FS Supplemental Project Agreement No. 21-FP-11041700-033

Cooperator Project Agreement No.

FIRE
SUPPLEMENTAL PROJECT AGREEMENT
Between
TRUCKEE MEADOWS FIRE RESCUE
And the
HUMBOLDT-TOIYABE NATIONAL FOREST

This Fire Supplemental Project Agreement (SPA) is hereby made and entered into by and between Truckee Meadows Fire Rescue, hereinafter referred to as "the Cooperator," and the USDA, Forest Service, Humboldt-Toiyabe National Forest, hereinafter referred to as the U.S. Forest Service under the Reciprocal Fire Protection Act of May 27, 1955, (42 U.S.C. 1856a) and under the provisions of the Local Cooperative Fire Protection Agreement No. 18-FI-11041700-050, executed between the Parties on 06/25/2018.

Project Title: Carson Ranger District Fuels Implementation

I. BACKGROUND:

As referenced above, the Parties entered into a Local Cooperative Fire Protection Agreement. The Agreement allows the parties to cooperatively conduct projects or share resources for fire protection and prevention, which includes such activities as prescribed fire/fuels management, preparedness, fire analysis/planning, rehabilitation, training, prevention, public affairs, and other beneficial efforts in support of fire management.

II. PURPOSE:

The purpose of this SPA is to document the Parties' contributions and cooperation regarding fuels and prescribed fire treatments. This project is further described in the hereby incorporated Financial and Project Plans, and Burn Plan, attached as Exhibits A, B, and C.

III. THE COOPERATOR SHALL:

A. Perform in accordance with the terms of this SPA and with the Financial and Project Plans, and Burn Plan; Exhibits A, B, and C.

B. Bill the U.S. Forest Service for actual costs incurred, not to exceed $149,996.00, as agreed to in the attached Financial Plan.

IV. THE U.S. FOREST SERVICE SHALL:

A. Perform in accordance with the terms of this SPA and with the attached Financial and Project Plans, and Burn Plan; Exhibits A, B, and C.

B. PAYMENT/REIMBURSEMENT. The U.S. Forest Service shall reimburse the Cooperator for the U.S. Forest Service's share of actual expenses incurred, not to exceed $149,996.00, as shown in the attached Financial Plan. The U.S. Forest Service shall make payment upon receipt of the Cooperator's monthly invoice. Each invoice from the Cooperator must display the total project costs for the billing period, including the Cooperator's share (when applicable).

Each invoice must include, at a minimum:

1) The Cooperator's complete legal name, address, and telephone number
2) U.S. Forest Service Supplemental Project Agreement number
3) Invoice date
4) Invoice number, if applicable
5) Performance dates of the work completed (start & end)
6) Total invoice amount for the billing period

The invoice must be forwarded to:

EMAIL: SM.FS.ASC_GA@USDA.GOV

FAX: 877-687-4894

POSTAL: USDA Forest Service
Albuquerque Service Center
Payments – Grants & Agreements

Send a copy to: steven.howell@usda.gov

V. IT IS MUTUALLY AGREED AND UNDERSTOOD BY AND BETWEEN THE PARTIES THAT:

A. PRINCIPAL CONTACTS. Individuals listed below are authorized to act in their respective areas for matters related to this SPA.

Principal Cooperator Contacts:

Cooperator Program Contact	Cooperator Administrative Contact
August Isernhagen 3663 Barron Way Reno, NV. 89511 T: 775-326-6000 aisernhagen@tmfpd.us	Charlie Moore 3663 Barron Way Reno, NV. 89511 T: 775-326-6123 cmoore@tmfpd.us

Principal U.S. Forest Service Contacts:

U.S. Forest Service Program Manager Contact	U.S. Forest Service Administrative Contact
Steven Howell 1536 South Carson Street Carson City, NV 89701 Te: 775-884-8114 F: 775-884-8199 steven.howell@usda.gov	Kevin Neely, Grants Management Specialist Southwest ID and NV Agreements Center 1249 South Vinnell Way, Suite 200 Boise, ID 83709 T: 208-373-4289 kevin.neely@usda.gov

B. LIABILITY. As set forth under the provisions of the referenced Cooperative Fire Protection Agreement.

C. Mutually agree to the Burn Plan relevant to this SPA, and to any agreed upon revision thereof. Revisions to the Burn Plan that do not materially affect the purpose and/or terms of the SPA, but rather only revises the implementation of the project, do not require a modification to this SPA. The Burn Plan, and any revision thereof, is incorporated by reference into this SPA and will be maintained by and provided to the Program Contacts listed above.

D. In the event of a conflict between the provisions of this SPA and the referenced Cooperative Fire Protection Agreement, the Cooperative Fire Protection Agreement shall take precedence.

E. PROPERTY IMPROVEMENTS. Improvements placed on federal land at the direction, or with the approval of, the U.S. Forest Service, becomes property of the United States. These improvements are subject to the same regulations and administration of the U.S. Forest Service as would other agency improvements. No part of this SPA entitles the Cooperator to any interest in the improvements, other than the right to use them under applicable U.S. Forest Service Regulations.

F. PARTICIPATION IN SIMILAR ACTIVITIES. This SPA in no way restricts the Parties from participating in similar activities with other public or private agencies, organizations, and individuals.

G. ENDORSEMENT. Either Party's contributions made under this SPA do not by direct reference or implication convey endorsement of each other's products or activities.

H. ALTERNATE DISPUTE RESOLUTION. In the event of any issue of controversy under this SPA, the Parties may pursue Alternate Dispute Resolution procedures to voluntarily resolve those issues. These procedures may include, but are not limited to, conciliation, facilitation, mediation, and fact finding.

I. MODIFICATION – COOPERATIVE FIRE. Modifications within the scope of this SPA must be made by mutual consent of the Parties, by the issuance of a written modification signed and dated by all properly authorized, signatory officials, prior to any changes being performed. Requests for modification should be made, in writing, at least 30 days prior to implementation of the requested change. No Party is obligated to fund any changes not properly approved in advance.

J. TERMINATION – FIRE SUPPLEMENTAL PROJECT AGREEMENT. Either Party, in writing, may terminate this SPA in whole, or in part, at any time before the date of expiration. Neither Party shall incur any new obligations for the terminated portion of this SPA after the effective date and shall cancel as many obligations as possible. Full credit shall be allowed for each Party's expenses and all non-cancelable obligations properly incurred up to the effective date of termination.

K. COMMENCEMENT/EXPIRATION DATE – FIRE SUPPLEMENTAL PROJECT AGREEMENT. This SPA is executed as of the date of last signature and is effective through 06/24/2023 at which time it will expire unless extended.

If the referenced Cooperative Fire Protection Agreement is superseded by a new Cooperative Fire Protection Agreement, this SPA may remain in effect to the extent that it does not conflict with the provisions of the new Cooperative Fire Protection Agreement, but only until such time that the project can be completed or modified to be incorporated within the terms of the new Cooperative Fire Protection Agreement.

L. AUTHORIZED REPRESENTATIVES. By signature below, the Parties certify that the individuals listed in this document as representatives of each Party are authorized to act in their respective areas for matters related to this SPA.

CHARLIE MOORE, Chief Date
Truckee Meadows Fire Rescue

WILLIAM A. DUNKELBERGER, Forest Supervisor Date
Humboldt-Toiyabe National Forest

The authority and format of this SPA have been reviewed and approved for signature.

KEVIN NEELY Digitally signed by KEVIN NEELY
Date: 2021.08.20 07:01:18 -07'00'

KEVIN NEELY Date
U.S. Forest Service, Grants Management Specialist

U.S. Forest Service

OMB 0596-0217
FS-1500-17B

Exhibit: A

USFS Agreement No.: 21-FP-11041700-033

Cooperator Agreement No.:

Mod. No.:

Agreements Financial Plan (Short Form)

Financial Plan Matrix: Note: All columns may not be used. Use depends on source and type of contribution(s).

	FOREST SERVICE CONTRIBUTIONS		COOPERATOR CONTRIBUTIONS		
COST ELEMENTS	(a) Noncash	(b) Cash to Cooperator	(c) Noncash	(d) In-Kind	(e) Total
Direct Costs					
Salaries/Labor	$28,550.00	$91,086.40	$0.00	$0.00	$119,636.40
Travel	$0.00	$0.00	$0.00	$0.00	$0.00
Equipment	$1,470.00	$45,273.60	$0.00	$0.00	$46,743.60
Supplies/Materials	$3,250.00	$0.00	$0.00	$0.00	$3,250.00
Printing	$0.00	$0.00	$0.00	$0.00	$0.00
Other	$0.00	$0.00	$0.00	$0.00	$0.00
Other					$0.00
Subtotal	$33,270.00	$136,360.00	$0.00	$0.00	$169,630.00
Coop Indirect Costs		$13,636.00	$0.00		$13,636.00
FS Overhead Costs	$3,992.40				$3,992.40
Total	$37,262.40	$149,996.00	$0.00	$0.00	
Total Project Value:					$187,258.40

Matching Costs Determination	
Total Forest Service Share = (a+b) ÷ (e) = (f)	(f) 100.00%
Total Cooperator Share (c+d) ÷ (e) = (g)	(g) 0.00%
Total (f+g) = (h)	(h) 100.00%

*Cooperator contributions not listed as partnership match not required per policy governing FP instruments.

WORKSHEET FOR

FS Non-Cash Contribution Cost Analysis, Column (a)

Salaries/Labor

Standard Calculation

Job Description		Cost/Day	# of Days		Total
Fuels Specialist	GS-11	$550.00	10.00		$5,500.00
AFMO Fuels	GS-9	$440.00	15.00		$6,600.00
Fuels Technician	GS-7	$295.00	30.00		$8,850.00
Burn Boss	GS-8	$380.00	20.00		$7,600.00
Total Salaries/Labor					**$28,550.00**

Equipment

Standard Calculation

Piece of Equipment	# of Units/Mil	Cost/Day	# of Days		Total
G63-1731S	150.00	$0.32	10.00		$480.00
G63-1731K	250.00	$0.33	12.00		$990.00
Total Equipment					**$1,470.00**

Supplies/Materials

Standard Calculation

Supplies/Materials		# of Items	Cost/Item		Total
Fuel Burning		1.00	$2,500.00		$2,500.00
Flagging		1.00	$750.00		$750.00
Total Supplies/Materials					**$3,250.00**

Subtotal Direct Costs	$33,270.00

Forest Service Overhead Costs

Current Overhead Rate	Subtotal Direct Costs			Total
12.00%	$33,270.00			$3,992.40
Total FS Overhead Costs				**$3,992.40**

TOTAL COST	**$37,262.40**

WORKSHEET FOR

FS Cash to the Cooperator Cost Analysis, Column (b)

Salaries/Labor

Standard Calculation

Job Description		Cost/Day	# of Days		Total
Crew Boss		$485.12	30.00		$14,553.60
Squad Boss		$402.56	30.00		$12,076.80
Equipment Operator		$402.56	20.00		$8,051.20
Crew Member		$313.36	180.00		$56,404.80
Total Salaries/Labor					**$91,086.40**

Equipment

Standard Calculation

Piece of Equipment	# of Units	Cost/Day	# of Days		Total
Chipper	1.00	$252.00	10.00		$2,520.00
Pickup 3/4 ton	2.00	$101.00	30.00		$6,060.00
Herbicide Trailer	1.00	$31.00	10.00		$310.00
Pickup 3/4 ton (mile rate)	2.00	$0.56	1405.00		$1,573.60
Masticator (Hourly)	1.00	$168.00	200.00		$33,600.00
Patrol truck (Hourly)	1.00	$121.00	10.00		$1,210.00
Total Equipment					**$45,273.60**

Subtotal Direct Costs	$136,360.00

Cooperator Indirect Costs

Current Overhead Rate	Subtotal Direct Costs			Total
10.00%	$136,360.00			$13,636.00
Total Coop. Indirect Costs				**$13,636.00**

TOTAL COST	**$149,996.00**

Annual Operating Plan
Fuels and Vegetation Projects Carson Ranger District
Agreement # 21-FP-11041700-033

Purpose: The purpose of this Annual Operating Plan (AOP) is to identify and provide guidance to conduct fuels reduction and vegetation management work on National Forest System Lands on the Carson Ranger District. The work to take place will be conducted on approved NEPA cleared projects authorizing fuels and vegetation implementation.

