2. Use legs not back when lifting. 3. Watch for slippery rocks due to water or retardant. 4. Uneven terrain, walk cautiously. 5. Drink plenty of fluids, pace yourself. 6. Be heads up for limbs and brush whipping back into face, getting caught with hose on staubs. 7. Stay away from poison oak, wash immediately if you make contact. 8. Watch for snakes, bees. Warn others, flag, if possible.

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**		**Date:** April 16, 1999	___X_ New _____ Revised
		Page: 1 **Of:** 2	**Reviewed by: (Safety manager)**
Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** DRIVING VEHICLES	
Personal Protective Equipment:			

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
1. Various Driving Conditions A) Log Trucks B) Fog or Dusty Roads C) Physical Fatigue D) Backing Vehicle E) "U" Turns on Narrow Roads F) Parking Vehicle G) Other Traffic H) Stopping Vehicle I) Visibility - Weather and Smoke J) Muddy Roads K) Rough Roads/Washboards L) Eating or Drinking While Driving M) Animals on or near Roadway N) Bees or Hornets in Cab O) Mechanical Breakdown P) Emergency Q) Transporting Hazardous Material R) Driving at Night S) Steep Grades	1. Vehicle Accidents (Collisions, spillage, etc.) Items A-I	1. Drive Defensively! Always wear seat belts and turn on headlights. Maintain speeds within safe limits for each driving condition. A) Reduce speed and yield right of way. Sound horn on blind corners. Check CB channel, if available. B) All roads, drive with lights on (especially at night, on low beam). Reduce speed. C) Before driving get plenty of rest. Take breaks when necessary. D) Always honk when backing. When backing face hazard. Use backer, if available. If no one is available, get out and look for hazards behind vehicle. E) For U turns, select a portion of the road with a good view of oncoming traffic. F) Always park vehicle in a safe area. Park away from heavy equipment operations and of felling timber. park in low gear, set brake, and use chock block. Fire vehicles should back into parking area. G) Drive Defensively! Stay on the right side of the roadway, especially around curves. Use the two second rule when following other vehicles.

UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT **JOB HAZARD ANALYSIS**	**Date:** April 16, 1999	___X_ New _____ Revised
	Page: 2 **Of:** 2	**Reviewed by: (Safety manager)**

Work Group: Lowden Ranch Prescribed Fire Project	**Supervisor:** Incident Commander	**Qualifications, training, and/or experience required:** DRIVING VEHICLES

Personal Protective Equipment:

BASIC JOB STEPS	POTENTIAL HAZARDS	SAFE JOB PROCEDURES
1. Various Driving Conditions A) Log Trucks B) Fog or Dusty Roads C) Physical Fatigue D) Backing Vehicle E) "U" Turns on Narrow Roads F) Parking Vehicle G) Other Traffic H) Stopping Vehicle I) Visibility - Weather and Smoke J) Muddy Roads K) Rough Roads/Washboards L) Eating or Drinking While Driving M) Animals on or near Roadway N) Bees or Hornets in Cab O) Mechanical Breakdown P) Emergency Q) Transporting Hazardous Material R) Driving at Night S) Steep Grades	J) Loss of Control; Getting Stuck; Collisions K) Loss of Control L) Distractions; Loss of Control; Collisions M) Swerving to Avoid Animals N) Loss of Control O) Possible Collision Q) Spillage; Fire R) Animals, Pedestrians, Potholes, Warning signs, or any other hazard not visible. Glare from oncoming vehicles headlights. S) Brakes giving out; Loss of Control on Curves	H) Maintain speeds that easily allow you to stop vehicle. Expect the unexpected. You should be able to stop the vehicle in 1/2 of sight distance. I) Clean windshield daily. Keep the washer fluid level up. Slow or stop in smokey or dusty conditions. J) When wet or muddy, go easy on the brakes and slow to a safe speed which will help prevent loss of traction. Pump brakes gently first, before reverting to slamming on the brakes. K) Reduce speeds L) Don't eat or drink while driving M) Be alert for animals while driving. be prepared to stop. N) If a bee or hornet is in the cab, maintain control of vehicle then stop to dispose of insect. O) If you have mechanical problems, pull off roadway. P) In case of emergency, contact Incident Commander, Burn Boss or immediate supervisor. Q) Carry hazardous material in approved containers and have "NO Smoking" signs conspicuously placed. Placards as needed. R) Always turn on headlights. Allow time to stop for hazards S) Use lower gears to descend steep grades.

APPENDIX 6 - Prescribed Fire Plan and Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

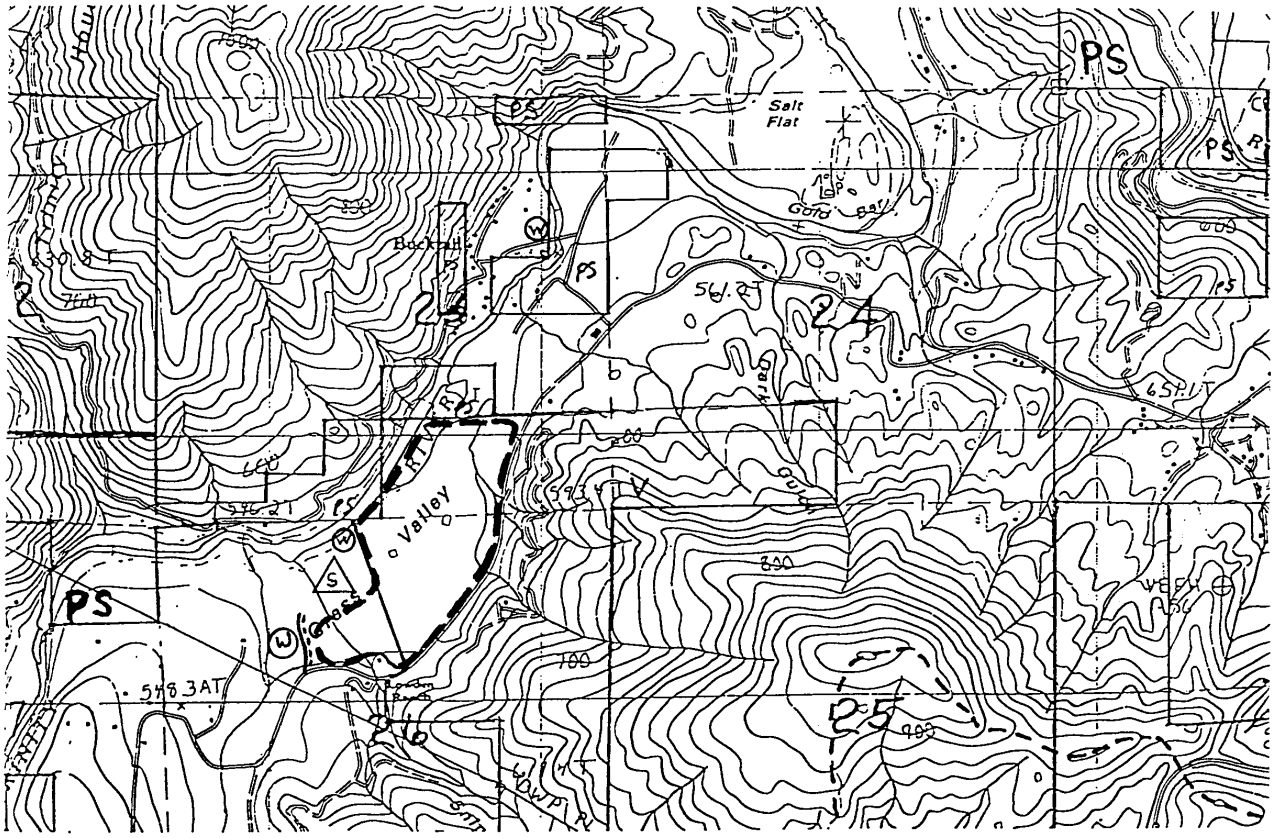
Lowden Ranch
Prescribed Fire
Project

Map
Project Area

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper
Douglas J. Held

Date
02/17/99



CALE: 1:24,000

LEGEND

- Project Area Boundary
- P Private Land
- Y Public Land
- Paved Roads
- Dirt Roads
- W Water Source
- S Safety Zone / Staging

☆U.S. GOVERNMENT PRINTING OFFICE: 1988 - 573-017/96022

Form 5400—1 (May 1971)

APPENDIX 6 - Prescribed Fire Plan and Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

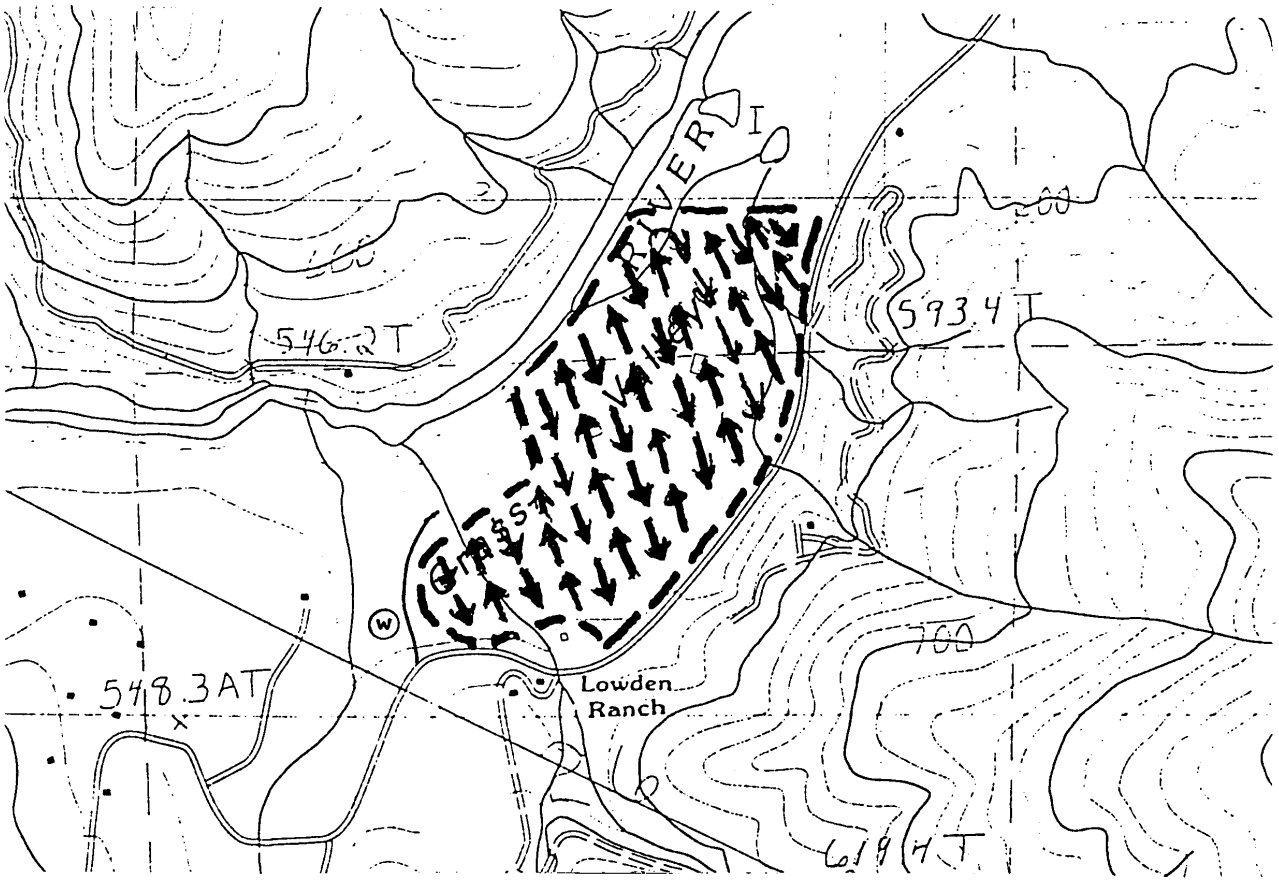
Lowden Ranch
Prescribed Fire
Project

Map
Ignition Plan

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper: Robert Perez

Date: March 3, 1999



SCALE: 1:24,000

LEGEND

Project Area Boundary	
P Private Land	
Y Public Land	
Ignition Pattern	

☆U.S. GOVERNMENT PRINTING OFFICE: 1988 - 573-017/96022

Form 5400—1 (May 1971)

APPENDIX 6 - Prescribed Fire Plan and Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

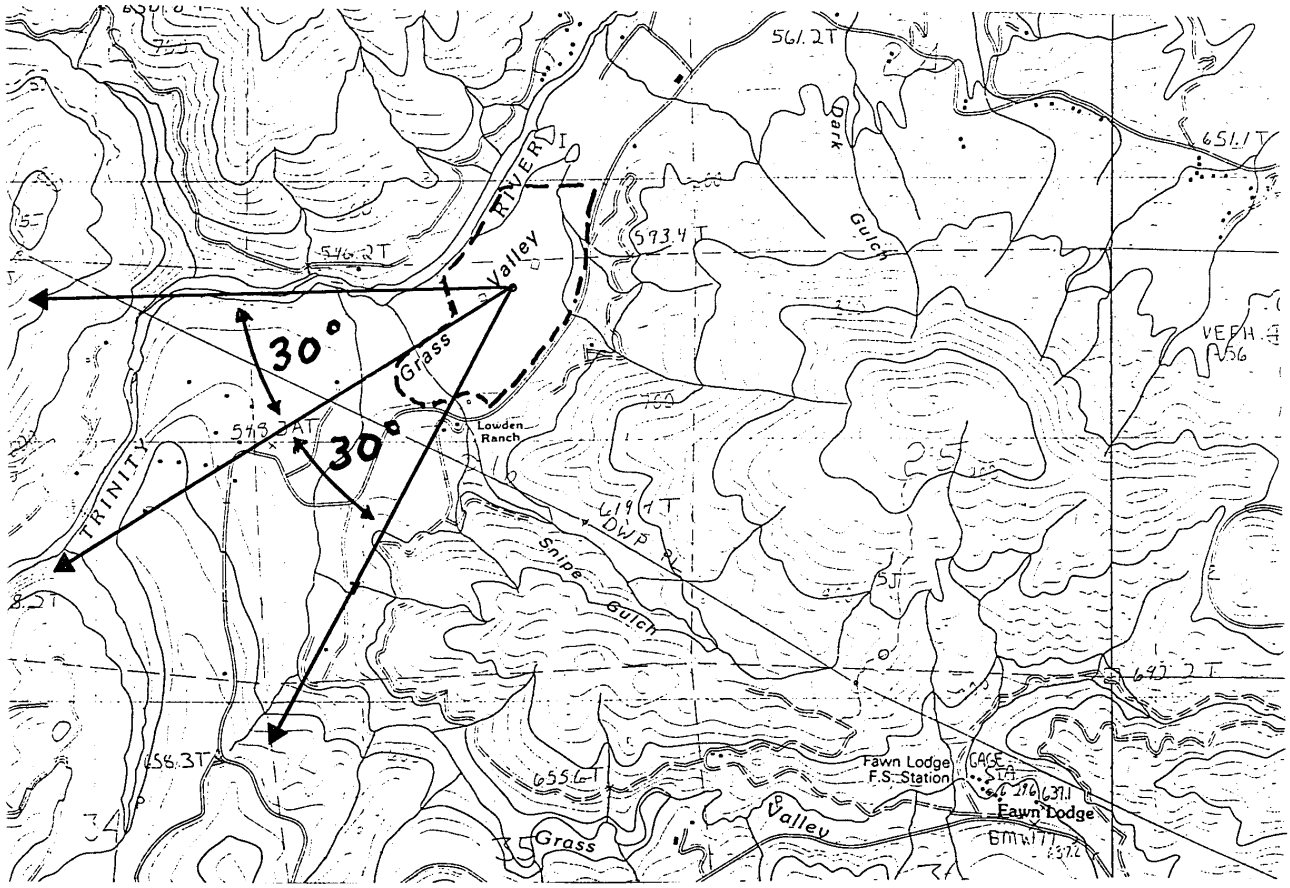
Lowden Ranch Prescribed Fire Project

Map Smoke Management Projection

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper: Robert Perez

Date: March 3, 1999



SCALE: 1:24,000

LEGEND

Project Area Boundary	
P Private Land	
V Public Land	

☆U.S. GOVERNMENT PRINTING OFFICE: 1988 - 573-017/96022

Form 5400—1 (May 1971)