Project Sites: Project implementation sites will be identified prior to any work being performed and will be depicted on a map along with a prescription for work to be performed within a separate statement of work issued prior to implementation.

1. **Vegetation Management Prescriptions:** Prescriptions are project-specific and will be provided and agreed upon prior to implementation. Methods for vegetation removal may include, but are not limited to: hand thinning using chainsaws, brush cutters, and/or weedwhackers; hand piling of cut vegetation; chipping of cut vegetation; lopping and scattering vegetation; mastication; pruning of trees; prescribed burning; decking of tree boles for public and/or commercial fuelwood; noxious and invasive weed treatments.
    a. All methods of implementation will follow existing NEPA decisions completed for the specific project area.
    b. During prescribed fire activities, the U.S. Forest Service will be responsible to write burn plans and provide qualified burn bosses and other personnel and will be the lead agency.

2. **Vehicle Access**: Access to project areas will be utilized through existing roads, through areas identified by the Forest Service, or as identified in NEPA prior to project implementation.

3. **Timing**: Timing for implementation will vary and will take place according to each project specific NEPA decision guidelines.

4. **Fire Precaution Plan**: Any fire precautions will be stated in the prescription provided prior to implementation.

5. **Contact Information:**

    Liaison contacts for reviews and approval of proposed activities will be as follows:

Truckee Meadows Fire

Name	Title	Phone Number	Email
August Isernhagen	Div. Chief Fuels and Wildlifre	775-741-0372	AIsernhagen@tmfpd.us

Carson Ranger District, Humboldt-Toiyabe National Forest

Name	Phone Number	Email
Carson Ranger District	(775) 882-2766 Business Hours	
Steven Howell, Fuels Specialist	(775)-721-2064	steven.howell@usda.gov
Sierra Front Interagency Dispatch Center	(775) 883-5995	

Humboldt-Toiyabe N.F.
Carson R.D.
Pile Burn Plan

Pile Burn, Clear Creek Project

Element 1: Signature Page

PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT NAME(S): Carson Ranger District

PRESCRIBED FIRE NAME:
Prescribed Fire Unit (Ignition Unit): Carson Ranger District Pile Burn Plan (District-Wide)

PREPARED BY:
Name (print): Steve Howell Qualification/Currency: RXB2

Signature: _____ Date: _____

TECHNICAL REVIEW BY:
Name (print): Carol Carlock Qualification/Currency: RXB1

Signature: /s/ Carol Carlock Date: January 25, 2018

COMPLEXITY RATING: Low

MINIMUM BURN BOSS QUALIFICATION: RXB3

APPROVED BY:
Name – Agency Administrator (print): Irene Davidson

Signature – Agency Administrator: _____ Date**:** _____

Element 2A: Agency Administrator Ignition Authorization

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

Prior to signature the agency administrator should discuss the following key items with the fire management officer (FMO) or burn boss. Attach any additional instructions or discussion documentation (optional) to this document.

Key Discussion Items

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

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

I am authorizing ignition of this prescribed fire between the dates of _____ and _____. It is my expectation that the project will be implemented within this time frame and as discussed and documented and attached to this plan. If the conditions we discussed change during this time frame, it is my expectation you will brief me on the circumstances and an updated authorization will be negotiated if necessary.

Additional Instructions or Discussion Documentation attached (Optional): Yes ☐ No☐

Ignition Authorized by:
Agency Administrator Signature and Title:_____ Date:_____

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

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

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

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

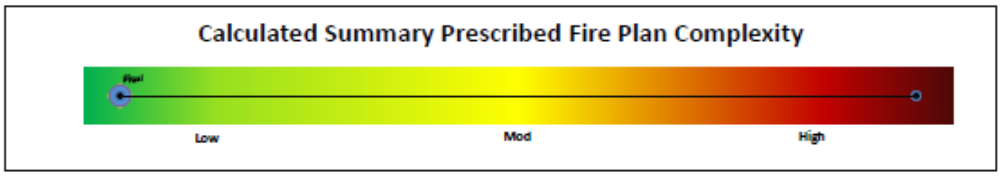
Burn Boss Signature:_____ Date:_____

Element 3: Complexity Analysis Summary and Final Complexity

NWCG Prescribed Fire Summary and Final Complexity Worksheet (PMS 424-1)
This worksheet is supplemental to the *Prescribed Fire Complexity Rating System Guide* (PMS 424). It is designed to enable effective risk management. The *Interagency Prescribed Fire Planning and Implementation Procedures Guide* (PMS 484) provides further explanation. This becomes Element 3 of the prescribed fire plan.

Type the Prescribed Fire Plan name here		Quantity	Significance
Values	On-Site	Multiple	Low
	Off-Site	Multiple	Low
	Public/Political Interest	Few	Mod

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



Final Complexity Determination	Final Complexity Determination Rationale
Low	Due to the seasonalisty of pile burning, the final complexity is classified as "Low". Pile burning will occur in Fall, Winter, and Spring, when fuel moistures are higher and weather patterns are cooler. While project locations are within the Wildland Urban Interface, there is extensive prescribed fire experience on the District and a large work force is available to efficiently and effectively accomplish pile burning targets.

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

Element 4: Description of Prescribed Fire Area

This plan is district wide pile burn plan and sites will vary year to year. An amendment to the burn plan will take place yearly and will include updated ignition unit information (ie. Vicinity maps, unit maps and project area descriptions).

A. Physical Description

1. Location**: Carson Ranger District, various project locations**
2. Size: Up to 1,000 acres could be burned per year, but specific acres will be defined per project area, and specified on attached maps.
3. Topography: Varies by project area.
4. Project area:
    a. Bower's: The project area encompasses approximately 5,600 acres which ranges in elevation from 5,400-7,000 feet.
    b. Clear Creek: The project area encompasses approximately 12,190 acres which ranges in elevation from 5,400-7,000 feet.
    c. Dog Valley: The project area encompasses approximately 16,000 acres which ranges in elevation from 5,200-7,000 feet.
    d. Arrowhawk: The project area encompasses approximately 7,500 acres which ranges in elevation from 5,900-7,200 feet.
    e. Little Valley: The project area encompasses approximately 1,660 acres which ranges in elevation from 6,400-7,000.
    f. Manzanita: The project area encompasses approximately 700 acres and ranges in elevation from 5,000-6,500 feet.
    g. Genoa: The project area encompasses approximately 10,211 acres and ranges in elevation from 4,000 –7,500 feet.
    h. Markleevillage: The project area encompasses approximately 1,200 acres and ranges in elevation from 5,500 –6,500 feet.
    i. Scotts Green Fuelwood: The project area encompasses approximately 82 acres which ranges in elevation from 7100 to 8000 feet. The total burn units to be burned are approximately 82 acres in size.
5. Ignition units:
    a. Bower's: The total burn units to be burned are approximately 109 acres in size.
    b. Clear Creek: The total burn units to be burned are approximately 42 acres in size.
    c. Dog Valley: The total burn units to be burned is approximately 100 acres in size.
    d. Arrowhawk: The total burn units to be burned is approximately 60 acres in size.
    e. Little Valley: The total burn units to be burned is approximately 106 acres in size.
    f. Manzanita: The total burn units to be burned is approximately 53 acres in size.

g. Genoa: The total burn units to be burned is approximately 30 acres in size.

h. Markleevillage: The total burn units to be burned is approximately 119 acres in size.

i. Scotts Green Fuelwood: The total burn units to be burned is approximately 82 acres in size.

Included maps show specific project areas and prescribed fire units.

B. Vegetation/Fuels Description:

1. On-site fuels data: Two fuel models TU1 (161) and SH2 (142) represent the burn units. The Burn Boss will need to identify the fuel type prior to the burn and follow the prescription for TU1 or SH2. Fuels in the adjacent areas are consistent with fuels in the primary burn unit. Fuel model TU1 (161) and SH2 (142) was referenced from Stand Fire Behavior Fuel Models: A Comprehensive Set For Use with Rothermel's Surface Fire Spread Model. The TU1 fuel model was chosen because its most represented of the burn units in the timbered areas – the primary carrier of fire in TU1 (161) is low load of grass and slash or shrub with litter. SH2 fuel model was chosen for the brush units with little to no timber and best represents those burn units without timber, where the primary carrier of fire in SH2 (142) is woody shrubs and shrub litter.

On-Site Fuels Data				**Adjacent Fuels Data**		
FBPS Fuel Model(s)		**TU1 (161)**	**SH2 (142)**	FBPS Fuel Model(s)	TU1 (161)	SH2 (142)
NFDRS Fuel Model(s)		**H**	**T**	NFDRS Fuel Model(s)	H	T
Fire Regime(s)		**1**	**1**	Fire Regime(s)	1	1
Fire Condition Class(es)		**2**	**2**	Fire Condition Class(es)	2	2
Fuel Loading	1 hour tlf	**.20**	**1.35**			
	10 hour tlf	**.90**	**2.40**			
	100 hour tlf	**1.5**	**0.75**			
	1000 hour tlf	**N/A**	**0**			
	Litter depth	**.60**	**1.0**			
	Duff depth	**0**	**0**			
	Live woody	**.90**	**3.85**			
	Live herbaceous	**.20**	**.50**			
	Total fuel loading	**4.3**	**9.85**			

2. Adjacent fuels data: Adjacent fuels are relatively consistent with fuels inside the primary burn unit.

3. Percent of vegetative type and fuels model(s): Vegetation types within the identified project areas are fairly consistent along the Sierra Front. The two fuel models identified (TU1 and SH2) are represented by approximately 60% TU1 and 40% SH2, depending on the elevation and project area.

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

Archeological sites across the district, Forest Service infrastructure adjacent to burn units, wilderness and recreation areas and wildlife protected activity centers. In addition, these projects are almost exclusively located within the Wildland Urban Interface and within close proximity to communities and off site infrastructure.

D. Maps - Attached in Appendix A

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

Element 5: Objectives

A. Resource objectives:

a. Reduce hazardous fuel loading within the Wildland Urban Interface, focusing on the Threat and Defense zones.

b. Maintain 10% or less of overstory tree mortality where piles might be next to trees.

B. Prescribed fire objectives:

a. Reduce fuels by 80%. Consumption of individual piles may vary between 90-100% of burnable material within the piles. No more than 10% of the original pile should be left on site.

b. 80% or more of piles are burned within the unit.

Element 6: Funding

A. Costs: Costs to successfully complete this project may include the following: NEPA planning, site preparation, ignition and holding, and mop-up and patrol.

B. Funding sources: Funding sources will vary by project area. In addition to appropriated funds, SNPLMA funds will be used within previously identified SNPLMA projects to complete prescribed burning activities. The following table addresses the estimated costs and sources of funding: The below figure is an approximate and is not exact.

Phase	Fuels	Wildlife	Range	Recreation	Timber	Other	Subtotal
NEPA Planning	$50,000					$100,000	$150,000
Clearances							
Burn Plan Preparation	$10,000					$10,000	$20,000
Site Preparation	$15,000					$60,000	$75,000
Ignition & holding	$25,000					$25,000	$50,000
Mop-Up & Patrol	$5,000					$5,000	$10,000
Subtotal	$105,000					$200,000	
Grand Total							**$305,000**

Element 7: Prescription

A. Prescription Narrative:

See attached Behave Plus simulations, used to calculate the parameters listed below. If site conditions do not match or are not representative of fuel models TU1 and SH2, either an amendment to this existing burn plan or a new burn plan must be completed.

The piles will experience high heat intensities within the pile. Some larger piles may experience high flame lengths but will be confined to the pile. The piles will have little to no fire spread outside of the perimeter of the pile because of time of year for burning.

Spotting distance may not exceed the contingency area, which will be dependent on project location.

Probability of ignition may not exceed 70% in dry conditions. 70% was used from local knowledge and experience in the projects areas where prescribed fire activities will take place. Behave Plus does not factor in local conditions such as green-up and recent precipitation and/or snow within the burn area. Resources on scene will be sufficient to handle any problems that may arise from a burning ember outside of the primary burn unit.

A 10-hour fuel stick will be placed a minimum of two weeks prior to ignition and kept on the burn unit site and will be used as a method for determining if the unit is within prescription. One hour fuel moistures can be taken by estimate in the field from measuring dry bulb temperature and relative humidity and referring to the Interagency Fire Use Module Field Guide 2005 page 50 or the Fire Line Handbook Appendix B for moisture tables. 10 hour fuel moistures may be measured and used with the rule of thumb for calculating 1 hour fine dead fuels by subtracting 1% from 10 hour fuel moisture. 100 hour fuel moistures can also be calculated by adding 2 from the 10 hour fuels. (Advanced Wildland Fire Behavior Calculations S-490 Jan. 1993 NFES 2285 page 49). Midlfame wind speeds can be converted to 20 foot winds using the adjustment factor appropriate to the site by dividing the midflame wind by the adjustment factor of 0.3 for partially sheltered fuels for the site (Fireline Handbook Appendix B).

Behave Plus runs and the Fine Dead Fuel Moisture tables do not take into account moisture that is present within the burn area for pile burning. The prescription is for an escape from a burn pile. Fuels outside the pile will have higher live woody moisture because of burning in the winter and early spring months.

When snow is covering the burn unit and or measurable precipitation events are happening when mid flame wind speed exceeds 14 mph line officer approval is needed and documented to continue to burn with higher winds.

*Relative humidity or 10 hour fuel moistures will be used only in dry ground conditions as a factor in the prescription. When snow and or rain are present RH and 10 hour fuels moistures will not be a factor in an escape. (RH and Fuel Moistures have read below prescription levels in the past when snow has been present in freezing conditions. Experience shows these readings will not play a factor into an escape when conditions are such with snow and rain present)

B. Prescription Parameters:

1. Environmental or fire behavior (or both)

a. <u>Fuel Model TU1 (161):</u>

Environmental Prescription (TU1)	Acceptable Prescription Range			Outside area at critical holding point
	Low Fire Intensity	Desired Fire Intensity	High Fire Intensity	
Temperature (°F)	0-69	0-69	0-69	**minimum acceptable moisture**
Relative humidity (%)	>45%*	25%-44%*	15%-24%*	
Mid-flame wind speed	<6	6.1-10	10.1-14	
Wind direction (azimuth°)	Any	Any	Any	
1-hr fuel moisture (%)	>11	9-10	7-8	<7
10-hr fuel moisture (%)	>12*	10-11*	8-9*	<8*

100-hr fuel moisture (%)	>14	12-13	10-11	<10
1000-hr fuel moisture (%)	N/A	N/A	N/A	N/A
Live fuel moisture (%)	N/A	N/A	N/A	N/A
Duff moisture (%)	N/A	N/A	N/A	N/A
Soil moisture (%)	N/A	N/A	N/A	N/A

Fire Behavior Prescription (TU1)	**Acceptable Fire Behavior Range**			**Outside area at critical holding points**
	Low Fire Intensity	**Desired Fire Intensity**	**High Fire Intensity**	
Fuel Model(s)	TU1(161)	TU1(161)	TU1(161)	TU1(161)
Rate of Spread (chains/hour)	0-6	6.1-12.5	12.6-19	>19
Flame Length (in feet)	0-2.7	0-4	4.1-6	>6.1
Scorch Height (in feet)	N/A	N/A	N/A	
Probability of Ignition (%)	N/A	N/A	70	>70
Spotting Distance (in miles)	0	0	0.1	>0.1

b. **Fuel Model SH2 (142):**

Environmental Prescription (SH2)	**Acceptable Prescription Range**			**Outside area at critical holding point**
	Low Fire Intensity	**Desired Fire Intensity**	**High Fire Intensity**	
Temperature (°F)	0-69	0-69	0-69	**minimum acceptable moisture**
Relative humidity (%)	>74%*	25-74%*	15-24%*	
Mid-flame wind speed	0-6	6-10	10.1-14	

Wind direction (azimuth°)	Any	Any	Any	
1-hr fuel moisture (%)	>14	9-13	7-8	<7
10-hr fuel moisture (%)	>15*	10-14*	8-9*	<8*
100-hr fuel moisture (%)	>16	12-15	10-11	<10
1000-hr fuel moisture (%)	N/A	N/A	N/A	N/A
Live fuel moisture (%)	N/A	N/A	N/A	N/A
Duff moisture (%)	N/A	N/A	N/A	N/A
Soil moisture (%)	N/A	N/A	N/A	N/A

Fire Behavior Prescription (SH2)	**Acceptable Fire Behavior Range**			**Outside area at critical holding points**
	Low Fire Intensity	**Desired Fire Intensity**	**High Fire Intensity**	
Fuel Model(s)	SH2(142)	SH2(142)	SH2(142)	SH2(142)
Rate of Spread (chains/hour)	0-6	6.1-11	11.1-17	>17.1
Flame Length (in feet)	0-3.2	3.2-4.2	4.3-5.2	>5.2
Scorch Height (in feet)	N/A	N/A	N/A	
Probability of Ignition (%)	N/A	N/A	70	>70
Spotting Distance (in miles)	N/A	N/A	N/A	N/A

2. Fire Modeling or empirical documentation (or both)
    a. See Appendix E.

Element 8: Scheduling

A. Implementation Schedule:

1. Ignition Time Frames or Season: Fall, Winter, Spring seasons only.

B. Projected Duration: October 1st – June 15th.

C. Constraints: The Burn Boss must note the 6-10 day forecast to determine if a warming trend or high wind event is forecasted. The National Weather Service, Reno office is the preferred weather office for spot weather forecasts. This will be included in the project folder. The project must fall within fall/winter/spring months. If burning when NFDRS is extreme in local area, then authorizations from the Regional Office is required.

Element 9: Pre-burn Considerations and Weather

A. Considerations:

1. On-site: Prior to implementing the burn, the following much be completed:
    a. A smoke permit must be obtained from the Air Quality District the burn is taking place in.
    b. A 10-hour fuel stick will be placed in or near the burn units a minimum of two weeks prior to burning. Weather observations will be taken on site and recorded prior to, during, and after ignition has taken place. The fuels specialist and/or the burn boss will be responsible to ensure pre-considerations are in place.
2. Off-site: Prior to implementing the prescribed fire, the Sierra Front Interagency Dispatch Center (Minden Dispatch) will be given a complete copy of the Prescribed Fire Plan. Notifications will be made prior to burning as listed in the notification sheet.

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

a. The majority of project areas this burn plan applies to is within 10 miles to the nearest RAWS station. If an on-site RAWS station is needed for whatever reason, the district has the capability to deploy their portable RAWS to ensure onsite weather is available.
b. A Spot Weather Forecast from the National Weather Service is required prior to ignition for each day active ignition will occur on the burn units. This Spot Weather Forecast will be obtained the day of the burn, prior to ignition.
c. Air Quality will be notified and checked prior to ignition for burn/no burn information. Attempts will be made to notify Air Quality 24 hours prior, but this is not always feasible.
d. Weather observations will be taken daily and recorded on appendix F and be put into the working file for records.
e. Local weather projected beyond the ignition operation and the need for additional Spot Weather Forecasts should be taken into account in order to minimize the risk of an escape.

C. Notifications: The District Fuels Specialist or the District Ranger will take the lead in talking to the media, as well as providing information and a quote for the Forest Service press release. The lead PAO for this project will be the District Fuels Specialist. If the Fuels Specialist is unavailable the District Ranger may act as the PAO for the project. Nearby residents will be notified at least one week prior to burning.

The following table shows what contacts will be made by who. Depending on the project location, not all of the contacts will be needed for a given day. For example, if burning activities will be taking place in Douglas County, the Reno Fire Department will not be notified – notifications will be based

on the project locations.