APPENDIX 6 - Prescribed Fire Plan and Map

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

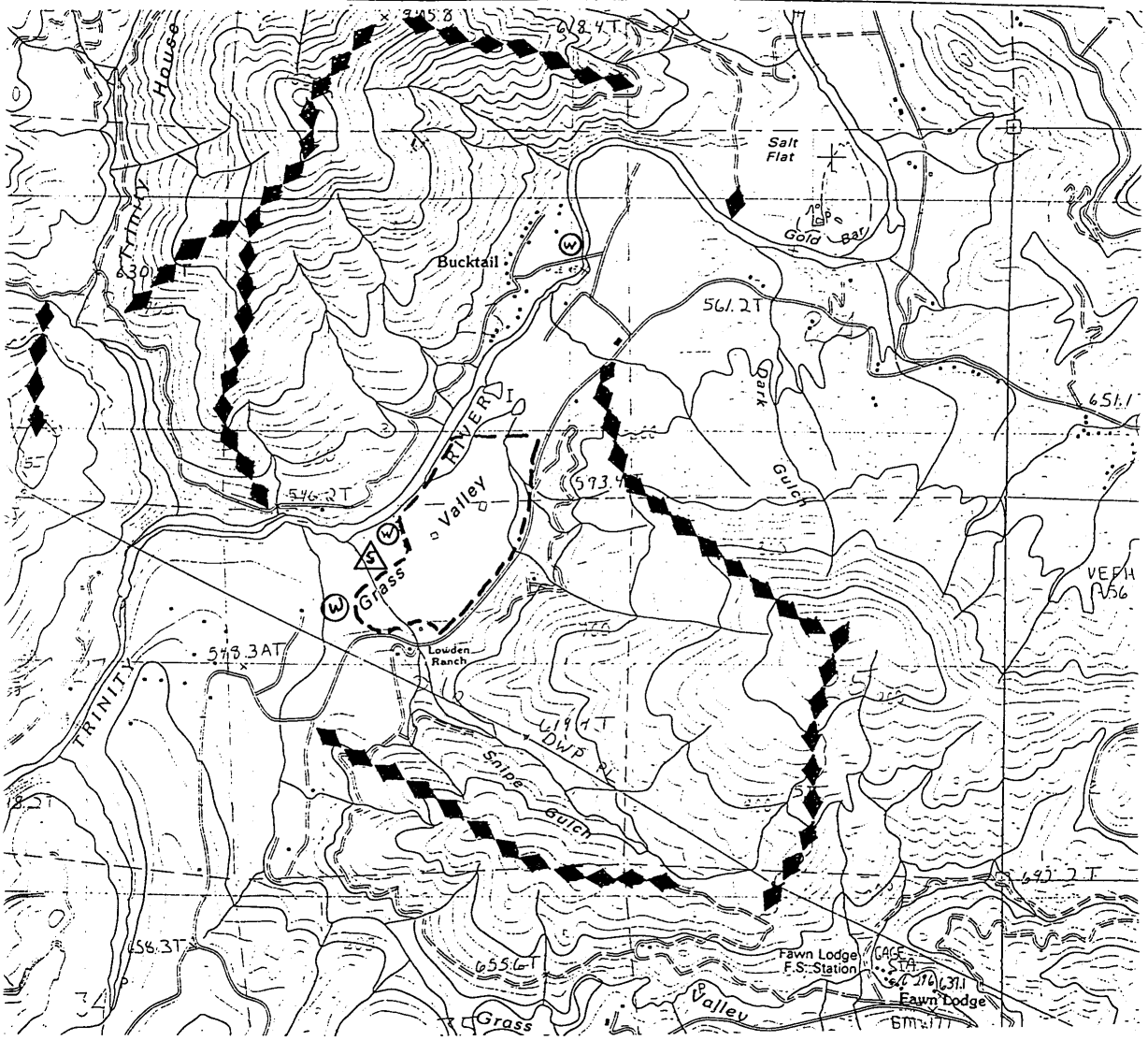
Lowden Ranch Prescribed Fire Project

Map Contingency Plan

Township	Range	Section	Meridian	District
33 N.	09 W.	23 & 24	M.D.M	NORCAL

Mapper: Robert Perez

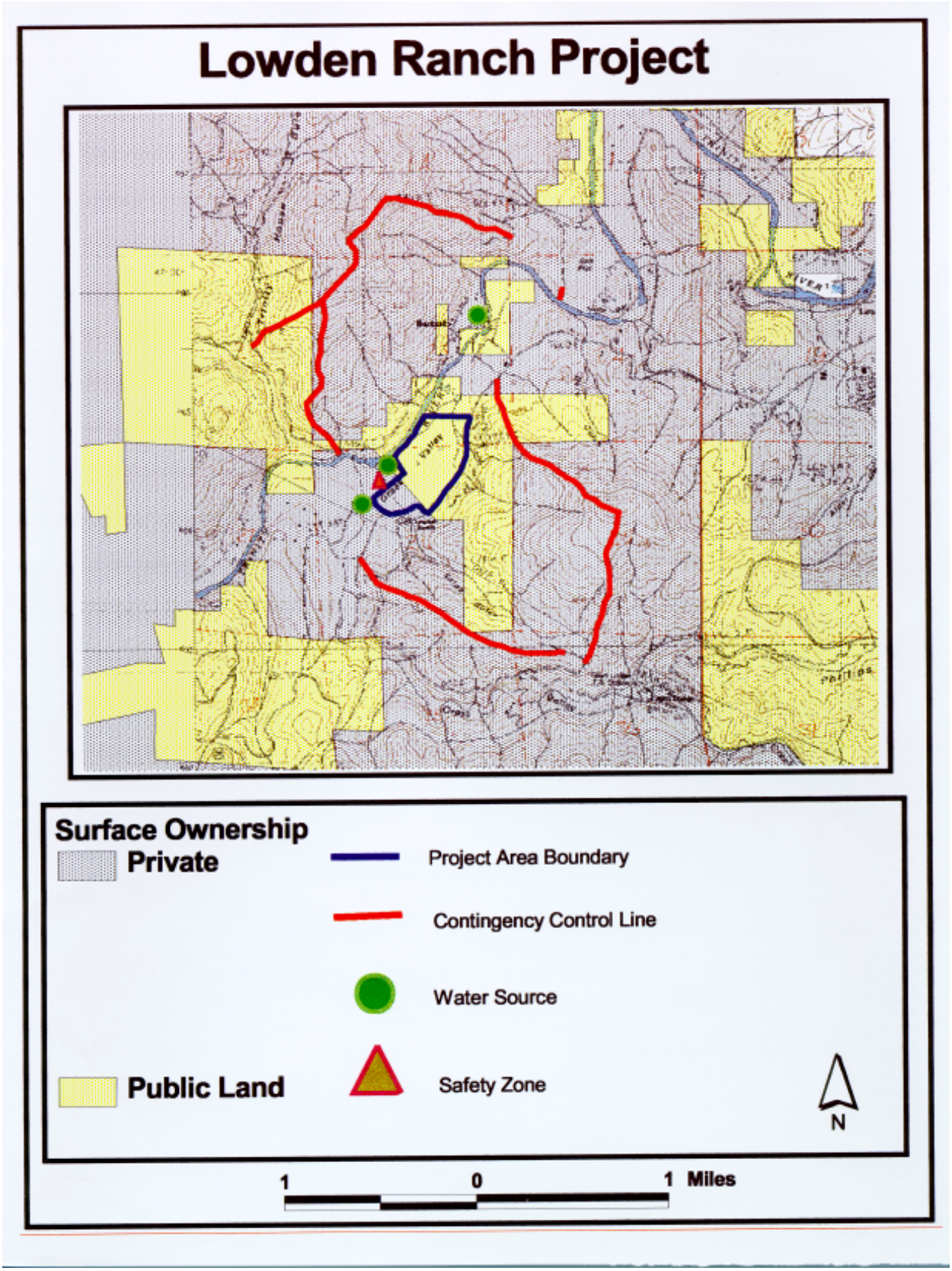
Date: March 3, 1999



SCALE: 1:24,000

LEGEND

- Project Area Boundary
- Private Land
- Public Land
- Contingency Control Lines
- Paved Roads
- Dirt Roads
- Water Source
- Safety Zone / Staging


Lowden Ranch Project
Surface Ownership
Private
Public Land
Project Area Boundary
Contingency Control Line
Water Source
Safety Zone
N
1
0
1 Miles

STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FORESTRY

PT. PERMIT Nº J 60535

PROJECT TYPE BURNING PERMIT

(Pub. Res. Code, Article 3 Sections 4491, 4492, 4493, 4494)

APPLICATION FOR PERMIT TO BURN

Dated JUNE 6, 19 99 — REDDING (Ranger Unit Hdqrs.) — 225-2418 (Telephone)

NAME USDI BUREAU OF LAND MGT Telephone 224-2100

Mailing Address 355 HEMSTED DR REDDING, CA 96002

is hereby permitted to burn 80 ACRE PRESCRIBED FIRE (100 ACRE) (Name kind of material to be burned)

on land at/near LOWDEN RANCH, LEWISTON RD, LEWISTON, CA

located in ____ of Sec. 23, 24, Twp. 33N, R. 9W, County of TRINITY State of California,

during the period JUNE 1, 19 99 to JULY 1, 19 99, subject to the following terms:

1. The PERMITTEE shall comply with all fire laws, ordinances, and regulations.
2. The PERMITTEE shall notify the adjoining property owners and occupants of his/her intention to burn and the date such burning will take place. This notice must be given not less than 2 days prior to the start of such burning, except that cotenants having rights or facilities on or adjoining the PERMITTEE'S property shall be notified not less than 15 days prior to the start of burning.
3. This permit is valid only on those days which are not prohibited by the State Air Resources Board pursuant to Section 41855 of the Health and Safety Code or by the Local Air Pollution Control District. Prior to burning PERMITTEE will contact Local Air Pollution Control District at telephone number ____.
4. This permit does not relieve the PERMITTEE from using reasonable and prudent care to prevent damage to the property of others or injury to persons as prescribed by law. *In the event of negligence* on the part of the holder of this permit, which results in escape of the fire that requires suppression action, the permit holder will be liable for suppression costs.
5. The "MINIMUM PRECAUTIONS FOR PROJECT TYPE BURNING" dated JUNE 6, 19 99, are made a part of this permit.
6. This permit is suspended during period shown above on all days for which the PREDICTED BURNING INDEX EXCEEDS ____ as determined by the Ranger Unit Hdqrs. and is suspended at all times of critical fire conditions as declared by the Director and posted at the Ranger Unit Hdqrs. or by proclamation of the Governor pursuant to Sec. 4423.1, Pub. Res. Code. Such suspension does not extend the above dates for burning.
7. Before burning, permittee will check with the forest fire station at Weaverville, Telephone 623-4201, or issuing office of this permit at REDDING (Ranger Unit Hdqrs.) 225-2411 (Telephone)
8. Upon completion of the burning, the PERMITTEE shall notify the issuing agency (Item 7) immediately after the fire is extinguished and the last watchperson has been removed.

NOTE TO PERMITTEE: PLEASE READ THE REVERSE SIDE OF THIS FORM. IT CONTAINS INFORMATION ON THE LAWS AND RULES RELATING TO FIRE

I have read and understand the terms of this permit.

Signed [signature]

Mailing Address 355 HEMSTED DR RDG CA 96002

Telephone (530) 224-2100

This permit issued 6TH day of JUNE, 19 99

DIRECTOR OF FORESTRY

By [signature], Agent

Title BATTALION CHIEF

To be filled in when PERMITTEE notifies agency of burn and Predicted Burning Index does not exceed terms of permit. (See 6, above)

Predicted Burning Index at time of notification ____.

____ (Ranger District) SRA ____ LRA ____ (Area of Responsibility)

Agency notified by ____ that burning would be started at ____ AM/PM on ____ (Date), 19 ____.

Recd. ____ AM/PM ____ (Date), 19 ____

by ____ (Emergency Command Center)

Agency notified by ____ that burning completed at ____ AM/PM on ____ (Date) 19 ____.

Recd. ____ (Emergency Command Center), ____ (Date) 19 ____

87140-356 4-83 25M TRIP * OSP
7540-130-0318

STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FORESTRY

APPLICATION FOR PERMIT TO BURN — REDDING (Ranger Unit Headquarters) — 225 2915 (Telephone)

June 6, 1999

MINIMUM PRECAUTIONS FOR PROJECT TYPE BURNING

USDI BUREAU OF LAND MGT (Agency) — 355 HEMSTED DR REDDING 224-2100 (Address)

having made application to burn on lands located in Sec. 23, 24, Twp. 33N, R. 4W, and having been inspected by the applicant (or his/her agent), DOUGLAS HELD (Name or names of applicants or agents) in the company of the undersigned FOREST OFFICER _____, the following precautions are herein made to prevent damage to the property of others:

These precautions are to be considered the minimum necessary to be taken by the PERMITTEE on his/her land to prevent damage to the property of others under average weather conditions for the period during which this burning operation is scheduled to take place. The PERMITTEE is cautioned that it is his/her responsibility to take any additional precautions that the judgment of a prudent person would dictate under the specific circumstances and conditions that exist at the exact time of the burning operation.

In addition to the terms of the permit when issued, the following precautions will be taken before, during, and after burning:

Advance preparation of area, firebreaks, snag removal, etc.

CONTROL LINES TO BE PLACED AS PER BURN PLAN ATTACHED

Fire fighting equipment and personnel to be on hand at time of starting fire, patrol, mop-up, etc.

- RESOURCES IN PLACE AND/OR AVAILABLE AS PER BURN PLAN ATTACHED
- NOTIFY TRINITY CO. DISPATCH 623-2611 PRIOR TO IGNITION

These terms are made a part of Project Type No. J60535

June 6, 1999

DIRECTOR

By Will G Burton Agent

Title BATTALION CHIEF

Date of Inspection _____, 19

ORIGINAL TO PERMITTEE, DUPLICATE TO RANGER, TRIPLICATE TO LOCAL FILE

7540-130-0313

APPENDIX 7 - Project Type Burning Permit

Air Resources Board - Technical Support Division - METEOROLOGY SECTION Month 6 YR 9
P. O. Box 2815, Sacramento, California 95812

CONTROLLED BURN "NOTICES" (48 HR DECISION, 72-Hr Outlooks)
Automatic Telecopier: (916) 445-0786 Duty Meteorologist: (916) 322-6014

Name of burn: Lowden Ranch Start of burn: 6-24-99
Date of request: 6-22-99 End of burn: 6-24-99

Mean elevation: 1,700 ft., Min. Elevation: 1,640 ft., Max. Elevation: 1,760 ft.
County: TRINITY Acres/Day: 100
Location: T 33 R 9W Sections 23 & 24 Total Acres: 100
T ____ R ____ Sections ____ Tons/Acres: 1
T ____ R ____ Sections ____ Percent Treated: ____
Meridian: Humboldt MDM Mount Diablo ____, San Bernardino ____

Nearest City Redding is East / 25 (Miles/Direction) of the burn.

Persons to notify	Organization	Telephone Number	Remarks (APCD notified, weekd #)
1 Bob Perez	USFS	530-242-2401	
2 Doug Held	BLM	530 224-2100	
3			

Date	Issued Time (PST)	BY	Valid Date	48-hour DECISION YES	NO	Valid Date	72-hour OUTLOOK FAV	UNF	NOTES
28			30			31(1)			
29			31(1)			1(2)			
30			1(2)			2(3)			
1			3			4			
2			4			5			
3			5			6			
4			6			7			
5			7			8			
6			8			9			
7			9			10			
8			10			11			
9			11			12			
10			12			13			
11			13			14			
12			14			15			
13			15			16			
14			16			17			
15			17			18			
16			18			19			
17			19			20			
18			20			21			
19			21			22			
20			22			23			
21			23			24			
22			24			25			
23			25			26			
24	1500	LINSEY	26	X		27		X	
25	1500	PERSEY	27	X		28		X	
26	1500	PERSEY	28		X	29		X	
27	1500	GHOLA	29	X		30		X	AT. WIND S, SW
28	1500	GHOLA	30	X		31(1)		X	
29	1600	GHOLA	31(1)	X		1(2)	X		
30	1600	JDE	1(2)	X		2(3)	X		
31			2			3			

DocID#863060-(CB-2 Nov

BUREAU OF LAND MANAGEMENT
DOUGLAS J. HELD
Redding Field Office
355 Hemsted Dr.
Redding, CA 96002
www.ca.blm.gov/redding/fire/fire.html
OFFICE (530)224-2100 FAX (530)224-2172 DESK (530)224-2153

06/23/99 12:46 ☎530 224 2172 BLM.RDG.CA. 002/004

FORM D-1 (-86) ...e. By WSOM D-41

FIRE WEATHER SPECIAL FORECAST REQUEST
(See reverse for instructions)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL WEATHER SERVICE

I - REQUESTING AGENCY WILL FURNISH:

1. NAME OF FIRE OR OTHER PROJECT	2. CONTROL AGENCY	3. REQUEST MADE TIME†	DATE
LOWDEN RANCH	BLM	10:30	6/23/99

4. LOCATION (By 1/4 Sec - Sec - Twp - Range)	5. DRAINAGE NAME	6. EXPOSURE (NE, E, SE, etc.)
SEC 23 & 24, T. 33N., R. 9W. MDM	TRINITY RIVER	FLAT - N

7. SIZE OF PROJECT (Acres)*	8. ELEVATION* TOP	BOTTOM	9. FUEL TYPE	10. PROJECT ON:
100	1,738	1,640	GRASS	☒ GROUND ☐ CROWNING

11. WEATHER CONDITIONS AT PROJECT OR FROM NEARBY STATIONS (See example on reverse)

PLACE	ELEVATION	OB TIME†	WIND DIR.-VEL. 20 FT.	EYE LEVEL	TEMP. DRY	WET	(Lv. Blank) RH	DP	REMARKS (Indicate rain, thunderstorms, etc. Also wind condition and 10ths of cloud cover.)
USE "LEWISTON FISH HATCHERY RAWS" LOCATED ON INTERNET AT:									
http://cdec.water.ca.gov/cgi-progs/queryF?LFH									
FOR PROJECT WEATHER OBSERVATIONS.									

12. SEND FORECAST TO:	PLACE	VIA	ATTN: (Name, if applicable)
	NWS - NORTH ZONE	(530) 226-2742 FAX	DUTY METEOROLOGIST

II - FIRE WEATHER FORECASTER WILL FURNISH:

13. FORECAST AND OUTLOOK: (Specify Wind - 20 foot or Eye Level) DELIVER TIME† AND DATE: 1500 1630 6/23/99

REQUESTED PRODUCT:

FORECAST FOR THURSDAY JUNE 24, 1999 AFTERNOON & EVENING
PLUS FRIDAY FORECAST MORNING/EVENING.

- TEMPERATURE - HIGH/LOW
- RELATIVE HUMIDITY - HIGH/LOW
- WIND - SPEED & DIRECTION (EYE LEVEL WINDS)
- PRECIPITATION OUTLOOK?

224-2172 Fax
224-2153
Doug Held

ANY QUESTIONS CALL: (530) 224-2153 DOUGLAS J. HELD
SEND SPOT VIA FAX: (530) 224-2172

NAME OF FIRE WEATHER FORECASTER	FIRE WEATHER OFFICE

III - REQUESTING AGENCY WILL COMPLETE UPON RECEIPT OF FORECAST

	TIME†	DATE	NAME
FORECAST RECEIVED:			

Explanation of Symbols
† Use 24-hour clock to indicate time. Example: 10:15 p.m. = 2215; 10:15 a.m. = 1015
* For concentrations (as groups of lightning fires) specify "Concentration"; then give number of fires and size of largest. If concentrations are in more than one drainage, request special forecast for each drainage.
‡ No entry necessary. To be computed by the Fire Weather Forecaster.

WS FORM D-1 SUPERSEDES PREVIOUS EDITIONS

WEATHER SUMMARY

In late May there were several burn escapes in northern California. The weather analysis for the period leading up to these escapes showed that there had been an above normal occurrence of foehn winds during May with 11 of the first 22 days having foehn (north) winds. This pattern of above normal winds and below normal humidity aided in the drying of "exposed" dead fuels. The pattern of dry windy conditions continued through June with precipitation over the area below normal for the period March 1 through July 1, 1999.

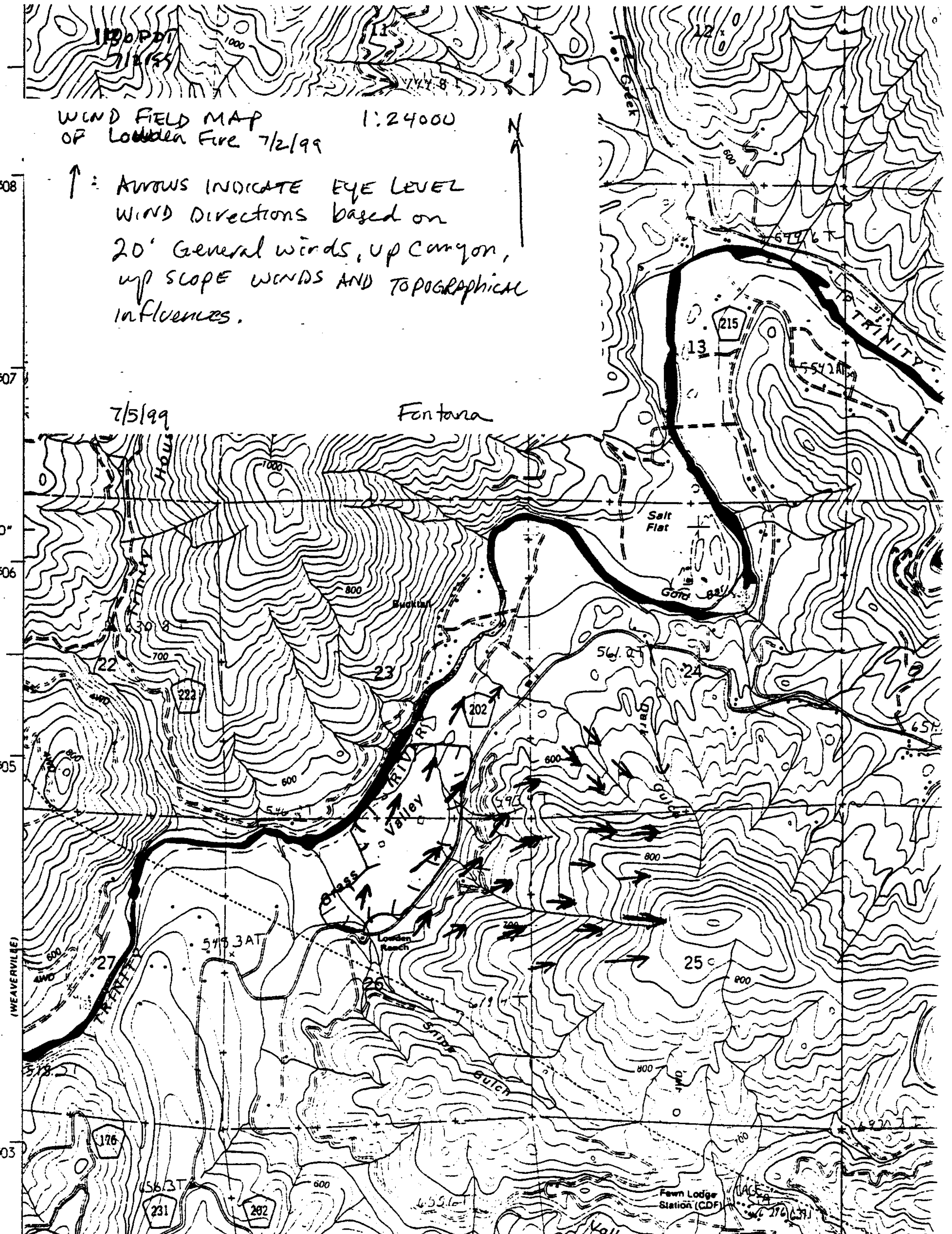
A large high pressure area was along the west coast during the week of June 27th. This weather pattern led to above normal temperatures and below normal humidity. The Trinity River Camp RAWS shown a max humidity of 52% for the period 0000PDT 6/29/99-07/02/99. The Lowden spot forecast for June 29th called for temperatures near over above 100 degrees for Tuesday (29th) and Wednesday. On Thursday a low pressure trough begin deepening from the Gulf of Alaska into the Pacific Northwest. This weakened the high pressure area that had been off the coast and pushed it south. This brought cooling to the site but also brought increased southwest to west winds. On the day of the burn winds were south to southwest in the morning and southwest to west in the afternoon. Speeds at the burn site gusted to 12 mph at eye level, while 20 foot winds at Trinity River RAWS gusted to 27 mph.