Who	When*	Phone Number and/or e-mail	Responsibility	Date	Initial
Local Residents	B, A		Dist Fuels Spec Dist FIO		
Local radio station	B(1wk)	KOH 780 (789-6700) KUNR (327-5867)	Dist Fuels Spec Or PIO		
TV stations	B(2wks)	CH 2 (861-4290) CH 4 (785-1210) CH 8 (885-8888)	Dist Fuels Spec or PIO		
Newspapers	B(1wk)		Dist Fuels Spec Or PIO		
Reno City Fire Department Truckee Meadows Protection District Carson Fire East Fork Fire Protection Lake Valley Fire(Scotts Lake Pile Burn) Alpine County	D		Minden		
Air Quality Management Divisions Dependent on air district	B, D, A (Submit permit at least 2 weeks in advance)		Dist Fuels Spec		
Minden Dispatch	B,D,A	883-5995	Burn Boss		
Markleeville Residents Email	B (only for burns taking place in Alpine County)		Dist. Fuels Spec		
County Sheriff's	D		Minden		
Nevada Division of Forestry	D	FMO	Minden		
Nevada Department of Transportation (Nevada Burns) Cal Trans (California Burns)	D		Minden		
Nevada Division of Environmental Quality	B, A	775-687-9358	Dist Fuels Specialist		

BLM – Carson City Field Office LTBMU Camino Dispatch	B		Minden		
National Weather Service www.wrh.noaa.gov/reno/fire	B, D, A	775-673-8105 775-673-8108 after 4:00pm, or fax 775-673-8110	Burn Boss		
Fire Staff, District FMO	B	352-1223 884-8145	Dist Fuels Spec		
Carson RD Front Desk	B	882-2766	Dist Fuels Spec		
Supervisor's Office Front Desk	B	355-3501	Dist Fuels Spec		
When to Notify Before **(B)**: The day prior to burn day. Day of **(D)**: Prior to ignition on burn day. After **(A)**: After burn is completed					

Element 10: Briefing

A. Briefing Checklist; including, but not limited to: (additional items may be added)

- ☐ Burn organization and assignments
- ☐ Provide maps
- ☐ Prescribed Fire objectives and prescription
- ☐ Description of prescribed fire project area
- ☐ Expected weather and fire behavior
  - ☐ Review Spot Weather Forecast
  - ☐ Make weather observer assignment and set collection schedule
  - ☐ Review critical weather that will terminate burn
- ☐ Communications
- ☐ Ignition plan
- ☐ Holding plan

- Contingency plan and assignments
  - Identify high value and areas of special concern
  - Identify mitigation measures, procedures, project boundary, etc.
- Wildfire declaration
- Safety and medical plan
- Aerial ignition briefing (if aerial ignition devices will be used)

Element 11: Organization and Equipment

A. Positions:

Fuel Model TU1		**Low**		**Desired**		**High**	
Position	**ICS Code**	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**
Prescribed Fire Burn Boss	RXB3	1		1		1	
Engine Boss	ENGB	0		0		1	
Ignition Crew/Holding Crew	FFt2	3	6	5	10	7	14
Fuel Model SH2		**Low**		**Desired**		**High**	
Position	**ICS Code**	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**
Prescribed Fire Burn Boss	RXB3	1		1		1	
Engine Boss	ENGB	0		0		1	
Ignition Crew/Holding Crew	FFt2	3	9	5	15	7	21

B. Equipment:

Fuel Models TU1 and SH2	**Low**		**Desired**		**High**	
Equipment Type	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**	**Total Amount**	**Line Building Rate**
Engine Type 3, 4, 6 (3 person minimum)	0		0		1	15

C. Supplies:

Fuel Models TU1 and SH2	**Low**	**Desired**	**High**

Type	Unit of Measure	Total Amount	Line Building Rate	Total Amount	Line Building Rate	Total Amount	Line Building Rate
Drip Torches	Each	2		4		5	
Hand Tools	Each	3		5		10	

***Calculations were taken from the Fireline Handbook Appendix A based on fuel model 8, which closely represented TU1 (161). Calculation was based on a 3 person crew minimum without an engine except for high prescription days where an engine with a three person crew is needed.

Firing crew will become holding crew when ignition operations are completed, therefore holding collateral duties. The Burn Boss will also hold collateral duties such as firing and holding. On high days the ignition and holding crews will have at least one person qualified at the Engine Boss level for engine staffing purposes for contingency plans. Line production rates from personnel are not duplicated for equipment.

Additional resources may be assigned to the project without amending the burn plan if the addition of these resources does not change the complexity of the burn or require additional supervisory positions. These changes must be documented in the daily briefing. Reduction in resource capabilities identified as required in the plan requires an amendment.

Element 12: Communication

A. Radio Frequencies: The below frequencies are suggested frequencies but can vary depending on project location

1. Command frequency(ies):

Channel	**Function**	**Frequency**		**Band Width**	**Assignment**	**Remarks**
H-1 M-1		RX:	173.7750	Narrow	Comm. To Minden	*H=Handheld Radio* *M=Mobile Radio*
		TX:	165.7500			
		Tones:	1 (Slide) 2 (Peavine) 3 (Hawkins) 4 (Rawe) 5 (Job's) 9 McClellan			

2. Tactical frequency(ies): Tactical frequencies will be assigned on the day of the burn by the Burn Boss.

3. Air operations frequency(ies): Not applicable for this burn plan.

C. Telephone Numbers:

Contact	Office Phone Number	Cell Phone Number
HTNF – Carson District Office	**775-882-2766**	
HTNF – Supervisor's Office	**775-355-5300**	
Minden Dispatch	**775-883-5995**	**775-721-0312 After Hours Cell**
Bill Dunkelberger, *Forest Supervisor*	**775-355-5310**	**775-720-9963**
Forest Duty Officer Cell Phone		**775-240-6244**
Jeremy Kiesling, *Forest AFMO*	**775-352-1222**	**775-313-6324**
Matthew Zumstein, *Line Officer*	**775-884-8100**	**775-721-1259**
Steve Howell, *District Fuels Specialist/ RXM2*	**775-884-8114**	**775-721-2064**
District FMO	**775-884-8145**	**775-721-0682**

Element 13: Public and Personnel Safety, Medical

A. Safety Hazards:

a. Firefighter: All personnel who are within the active burn area are required to wear personal protective equipment. All burn personnel will be appropriately red-carded and qualified for the position they are filling. Smoke exposure may be heavy at times due to heavy fuels in piles. JHA's for the project will be followed and signed by all personnel on the project.

b. Public: The project area will be signed with notices of the prescribed fire to alert the public of planned prescribed fire. Non-red-carded individuals will be escorted by a qualified prescribed fire employee assigned to the project. Media will be directed to the District Fuels Specialist, the District Fire Information Officer, or the District Ranger.

B. Mitigation: Measures Taken to Reduce the Hazards: Prescribed burn signs will be placed prior to daily ignition along any possible impacted highways. Prescribed burn signs will also be placed near the burn alerting public in the area. The project area will be signed with prescribed burn notices prior to the project implementation. Tailgate safety sessions will be conducted prior to operations and JHA's will be reviewed and signed by all personnel assigned to the project.

C. Emergency Medical Procedures: In the event of serious accidents or injuries, the Burn Boss shall be notified immediately. Individuals with medical qualifications (i.e. First Responder, EMT, Paramedic, etc) and helitack qualified should be identified at the pre-burn briefing. The Burn Boss or assigned person will initiate on-site response (if not already in progress) and coordinate additional response needs. If a serious injury should occur, the incident will be treated as an incident within an incident. If the injury is serious, then ignition will stop and holding will take place until the injury is taken care of. The Burn Boss may assign a qualified person to take over the burn while the injury incident is being handled. In the event of a serious injury, the Burn Boss will notify Minden Dispatch and the Duty Officer. Minden Dispatch and/or the Duty Officer will then notify the line officer, in accordance with the district safety plan.

D. Emergency Evacuation Methods:

To prepare for an emergency which requires first aid, and/or immediate evacuation of personnel due to serious illness or injury, the following information should be predetermined, and available to all crew members:

DESIGNATED FIRST AID PROVIDER(S):
(At least one person on each crew should be designated to provide first aid)

_____

_____

COMMUNICATION PROCEDURES TO FOLLOW IN THE EVENT OF AN EMERGENCY:

MEANS OF COMMUNICATION:

RADIO CHANNEL: 1 (HTF local or tones 1,2,3,4 and 9) **PHONE NUMBER:** Dispatch 775-883-5995

HOME BASE: Carson Ranger District

HOME BASE EMERGENCY COORDINATOR: Line Officer

EMERGENCY SERVICES:

PHONE NUMBER: 911

HOSPITALS:

PHONE NUMBER:

(Air evacuation should be obtained through the SO dispatcher, if needed.)

EMERGENCY EVACUATION TRAVEL ROUTES: Routes will vary depending on location of burn units. Refer to emergency facilities section E to determine nearest medical center. Routes will be identified in daily briefing.

CREW MEMBERS SHOULD PROVIDE THE FOLLOWING WHEN CALLING FOR ASSISTANCE:

- nature of injury or accident (do not broadcast victim(s) name(s);
- type of assistance needed;
- number, and (for air transport) estimated weight, of persons to be transported;
- location of injured, using landmarks identifiable on ground and/or map;
- current information about weather and travel hazards/obstacles;
- (Crew should remain in contact with home unit until evacuation team arrives, if possible.)
- Copies of this plan should be provided to crew leader(s) and Home Base Coordinator(s), prior to beginning work.

E. Emergency Facilities:

EMERGENCY TRANSPORTATION						
NAME	**TELEPHONE**	**LOCATION**			**PARAMEDICS**	
					YES	**NO**
CARE FLIGHT REMSA	911	RENO, NV, Carson City NV			X	
UC DAVIS (BURN CENTER)	916-734-2011 Sacramento California	Sacramento, Ca.			X	
HELISPOT CLOSEST TO PROJECT	**LAT.**	Sites will be identified on the ground prior to burning. Because this is a district wide plan sites will change on a day to day basis. Lat and Longs will be noted on the medical plan for that days burning.	**LONG.**			

HOSPITALS								
NAME	**ADDRESS AND LATITUDE AND LONGITUDE**	**TRAVEL TIME (MIN)**		**PHONE**	**HELI PAD**		**BURN CENTER**	
		AIR	**GROUND**		**YES**	**NO**	**YES**	**NO**
ST. MARY'S	235 W. SIXTH ST. Reno, Nv.	10 MIN.	½ HR.	770-3000	X			X
RENOWN	1155 MILL ST. RENO ,NV	10 MIN.	½ HR.	982-4100	X			X

SOUTH MEADOWS MED. CENTER	10101 DOUBLE R BLVD. Reno, Nv.	10 MIN	½ HR.	982-7000		X		X
UC DAVIS (BURN CENTER)	916-734-2011 Sacramento California	1 HR	4 HR.	916-734-2011	X		X	
University Medical Center (Burn Center)	702-383-2000 Las Vegas Nevada	1 HR	9 HR.	702-383-2000	X		X	
Carson Tahoe Hospital	1600 Medical Parkway Carson City, NV	10 MIN	½ HR.	445-8000	X			**X**
Carson Valley Medical Center	**1107 US Highway 395 N, Gardnerville, NV**	10 MIN.	½ HR.	782-1500	X			**X**

Element 14: Test Fire

A. Planned Location: Provisions for a test fire are required and results must be recorded. The test fire must be ignited in a representative location and in an area that can be easily controlled. The purpose of the test fire is to verify that the prescribed fire behavior characteristics will meet management objectives and to verify predicted smoke dispersion. In many application, analysis of the initial ignitions may provide adequate test fire results. On multiple-day projects, evaluation of current active fire behavior, in lieu of a test fire, may provide a comparative basis for continuing and must be documented. If in doubt however, initiate a separate test fire and evaluate results. A test fire will consist of a single pile in a representative spot in the burn unit for that day's ignition. The pile will be ignited and monitored for smoke dispersion and effectiveness of the pile being consumed. Minden Dispatch must be notified of a test fire and then notified if ignition will continue.

B. Test Fire Documentation:

1. Weather conditions on site:

Location:	
Date and Time:	
Weather/Fuels Conditions	
Cloud Cover %	
Temperature	
Relative Humidity	
Fine Dead Fuel Moisture	
Wind Speed	
Fuels	

2. Test fire results

Test Fire Results				
Flame Length				
Rate of Spread				
Smoke Dispersion				
Other				
The test fire meets the prescription parameters:	YES		NO	

Element 15: Ignition Plan

A. Firing Methods:

a. This project consists of pile burning and piles will be hand ignited appropriately according to fuels and weather conditions.

B. Devices: The means by which a fire is ignited can be Air Curtain Burner, handheld drip torches, fusees, fire-gel, propane torches, backpack torches, and/or matches.

C. Minimum Ignition Staffing: Ignition staffing will follow Element 11, organization and staffing depending on the prescription. Igniters will hold collateral duties such as holding.

Element 16: Holding Plan

A. General Procedures for Holding: Each individual lighter will be responsible for holding and monitoring piles within the project area that have been ignited. The holding crew will consist of the ignition crew after ignition is completed for the day.

B. Critical Holding Points and Actions: Piles located within the project area will be monitored appropriately and each pile will be confined to its perimeter before the end of shift.

C. Minimum Organization or Capabilities Needed: Minimum capabilities needed for holding are identified under Element 11 – Organization and Equipment. On burn day and subsequent days of prescribed fire operations, a mix of number and kinds of hand crews and engines may be modified as long as stated production capabilities are not compromised. As prescribed fire operations progress from ignition to holding to mop up and patrol, specified capabilities and/or types of resources may be adjusted by the Burn Boss.

Element 17: Contingency Plan

Management Action Points or Limits: If any of the following situation occur, contingency actions will take place:

1. Fire threatens the project boundary.
2. Fire outside the primary unit boundary (notify duty officer as soon as possible).
3. Smoke impacting sensitive areas.
4. Potential for costs to control exceed available project funds.
5. If fire exceeds objectives.

B. **Actions Needed:** If the objectives are not being met, ignition will stop. Ignition may resume if environmental conditions allow for objectives to be met. If circumstances 1-5 listed above occur, the Contingency Plan will be implemented. If the contingency actions are successful at bringing the project back within the scope of the Prescribed Fire Plan, the project may continue. If contingency actions are not successful by the end of the next burning period or earlier depending on circumstances and threat, then the prescribed fire will be converted to a wildfire.

In order to utilize cooperating agencies for a contingency plan or other unplanned circumstances, the Forest

Service will make every attempt to establish agreements in advance when planning to utilize non-FS resources. In the event of a contingency plan being implemented, and the use of cooperating agency resources, the Forest Service will pursue executing an agreement within 30 days of the event, as dictated by Chapter 17 of the Red Book.

Due to lack of current interagency agreements to allow interagency resources to be compensated for prescribed fire, contingency resources will be agency only and Burn Boss will need to arrange to have contingency forces available on site during project implementation. In the event an escape occurs, interagency resources can be utilized and estimated response times and locations are listed in Item C below.

On site contingency forces:

- Pre- identified water locations for engine water fill determined the day of ignition.
- If portable tanks are used, ensure they are filled prior to implementation.
- Type 7 engine (patrol) or portable pumps with hose (if water source available) will be on scene during low and moderate prescription days when snow is not present in the burn unit or the site has not received recent rains.

Contingency Points:

- Primary Burn Unit: On site contingency forces should be able to utilize the existing road system natural features that surround the burn units to contain the fire. If fire crosses outside the burn unit under the high prescription, 1 additional engine should be ordered to support the onsite contingency forces.

Control points if fire escapes outside of burn piles: If fire escapes outside of burn pile initiate action to bring fire back into pile, if creep is observed outside of pile then monitoring can take place to allow some creep as long as there is no threat of escape. If fire cannot be contained back to the pile use the burn unit boundary as a fallback option.

A list of available resources in addition to the onsite contingency resources will be documented by the Burn Boss on Appendix I each day of the burn. The Burn Boss will contact adjacent Duty Officers and dispatch centers daily to confirm availability of resources.

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

Resources	**Agency & Location**	**Maximum Response Time**	**Confirmation of Availability***	
			Yes/No	Date
Brush Engines/Structure Engines	Local County or City Fire Departments	25 minuets		
Brush Engines/Structure Engines	Any other available Cooperators	2 Hours		
Hand Crews	Nevada Division of Forestry (Closest Available)	12 Hours		
• To be completed within one day of the burn and adjusted during course of extended burning conditions.				

Element 18: Wildfire Declaration

A. Wildfire Declared By: The Prescribed Fire Burn Boss will have the authority to declare the prescribed burn a wildfire. If any of the following situations, the burn will be declared a wildfire, initial attack will occur, and appropriate management response will take place. The Burn Boss will make the decision on whether to declare an escape within the next burning period or sooner if warranted.

a. Contingency actions have failed or are likely to fail and cannot be mitigated.
b. Fire outside of the project area.
c. Costs for control exceed available project funds.

B. IC Assignment: Should a wildfire be declared, the Prescribed Fire Burn Boss will become the Incident Commander until relieved or replaced. The IC will organize all resources on-site for a safe and aggressive response. Personnel within the prescribed fire organization will transition into ICS wildfire positions they are qualified to carry out. The IC will order additional suppression resources identified in the Contingency Plan as well as any other required resources necessary to support the suppression effort. Upon a wildfire conversion occurring, all overhead personnel will document actions taken. After the incident is contained, the Prescribed Fire Burn Boss will submit a post fire report documenting weather, resources on site, ignition operations, holding actions, and other pertinent data.

C. Notifications: The Prescribed Fire Burn Boss/IC will notify Minden Dispatch and the District Duty Officer of the escape and identify himself/herself as the IC. District Duty Officer will then notify the District Ranger and the FMO. Dispatch Center will notify contacts listed on the notification plan of the escape and the current situation. District Ranger reports to the Forest Supervisor within 4 hours and the Forest Supervisor will notify Regional Forester within 12 hours or sooner of an escape, threat of an escape, or activation of contingency resources identified in the plan, or any prescribed fire that requires additional resources or operational time not accounted for in the IAP.

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression (Optional): The appropriate management response will be used in order to flank the fire with suppression resources until the forward rate of spread is stopped. The containment strategy will be to utilize safe anchor points and create direct fire line where feasible and indirect fire line, including burning out, depending upon location of natural barriers and roads .The FMO and/or IC, Resource Advisor, and Agency Administrator may develop a WFDSS which will determine the appropriate management response to the escaped fire. Opportunities to aid in fire suppression include: utilize existing roads in the vicinity of the burn unit, moist drainages, and changes in fuels (i.e. transition from brush field into timber fuel models). Areas of high value and special concerns include: structures near burn site and all major roads that may be affected by the burn.

Element 19: Smoke Management and Air Quality

A. Compliance: This burn plan complies with the Northern Sierra Air Quality Management District and the Great Basin Unified Air District which is designed to meet California air quality standards. Compliance will also be made with Washoe County Air Quality District and the Nevada Department of Environmental Protection Air Quality division and is designed to meet Nevada air quality standards. Attempts will be made to notify the respective air quality agency 24 hours in advance of ignition, but due to multiple air quality jurisdictions and multiple projects, this might not always be feasible. Notifications will take place prior to ignition. The Burn Boss will be responsible to call air quality and or check air quality websites and determine if it is a burn day or not. Alternatives to burning were considered for this project. Mechanical treatment using equipment to masticate vegetation was considered as a possible alternative to prescribed burning and has been an accepted treatment method on many fuels reduction projects. For the following reasons prescribed fire was considered a more appropriate method of treatment on the project.

1.) The project area is within an ecosystem where wildfire has historically played a natural role. The use of prescribed fire is considered a more natural treatment than mechanical treatments.

2.) The cost difference is substantial especially for large acreage projects like this project. Approximately $750.00 or more per acre for mechanical mastication compared to approximately $400.00 per acre for prescribed burning.

3.) Mechanical treatments using tractors or heavy equipment are much more ground disturbing then prescribed fire. Due to the many prehistoric cultural resource sites (lithic scatters, etc.) within the project area prescribed fire was considered more desirable because there would be less impact to these sites.

4.) Much of the project area is mountainous with steep slopes. Tractors and heavy equipment have safety limitations on steep slopes (they roll over). The steeper areas could not be treated mechanically due to safety concerns. Prescribed fire can be effectively and safely used on steeper slopes.

Prescribed fire was considered a good alternative compared to other treatments and with proper implementation and compliance with the requirements of the Clean Air Act this alternative should meet the Forest's goals and objectives and have minimal impact to the States air quality.

FOFEM and or California ARB estimate sheets were used to calculate PM10 from the burn. The PM10 calculation is an estimate for the entire burn areas. The approximate PM10 released will vary depending on location and amount of materials to be burned. Estimates for PM 10 will be noted on each permit for the different air sheds.

B. Permits to be Obtained: Within 24 hours of burning a permit will be obtained. Permits will vary depending on unit locations but may include all or some of the following.

a. Washoe County Air Quality Management District: 775-784-7200 (Washoe County)
b. Nevada Department of Environmental Protection: 775-687-9360 (Douglas County and Carson City)
c. Great Basin Unified Air Quality Management District: 760-873-2555 (Alpine County)
d. Northern Sierra Air Quality Management District: 530-994-3561 (Sierra County)

C. Smoke-Sensitive Receptors: Carson-Iceberg Wilderness Area, near Alpine County, California.

D. Potential Impacted Areas: Smoke should be minimal and not affect the airshed and have little impact on the surrounding homes and highways. The following table defines potential impacted areas to the various project areas.

Receptor	Direction	Distance
Reno, Nevada	North/East	10 miles
Douglas County/Carson City, Nevada	North	5 miles
Markleeville, California	South	10 miles.

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts: Some potential for visual impairments to nearby highways may occur and cause a road hazard that will require immediate mitigation. The Burn Boss will assure monitoring of the public roadways and smoke dispersal. Signs will be in place prior to ignition. On days of inversions affecting the airshed the Burn Boss and/or the air quality district will make the determination to burn or not.