Station ID	Obs Date	Ob Tm	O T	MSGC	WS	WDY	HRB	1H	10	HU	TH	IC	SC	EC	BI	FL	SL	R	KBD
40501_	070399	12	O	7G3P3	9	61	49	5	5	6	9	37	15	69	73	52	5_	V	584
40503_	070399	12	O	7G3P3	4	75	59	4	5	6	11	30	-9	63	54	38	3_	M	470
40510_	070399	12	O	7G3P3	8	60	50	3	3	5	9	51	16	73	76	54	5_	V	567
40512_	070399	12	O	7G3P3	4	83	78	6	6	6	12	19	7	57	47	33	3_	M	346
40516_	070399	12	O	7G3A2	7	50	4	4	4	6	15	45	14	55	65	46	3_	H	386
40501_	070299	12	O	7G3P3	9	62	50	3	3	5	10	60	17	73	80	57	5_	V	582
40503_	070299	12	O	7G3P3	3	77	61	2	3	6	11	49	9	65	57	41	3_	H	466
40510_	070299	12	O	7G3P3	8	62	51	2	3	5	10	63	16	74	79	56	5_	V	564
40512_	070299	12	O	7G3P3	2	86	81	3	3	5	12	34	7	62	48	34	3_	M	342
40501_	070199	12	O	7G3P3	9	63	51	3	3	5	10	61	17	72	79	56	5_	V	577
40503_	070199	12	O	7G3P3	3	83	67	2	3	7	12	45	8	61	53	38	3_	H	459
40510_	070199	12	O	7G3P3	4	63	53	2	3	5	10	53	11	72	64	46	4_	V	558
40512_	070199	12	O	7G3P3	4	89	84	3	4	5	13	36	8	60	51	37	3_	M	334
40516_	070199	13	O	7G3A2	4	50	3	3	3	5	15	47	11	56	58	41	3_	H	382
40501_	063099	12	O	7G3P3	6	65	53	2	3	6	10	61	13	71	70	50	5_	V	571
40503_	063099	12	O	7G3P3	3	85	69	2	3	8	12	48	9	60	53	38	3_	H	450
40510_	063099	12	O	7G3P3	7	66	56	2	3	6	10	61	14	71	72	51	5_	V	551
40512_	063099	12	O	7G3P3	3	92	88	2	3	6	13	46	8	59	50	36	3_	H	324
40516_	063099	13	O	7G3A2	6	50	3	3	3	6	17	54	14	47	59	42	3_	H	374
40517_	063099	12	O	7G3P3	__	70	30	25	25	20	25	___	___	___	___	___	__	_	100
40501_	062999	12	O	7G3P3	7	67	55	3	4	6	10	52	13	68	69	49	4_	V	564
40503_	062999	12	O	7G3P3	2	87	71	3	4	8	12	38	7	58	48	34	3_	M	441
40510_	062999	12	O	7G3P3	0	67	57	3	3	6	10	40	7	69	52	37	3_	M	542
40512_	062999	12	O	7G3P3	3	95	92	4	4	7	13	32	7	55	45	32	3_	M	313
40516_	062999	12	O	7G3A2	5	50	4	4	4	6	18	43	12	45	53	38	3_	M	364

040501-Big Bar
040503-Hayfork
040510-Weaverville
040512-Friend Mtn
040516-Trinity Camp

TRC	990627	2250	63	50	1	138	58	-98	6	159	32.62	12.90	30.15
TRC	990627	2350	60	53	4	141	57	-98	5	143	32.62	12.90	30.16
TRC	990628	0050	59	57	2	150	55	-98	5	164	32.62	12.90	30.16
TRC	990628	0150	57	58	1	117	53	-98	4	108	32.62	12.80	30.17
TRC	990628	0250	57	57	2	104	53	-98	3	120	32.62	12.80	30.17
TRC	990628	0350	56	60	1	203	51	-98	3	93	32.62	12.80	30.17
TRC	990628	0450	54	63	0	353	51	13	3	298	32.62	12.80	30.18
TRC	990628	0550	59	58	3	176	70	-98	5	178	32.62	12.80	30.19
TRC	990628	0650	62	60	2	107	78	-98	4	143	32.62	12.80	30.19
TRC	990628	0750	67	49	3	90	86	-98	5	108	32.62	13.20	30.21
TRC	990628	0850	71	47	2	81	95	-98	7	150	32.62	13.70	30.22
TRC	990628	0950	76	39	3	57	100	-98	7	111	32.62	13.60	30.22
TRC	990628	1050	78	37	5	94	99	-98	9	102	32.62	13.70	30.22
TRC	990628	1150	82	30	5	156	104	-98	10	112	32.62	13.70	30.22
TRC	990628	1250	84	26	5	174	100	-98	13	134	32.62	13.70	30.20
TRC	990628	1350	86	23	7	153	104	-98	13	186	32.62	13.70	30.20
TRC	990628	1450	89	22	5	255	106	-98	14	162	32.62	13.70	30.19
TRC	990628	1550	89	23	6	196	104	-98	13	120	32.62	13.70	30.18
TRC	990628	1650	87	26	7	174	93	-98	16	187	32.62	13.70	30.17
TRC	990628	1750	86	27	6	209	86	-98	12	232	32.62	13.40	30.16
TRC	990628	1850	82	30	7	210	89	-98	14	180	32.62	13.10	30.16
TRC	990628	2050	74	34	6	167	70	-98	10	170	32.62	13.00	30.18
TRC	990628	2150	70	39	4	148	67	-98	9	176	32.62	13.00	30.20
TRC	990628	2250	70	38	5	201	66	-98	10	169	32.62	13.00	30.20
TRC	990628	2350	67	39	4	152	64	-98	8	146	32.62	12.90	30.20
TRC	990629	0050	65	42	5	115	62	-98	8	175	32.62	12.90	30.20
TRC	990629	0150	64	43	4	123	60	-98	7	127	32.62	12.90	30.20
TRC	990629	0250	62	46	3	127	59	-98	7	117	32.62	12.90	30.20
TRC	990629	0350	61	49	2	107	57	-98	5	119	32.62	12.80	30.20
TRC	990629	0450	60	52	1	198	56	-98	4	120	32.62	12.80	30.20
TRC	990629	0550	63	52	1	84	71	-98	3	279	32.62	12.80	30.20
TRC	990629	0650	67	51	3	78	81	-98	4	81	32.62	12.80	30.21
TRC	990629	0750	70	50	2	49	89	-98	8	89	32.62	13.20	30.21
TRC	990629	0850	70	47	6	90	90	-98	9	95	32.62	13.70	30.21
TRC	990629	0950	79	37	2	188	103	-98	11	102	32.62	13.60	30.21
TRC	990629	1050	80	36	6	81	101	-98	10	90	32.62	13.70	30.20
TRC	990629	1150	85	32	4	163	106	-98	9	111	32.62	13.70	30.20
TRC	990629	1250	87	29	5	132	107	-98	12	120	32.62	13.70	30.20
TRC	990629	1350	87	27	4	136	107	-98	14	142	32.62	13.70	30.18
TRC	990629	1450	90	18	8	163	104	-98	16	156	32.62	13.70	30.16
TRC	990629	1550	91	20	7	144	103	-98	15	197	32.62	13.70	30.15
TRC	990629	1650	89	23	7	176	95	-98	17	196	32.62	13.70	30.15
TRC	990629	1750	87	25	7	212	88	-98	15	199	32.62	13.40	30.14
TRC	990629	1850	85	32	5	250	93	-98	13	183	32.62	13.10	30.14
TRC	990629	2050	75	37	5	162	72	-98	9	197	32.62	13.00	30.16
TRC	990629	2150	74	38	2	128	70	-98	5	127	32.62	13.00	30.17
TRC	990629	2250	72	41	3	110	68	-98	4	105	32.62	13.00	30.18
TRC	990629	2350	69	46	2	110	65	-98	5	125	32.62	12.90	30.18
TRC	990630	0050	67	47	3	109	63	-98	6	151	32.62	12.90	30.17
TRC	990630	0150	65	50	2	146	61	-98	5	149	32.62	12.90	30.17
TRC	990630	0250	64	50	1	108	59	-98	3	197	32.62	12.90	30.16
TRC	990630	0350	63	50	4	138	60	-98	7	120	32.62	12.80	30.15
TRC	990630	0450	62	51	3	171	59	3	6	166	32.62	12.80	30.15
TRC	990630	0550	64	48	3	161	73	-98	6	179	32.62	12.80	30.16
TRC	990630	0650	66	46	3	160	85	-98	5	145	32.62	12.80	30.16
TRC	990630	0750	70	47	2	163	90	-98	7	173	32.62	13.20	30.16
TRC	990630	0850	73	42	4	185	93	-98	9	187	32.62	13.70	30.16
TRC	990630	0950	79	36	5	181	101	-98	9	179	32.62	13.60	30.16
TRC	990630	1050	81	31	5	187	105	-98	10	95	32.62	13.70	30.17
TRC	990630	1150	85	27	3	228	106	-98	11	141	32.62	13.70	30.14
TRC	990630	1250	87	24	7	182	106	-98	14	119	32.62	13.70	30.13
TRC	990630	1350	88	21	9	165	104	-98	17	186	32.62	13.70	30.11
TRC	990630	1450	88	21	7	225	104	-98	14	168	32.62	13.70	30.10
TRC	990630	1550	87	21	8	170	102	-98	20	176	32.62	13.70	30.09
TRC	990630	1650	86	21	9	195	94	-98	16	206	32.62	13.70	30.08

TRC	990630	1850	82	25	5	198	90	-98	13	197	32.62	13.10	30.07
TRC	990701	1250	85	22	4	141	106	-98	11	167	32.62	13.70	30.04
TRC	990701	1350	85	21	8	176	103	-98	15	129	32.62	13.70	30.02
TRC	990701	1450	85	21	9	188	101	-98	16	173	32.62	13.70	30.01
TRC	990701	1550	85	22	10	171	98	-98	16	188	32.62	13.70	29.99
TRC	990701	1650	85	25	7	188	90	-98	15	163	32.62	13.70	29.99
TRC	990701	1750	81	29	5	148	82	-98	12	156	32.62	13.50	29.98
TRC	990701	2050	67	42	4	128	63	-98	13	185	32.62	13.00	29.99
TRC	990701	2150	64	43	4	117	61	-98	9	170	32.62	12.90	30.00
TRC	990701	2250	61	44	4	140	58	-98	7	130	32.62	12.90	30.00
TRC	990701	2350	60	39	7	158	56	-98	16	173	32.62	12.90	30.00
TRC	990702	0050	56	38	5	115	53	-98	13	155	32.62	12.90	29.99
TRC	990702	0150	55	35	5	106	51	-98	9	117	32.62	12.80	29.98
TRC	990702	0250	54	31	7	118	51	-98	9	125	32.62	12.80	29.98
TRC	990702	0350	53	30	5	114	49	-98	10	114	32.62	12.80	29.97
TRC	990702	0450	52	30	4	116	48	-98	7	128	32.62	12.70	29.98
TRC	990702	0550	55	30	3	135	63	-98	7	102	32.62	12.80	29.98
TRC	990702	0650	58	31	4	96	72	-98	6	120	32.62	12.80	29.97
TRC	990702	0750	60	30	5	144	80	-98	8	141	32.62	13.30	29.98
TRC	990702	0850	64	30	4	137	86	-98	9	104	32.62	13.50	29.97
TRC	990702	0950	70	26	5	122	91	-98	11	102	32.62	13.60	29.96
TRC	990702	1050	73	23	5	127	94	-98	16	175	32.62	13.70	29.95
TRC	990702	1150	73	21	10	178	93	-98	20	187	32.62	13.80	29.93
TRC	990702	1250	76	20	7	169	94	-98	21	198	32.62	13.80	29.92
TRC	990702	1350	75	21	13	204	90	-98	22	184	32.62	13.80	29.91
TRC	990702	1450	75	22	11	207	90	-98	25	214	32.62	13.80	29.90
TRC	990702	1550	72	24	13	208	84	-98	27	167	32.62	13.80	29.89
TRC	990702	1650	70	26	12	209	75	-98	27	222	32.62	13.90	29.88
TRC	990702	1750	68	28	10	167	69	-98	23	179	32.62	13.80	29.90
TRC	990702	1950	59	39	13	183	57	-98	23	154	32.62	13.00	29.92
TRC	990702	2050	56	42	13	180	54	-98	24	179	32.62	12.90	29.91
TRC	990702	2150	54	44	7	129	52	-98	18	190	32.62	12.90	29.92
TRC	990702	2250	52	47	9	153	50	-98	15	151	32.62	12.90	29.92
TRC	990702	2350	50	48	8	116	47	-98	13	115	32.62	12.90	29.93
TRC	990703	0050	48	53	5	107	45	-98	11	124	32.62	12.80	29.93


WIND FIELD MAP 1:24000
OF Lowden Fire 7/2/99
N
↑ : Arrows indicate eye level wind directions based on 20' General winds, up canyon, up slope winds and topographical influences.
7/5/99
Fontana
Salt Flat
Lowden Ranch
Trinity River
Grass Valley
Fawn Lodge Station (CDF)
(WEAVERVILLE)

to convert to mph kts x 1.15

Untitled

30 Minute Data

month day	hour min	avg wind knots	avg wind degrees	max wind knots	max wind degrees	std dev wind direct
7 1	1600	6.439	252.6	17.06	303.6	33.66
7 1	1630	5.869	268.8	14.43	260.4	35.29
7 1	1700	5.304	274.4	12.18	260.9	39.94
7 1	1730	4.793	280	12.68	300.2	47.65
7 1	1800	4.953	262.8	14.54	291.4	42.07
7 1	1830	3.735	258.3	11.04	280.5	49.11
7 1	1900	4.844	271.1	17.25	274.2	32.54
7 1	1930	7.05	273.1	12.64	271.9	27.07
7 1	2000	7.82	268.6	15.3	262.3	23.92
7 1	2030	7.33	267.7	16.79	253.6	28.94
7 1	2100	2.917	245.7	9.97	239	39.54
7 1	2130	1.814	204.7	5.216	216.2	28.98
7 1	2200	2.077	217	6.853	171.2	38.41
7 1	2230	3.705	219.4	9.82	258.8	32.54
7 1	2300	3.55	214.5	10.47	214.6	24.96
7 1	2330	3.832	201.5	9.59	201.9	29.42
7 1	2400	4.173	205.5	10.09	181	22.04
7 2	30	3.774	206.2	8.07	266.6	21.63
7 2	100	4.813	217.8	12.56	214.3	21.42
7 2	130	4.713	212	9.78	193.7	23.2
7 2	200	4.907	219.3	9.78	231.4	21.28
7 2	230	5.019	220.8	10.85	245	21.58
7 2	300	5.426	234.8	10.93	232.9	16.74
7 2	330	3.625	233.6	8.87	230.9	15.06
7 2	400	3.828	237.7	7.2	248.8	16.2
7 2	430	3.919	233.6	8.11	256.5	25
7 2	500	3.118	221.8	7.42	206.8	23.45
7 2	530	3.575	222.2	8.45	276.8	25.38
7 2	600	3.313	228.4	6.091	185.6	23.43
7 2	630	2.926	225.6	6.32	228.1	19.19
7 2	700	2.743	208.3	5.863	202.1	22.41
7 2	730	2.159	180.2	5.787	216.1	19.49
7 2	800	1.278	182.5	3.236	191.2	30.03
7 2	830	1.23	185.2	3.655	199.7	30.07
7 2	900	1.649	173.9	3.807	151.1	29.61
7 2	930	1.01	200.3	3.845	157.7	35.82
7 2	1000	1.901	182	6.053	160.3	34.43
7 2	1030	1.832	227.6	5.33	275.5	46
7 2	1100	2.569	229.6	9.67	255.8	42.17
7 2	1130	4.056	246.1	12.37	290.5	40.71
7 2	1200	4.701	282.5	11.8	289.9	36.8
7 2	1230	4.928	263.4	13.06	281	45.21

Untitled

7 2	1300	6.197	271.2	15.53	297.6	33.38
7 2	1330	5.747	260.1	14.35	286.9	35.06
7 2	1400	6.366	253.7	16.83	246.1	41.38
7 2	1430	6.747	264.9	17.89	264.9	34.56
7 2	1500	5.724	265.1	16.18	247.5	39.9
7 2	1530	7.93	254.7	16.71	228.3	32.11
7 2	1600	7.74	253.5	21.78	250.5	33.98
7 2	1630	8.24	255.8	20.37	253.1	33.92

30 Minute Data

month day	hour min	avg wind knots	avg wind degrees	max wind knots	max wind degrees	std dev wind direct
7 2	1700	7.72	265.8	21.05	267.5	35.23
7 2	1730	6.294	291.5	15.76	262.2	34.87
7 2	1800	7.45	258.2	17.28	273.4	34.01
7 2	1830	5.738	236.4	21.24	273.7	37.65
7 2	1900	3.819	235.7	10.93	287.8	36
7 2	1930	3.727	248.1	12.22	238.2	42.87
7 2	2000	3.343	261.1	12.26	267.9	45.89
7 2	2030	5.059	252.6	12.56	262.1	31.22
7 2	2100	3.917	242.4	11.57	207.7	27.77
7 2	2130	3.399	248.1	7.92	255.8	26.21
7 2	2200	3.382	240.5	8.22	258.4	25.58
7 2	2230	3.298	219.9	9.06	222.8	25.33
7 2	2300	3.379	232.9	8.95	233.2	21.6
7 2	2330	2.991	219.5	5.825	221	17.82
7 2	2400	2.431	212.1	5.444	235.2	17.15
7 3	30	2.723	218.3	6.091	260.2	17.36
7 3	100	2.27	212.8	5.901	209	15.43
7 3	130	2.406	203.6	4.721	198.4	12.87
7 3	200	2.1	195.4	5.063	194	12.81
7 3	230	2.452	202.9	5.254	200.3	15.02
7 3	300	2.117	206	4.302	197.9	12.01
7 3	330	1.833	188.7	4.454	190.9	11.45
7 3	400	1.858	199.1	4.226	198.8	8.81
7 3	430	1.348	189.8	3.845	204.3	18.98
7 3	500	1.461	204.6	2.893	230.1	18.42
7 3	530	.633	201.7	2.817	223.5	58.64
7 3	600	.872	186.1	3.959	239.2	46.29
7 3	630	1.221	198.2	2.741	214.8	7.66
7 3	700	.274	175.3	1.371	169.1	6.451
7 3	730	.975	182.2	2.931	195.9	13.39

REDDING INTERAGENCY FIRE FORECAST AND WARNING UNIT
1400PDT MONDAY JUNE 28, 1999
Spot Forecast for the Lowden Ranch Burn

T33N R9W Sec 23&24 Flat 10ac 1640-1738'

Based on data from Lewiston Fish Hatchery Weather Station

Discussion: High pressure will continue to build over the area. This will bring hotter and drier weather Tuesday and Wednesday. Winds aloft will continue to be northwest to northeast but surface winds will be upslope and upcanyon.

Tuesday: Clear. Max temp 95 to 100. Min humidity 19 to 24%. Wind calm to northeast 5 mph in the morning becoming upcanyon 3 to 7 mph by early afternoon.

Tuesday Night: Clear. Min temp upper 50s and lower 60s. Max humidity 65 to 75%. Wind calm to northeast 5 mph.

Outlook Wednesday: Clear. Max temp 100 to 105. Min humidity 12 to 18%. Wind upcanyon 4 to 8 mph in the afternoon.

Fontana

ATTN
DOUG
HELD

ZCZC SFOFWFRDD W
TTAA00 KRDD DDHHMM
Redding Interagency Fire Forecast and Warning Unit
Morning General Forecast
0930 PDT Thursday, July 01, 1999

* * * Refine Red Flag Warning area for today to the following: Western Shasta and Tehama counties from the NW Sac Valley floor west and north to 3000' elevation. This area has low RH, tightening pressure gradients for NW to North (downslope) winds, and still hot temperatures. * * *

Discussion: Conditions still marginal for the above Red Flag, but it is breezy and dry in the above area. Air will be flowing from coastal surface high over coast range into thermal trough in valley. In the big picture, the large upper high stretches from the north-central Pacific to the SW United States. It will weaken in its middle portion over Calif today/Friday, allowing cool weather disturbances to carve out a trough southward along the PacNW coast. This will bring a cooling trend, but also gusty SW to NW winds winds Friday and Saturday. The marine layer deepened a lot overnight, with low cloud tops jumping from 1000' yesterday to 3000-3500' in Humboldt Co. this morning.

Haines	Low	Mid	High	Elevation
Medford	3	3	3	
Oakland	4	5	4	
Reno	N/A	4	4	

* *

ZONE 1 -- COASTAL STRIP - FROM COAST TO 10 MILES INLAND
ZONE 2 -- SIX RIVERS NF, HOOPA, AND ALL OF HUU EAST OF
THE COASTAL STRIP

Today:

Sky/Weather: Areas of morning fog/low clouds from Cape Mendocino northward, otherwise mostly sunny.
Max Temps: Upper 70s to near 90 inland, 60s to mid 70s in Zone 1.
Min Humidity: 25-55%, highest readings in Zone 1 and SW Zone 2.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: WNW to North 10-20 mph
Upper Slopes/Ridges: NW to North 12-25 mph.