Element 20: Monitoring

A. Fuels Information Required and Procedures: Weather and dead fuel conditions will be monitored at least 1 week prior to burning by either manually. If onsite weather data is representable to nearest RAWS, then the RAWS may be used for weather data. These conditions will also be monitored each day of planned ignition. A ten hour fuel stick will be on site within or near the burn unit so that it can be compared to the RAWS most representative of the burn site. Zone Fire Weather forecasts will be monitored prior to the burn date if available. A spot weather forecast will be requested through National Weather Service on the day before the burn. Regional weather forecasts may be copied from the internet and used for documentation.

B. Weather Monitoring (Forecasted and Observed) Required and Procedures: Weather observations will be measured and recorded on a daily basis on the Weather/Fuels/Fire Behavior/Smoke Observations form found in Appendix F or equivalent form.

C. Fire Behavior Monitoring Required and Procedures: Weather observations will be measured and recorded on a daily basis on the Weather/Fuels/Fire Behavior/Smoke Observations form found in Appendix F or equivalent form.

D. Monitoring Required to Ensure that Prescribed Fire Plan Objectives are Met: Igniters will monitor piles and ensure 80% or greater consumption takes place. Burn Boss will inspect the project area to ensure that objectives are met.

E. Smoke Dispersal Monitoring Required and Procedures: The Burn Boss will assure monitoring of the public roadways for smoke and smoke dispersal in the project area. Signs will be in place prior to ignition.

Element 21: Post-burn Activities

A. Post-Burn Activities that must be Completed: The Prescribed Fire Burn Boss will insure the Prescribed Fire Post Burn Evaluation is completed (Appendix G). The Weather/Fuels/Fire Behavior/ Smoke Observations (Appendix F) will be collected and placed into the project folder. Any addition Fire Effect Reports will be completed and place in the project folder.

Prescribed Fire Plan Appendices

Appendix A: Maps: Vicinity, Project or Ignition Units

Appendix B: Technical Reviewer Checklist

Appendix C: Complexity Analysis

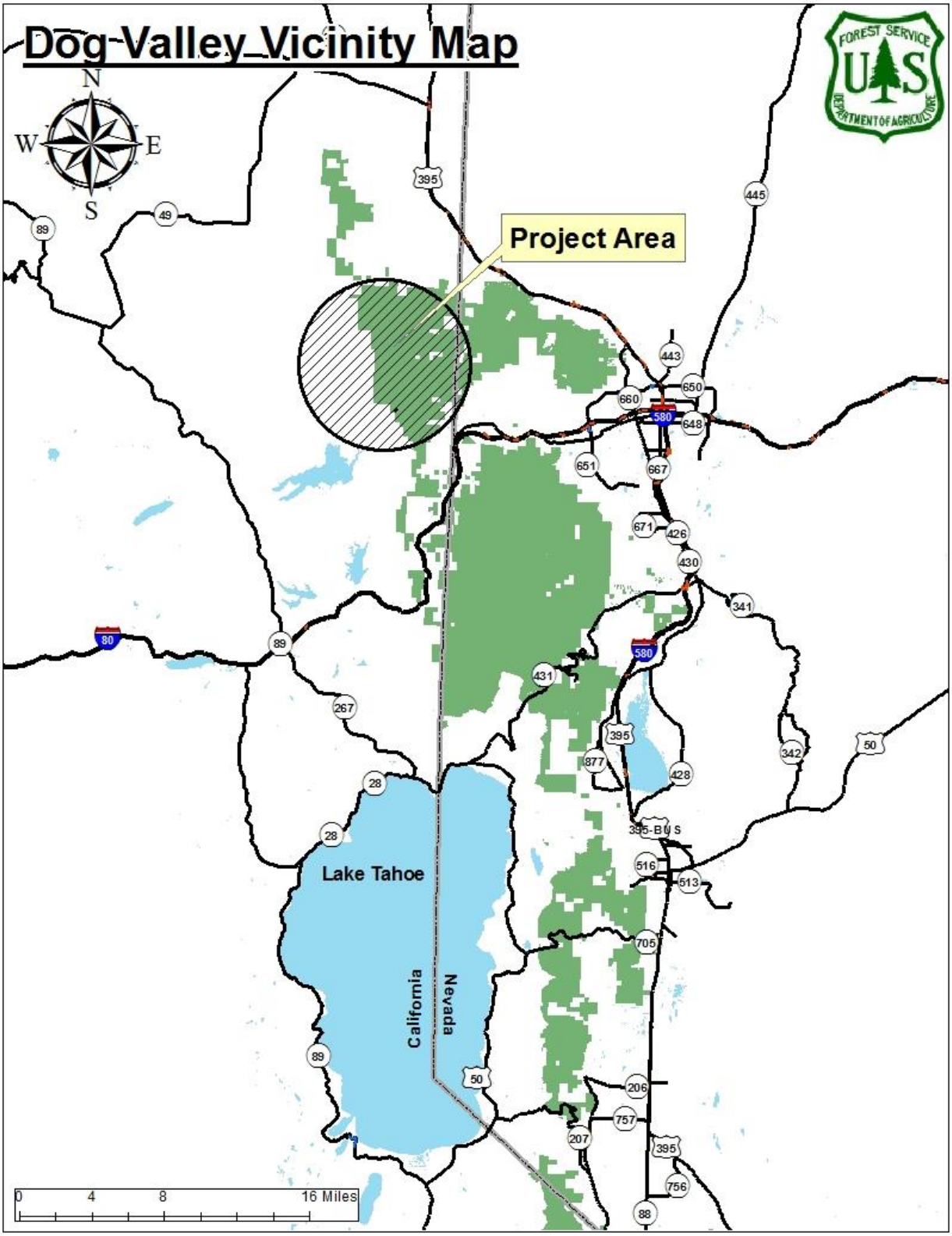
Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment

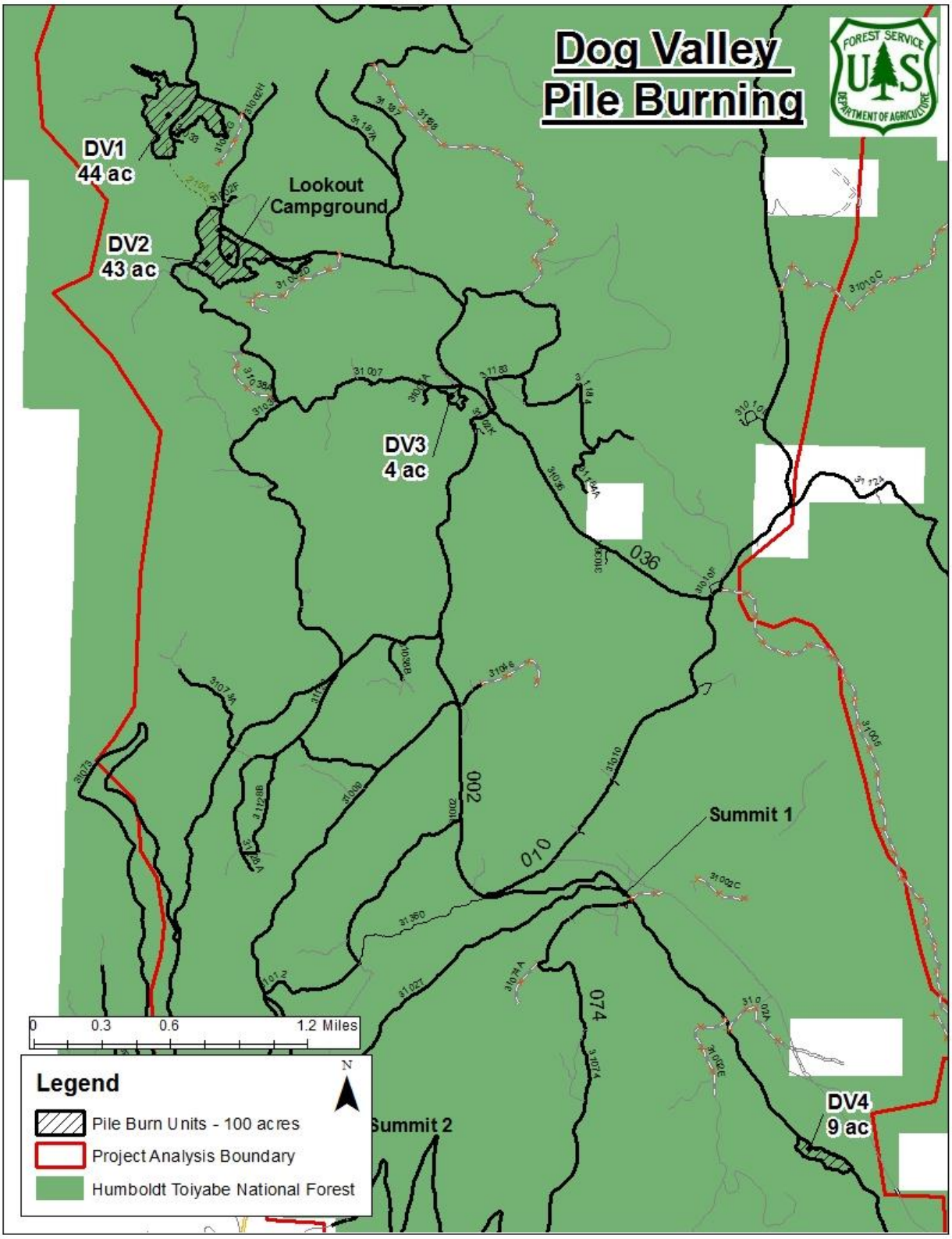
Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation

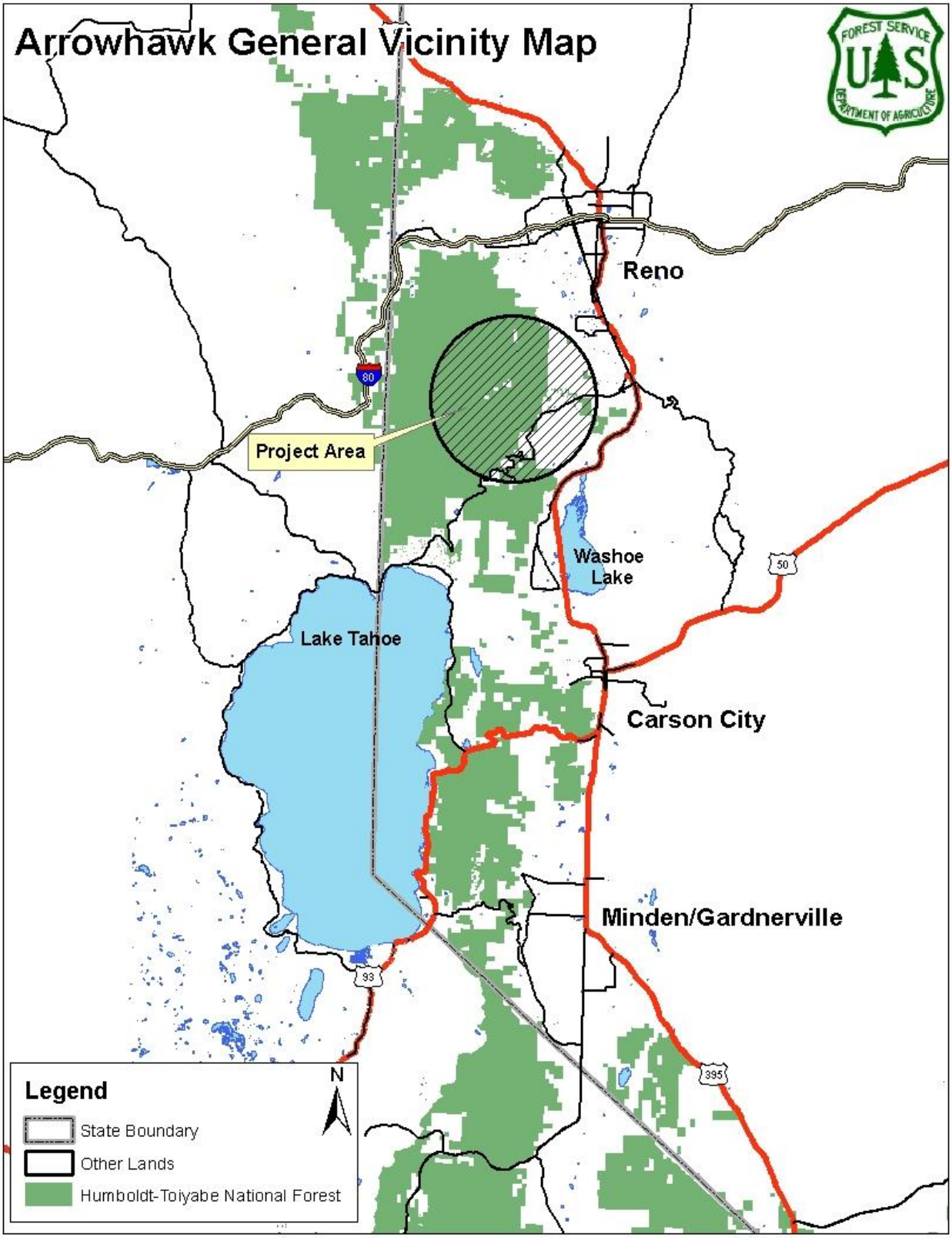
Appendix F: Smoke Modeling Documentation

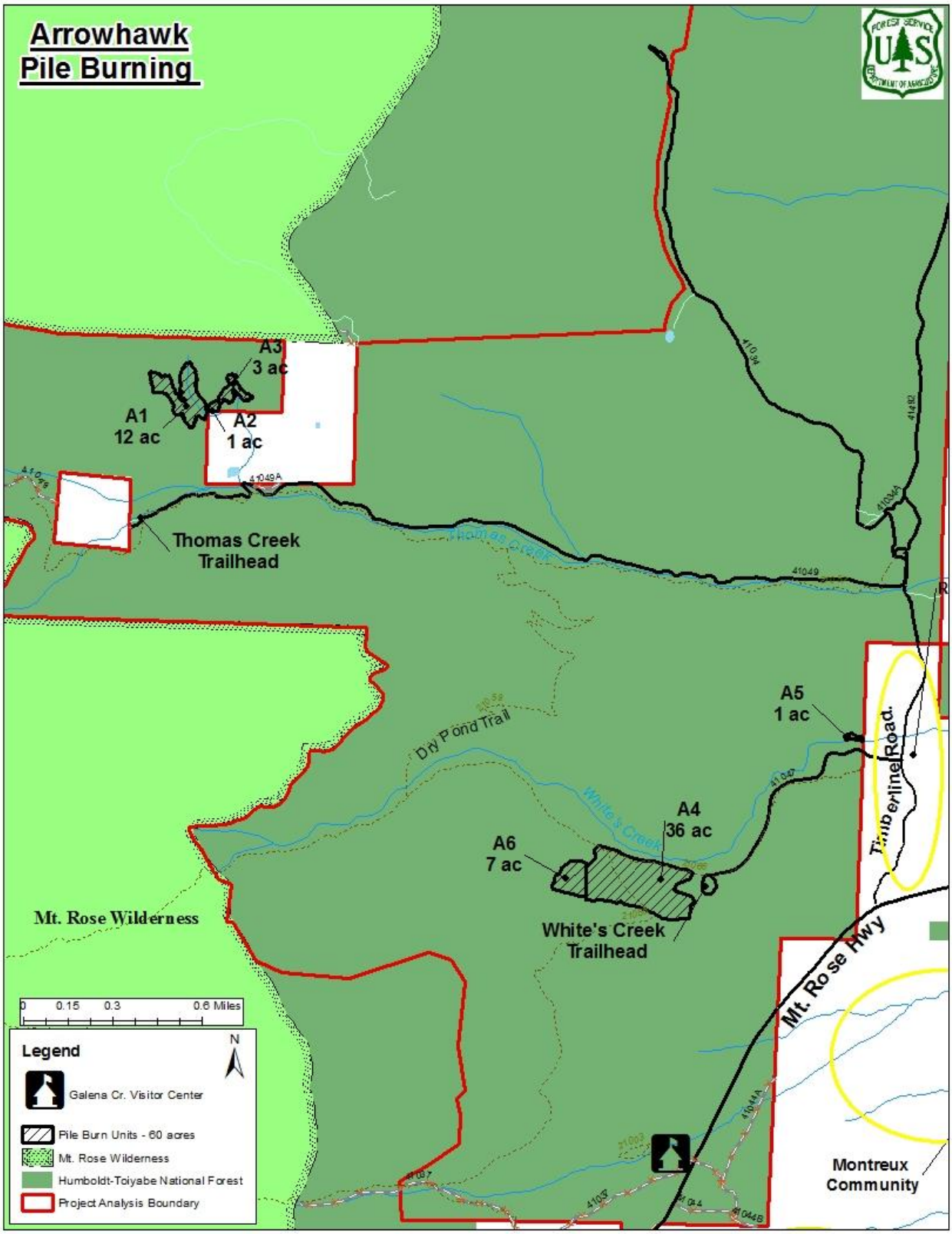
Appendix G: Prescribed Fire Post Burn Evaluation

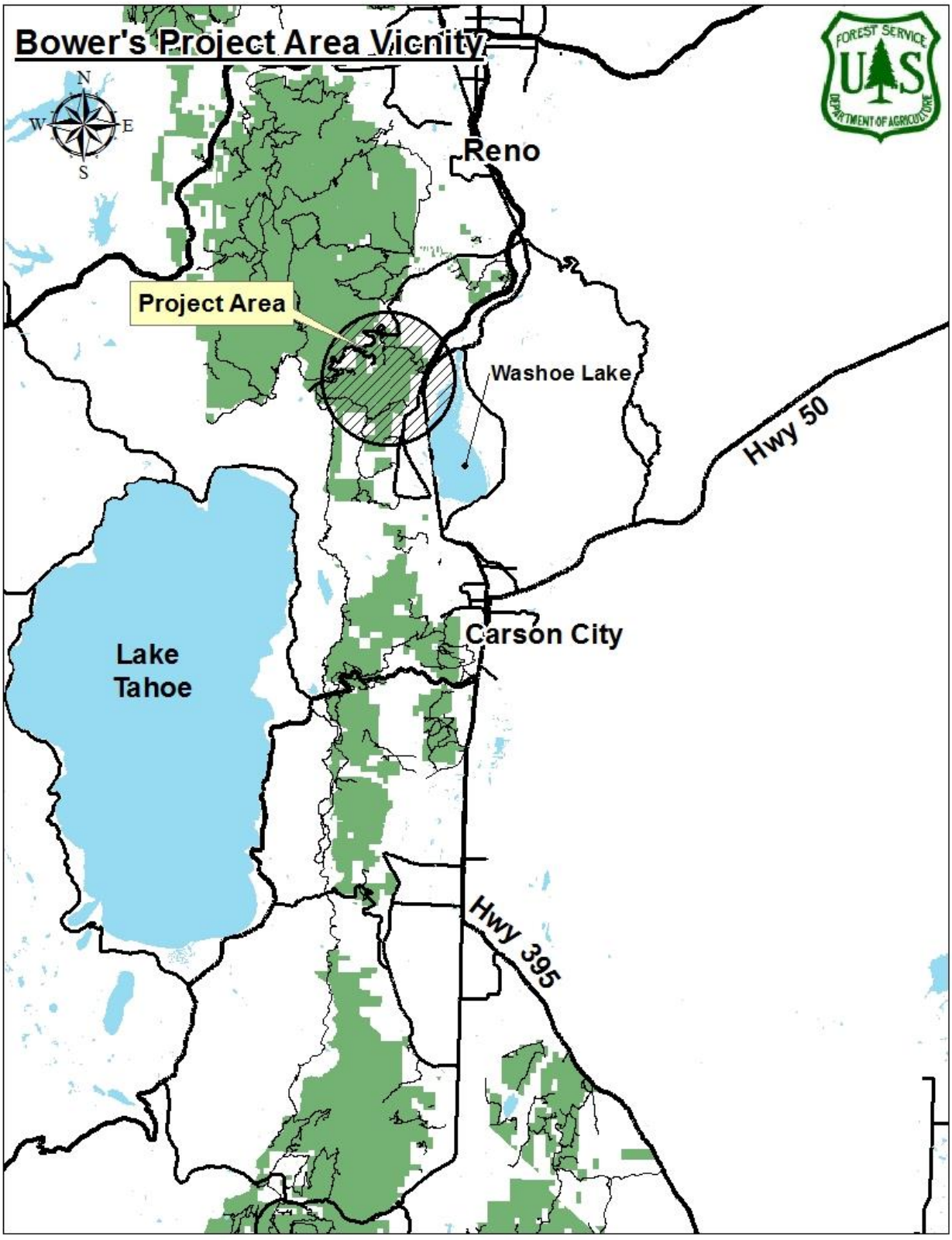
Appendix A: Vicinity, Values at Risk, and Ignition Unit Maps