Friday:

Sky/Weather: Partly cloudy to cloudy, with patchy fog. Mostly clearing southern Zone 1 and eastern Zone 2 after midday.
Max Temps: Cooler, in the 60s to lower 80s.
Min Humidity: 38-60%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: NW to North 12-25 mph, a few higher gusts.
Upper Slopes/Ridges: NW to North 15-30 mph.

* *

ZONE 3 -- WESTERN KLAMATH NF
ZONE 4 -- CENTRAL SISKIYOU COUNTY, INCLUDING SCOTT AND
SHASTA VALLEYS
ZONE 6 -- ALL OF TRINITY NF, AND CDF AREAS OF EASTERN
TRINITY COUNTY (ALSO INCLUDES SW SHU/NW TGU

ABOVE 2000 FEET
ZONE 7 -- SHASTA NF FROM MT EDDY-HWY 89 SOUTHWARD;
INCLUDES WHISKEYTOWN NP AND FRENCH GULCH AREA
ZONE 10 -- MENDOCINO COUNTY EAST OF THE COASTAL STRIP.
INCLUDING COVELO AND UPPER LAKE RD'S OF
MENDOCINO NF
ZONE 11 -- CORNING AND STONYFORD RD'S OF MENDOCINO NF AND
WESTERN TGU WHERE ABOVE 2000 FT

Today:

Sky/Weather: Sunny and not quite as warm.
Max Temps: 80s and 90s, near 100 hottest parts of Trinity Canyon.
Min Humidity: 12-25%
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to North increasing to 7-17 mph exposed terrain.
Upper Slopes/Ridges: West to NNW 12-25 mph, with isolated higher gusts.

Friday:

Sky/Weather: Patchy fog or low clouds in the morning in western drainages of Zones 3, 6, and 10. Otherwise mostly sunny, but locally breezy. Scattered clouds developing in p.m. hours.
Max Temps: A little cooler, from the mid 70s to near 90.
Min Humidity: 16-32%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NW increasing to 10-20 mph.
Upper Slopes/Ridges: WSW to NW 15-30 mph.

****
ZONE 5 -- SISKIYOU CO. FROM CASCADE CREST EASTWARD AND
HWY-89 NORTHWARD AND MODOC COUNTY EXCEPT
THE SURPRISE VALLEY
ZONE 8 -- EASTERN SHASTA, TEHAMA, AND BUTTE COUNTIES
ABOVE 2000 FT, WESTERN 2/3 OF LASSEN NP, AND PLUMAS
CO. WEST OF EVANS PK-GRIZZLY PK- BECKWOURTH PK LINE
ZONE 9 -- LASSEN COUNTY EXCEPT THE BLM AREA COVERED BY
RENO FIRE WX AND PLUMAS COUNTY EAST OF AN EVANS PK-
GRIZZLY PK-BECKWOURTH PK LINE

Today:

Sky/Weather: Sunny and quite warm.
Max Temps: 80s and 90s.
Min Humidity: 12-22%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: Variable to 12 mph morning hours, increasing to WSW to NW 10-18 mph in afternoon.
Upper Slopes/Ridges: SW to WNW increasing to 12-25 mph.

Friday:

Sky/Weather: Mostly sunny and a little cooler.
Max Temps: Upper 70s to lower 90s.

Min Humidity: 14-26%
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to West increasing to 10-22 mph in afternoon.
Upper Slopes/Ridges: SW to West 17-35 mph.

* *
ZONE 12 -- SACRAMENTO VALLEY AND FOOTHILLS (SHASTA, TEHAMA, GLENN, AND BUTTE COUNTIES BELOW 2000 FT)

Today:

Sky/Weather: Sunny and slightly cooler.
Max Temps: Upper 90s to near 103.
Min Humidity: 12-25%.
CWR: 0%. LAL: 1.
Wind: SW to NW mainly 7-15 mph.

Friday:

Sky/Weather: Mostly sunny and cooler.
Max Temps: Upper 80s to mid 90s.
Min Humidity: 18-34%
CWR: 0%. LAL: 1.
Wind: Variable under 10 mph in morning, then South to SW 8-18 mph in afternoon.

* *
* *
Outlook for Saturday through Monday: Partly cloudy and cooler Saturday, with possibly some overcast and slight shower chance in Oregon-border counties. Sunnier and getting a little warmer Sunday and Monday. Maximum temps 5-15 below early-July normals Saturday, warming to 2-7 below normal Monday. Winds SW to NW 7-17 mph, stronger at times near the coast and over high terrain.

6-10 day outlook July 6 through July 10: Little, if any, precip chance, with temperatures near normal.

END/Snook
NNNN

Redding IFFWU 1425 PDT Thu. July 1, 1999
Spot forecast for **Lowden Ranch burn,** BLM
Attn: **Doug Held**

Map available T 33N R 9W Secs 23 and 24 1640 to 1738' Grass Aspect: Flat to North 100 acres
On site weather from Lewiston Fish Hatchery via Internet (see Dell 2 favorites list)
Shows no wind since 2200 PDT yesterday. Max/Min temps: 94/53 RH 59/17%

Discussion: This is the last day of current heat wave under strong High pressure aloft. Friday will see beginning of switch to weekend dominance by a cooler low pressure trough off the West coast. This will switch gradient winds to less NW to North and more SW to West through Lewiston area. Look for temps to drop by as much as 15-17 degrees by Sunday, with a deeper marine influence bringing RH up slightly Friday and more substantially on the weekend. I don't expect you'll see any precip associated with the trough.

Friday: Mostly sunny, might have scattered afternoon cumulus or strato-cumulus. LAL: 1. Max temps cooler, in the upper 80s. Minimum RH 20-25%. Eye-level winds upslope 1-3 mph in morning, becoming West to SW (up the drainage) and increasing to 4-8 mph in the afternoon, with gusts 11-14 mph mid and late afternoon.

Friday night: Scattered clouds, with a chance of becoming broken for a few hours late night. LAL: 1 Min temps 46-49 with maximum RH around 75%. Winds decreasing after dark to variable under 6 mph, mainly SW to West, but could become just light downslope under drainage inversion.

Outlook Saturday: Partly cloudy, with the chance of showers under 5%. Max temps cooler in the lower 80s, with minimum RH 27-33%. Winds similar to Saturday's.

Snook

ZCZC SFOFWFRDD W
TTAA00 KRDD DDHHMM
Redding Interagency Fire Forecast and Warning Unit
Afternoon General Forecast
1530 PDT Thursday, July 01, 1999

* * * Cancel the Red Flag Warning for Western Shasta/Tehama counties from the NW Sac Valley floor west and north to 3000' elevation as of 2100 PDT this evening.
* * * Begin a Fire Weather Watch for Friday for Cascades/Sierras eastward for gusty SW to West winds combined with low RH. This is narrative Zones 5, 9, and eastern 8. * * *

Discussion: Skies are clear over nearly all of district under strong high pressure aloft. Cooling so far has been minor well inland but significant within 50 miles of coast, due to deeper marine influence. A trough of low pressure aloft will gradually deepen southward into the district over the next 2 ½ days, bringing about 10-15 degrees of cooling by Saturday or Sunday. Gradient winds will become a more general SW to West across mid and higher terrain Friday, with a chance of afternoon gusts to 30 mph on the Modoc Plateau – hence the above F.W. Watch. The trough won't produce much weekend precip threat, except for a short-lived chance in the Oregon-border counties Saturday/early Sunday.

* *
ZONE 1 -- COASTAL STRIP - FROM COAST TO 10 MILES INLAND
ZONE 2 -- SIX RIVERS NF, HOOPA, AND ALL OF HUU EAST OF
THE COASTAL STRIP

Tonight:

Sky/Weather: Increasing fog/low clouds, mainly north of Cape Mendocino- Dinsmores line. Otherwise skies mostly clear.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: NW to North 4-12 mph, higher gusts in coastal Zone 1.
Upper Slopes/Ridges: NW to North 12-25 mph.

Friday:

Sky/Weather: Partly cloudy, with areas of morning fog/low overcast. Mostly sunny in southern Zone 1 and eastern Zone 2 in the afternoon.
Max Temps: Cooler, in the 60s to lower 80s.
Min Humidity: 35-60%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: NW to North 12-25 mph, a few higher gusts.
Upper Slopes/Ridges: NW to North 15-30 mph.

* *
ZONE 3 -- WESTERN KLAMATH NF
ZONE 4 -- CENTRAL SISKIYOU COUNTY, INCLUDING SCOTT AND
SHASTA VALLEYS
ZONE 6 -- ALL OF TRINITY NF, AND CDF AREAS OF EASTERN
TRINITY COUNTY (ALSO INCLUDES SW SHU/NW TGU
ABOVE 2000 FEET
ZONE 7 -- SHASTA NF FROM MT EDDY-HWY 89 SOUTHWARD;
INCLUDES WHISKEYTOWN NP AND FRENCH GULCH AREA
ZONE 10 -- MENDOCINO COUNTY EAST OF THE COASTAL STRIP,
INCLUDING COVELO AND UPPER LAKE RD'S OF
MENDOCINO NF

Tonight:

Sky/Weather: Clear skies.
CWR: 0%. LAL: 1.
Wind: Variable under 10 mph, mainly West to NW after sunset.

Friday:

Sky/Weather: Mostly sunny, and cooler.
Max Temps: Upper 80s to mid 90s.
Min Humidity: 18-34%
CWR: 0%. LAL: 1.
Wind: Variable under 10 mph in morning, then South to SW 8-18 mph in afternoon.

* *

Forecast for all zones Saturday:

Sky/Weather: Becoming partly cloudy by midday except mostly sunny Sac Valley and south end of district. Overcast possible for a few hours in Oregon-border counties, with a 10-20% chance of showers or isolated thunderstorms. Considerable low cloud cover along/near the coast through the morning.
Max Temps: Cooler 2-6 south but 5-11 north end district.
Min Humidity: Higher 8-20% north to 4-10% south.
CWR: 10% for a time in Oregon-border counties, otherwise near 0%0%. LAL: 1.
Wind: South to West increasing to 12-25 mph, higher ridge level gusts.

* *

Outlook for Sunday through Tuesday: Partly to mostly sunny Sunday. Mostly sunny Monday and Tuesday, with some afternoon clouds across the northern mountains. Maximum temps 6-12 below early-July normals Sunday, then a warming trend. Winds SW to NW 7-15 mph, stronger at times near the coast and over high terrain.

6-10 day outlook July 7 through July 11: Little precip chance (if any), with temperatures near normal.

END/Snook
NNNN

ZCZC SFOFWFRDD W
TTAA00 KRDD DDHHMM
Redding Interagency Fire Forecast and Warning Unit
Morning General Forecast
0930 PDT Friday, July 02, 1999

*** Change Fire Weather Watch for Cascade/Sierras eastward to a Red Flag Warning. This warning covers Zones 5, 9, and eastern 8, for gusty SW to West winds this afternoon, along with locally low humidities * * *

Discussion: The upper level high pressure ridge which has produced several days of hot weather will weaken today and Saturday. Meanwhile a trough of low pressure will sag southward along the Pacific coast. Pressure gradients for SW to NW winds will tighten today, bringing a generally breezy day to all elevations of the district. Warning area (Zones 5, 9, and eastern 8) will see strongest SW to West gusts in 25-35mph range this afternoon. Saturday will see trough at its deepest, producing SW gradient winds and partly cloudy skies across the northern mountains for a time. Shower potential is quite limited though. High pressure rebuilds for a warm dry week ahead, with a stable airmass.

Haines	Low	Mid	High Elevation
Medford	3	2	4
Oakland	4	5	5
Reno	N/A	N/A	5

* *
ZONE 1 -- COASTAL STRIP - FROM COAST TO 10 MILES INLAND
ZONE 2 -- SIX RIVERS NF, HOOPA, AND ALL OF HUU EAST OF
THE COASTAL STRIP

Today:

Sky/Weather: Low clouds and patchy fog this morning in Humboldt/ southern Del Norte Co. interiors but not much at the coast. Otherwise mostly sunny.
Max Temps: 60s coast to 70s and lower 80s inland.
Min Humidity: 33-58%, with the highest readings in northern Zone 1 and western 2.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NNW increasing to 10-22 mph exposed terrain.
Upper Slopes/Ridges: WNW to North 12-25 mph, local Zone 1 gusts in 30s.

Saturday:

Sky/Weather: Some low clouds Cape Mendocino northward in the morning, otherwise mostly sunny except partly cloudy in and near Del Norte Co.
Max Temps: 60s coast to 70s inland.
Min Humidity: 40-60%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NNW increasing to 7-15 mph by early afternoon.
Upper Slopes/Ridges: West to NW 12-22 mph.

* *
ZONE 3 -- WESTERN KLAMATH NF
ZONE 4 -- CENTRAL SISKIYOU COUNTY, INCLUDING SCOTT AND
SHASTA VALLEYS
ZONE 6 -- ALL OF TRINITY NF, AND CDF AREAS OF EASTERN
TRINITY COUNTY (ALSO INCLUDES SW SHU/NW TGU

ABOVE 2000 FEET
ZONE 7 -- SHASTA NF FROM MT EDDY-HWY 89 SOUTHWARD;
INCLUDES WHISKEYTOWN NP AND FRENCH GULCH AREA
ZONE 10 -- MENDOCINO COUNTY EAST OF THE COASTAL STRIP,
INCLUDING COVELO AND UPPER LAKE RD'S OF
MENDOCINO NF
ZONE 11 -- CORNING AND STONYFORD RD'S OF MENDOCINO NF AND
WESTERN TGU WHERE ABOVE 2000 FT

Today:

Sky/Weather: Mostly sunny, scattered clouds at times.
Max Temps: Cooler, in the upper 70s and 80s.
Min Humidity: 13-25%, except 22-32% in western Zones 3 and 10.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to NW increasing in afternoon to 8-18 mph, local gusts in lower 20s.
Upper Slopes/Ridges: SW to WNW increasing to 15-30 mph.

Saturday:

Sky/Weather: Mostly sunny south and partly cloudy north, after patches of low clouds in Zones 3, 6, and 10 during the morning hours. A 10% chance of showers in Zones 3 and 4.
Max Temps: Cooler, in the 70s to lower 80s.
Min Humidity: 20-40%.
CWR: 2-5% in Zone 3 and 4, elsewhere near 0% LAL: 1.
Wind:
Valleys/Lower Slopes: SW to NW 5-15 mph.
Upper Slopes/Ridges: SW to WNW 12-25 mph, with local gusts 30.

****

ZONE 5 -- SISKIYOU CO. FROM CASCADE CREST EASTWARD AND
HWY-89 NORTHWARD AND MODOC COUNTY EXCEPT
THE SURPRISE VALLEY
ZONE 8 -- EASTERN SHASTA, TEHAMA, AND BUTTE COUNTIES
ABOVE 2000 FT, WESTERN 2/3 OF LASSEN NP, AND PLUMAS
CO. WEST OF EVANS PK-GRIZZLY PK- BECKWOURTH PK LINE
ZONE 9 -- LASSEN COUNTY EXCEPT THE BLM AREA COVERED BY
RENO FIRE WX AND PLUMAS COUNTY EAST OF AN EVANS PK-
GRIZZLY PK-BECKWOURTH PK LINE

Today:

Sky/Weather: Mostly sunny, with patchy high clouds at times in the north.
Max Temps: Cooler, in the 70s to mid 80s, except near 90 west fringe of Zone 8.
Min Humidity: 11-22%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to WNW increasing to 10-20 mph, with local gusts near 30 mph this aftenoon.
Upper Slopes/Ridges: SW to West increasing to 18-35 mph, isolated higher gusts.

Saturday:

Sky/Weather: Partly cloudy in Zone 5, with a chance of an isolated shower. Mostly sunny in Zones 8 and 9, with scattered clouds for a time.

ZONE 11 -- CORNING AND STONYFORD RD'S OF MENDOCINO NF AND
WESTERN TGU WHERE ABOVE 2000 FT

Tonight:

Sky/Weather: Clear skies, except a few late night low clouds into west part of Zones 3, 6, and 10.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: WNW to North 4-12 mph.
Upper Slopes/Ridges: WNW to North 12-22 mph, with a few higher gusts.

Friday:

Sky/Weather: Patchy fog or low clouds in the morning in western drainages of Zones 3, 6, and 10. Otherwise mostly sunny, but locally breezy. Scattered clouds developing in p.m. hours.
Max Temps: Cooler, ranging from the mid 70s to near 90.
Min Humidity: 16-32%.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: Becoming SW to NW increasing to 10-20 mph.
Upper Slopes/Ridges: WSW to NW 15-30 mph.

* *

ZONE 5 -- SISKIYOU CO. FROM CASCADE CREST EASTWARD AND
HWY-89 NORTHWARD AND MODOC COUNTY EXCEPT
THE SURPRISE VALLEY
ZONE 8 -- EASTERN SHASTA, TEHAMA, AND BUTTE COUNTIES
ABOVE 2000 FT, WESTERN 2/3 OF LASSEN NP, AND PLUMAS
CO. WEST OF EVANS PK-GRIZZLY PK- BECKWOURTH PK LINE
ZONE 9 -- LASSEN COUNTY EXCEPT THE BLM AREA COVERED BY
RENO FIRE WX AND PLUMAS COUNTY EAST OF AN EVANS PK-
GRIZZLY PK-BECKWOURTH PK LINE

Tonight:

Sky/Weather: Clear skies.
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NNW 7-15 mph early evening, decreasing to variable under 8 mph.
Upper Slopes/Ridges: West to NW 12-25 mph.

Friday:
* * Fire weather Watch for gusty increaing SW to West winds, along with low RH * * *

Sky/Weather: Mostly sunny and a little cooler.
Max Temps: Upper 70s to lower 90s.
Min Humidity: 13-24%
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to West increasing to 11-22 mph in afternoon.
Upper Slopes/Ridges: SW to West 17-35 mph.

* *

ZONE 12 -- SACRAMENTO VALLEY AND FOOTHILLS (SHASTA,
TEHAMA, GLENN, AND BUTTE COUNTIES BELOW 2000 FT)

Max Temps: Cooler, in the 60s to near 80.
Min Humidity: 15-30%, highest in Zone 5.
CWR: 5% far north, elsewhere near 0% LAL: 1.
Wind:
Valleys/Lower Slopes: SW to West 10-20 mph, with higher afternoon gusts.
Upper Slopes/Ridges: SW 18-35 mph, higher gusts possible.

* *
ZONE 12 -- SACRAMENTO VALLEY AND FOOTHILLS (SHASTA, TEHAMA, GLENN, AND BUTTE COUNTIES BELOW 2000 FT)

Today:

Sky/Weather: Sunny and a little cooler.
Max Temps: 90s.
Min Humidity: 13-28%, driest in the north.
CWR: 0%. LAL: 1.
Wind: Some north wind to 12 mph in the north valley this morning, otherwise South to SW winds increasing to 8-18 mph most areas this afternoon.

Saturday:

Sky/Weather: Mostly sunny.
Max Temps: Cooler, in the 80s.
Min Humidity: 18-33%.
CWR: 0%. LAL: 1.
Wind: SSE to SW 8-18 mph.

* *
* *
Outlook for Sunday through Tuesday: Fair except partly cloudy near the Oregon border at times. Also patchy night/morning fog or low clouds along and near the coast. Maximum temps moving from a little below early-July normals Sunday to just above on Tuesday. Winds varying SW to NW 5-15 mph for the most part.

6-10 day outlook July 7 through July 11: Dry and warm.

END/Snook
NNNN

ZCZC SFOFWFRDD W
TTAA00 KRDD DDHHMM
Redding Interagency Fire Forecast and Warning Unit
Afternoon General Forecast
1530 PDT Friday, July 02, 1999

*** Continue Red Flag Warning in Zones 5, 9, and eastern 8 until midnight. Warning is for gusty SW to West, along with generally low humidities * * *

Discussion: The low pressure trough which is gradually deepening south along the West coast is kicking up SSW to West winds on exposed mid and high terrain this afternoon. Quite a few RAWS stations reported peak gusts between 15 and 25 mph in past hour. Breezy areas will have only poor to fair RH recovery tonight. Saturday p.m. to Sunday a.m. will see trough at its deepest, producing SW gradient winds and partly cloudy skies across the northern mountains for a time Saturday. Shower potential is quite limited, and high pressure rebuilds for a warm dry week ahead, with a stable airmass.

* *

ZONE 1 -- COASTAL STRIP - FROM COAST TO 10 MILES INLAND
ZONE 2 -- SIX RIVERS NF, HOOPA, AND ALL OF HUU EAST OF
THE COASTAL STRIP

Tonight:

Sky/Weather: Increasing low clouds with patchy fog, mainly north of Cape Mendocino- Dinsmores. Otherwise mostly clear skies in southern Zone 1.
CWR: Near 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NW 8-20 mph until sunset, then decreasing to 4-12 mph.
Upper Slopes/Ridges: West to NW 12-22 mph, local Zone 1 gusts to 30-35 mph.

Saturday:

Sky/Weather: Partly to mostly cloudy Cape Mendocino northward - especially in the morning- with a slight chance of an isolated light shower. Partly to mostly sunny south of Cape Mendocino.
Max Temps: Cooler, from the 60s coast to 70s inland.
Min Humidity: 35-57%
CWR: 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: West to NNW increasing to 7-15 mph by early afternoon.
Upper Slopes/Ridges: West to NW 12-22 mph.

* *

ZONE 3 -- WESTERN KLAMATH NF
ZONE 4 -- CENTRAL SISKIYOU COUNTY, INCLUDING SCOTT AND
SHASTA VALLEYS
ZONE 6 -- ALL OF TRINITY NF, AND CDF AREAS OF EASTERN
TRINITY COUNTY (ALSO INCLUDES SW SHU/NW TGU
ABOVE 2000 FEET
ZONE 7 -- SHASTA NF FROM MT EDDY-HWY 89 SOUTHWARD;
INCLUDES WHISKEYTOWN NP AND FRENCH GULCH AREA
ZONE 10 -- MENDOCINO COUNTY EAST OF THE COASTAL STRIP,
INCLUDING COVELO AND UPPER LAKE RD'S OF
MENDOCINO NF
ZONE 11 -- CORNING AND STONYFORD RD'S OF MENDOCINO NF AND
WESTERN TGU WHERE ABOVE 2000 FT

Tonight:

Sky/Weather: Mostly clear, becoming partly cloudy late night, with patchy fog in Zones 3, 6, and 10 drainages.
CWR: Near 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to WNW 8-18 mph early evening, then decreasing to variable under 10 mph.
Upper Slopes/Ridges: SW to WNW 12-25 mph, with locally higher evening gusts.

Saturday:

Sky/Weather: Mostly sunny south and partly cloudy north, after patches of low clouds in Zones 3, 6, and 10 during the morning. A slight (10%) chance of showers in Zones 3 and 4.
Max Temps: Cooler, in the 70s to lower 80s.
Min Humidity: 20-40%.
CWR: 2-5% in Zone 3 and 4, elsewhere near 0% LAL: 1.
Wind:
Valleys/Lower Slopes: SW to NW 5-15 mph.
Upper Slopes/Ridges: SW to WNW 12-25 mph, with local gusts 30.

* *
ZONE 5 -- SISKIYOU CO. FROM CASCADE CREST EASTWARD AND
HWY-89 NORTHWARD AND MODOC COUNTY EXCEPT
THE SURPRISE VALLEY
ZONE 8 -- EASTERN SHASTA, TEHAMA, AND BUTTE COUNTIES
ABOVE 2000 FT, WESTERN 2/3 OF LASSEN NP, AND PLUMAS
CO. WEST OF EVANS PK-GRIZZLY PK- BECKWOURTH PK LINE
ZONE 9 -- LASSEN COUNTY EXCEPT THE BLM AREA COVERED BY
RENO FIRE WX AND PLUMAS COUNTY EAST OF AN EVANS PK-
GRIZZLY PK-BECKWOURTH PK LINE

Tonight: * * * Continue the Red Flag Warning until midnight, for gusty SW to West winds with generally low RH * * *

Sky/Weather: Mostly clear skies, a few high cloud patches.
CWR: Near 0%. LAL: 1.
Wind:
Valleys/Lower Slopes: SW to WNW 10-20 mph, with higher gusts through early evening. Winds decreasing after dark.
Upper Slopes/Ridges: SW to West 18-35 mph.

Saturday:

Sky/Weather: Partly cloudy in Zone 5, with a slight chance of an isolated shower. Mostly sunny in Zones 8 and 9, with scattered clouds over the higher Cascade/Sierras for a time.
Max Temps: Cooler, in the 60s to near 80.
Min Humidity: 15-30%, highest in Zone 5.
CWR: 5% far north, elsewhere near 0% LAL: 1.
Wind:
Valleys/Lower Slopes: SW to West 10-20 mph, with higher afternoon gusts.
Upper Slopes/Ridges: SW 18-35 mph, higher gusts possible.

* *
ZONE 12 -- SACRAMENTO VALLEY AND FOOTHILLS (SHASTA,
TEHAMA, GLENN, AND BUTTE COUNTIES BELOW 2000 FT)

Tonight:

Sky/Weather: Fair skies.
CWR: 0%. LAL: 1.
Wind: Variable,mainly south to west, at 7-15 mph early evening, becoming lighter SW to NW after dark.

Saturday:

Sky/Weather: Mostly sunny.
Max Temps: Cooler, in the 80s to near 90.
Min Humidity: 16-30%.
CWR: 0%. LAL: 1.
Wind: SSE to SW 8-18 mph.

****

Forecast for all Zones Sunday:

Sky/Weather: Mostly sunny after some morning low clouds in and west of coast ranges.
Max Temps: :Little change.
Min Humidity: Little change to higher 8%
CWR: Near 0%. LAL: 1.
Wind: NW to NNE 7-15 mph, with a few higher morning gusts.

****

Outlook for Monday through Wednesday: Fair except scattered clouds near the Oregon border at times. Also patchy night/morning fog or low clouds along and near the coast. Maximum temps moving from near to a little above early-July normals over the period. Winds varying SW to NW 5-1: mph for the most part.

6-10 day outlook July 7 through July 11: Dry and warm.

END/Snook
NNNN

Redding IFFWU 2215 PDT Friday July 2, 1999
Spot forecast for **Lowden Fire**, BLM/CDF

Map available T 33N R 9W Secs 23 and 24 1640 to 1738' Grass Aspect: Flat to North 100 acres

OBSERVATIONS
1) Two evening weather obs (from Ralph Minnick, CDF), as follows:
At intersec. Of Lewiston Turnpike and Trinity Dam Road..... Temp 74 RH 26%
Wind (eye-level?) SW 6-9 mph
On Hoadley Peak; Temp 68 Wind south 8-12 mph
2) Near site weather from Lewiston Fish Hatchery via Internet
24-hour summary through 2000 PDT 7/2/99: Max/Min Temps 85/50 RH 49/13%
Peak wind SW 19 mph at 1400 PDT Friday, otherwise generally 3-7 mph, with one 12 mph reading.
3) Also from Trinity Camp RAWS: Temps 76/52 RH 44/20/42% Peak winds (20') today were South to SW 9-13 mph, with gusts 22-27 mph.

Discussion: The rather dry low pressure trough will deepen a little farther south tonight/Saturday, with Saturday's winds similar to today. There will be a little more of a SW'ly component aloft, sending smoke more toward the NE rather than East. By Sunday, most of the energy will have moved through the bottom of the trough and lifted out, which will help decrease the winds some.

Rest of Friday night: Clear skies, with possibly scattered clouds late night hours. Min temps from upper 40s river bottom to low 50s mid slope. Max RH ranging from near 45% upper slopes of fire area to near 60-65% river bottom. Winds variable 2-5 gusts 7-9 mph, mainly WNW to North, but locally light downslope on lower slopes by later night hours. Any inversion in drainage will likely be weak.

Saturday: Varying partly to mostly sunny. Chance of showers under 5%. LAL 1. Max temps cooler, in the 70s to near 80. Minimum relative humidity 21-27%. Eye-level winds a lot like Friday's... Upslope to SW 3-7 mph in the morning, increasing midday and becoming SSW to WSW 5-10 mph, with peak afternoon gusts 14-18 mph.

Saturday night: Partly cloudy. LAL 1. Min temps 40s with max RH improved to 60-67% ridges and 80-90% river bottom. Winds breezy from SW in early evening, then decreasing after dark to variable under 7 mph, mainly West to North, except occasionally SW to West 5-9 mph at ridge levels.

Outlook Sunday: Mostly sunny. LAL 1. Max temps slightly warmer, with minimum RH 19-26%. Winds SSW to WNW increasing to 3-7 gusts 10-15 mph.

Snook

Table 1. Weather Observations & Fire Behavior Predictions*

INPUTS	PRESCRIPTION **	FORECASTED***	1000	1030	1100	1200	1300	1330	1400	1445
TEMP, F°	70-90	85	72	72	74	79	83	83	86	85
RH%	14-40	20	25	29	30	26	17	19	17	16
FUEL MODEL ****	1	1	1	1	1	1	1	1, 9	1, 9	9
1HR FUEL MOIST. %	6-10	3	5	5	6	4	2	2, 5	2, 5	5
10HR FUEL MOIST %	0	N/A	0	N/A	0	0	0	0, 6	0, 6	6
100 HR FUEL MOIST %	0	N/A	0	N/A	0	0	0	0, 7	0, 7	7
MFWS, MI/H*****	2-5	4-8	3	7	7	7	9	9	9	3
SLOPE %	0-30	N/A	0	0	0	0	0	0, 60	0, 60	60
WIND VECTOR, Degrees	ALL	180	180	180	180	180	180	180, 270	180, 270	0
PREDICT AT MAX? Y/N	NO	NO	NO	NO	NO	NO	NO	NO/YES	NO/YES	YES
OUTPUTS										
Rate of Spread, chains/hr	1-5	9	4	7	7	7	11	11, 25	11, 25	10
Heat/Unit Area, btu/sqft	59-91	103	92	92	91	96	116	116, 390	116, 390	390
Fireline Intensity, btu/ft/sec	2-8	17	6	12	11	13	24	24, 181	24, 181	70
Flame Length, feet	0.6-1.2	1.7	1.0	1.4	1.3	1.5	1.9	1.9, 4.9	1.9, 4.9	3.2
Reaction Intensity, btu/sqft/m	538-826	939	843	843	826	874	1057	1057,2524	1057,2524	2524
Effective Windspeed, mi/h	0-2	1.0	0	.9	.9	.9	1.0	1.0, 9.1	1.0, 9.1	5.1
Direction of Spread, degrees	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A, 282	N/A, 282	0
Spotting Distance, mi	0-0.1	.4	.1		.3	.3	.5	.5, .3	.3, .3	.1
Probability of Ignition, %	30-60	90	60	60	60	70	100	100, 70	100, 70	70

Bold (color) numbers indicate values exceeding prescription range in approved project plan.

* Fire behavior predictions calculated using BEHAVE. Weather observations taken at project site, various locations, at 1700 feet elevation (refer to Weather Observation sheets in Appendix _____).

** Expected weather and predicted fire behavior (burn prescription) from Lowden Ranch Prescribed Fire Project Plan, Section 6, Weather and Fuel Parameters.

*** Predicted fire behavior predictions calculated using IFFWU Spot Weather Forecast dated 1425 PDT THU. July 1,1999.

**** NFFL Fuel Models used include 1 and 9. FM1 was identified in the burn plan as the descriptive fuel model (refer to Section I B, 1&2.

***** MFWS is the acronym for "Mid-Flame Wind Speeds," or eye-level winds.

Head Fire Calculations for Fuel Model 1, Short Grass using 1400 hour weather observations (immediately after prescribed burn declared a wildfire):

Rate of Spread: 457 chains/hour
Flame Length: 10.7
Spot Distance: .5
Prob of Ignition: 70
Scorch Height: 17

WEATHER OBSERVATIONS

FIRE#/NAME ______ LOCATION ______ DATE ______ OBSERVER(S) ______ P.___ OF___

LOCATION	ELEVATION	TIME	WIND DIRECTION	EYE LEVEL WIND SPEED	DB	WB	RH	Wx* STATE	ASPECT	10-HR TLFM	REMARKS
MiDle of Burn East side	1700	1000	S	2-3	72	53	25	6	F		TAKEN BY ROAD
NORTH EAST END	1700	1030	SW	6-7 g9	72	54	29	0	F		TAKEN BY ROAD
" " "	1700	1100	SW	6-7 g10	74	56	30	0	F		" " "
MiDle of Burn interior	1700	1120	SW	7 g10	75	57	31				
middle of burn · west	1700	1200	S/SW	6-7 g10	79	57	26				by rock pile
	1700	1230	S	6-7 g10	81	58	22				
mid of burn S. end	1700	1300	S	8-9 g12	83	57	17				spot fire stared
east side south end	1700	1330	S	8-9 g10	83	58	19				
" " "		1400	S	8-9 g10	86	59	17				
senter of Burn		1445	S	7-8 g10	85	58	16				
west side		1530	SW	5-6 g8	82	57	18				By creek

FIRE BEHAVIOR OBSERVATIONS

TIME	LOCATION	SPREAD DIRECTION	*ROS	*FL	FZD	FUEL MODEL	% SHADING	% SLOPE	SMOKE COLUMN MIX HEIGHT	SMOKE COLUMN DIRECTION	INFO DESCRIPTION	VISIBILITY	REMARKS
11:10	midle of Burn	B	1.5	2'	1	1	5	15	150'	~	Light	fair to mod	

*Rate of Spread (ROS): in/sec, or ft/min.
*Flame Length (FL): nearest inch (0-23 in); 0.5 foot (2-4 ft); 1.0 foot (4-15 ft); 5.0 foot (>15 ft)
*Zone Depth (FZD): nearest inch (0-23 in); 0.5 foot (2-4 ft); 1.0 foot (>4 ft)

Smoke Column Info:
-Use AGL measurement for column mixing height
-Describe column shape; layers or vertical growth
-Visibility for fireline or roads

*Remarks include:
-unusual fire behavior
-weather effects on fire behavior
-photo #

WEATHER OBSERVATIONS

FIRE#/NAME ____________
LOCATION ____________

DATE ____________
OBSERVER(S) ____________

P.____ OF____

LOCATION	ELE-VATION	TIME	WIND DIRECTION	EYE LEVEL WIND SPEED	DB	WB	RH	Wx* STATE	ASPECT	10-HR TLFM	REMARKS
ON Road	1700	1600	S	5-7 G8	86	58	15	1			
NEXT TO TRINITY RIVER	1700	1645	S/SW	5-6 g8	80	57	21				
W. EDGE OF BURN	1700	1745	W	5-6 g8	75	56	28				

READ ITALICIZED COLUMNS FOR SPOT WEATHER FORECASTS

State of Weather Codes: 0=clear; 1=10-60% cloud cover; 2=60-90% cloud cover; 3=90%+ cloud cover; 4=foggy; 5=drizzling; 6=raining; 7=snow or sleet; 8=showering; 9=thunderstorms

*Remarks include: ... erratic winds ... cloud type

FIRE BEHAVIOR OBSERVATIONS

TIME	LOCATION	SPREAD DIRECTION	*ROS	*FL	FZD	FUEL MODEL	% SHADING	% SLOPE	SMOKE COLUMN INFO: MIX HEIGHT	SMOKE COLUMN INFO: DIRECTION	SMOKE COLUMN INFO: DESCRIPTION	VISIBILITY	REMARKS

*Rate of Spread (ROS): in/sec, or ft/min.
*Flame Length (FL): nearest inch (0-23 in); 0.5 feet (2-4 ft); 1.0 feet (4-15 ft); 5.0 feet (>15 ft)
*Flame Zone Depth (FZD): nearest inch (0-23 in); 0.5 feet (2-4 ft); 1.0 feet (>4 ft)

Smoke Column Info:
-Use AGL measurement for column mixing height
-Describe column shape; layers or vertical growth
-Visibility for fireline or roads

*Remarks include:
-unusual fire behavior
-weather effects on fire behavior
-photo #

LEWISTON FISH HATCHERY *(LFH)*

Elevation: 1870' · TRINITY R basin · Operator: US Bureau of Reclamation

Query executed Sunday at 6:04:15

Select data type to plot recent data.

Date Time (PDT)	WIND SP *MPH*	WIND DR *DEG*	REL HUM *%*	BAT VOL *VOLTS*	RAINTIP *INCHES*	TEMP W *DEG F*	SOLAR R *CAL/CM*	TEMP AV *DEG F*	EVP PAN *INCHES*
Earlier									
1999 06/28 20:00	6.00	153.00	24.00	13.00	31.84	48.90	0.00	86.60	7.10
1999 06/28 21:00	0.00	92.00	31.00	13.00	31.84	48.90	0.00	79.30	7.10
1999 06/28 22:00	0.00	61.00	40.00	12.90	31.84	48.90	0.00	71.70	7.10
1999 06/28 23:00	0.00	336.00	42.00	12.90	31.84	49.00	0.00	69.20	7.10
1999 06/29 00:00	0.00	54.00	48.00	12.90	31.84	48.80	0.00	66.30	7.10
1999 06/29 01:00	2.00	92.00	55.00	12.80	31.84	48.70	0.00	63.10	7.10
1999 06/29 02:00	2.00	122.00	58.00	12.80	31.84	48.60	0.00	60.90	7.10
1999 06/29 03:00	0.00	84.00	58.00	12.80	31.84	48.60	0.00	59.20	7.20
1999 06/29 04:00	0.00	105.00	60.00	12.70	31.84	48.40	0.00	57.40	7.20
1999 06/29 05:00	0.00	84.00	63.00	12.70	31.84	48.20	0.00	55.80	7.20
1999 06/29 06:00	0.00	289.00	68.00	12.70	31.84	48.20	0.00	54.10	7.20
1999 06/29 07:00	0.00	301.00	70.00	12.70	31.84	48.10	0.00	53.60	7.20
1999 06/29 08:00	0.00	60.00	53.00	12.80	31.84	48.20	152.00	61.50	7.20
1999 06/29 09:00	0.00	85.00	46.00	12.80	31.84	48.30	222.00	69.30	7.20
1999 06/29 10:00	0.00	282.00	31.00	13.30	31.84	48.50	291.00	80.60	7.20
1999 06/29 11:00	0.00	64.00	28.00	13.30	31.84	48.60	355.00	83.70	7.20
1999 06/29 12:00	0.00	38.00	23.00	13.20	31.84	48.70	388.00	87.80	7.20
1999 06/29 13:00	0.00	269.00	22.00	13.20	31.84	48.80	403.00	93.30	7.20
1999 06/29 14:00	0.00	38.00	21.00	13.20	31.84	48.80	393.00	93.70	7.20
1999 06/29 15:00	3.00	96.00	19.00	13.20	31.84	48.90	372.00	97.50	7.20
1999 06/29 16:00	0.00	0.00	12.00	13.20	31.84	49.10	308.00	100.30	7.30
1999 06/29 17:00	6.00	248.00	16.00	13.20	31.84	49.10	230.00	99.10	7.30
1999 06/29 18:00	4.00	220.00	18.00	13.20	31.84	49.20	146.00	98.00	7.30
1999 06/29 19:00	5.00	202.00	21.00	13.20	31.84	49.00	74.00	94.80	7.40
1999 06/29 20:00	0.00	276.00	28.00	13.00	31.84	49.00	0.00	87.10	7.40
Later									
Latest									

LEWISTON FISH HATCHERY *(LFH)*

Elevation: 1870' · TRINITY R basin · Operator: US Bureau of Reclamation

Query executed Sunday at 6:06:43

Select data type to plot recent data.

Date Time (PDT)	WIND SP MPH	WIND DR DEG	REL HUM %	BAT VOL VOLTS	RAINTIP INCHES	TEMP W DEG F	SOLAR R CAL/CM	TEMP AV DEG F	EVP PAN INCHES
Earlier									
1999 06/30 22:00	3.00	107.00	31.00	12.90	31.84	49.00	0.00	74.70	7.80
1999 06/30 23:00	0.00	130.00	35.00	12.90	31.84	48.90	0.00	70.10	7.80
1999 07/01 00:00	0.00	75.00	44.00	12.80	31.84	49.00	0.00	66.40	7.90
1999 07/01 01:00	0.00	12.00	46.00	12.80	31.84	48.80	0.00	63.50	7.90
1999 07/01 02:00	0.00	139.00	49.00	12.80	31.84	48.70	0.00	61.80	7.90
1999 07/01 03:00	0.00	9.00	50.00	12.80	31.84	48.60	0.00	59.50	7.90
1999 07/01 04:00	0.00	107.00	53.00	12.70	31.84	48.60	0.00	57.20	7.90
1999 07/01 05:00	0.00	129.00	54.00	12.70	31.84	48.50	0.00	55.30	7.90
1999 07/01 06:00	0.00	93.00	58.00	12.70	31.84	48.30	0.00	54.00	7.90
1999 07/01 07:00	0.00	102.00	59.00	12.70	31.84	48.20	0.00	53.40	7.90
1999 07/01 08:00	0.00	71.00	47.00	12.80	31.84	48.30	158.00	60.80	7.90
1999 07/01 09:00	0.00	92.00	36.00	12.80	31.84	48.50	490.00	69.50	7.90
1999 07/01 10:00	0.00	53.00	21.00	13.40	31.84	48.60	317.00	76.30	7.90
1999 07/01 11:00	0.00	111.00	20.00	13.30	31.84	48.70	370.00	81.60	7.90
1999 07/01 12:00	--	--	--	--	--	--	--	--	--
1999 07/01 13:00	0.00	309.00	19.00	13.20	31.84	48.90	458.00	87.50	8.00
1999 07/01 14:00	0.00	310.00	17.00	13.20	31.84	49.20	440.00	92.60	8.00
1999 07/01 15:00	0.00	290.00	17.00	13.20	31.84	49.30	409.00	94.10	8.00
1999 07/01 16:00	6.00	292.00	15.00	13.20	31.84	49.30	315.00	94.90	8.00
1999 07/01 17:00	2.00	238.00	18.00	13.20	31.84	49.20	235.00	94.00	8.10
1999 07/01 18:00	0.00	211.00	20.00	13.20	31.84	49.30	152.00	92.00	8.10
1999 07/01 19:00	4.00	198.00	22.00	13.20	31.84	49.20	65.00	87.70	8.10
1999 07/01 20:00	11.00	229.00	25.00	13.00	31.84	49.20	0.00	82.40	8.20
1999 07/01 21:00	0.00	140.00	28.00	12.90	31.84	49.10	0.00	77.90	8.20
1999 07/01 22:00	0.00	66.00	30.00	12.90	31.84	49.20	0.00	73.60	8.20
Later									
Latest									

LEWISTON FISH HATCHERY *(LFH)*

Elevation: 1870' · TRINITY R basin · Operator: US Bureau of Reclamation

Query executed Sunday at 6:07:21

Select data type to plot recent data.

Date Time (PDT)	WIND SP MPH	WIND DR DEG	REL HUM %	BAT VOL VOLTS	RAINTIP INCHES	TEMP W DEG F	SOLAR R CAL/CM	TEMP AV DEG F	EVP PAN INCHES
Earlier									
1999 07/01 23:00	3.00	269.00	28.00	12.90	31.84	49.30	0.00	70.60	8.20
1999 07/02 00:00	0.00	100.00	29.00	12.90	31.84	49.10	0.00	68.30	8.20
1999 07/02 01:00	3.00	74.00	26.00	12.80	31.84	48.90	0.00	65.50	8.20
1999 07/02 02:00	0.00	141.00	24.00	12.80	31.84	48.80	0.00	64.40	8.30
1999 07/02 03:00	0.00	98.00	28.00	12.80	31.84	48.80	0.00	59.70	8.30
1999 07/02 04:00	0.00	135.00	39.00	12.80	31.84	48.80	0.00	55.30	8.30
1999 07/02 05:00	0.00	290.00	48.00	12.70	31.84	48.60	0.00	52.80	8.30
1999 07/02 06:00	4.00	102.00	45.00	12.70	31.84	48.50	0.00	50.90	8.30
1999 07/02 07:00	3.00	71.00	49.00	12.70	31.84	48.40	0.00	50.00	8.30
1999 07/02 08:00	2.00	82.00	38.00	12.70	31.84	48.50	305.00	55.60	8.30
1999 07/02 09:00	3.00	16.00	25.00	12.80	31.84	48.70	235.00	66.80	8.30
1999 07/02 10:00	5.00	56.00	23.00	13.40	31.84	48.90	473.00	71.70	8.30
1999 07/02 11:00	4.00	32.00	20.00	13.40	31.84	49.20	355.00	75.40	8.30
1999 07/02 12:00	0.00	309.00	17.00	13.30	31.84	49.30	402.00	79.90	8.30
1999 07/02 13:00	4.00	147.00	14.00	13.30	31.84	49.50	439.00	82.10	8.40
1999 07/02 14:00	19.00	242.00	13.00	13.30	31.84	49.50	418.00	83.60	8.40
1999 07/02 15:00	12.00	281.00	14.00	13.30	31.84	49.80	390.00	83.80	8.40
1999 07/02 16:00	0.00	249.00	13.00	13.30	31.84	49.70	336.00	84.70	8.50
1999 07/02 17:00	5.00	1.00	13.00	13.30	31.84	49.60	255.00	82.60	8.50
1999 07/02 18:00	3.00	212.00	15.00	13.30	31.84	49.60	171.00	80.10	8.50
1999 07/02 19:00	7.00	294.00	17.00	13.40	31.84	49.40	80.00	76.20	8.60
1999 07/02 20:00	6.00	230.00	21.00	13.00	31.84	49.40	0.00	72.50	8.60
1999 07/02 21:00	3.00	317.00	25.00	13.00	31.84	49.20	0.00	68.40	8.60
1999 07/02 22:00	5.00	304.00	28.00	12.90	31.84	49.20	0.00	65.00	8.60
1999 07/02 23:00	6.00	32.00	29.00	12.90	31.84	49.20	0.00	62.00	8.60
Later Latest									

LEWISTON FISH HATCHERY *(LFH)*

Elevation: 1870' · TRINITY R basin · Operator: US Bureau of Reclamation

Query executed Sunday at 6:08:25

Select data type to plot recent data.

Date Time (PDT)	WIND SP MPH	WIND DR DEG	REL HUM %	BAT VOL VOLTS	RAINTIP INCHES	TEMP W DEG F	SOLAR R CAL/CM	TEMP AV DEG F	EVP PAN INCHES
Earlier									
1999 07/03 00:00	5.00	205.00	30.00	12.90	31.84	49.20	0.00	59.70	8.70
1999 07/03 01:00	6.00	10.00	34.00	12.80	31.84	49.10	0.00	57.50	8.70
1999 07/03 02:00	1.00	22.00	36.00	12.80	31.84	48.90	0.00	55.70	8.70
1999 07/03 03:00	5.00	324.00	41.00	12.80	31.84	48.80	0.00	54.30	8.70
1999 07/03 04:00	0.00	69.00	44.00	12.80	31.84	48.70	0.00	52.60	8.70
1999 07/03 05:00	0.00	139.00	48.00	12.80	31.84	48.60	0.00	50.40	8.70
1999 07/03 06:00	0.00	284.00	56.00	12.70	31.84	48.50	7.00	47.90	8.70
1999 07/03 07:00	0.00	75.00	59.00	12.70	31.84	48.50	17.00	46.80	8.70
1999 07/03 08:00	3.00	44.00	46.00	12.80	31.84	48.60	363.00	54.30	8.70
1999 07/03 09:00	0.00	78.00	38.00	12.80	31.84	48.80	544.00	58.50	8.70
1999 07/03 10:00	6.00	143.00	31.00	13.50	31.84	49.10	296.00	63.90	8.70
1999 07/03 11:00	9.00	122.00	28.00	13.40	31.84	49.40	366.00	66.60	8.70
1999 07/03 12:00	4.00	279.00	19.00	13.40	31.84	49.50	581.00	70.20	8.70
1999 07/03 13:00	10.00	245.00	18.00	13.40	31.84	49.70	504.00	72.10	8.70
1999 07/03 14:00	11.00	236.00	21.00	13.40	31.84	49.70	486.00	73.60	8.80
1999 07/03 15:00	9.00	281.00	22.00	13.40	31.84	49.70	408.00	73.00	8.80
1999 07/03 16:00	0.00	257.00	24.00	13.40	31.84	49.80	357.00	72.20	8.80
1999 07/03 17:00	6.00	186.00	23.00	13.40	31.84	49.80	118.00	71.60	8.90
1999 07/03 18:00	4.00	226.00	21.00	13.40	31.84	49.70	349.00	70.30	8.90
1999 07/03 19:00	9.00	190.00	30.00	13.50	31.84	49.50	105.00	65.10	8.90
1999 07/03 20:00	0.00	283.00	35.00	13.10	31.84	49.40	40.00	61.60	8.90
1999 07/03 21:00	10.00	230.00	39.00	13.00	31.84	49.30	0.00	58.40	8.90
1999 07/03 22:00	0.00	235.00	42.00	12.90	31.84	49.20	0.00	56.70	9.00
1999 07/03 23:00	5.00	101.00	44.00	12.90	31.84	49.10	0.00	55.60	9.00
1999 07/04 00:00	0.00	147.00	50.00	12.90	31.84	49.00	0.00	52.40	9.00
Later									
Latest									

United States
Department of
Agriculture

Forest Service

**Intermountain
Forest and Range
Experiment Station
Ogden, UT 84401**

General Technical
Report INT-122

April 1982

Aids to Determining Fuel Models For Estimating Fire Behavior

Hal E. Anderson

INTRODUCTION

During the past two decades in the United States, the USDA Forest Service has progressed from a fire danger rating system comprising two fuel models (USDA 1964), to nine models in 1972 (Deeming and others 1972), and to 20 models in 1978 (Deeming and others 1977). During this time the prediction of fire behavior has become more valuable for controlling fire and for assessing potential fire damage to resources. A quantitative basis for rating fire danger and predicting fire behavior became possible with the development of mathematical fire behavior models (Rothermel 1972). The mathematical models require descriptions of fuel properties as inputs to calculations of fire danger indices or fire behavior potential. The collections of fuel properties have become known as fuel models and can be organized into four groups: grass, shrub, timber, and slash. Fuel models for fire danger rating have increased to 20 while fire behavior predictions and applications have utilized the 13 fuel models tabulated by Rothermel (1972) and Albini (1976). This report is intended to aid the user in selecting a fuel model for a specific area through the use of photographic illustrations. A similarity chart allows the user to relate the fire behavior fuel models to the fire danger rating system fuel models. The chart also provides a means to associate the fire danger rating system fuel models with a photographic representation of those fuel types.

HOW FUEL MODELS ARE DESCRIBED

Fuels have been classified into four groups—grasses, brush, timber, and slash. The differences in fire behavior among these groups are basically related to the fuel load and its distribution among the fuel particle size classes. This can be illustrated by the shift in size class containing the maximum fraction of load when considering the four fuel groups shown in figure 1. Notice that the fraction of the total load in the less than ¼-inch (0.6-cm) size class decreases as we go from grasses to slash. The reverse is true for the 1- to 3-inch (2.5- to 7.6-cm) material. In grasses, the entire fuel load may be herbaceous material less than one-fourth inch (0.6 cm), but grass may include up to 25 percent material between one-fourth and 1 inch (0.6 and 2.5 cm) and up to 10 percent material between 1 and 3 inches (2.5 cm and 7.6 cm). Each fuel group has a range of fuel loads for each size class, with maximum fuel load per size class approximately as shown in figure 1.

Fuel load and depth are significant fuel properties for predicting whether a fire will be ignited, its rate of spread, and its intensity. The relationship of fuel load and depth segregates the 13 fuel models into two distinctive orientations, with two fuel groups in each (fig. 2). Grasses and brush are vertically oriented fuel groups, which rapidly increase in depth with increasing load. Timber litter and slash are horizontally positioned and slowly increase in depth as the load is increased. Observations of the location and positioning of fuels in the field help one decide which fuel groups are represented. Selection of a fuel model can be simplified if one recognizes those features that distinguish one fuel group from another.

The 13 fuel models (table 1) under consideration are presented on page 92 of Albini's (1976) paper, "Estimating Wildfire Behavior and Effects." Each fuel model is described by the fuel load and the ratio of surface area to volume for each size class; the depth of the fuel bed involved in the fire front; and fuel moisture, including that at which fire will not spread, called the moisture of extinction. The descriptions of the fuel models include the total fuel load less than 3 inches (7.6 cm), dead fuel load less than one-fourth inch (0.6 cm), live fuel load of less than one-fourth inch (0.6 cm), and herbaceous material and fuel depth used to compute the fire behavior values given in the nomographs.

APPENDIX 9 - Fire Behavior

FUEL MODEL DESCRIPTIONS
Grass Group

Fire Behavior Fuel Model 1

Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model. Refer to photographs 1, 2, and 3 for illustrations.

This fuel model correlates to 1978 NFDRS fuel models A, L, and S.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	0.74
Dead fuel load, ¼-inch, tons/acre	.74
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	1.0

Photo 1. Western annual grasses such as cheatgrass, medusahead ryegrass, and fescues.

Photo 2. Live oak savanna of the Southwest on the Coronado National Forest.

Photo 3: Open pine—grasslands on the Lewis and Clark National Forest

APPENDIX 9 -Fire Behavior

Fire Behavior Fuel Model 2

Fire spread is primarily through the fine herbaceous fuels, either curing or dead. These are surface fires where the herbaceous material, in addition to litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity. Open shrub lands and pine stands or scrub oak stands that cover one-third to two-thirds of the area may generally fit this model; such stands may include clumps of fuels that generate higher intensities and that may produce firebrands. Some pinyon-juniper may be in this model. Photographs 4 and 5 illustrate possible field situations.

This fuel model correlates to 1978 NFDRS fuel models C and T.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	4.0
Dead fuel load, ¼ inch, tons/acre	2.0
Live fuel load, foliage, tons/acre	0.5
Fuel bed depth, feet	1.0

Photo 4. Open ponderosa pine stand with annual grass understory.

Photo 5: Scattered sage within grass-lands on the Payette National Forest.

APPENDIX 9 - Fire Behavior

Fire Behavior Fuel Model 9

Fires run through the surface litter faster than model 8 and have longer flame height. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Closed stands of long-needled pine like ponderosa, Jeffrey, and red pines, or southern pine plantations are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

NFDRS fuel models E, P, and U are represented by this model. It is also a second choice for models C and S. Some of the possible field situations fitting this model are shown in photographs 25, 26, and 27.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	3.5
Dead fuel load, ¼-inch, tons/acre	2.9
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	0.2

Photo 25. Western Oregon white oak fall litter; wind tumbled leaves may cause short-range spotting that may increase ROS above the predicted value.

Photo 26. Loose hardwood litter under stands of oak, hickory, maple and other hardwood species of the East.

Photo 27. Long-needle forest floor litter in ponderosa pine stand near Alberton, Mont.

Fire Behavior Analyst Summary of the Lowden Prescribed Burn

The Fire Behavior Analyst (T) (Dan Buckley) and Chris Fontana (IFFWU Meteorologist) traveled to the burn site on 7/3/99 with Diamond Mountain IHC Superintendent (Kurt Larue), who gave a briefing of what occurred at the Lowden Prescribed Fire Incident on 7/2/99. The 100-acre prescribed burn was conducted to control YST and to restore ecosystem of the meadow.

Prescribed fire is recognized treatment for controlling yellow star thistle seed production, according to the Fire Effects Information System citation (reference: Centaurea solstitialis in the FEIS). Plants must be burned early in flowering stage to be effective. The yellow star thistle at the site the day after the burn appeared to be just sarting to show color. This was the appropriate time to conduct the burn to meet the objective of controlling yellow star thistle. Annual fire treatments would be necessary for this treatment method to remain effective. It is unknown how many years these treatments would be required.

The test fire for the burn was conducted 7/2/99 at approximately 1045 hours in the NE corner of the unit. After burning approximately 100 square feet, the burn was declared a go. Conditions at 1000 hrs recorded by on-site weather observers show that the project was not within prescription. The one-hour fuel moistures, which were calculated by the investigation team (using the Fire Behavior Field Reference Guide) to be at 5%. There is no record of fuel moisture measurements or calcualtions being done by personnel assigned to the prescribed burn. Without measuring or calculating the fuel moistures, the project manager would not have known that the burn was not in prescription, with regard to fuel moistures.

At 1030, the winds were recorded at 6-7 miles per hour. The project burn plan acceptable prescription range for wind speed lists a low of 2 mph, a high of 5 mph, and a desired target of 3 mph. From 1100 on until weather observations ceased at 1700, the recorded winds ranged from 6-9 mph, with gusts to 12 mph.

In an on-site interview with Larue, he stated that the burn was initially going well with flame lengths of 1-2 feet and a backing fire rate of spread of 1-5 chains per hour. Strip head firing produced rates of spread of 60-80 chains per hour, and flame lengths of 3-6 feet. The estimated flame lengths are corroborated by statements from other incident personnel, photographs by Bill Crothers, and BEHAVE outputs.

Fuel consumption in the prescribed burn unit is estimated to be 90-95%. Scorch heights on trees within the unit were low, generally under 10 feet. This is probably due to the steady moderate 5-10 mph winds that were blowing while ignition took place. However, 30' scorch heights were recorded on a ponderosa pine in the exclusion area along the east flank where a spot fire occurred.

At approximately 1300 hours, with windspeeds recorded at 8-9 mph and relative humidity at 17%, spot fires began to occur on the NW corner and along Old Lewiston Road. Flame lengths predicted by BEHAVE would be about five feet (in FM 9), beyond the capability of firefighters working direct line with handtools.
At approximately 1330 hours, with no water near the third recorded spot on the east side of Lewiston Road, firefighters were unable to contain the fire as it burned upslope with the wind. The slope, winds, and solar radiation were all in alignment at this time to produce rapid rates of spread, possibly up to 5-6 miles an hour in grass fuel type (FM 1). The prescribed burn was declared a wildfire at 1338 hours.

7/7/99

Dan Buckley, Fire Behavior Analyst (trainee)

FIRE EFFECTS

SPECIES: Centaurea solstitialis

IMMEDIATE FIRE EFFECT ON PLANT :
Most fires probably kill yellow starthistle. Seeds buried in the soil probably survive most fire.

A grassland in northern California was burned in October to remove brush and improve grass vigor. The fire spread and burned quickly, consuming most of the perennial growth and annual grass litter. Germinating annual plants beneath the litter, probably including yellow starthistle, were not visibly affected [8].

DISCUSSION AND QUALIFICATION OF FIRE EFFECT :
NO-ENTRY

PLANT RESPONSE TO FIRE :
Buried seed may germinate after fire, as after other disturbances, if moisture conditions are favorable. The removal of existing vegetation by fire may increase survival of postfire yellow starthistle seedlings by reducing shade.

According to Thomsen and others [39], the ability of yellow starthistle to regrow following defoliation surpasses most, if not all other annual plants on California ranges. Yellow starthistle may regrow after spring or early summer fire if damage is not severe.

DISCUSSION AND QUALIFICATION OF PLANT RESPONSE :
NO-ENTRY

FIRE MANAGEMENT CONSIDERATIONS :
Prescribed fire may be used to control yellow starthistle seed production if plants are burned in the early flowering stage before seed matures. Yellow starthistle is still green prior to seed maturity so there must be adequate dry fuel from other plants for fire to carry [39].

Burd Bos Copy

INCIDENT OBJECTIVES	1. INCIDENT NAME: Lowden Ranch	2. DATE PREPARED: 6-24-99	3. TIME PREPARED: 0700

4. OPERATIONAL PERIOD (DATE TIME): 7-2-99 0900-1700

5. GENERAL CONTROL OBJECTIVES FOR THE INCIDENT (INCLUDE ALTERNATIVES)

1. Ensure firefighter and public safety at all times and confine the fire to the project area boundary.

2. Reduce 0-3 inches diameter dead and down fuels by 40-90%

3. Reduce 3 + inch diameter dead and down fuels by 20-50%

4 Limit scorch heights 15 feet above ground

5. Limit mature conifer and hardwood spieces mortality to less then 10 %

TAC 11

6. WEATHER FORECAST FOR OPERATIONAL PERIOD

See "Spot Weather Forecast"

7. GENERAL SAFETY MESSAGE

Think LCES. Wear proper PPE at all times. Drive Defensively. Be aware of your surroundings. Stay alert, keep calm, act decisively.

8. ATTACHMENTS (✓ IF ATTACHED)

- [X] ORGANIZATION LIST (ICS 203)
- [X] DIVISION ASSIGNMENT LISTS (ICS 204)
- [X] COMMUNICATIONS PLAN (ICS 205)
- [X] MEDICAL PLAN (ICS 206)
- [X] INCIDENT MAP
- [ ] TRAFFIC PLAN
- [ ] Unit Log
- [X] Spot Weather Forecast
- [ ] _____

202 ICS 3/80	9. PREPARED BY (PLANNING SECTION CHIEF)	10. APPROVED BY (INCIDENT COMMANDER) Douglas A Feld

APPENDIX 11 - Organization Assignment List

ORGANIZATION ASSIGNMENT LIST

1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED
LOWDEN RANCH	6-29-99	0700

4. OPERATIONAL PERIOD (DATE/TIME): 7-2-99 0930-1700

POSITION	NAME
5. INCIDENT COMMANDER AND STAFF	
INCIDENT COMMANDER	BOB PEREZ TYPE IV
DEPUTY	DOUG HELD
SAFETY OFFICER	
INFORMATION OFFICER	
LIAISON OFFICER	

6. AGENCY REPRESENTATIVES

AGENCY	NAME

7. PLANNING SECTION

CHIEF	
DEPUTY	
RESOURCES UNIT	
SITUATION UNIT	
DOCUMENTATION UNIT	
DEMOBILIZATION UNIT	
TECHNICAL SPECIALISTS	

8. LOGISTICS SECTION

CHIEF	
DEPUTY	
a. SUPPORT BRANCH	
DIRECTOR	
SUPPLY UNIT	
FACILITIES UNIT	
GROUND SUPPORT UNIT	
b. SERVICE BRANCH	
DIRECTOR	
COMMUNICATIONS UNIT	
MEDICAL UNIT	
FOOD UNIT	

9. OPERATIONS SECTION

CHIEF BURN BOSS	DOUG HELD
DEPUTY BURN BOSS	BOB PEREZ (+)
a. TRAINEE BRANCH I - DIVISION/GROUPS	HOLDING
BRANCH DIRECTOR	
DEPUTY	
DIVIDION/GROUP	~~PARKINSON~~ HOLT
DIVISION/GROUP	
DIVISION/GROUP	
DIVISION/GROUP	
DIVISION/GROUP	
b. BRANCH II - DIVISION/GROUPS	HOLDING
BRANCH DIRECTOR	
DEPUTY	
DIVISION/GROUP	MITTY
DIVISION/GROUP	
DIVISION/GROUP	
DIVISION/GROUP	
DIVISION/GROUP	
c. BRANCH III - DIVISION/GROUPS	IGNITION
BRANCH DIRECTOR	
DEPUTY	
DIVISION/GROUP	~~QUIGLEY~~ SPENCE
DIVISION/GROUP	WARNER
DIVISION/GROUP	
DIVISION/GROUP	
DIVISION/GROUP	
d. AIR OPERATIONS BRANCH	
AIR OPERATIONS BR. DIR.	
AIR TACTICAL GROUP SUP.	
AIR SUPPORT GROUP SUP.	
HELICOPTER COORDINATOR	
AIR TANKER/FIXED-WING CRD.	

10. FINANCE SECTION

CHIEF	
DEPUTY	
TIME UNIT	
PROCUREMENT UNIT	
COMPENSATION/CLAIMS UNIT	
COST UNIT	

PREPARED BY (RESOURCES UNIT)

APPENDIX 12 - Division Assignment List

1. BRANCH	2. DIVISION/GROUP	DIVISION ASSIGNMENT LIST
HOLDING	A	

INCIDENT NAME	4. OPERATIONAL PERIOD
LOWDEN RANCH	DATE 7-2-99 TIME 0930-1700

5. OPERATIONS PERSONNEL

HOLT, ~~ROBIM PARKINSON~~

OPERATIONS CHIEF: HOLDING SPECIALIST

BRANCH DIRECTOR: _____

6. RESOURCES ASSIGNED THIS PERIOD

STRIKE TEAM/TASK FORCE/ RESOURCE DESIGNATOR	EMT	LEADER	NUMBER PERSONS	TRANS. NEEDED	PICK UP PT./TIME	DROP OFF PT./TIME
~~SHF ENG 32~~ ~~SHF ENG 21~~		GONZALES	~~+4~~			
SHF ENG 31		GROSSMAN	+4			
DOUGLAS CITY ENG 5		~~TBA~~ MICKELSON	+2			
~~DOUGLAS CITY WT~~ LEWISTON ENG 1		TBA GANNON				
Diamond Mtn. Hot Shots		TBA	18-20			
~~CDF 2475~~		~~HERNANDEZ~~	~~+2~~			
NPS ENG 4		MITTY	+4			
LEWISTON ENG 5		~~TBA~~ CANN				

CONTROL OPERATIONS

Patrol, hold and mop-up, as necessary. Coordinate efforts with Ignition Specialist

SPECIAL INSTRUCTIONS

Immediately notify IC of any holding conserns, spot fires or slop overs.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

FUNCTION		FREQ.	SYSTEM	CHAN.	FUNCTION		FREQ.	SYSTEM	CHAN.
COMMAND	LOCAL	166.375-RX			SUPPORT	LOCAL			
	REPEAT	166.975-TX				REPEAT			
DIV/GROUP TACTICAL		168.200			GROUND TO AIR				

PREPARED BY (RESOURCE UNIT LDR.)	APPROVED BY (PLANNING SECT. CH.)	DATE	TIME

ICS (3-92) NFES 132

APPENDIX 12 - Division Assignment List

1. BRANCH	2. DIVISION/GROUP	DIVISION ASSIGNMENT LIST
GROUND IGNITION	C	

INCIDENT NAME: LOWDEN RANCH

4. OPERATIONAL PERIOD
DATE: 7-2-99
TIME: 0930-1700

5. OPERATIONS PERSONNEL
WARNER / ~~QUIGLEY~~ SPENCE
OPERATIONS CHIEF: IGNITION SPECIALIST
BRANCH DIRECTOR:

6. RESOURCES ASSIGNED THIS PERIOD

STRIKE TEAM/TASK FORCE/ RESOURCE DESIGNATOR	EMT	LEADER	NUMBER PERSONS	TRANS. NEEDED	PICK UP PT./TIME	DROP OFF PT./TIME
SMOKE JUMPERS		~~QUIGLEY~~ SPENCE	~~+4~~ +2			
NPS RX MODULE		WARNER	+4			

CONTROL OPERATIONS
Coordinate and support operations with Ignition Specialists

SPECIAL INSTRUCTIONS
Immediately notify Burn Boss of any holding conserns, spot fires or slop overs, and ensure operation is in place and functioning properly at all times.

9. DIVISION/GROUP COMMUNICATIONS SUMMARY

FUNCTION		FREQ.	SYSTEM	CHAN.	FUNCTION		FREQ.	SYSTEM	CHAN.
COMMAND	LOCAL	166.375-RX			SUPPORT	LOCAL			
	REPEAT	166.975-TX				REPEAT			
DIV/GROUP TACTICAL		168.050			GROUND TO AIR				

PREPARED BY (RESOURCE UNIT LDR.) | APPROVED BY (PLANNING SECT. CH.) | DATE | TIME

ICS 204 ICS (3-92) NFES 13

MEDICAL PLAN	1. INCIDENT NAME: Lowden Ranch	2. DATE PREPARED: 7-2-99	3. TIME PREPARED: 0700	4. OPERATIONAL PERIOD: 0930-1700

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS YES	PARAMEDICS NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS YES	PARAMEDICS NO
Ambulance Rescue-Emergency	Redding, Calif.	2461111	-X	
Central Dispach				

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS YES	PARAMEDICS NO
N/A			

7. HOSPITALS

NAME	ADDRESS	TRAVEL TIME AIR	TRAVEL TIME GRND	PHONE	HELIPAD YES	HELIPAD NO	BURN CENTER YES	BURN CENTER NO
Mercy Medical	Clairmont Heights, Rdg.	20	35	2257200	X			X
Redding Medical	Redding,Calif	20	35	2245353	X			X
UC Davis	2315 Stockton,Davis,Ca	1hr	3hr	916-734-3636				X

8. MEDICAL EMERGENCY PROCEDURES

Safety is the top priority. If any emergency occurs, stabilize patient and have supervisor immediately notify the IC who will take approprite action. Continue administering first aid until appropriate help arrives.

206 ICS 8/78 | 9. PREPARED BY (MEDICAL UNIT LEADER) | 10. REVIEWED BY (SAFETY OFFICER)

APPENDIX 14 - Medical Plan

MEDICAL PLAN	1. INCIDENT NAME	2. DATE PREPARED	3. TIME PREPARED	4. OPERATIONAL PERIOD
	Lowden Ranch	7-2-99	0700	0930-1700

5. INCIDENT MEDICAL AID STATIONS

MEDICAL AID STATIONS	LOCATION	PARAMEDICS YES	PARAMEDICS NO

6. TRANSPORTATION

A. AMBULANCE SERVICES

NAME	ADDRESS	PHONE	PARAMEDICS YES	PARAMEDICS NO
Ambulance Rescue-Emergency	Redding, Calif.	2461111	X	
Central Dispach				

B. INCIDENT AMBULANCES

NAME	LOCATION	PARAMEDICS YES	PARAMEDICS NO
N/A			

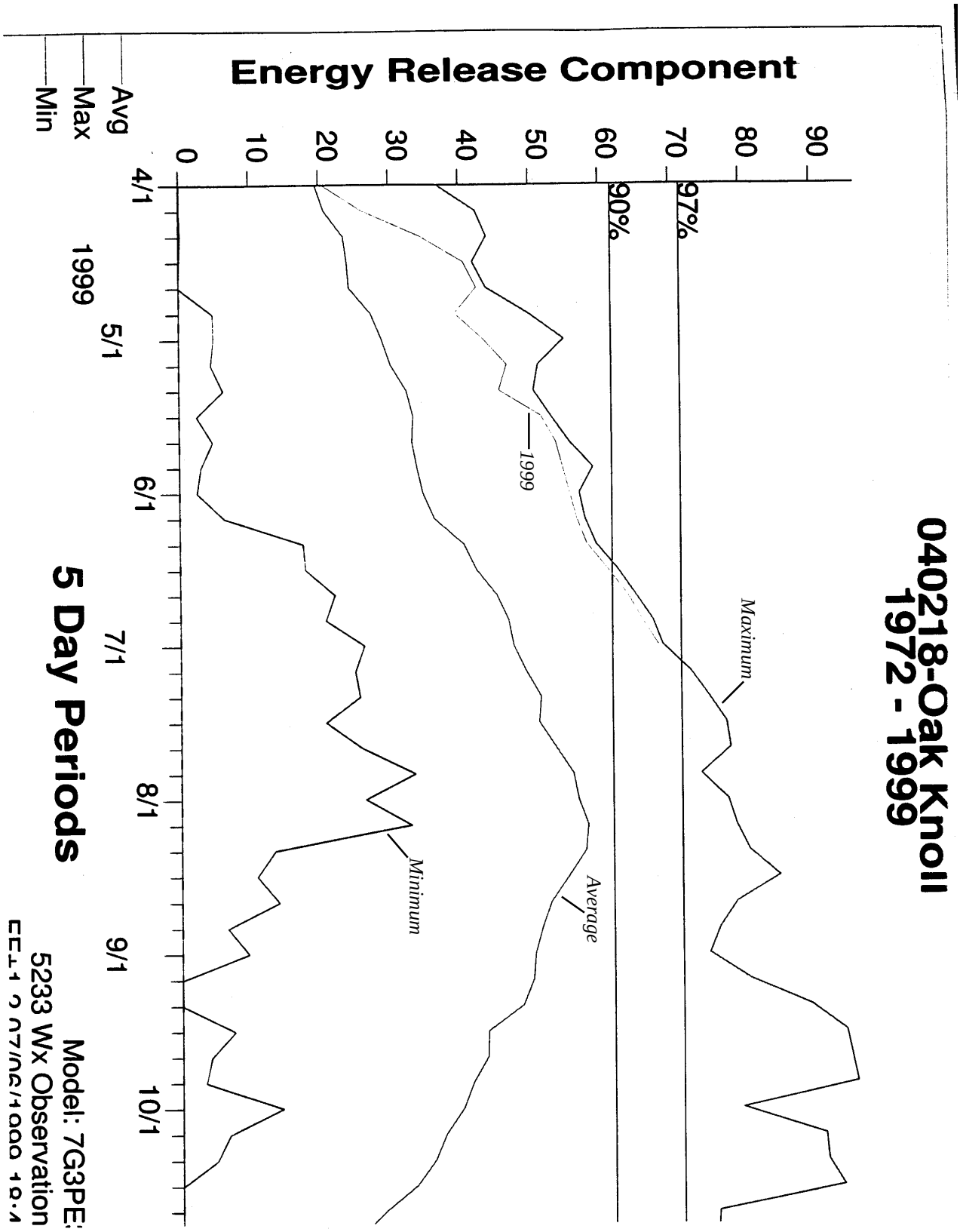
7. HOSPITALS

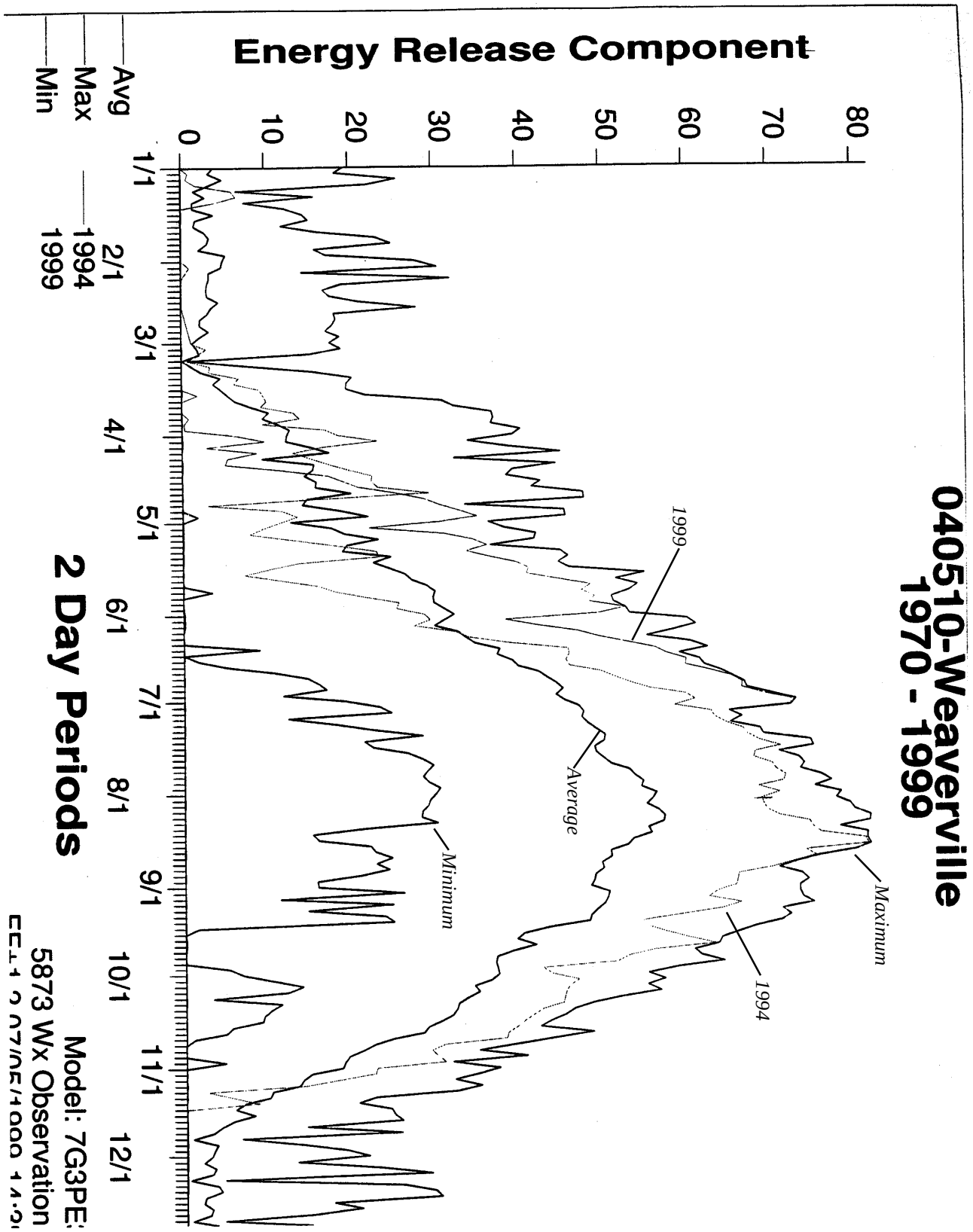
NAME	ADDRESS	TRAVEL TIME AIR	TRAVEL TIME GRND	PHONE	HELIPAD YES	HELIPAD NO	BURN CENTER YES	BURN CENTER NO
Mercy Medical	Clairmont Heights, Rdg.	20	35	2257200	X			X
Redding Medical	Redding,Calif	20	35	2245353	X			X
UC Davis	2315 Stockton,Davis,Ca	1hr	3hr	916-734-3636				X

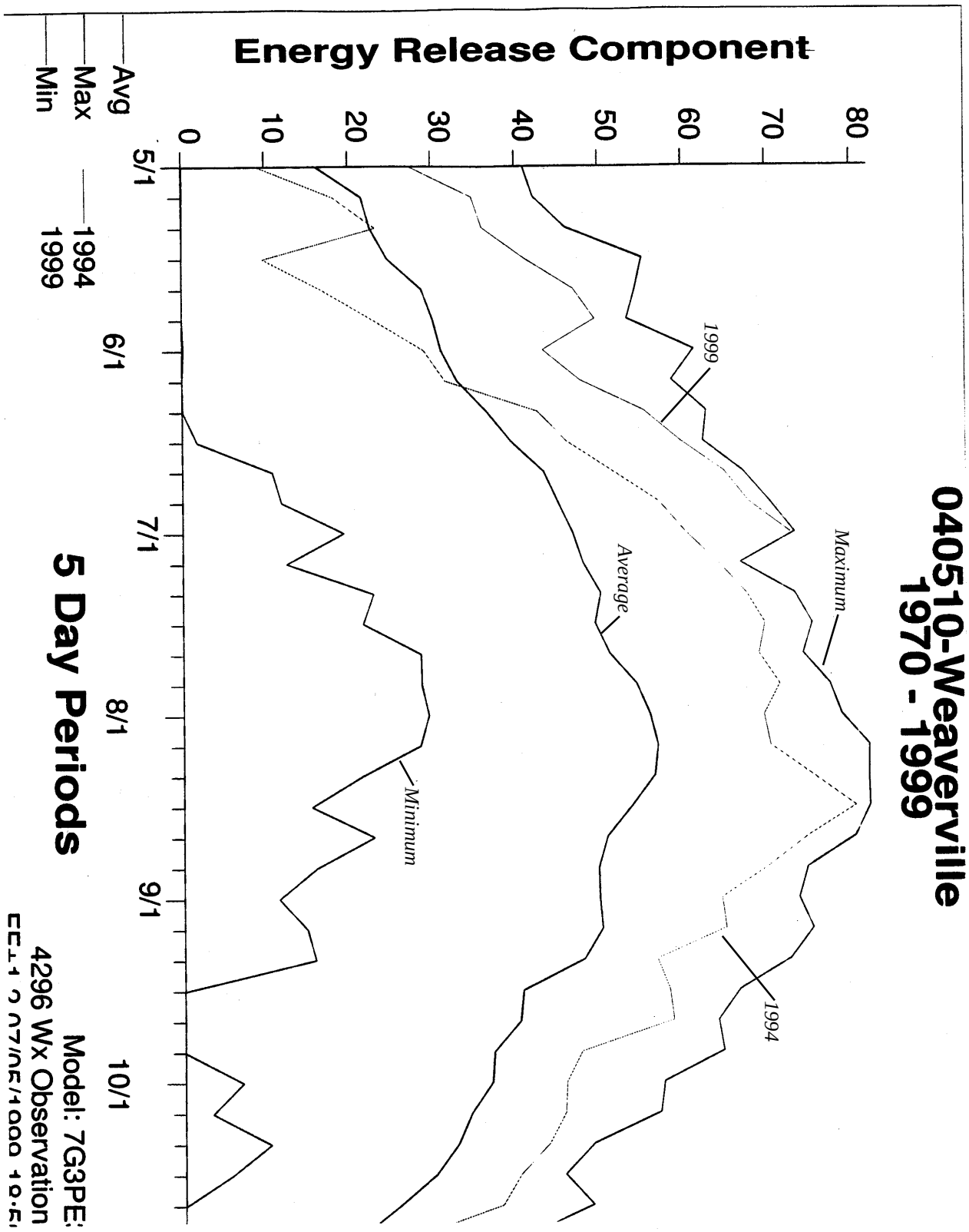
8. MEDICAL EMERGENCY PROCEDURES

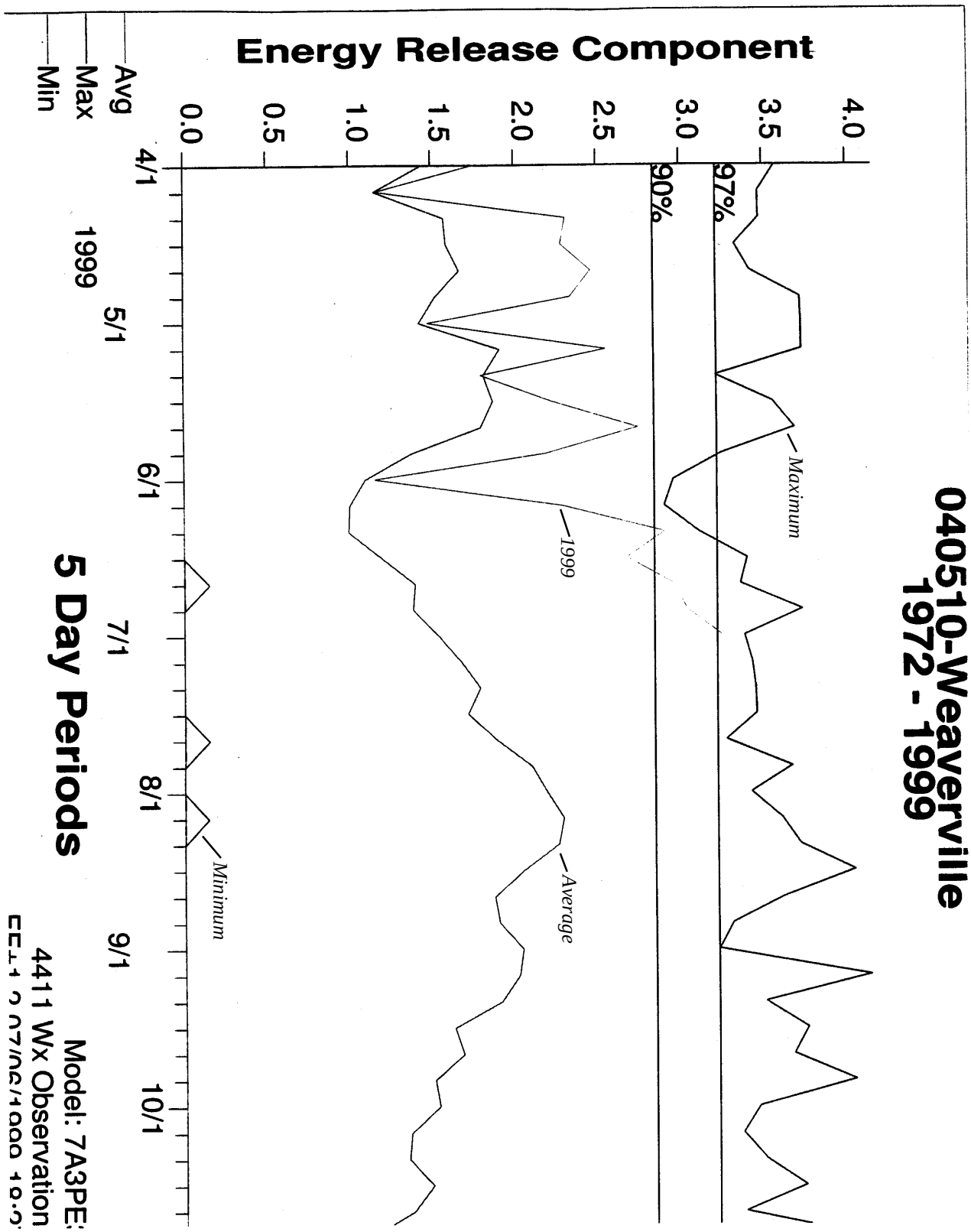
Safety is the top priority. If any emergency occurs, stabilize patient and have supervisor immediately notify the IC who will take approprite action. Continue administering first aid until appropriate help arrives.

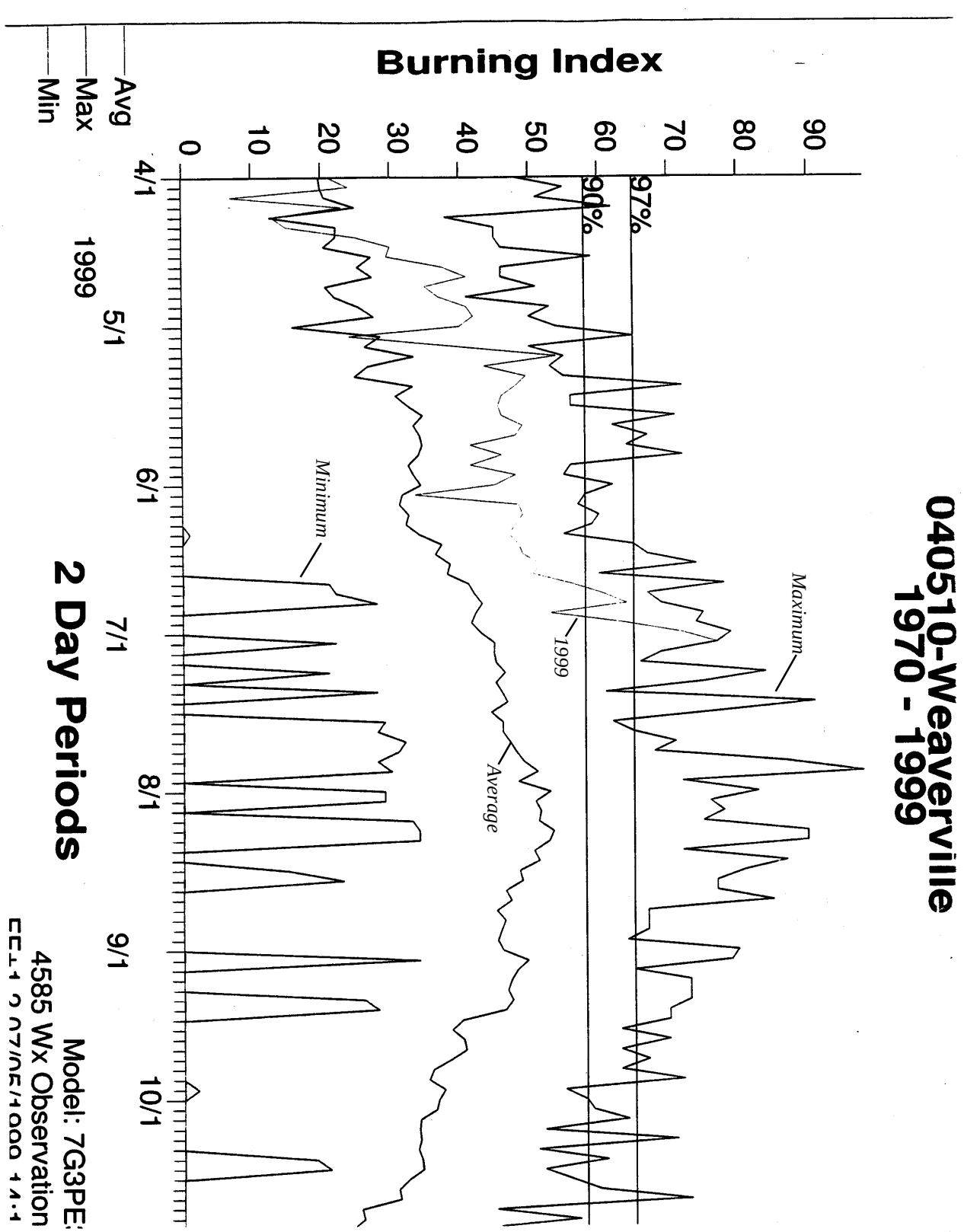
206 ICS 8/78 | 9. PREPARED BY (MEDICAL UNIT LEADER) | 10. REVIEWED BY (SAFETY OFFICER)

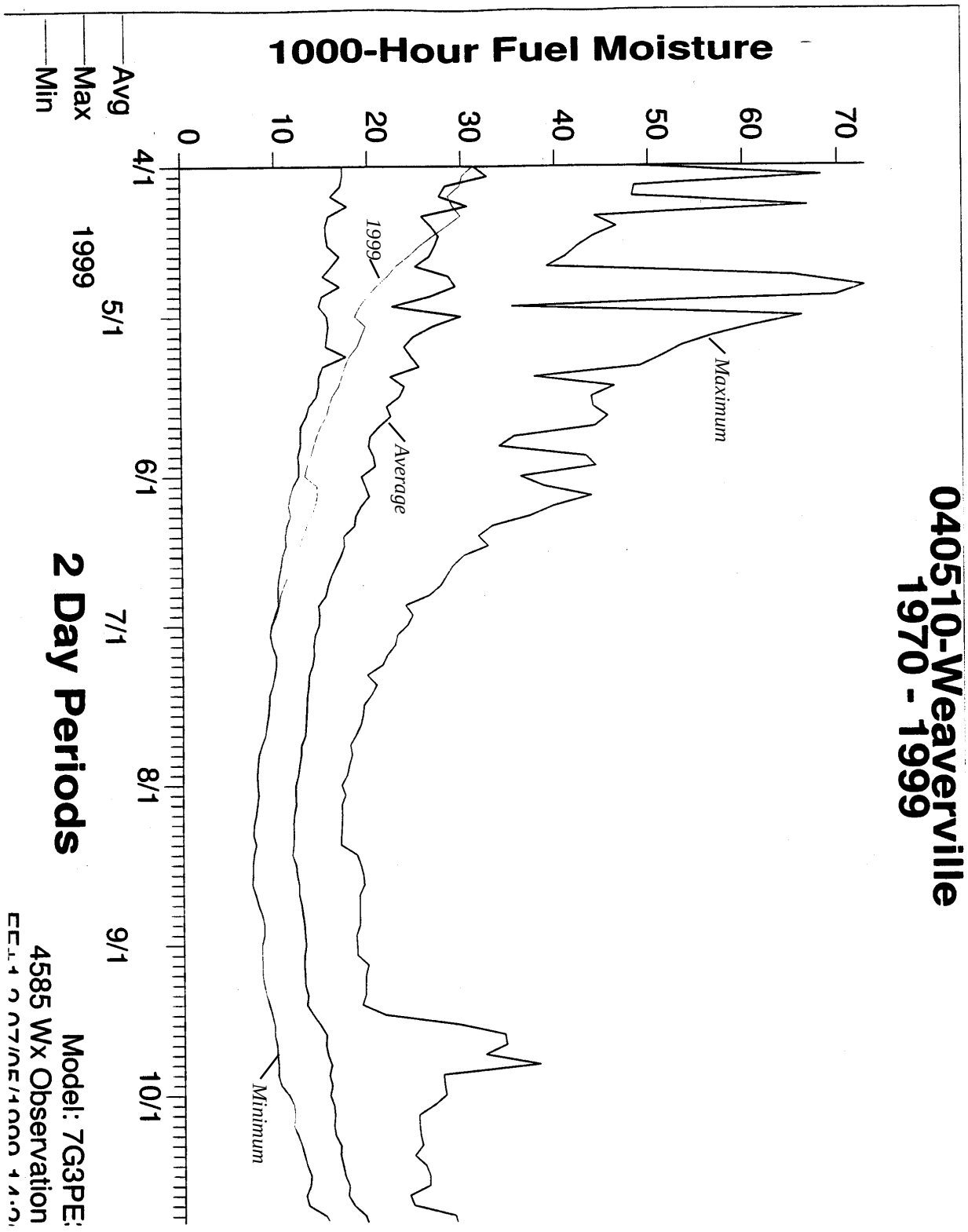

040218-Oak Knoll
1972 - 1999
Energy Release Component
90
80
70
60
50
40
30
20
10
0
97%
90%
Maximum
1999
Average
Minimum
4/1
5/1
6/1
7/1
8/1
9/1
10/1
5 Day Periods
Avg
Max
Min
1999
Model: 7G3PE
5233 Wx Observation

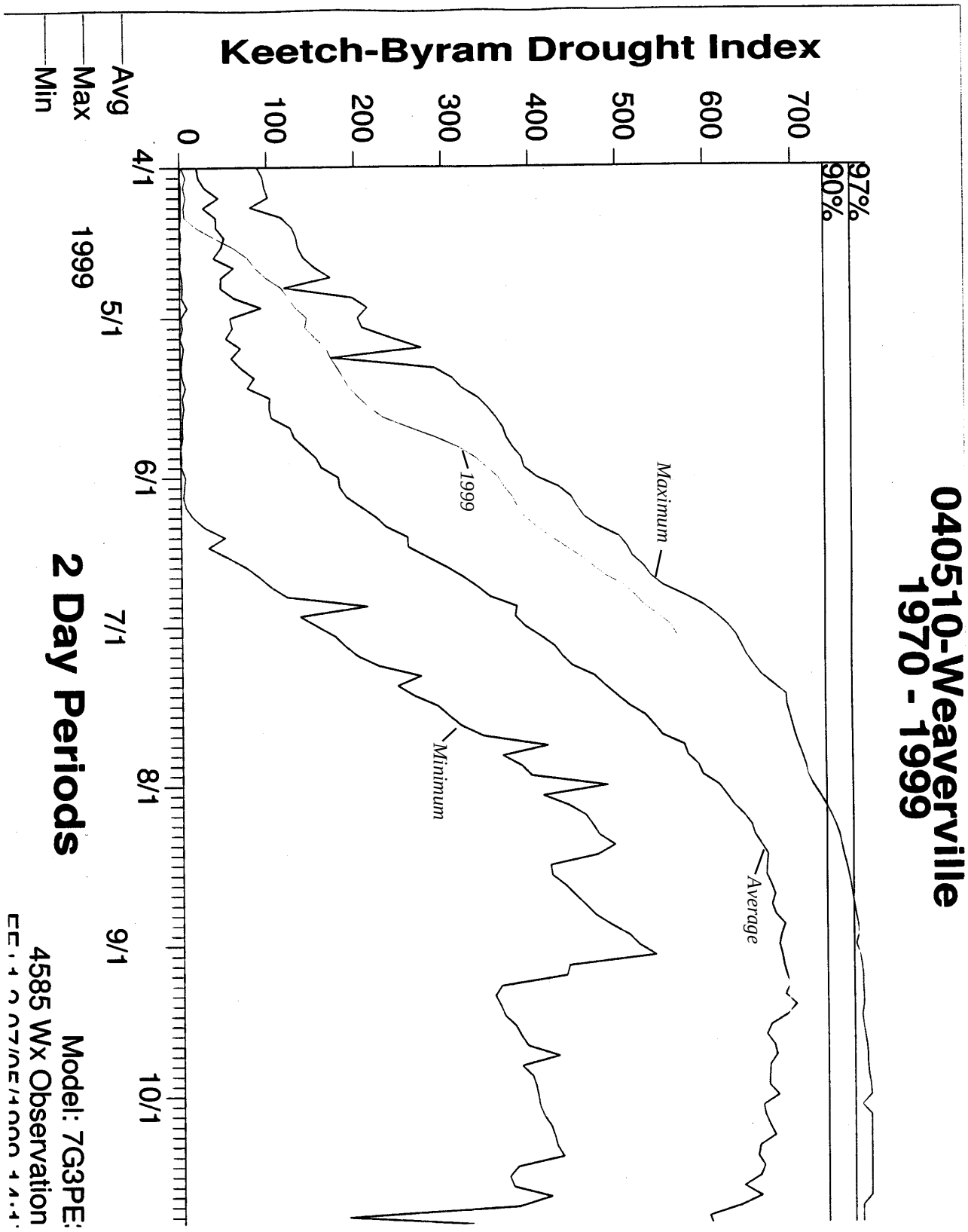

040510-Weaverville
1970 - 1999
Energy Release Component
0
10
20
30
40
50
60
70
80
1/1
2/1
3/1
4/1
5/1
6/1
7/1
8/1
9/1
10/1
11/1
12/1
2 Day Periods
Avg
Max
Min
1994
1999
Maximum
1999
Average
Minimum
1994
Model: 7G3PE
5873 Wx Observation


040510-Weaverville
1970 - 1999
Energy Release Component
5 Day Periods
Maximum
Average
Minimum
1999
1994
0
10
20
30
40
50
60
70
80
5/1
6/1
7/1
8/1
9/1
10/1
Avg
Max
Min
1994
1999
Model: 7G3PE
4296 Wx Observation


040510-Weaverville
1972 - 1999
Energy Release Component
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
97%
90%
Maximum
1999
Average
Minimum
Avg
Max
Min
4/1
5/1
6/1
7/1
8/1
9/1
10/1
1999
5 Day Periods
Model: 7A3PE:
4411 Wx Observation


040510-Weaverville
1970 - 1999
Burning Index
0
10
20
30
40
50
60
70
80
90
97%
90%
Maximum
1999
Average
Minimum
4/1
5/1
6/1
7/1
8/1
9/1
10/1
1999
2 Day Periods
Avg
Max
Min
Model: 7G3PE
4585 Wx Observation

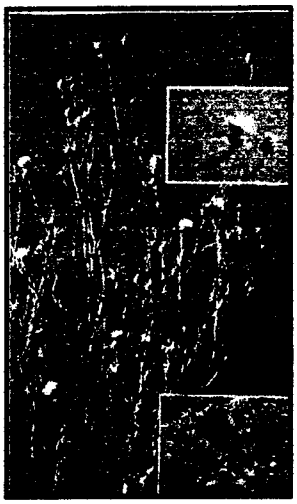

040510-Weaverville
1970 - 1999
1000-Hour Fuel Moisture
70
60
50
40
30
20
10
0
Maximum
Average
1999
Minimum
Avg
Max
Min
1999
4/1
5/1
6/1
7/1
8/1
9/1
10/1
2 Day Periods
Model: 7G3PE
4585 Wx Observation


040510-Weaverville
1970 - 1999
Keetch-Byram Drought Index
0
100
200
300
400
500
600
700
97%
90%
Maximum
Average
1999
Minimum
Avg
Max
Min
1999
4/1
5/1
6/1
7/1
8/1
9/1
10/1
2 Day Periods
Model: 7G3PE
4585 Wx Observation

APPENDIX 16 - Yellow starthistle

Biology and management of yellow starthistle

Yellow starthistle is a highly competitive, non-native winter annual.



Occurrence: It occurs throughout the U.S. except in the southeast, with the highest concentrations in California, Oregon, Washington, and Idaho. It is common in grasslands, pastures, disturbed sites and open woodlands, and occurs with other exotic annuals. Optimal growing conditions are deep silt-loam soils with adequate spring and early summer soil moisture.

Growth: Seeds usually germinate in fall, form basal rosettes, and begin growing a taproot. Rosettes are susceptible to shading from overtopping vegetation. The plant forms a stalk in spring and flowers for several months. Two kinds of seeds are formed, plumed seeds which are dispersed soon after they mature, and plumeless seeds which remain on the flower stalks. Some proportion of the annual seed crop remains dormant in the soil, with 20 to 40 percent of the seeds alive after 1 year, and 1 to 2 percent still viable for up to 10 years.

Value and Use: It can provide valuable forage for ruminants when in the basal rosette stage, but becomes unpalatable after it bolts and produces spines. Extended use by horses can kill them.

Management: Objectives should be to reduce dense stands to controllable levels. Elimination is almost impossible. Well timed mowing or intensive grazing can control infestations. Mowing during the early flowering stage is the most effective, but plants must be monitored for regrowth, and mowed again if significant growth occurs. Biocontrol methods are being studied. Herbicides can be effective although resistance to them has developed in some areas.

Establishment of perennial grasses after any treatment is necessary to prevent reinvasion by yellow starthistle. Grasses with early growth, strong seedling vigor, and a large root system with good lateral spread have the greatest potential to compete successfully with yellow starthistle.

Prescribed fire may be used to control yellow starthistle seed production if plants are burned in the early flowering stage before seed matures. Buried seed can survive fire, and their establishment may be enhanced by removal of competing vegetation.

Near Santa Rosa, California, summer burning was used to control starthistle on a site also dominated by purple needlegrass. Early July burns were conducted in three sequential years prior to seed production of starthistle but after native grasses and forbs had cured. Starthistle germination in subsequent springs could only occur from residual seed. By the third year, the seedbank was reduced by over 99 percent, and native plant diversity, species richness, and needlegrass production had significantly increased.

Prescribed fire can be an effective tool for managing starthistle by decreasing its seed supply. It is most effective if applied before the current year's crop of seed is set, so carrier fuels must be cured in order to lethally heat the still green starthistle plants. Control will be increased if fire stimulates growth of competing perennial vegetation that can shade out seedlings, and if it is used several years in sequence.

Melanie Miller
July 9, 1999

References

Carey, Jennifer H., and G. Winkler. 1995. *Centaurea solstitialis*. In: Fischer, William C., compiler. The Fire Effects Information System [Database]. Missoula, MT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Intermountain Fire Sciences Laboratory. Magnetic tape reels; 9 track; 1600 bpi, ASCII with Common LISP present.
(http://www.fs.fed.us/database/feis)

Herzog, Peggy and John Randall. 1998. Elemental stewardship abstract for *Centaurea solstitialis*. The Nature Conservancy.
(http://tncweeds.ucdavis.edu/esadocs/centsols.html)