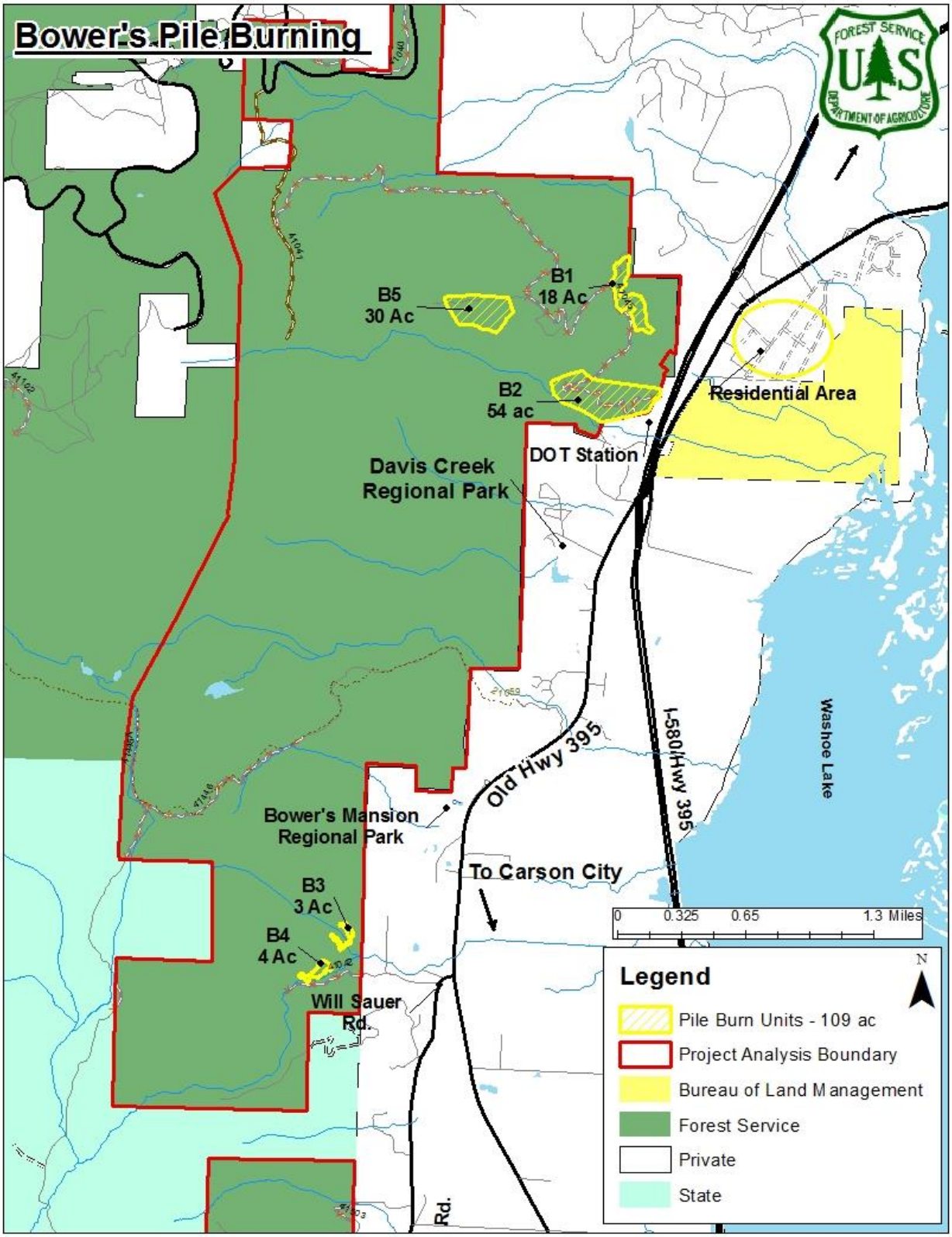


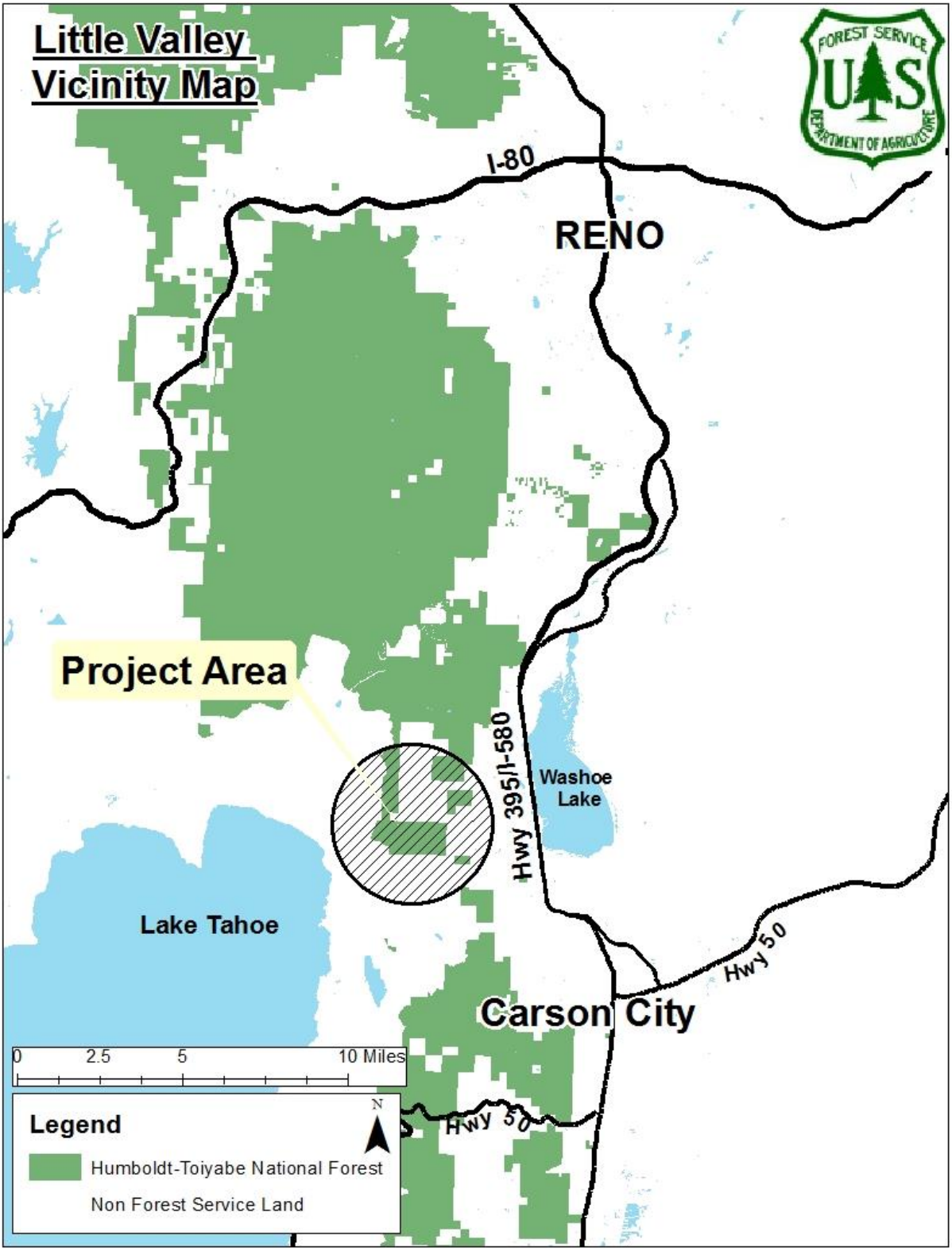

Dog Valley
Pile Burning
DV1
44 ac
Lookout
Campground
DV2
43 ac
DV3
4 ac
036
200
010
074
Summit 1
Summit 2
DV4
9 ac
0 0.3 0.6 1.2 Miles
N
Legend
Pile Burn Units - 100 acres
Project Analysis Boundary
Humboldt Toiyabe National Forest

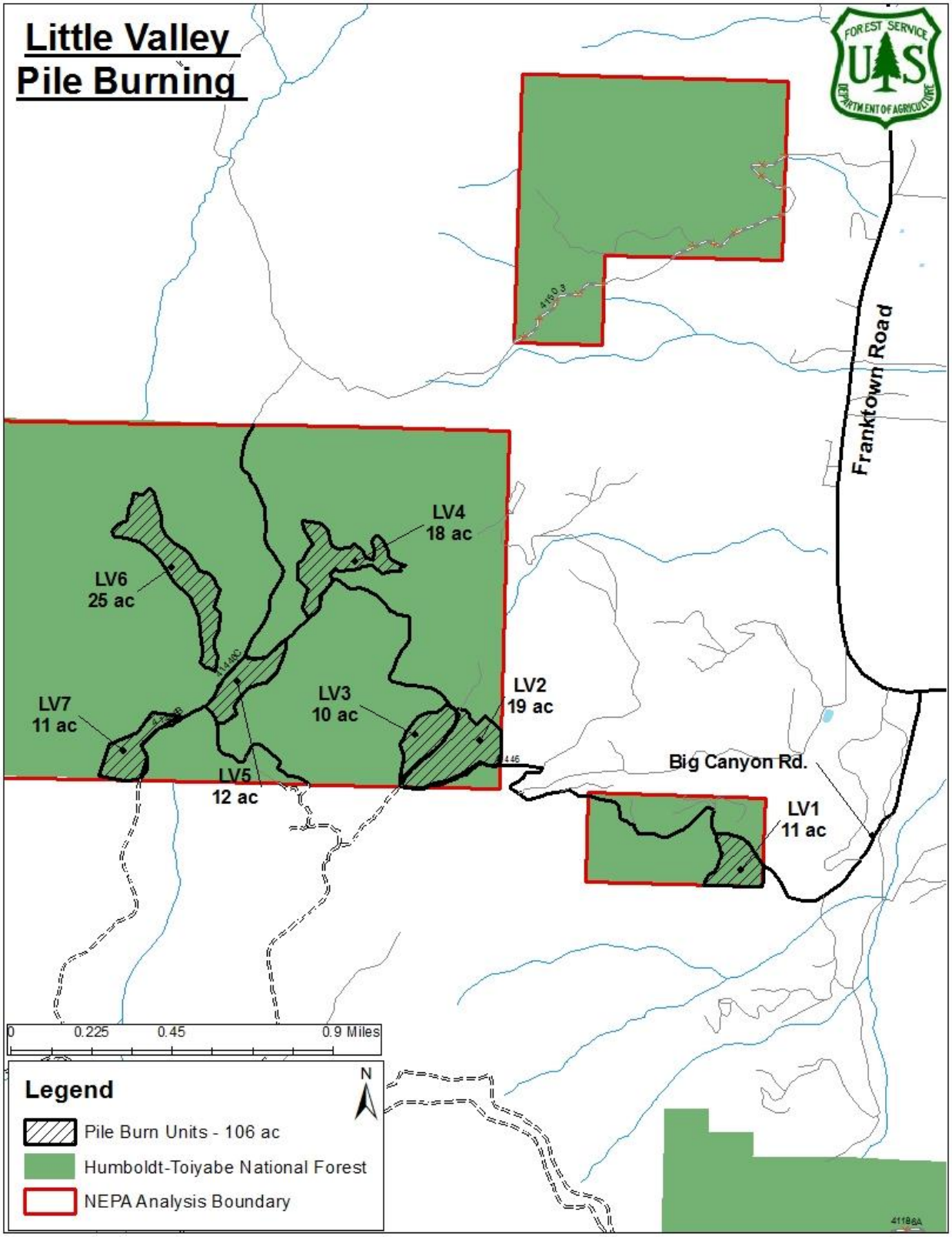

Arrowhawk General Vicinity Map
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Reno
80
Project Area
Washoe
Lake
50
Lake Tahoe
Carson City
Minden/Gardnerville
93
395
N
Legend
State Boundary
Other Lands
Humboldt-Toiyabe National Forest

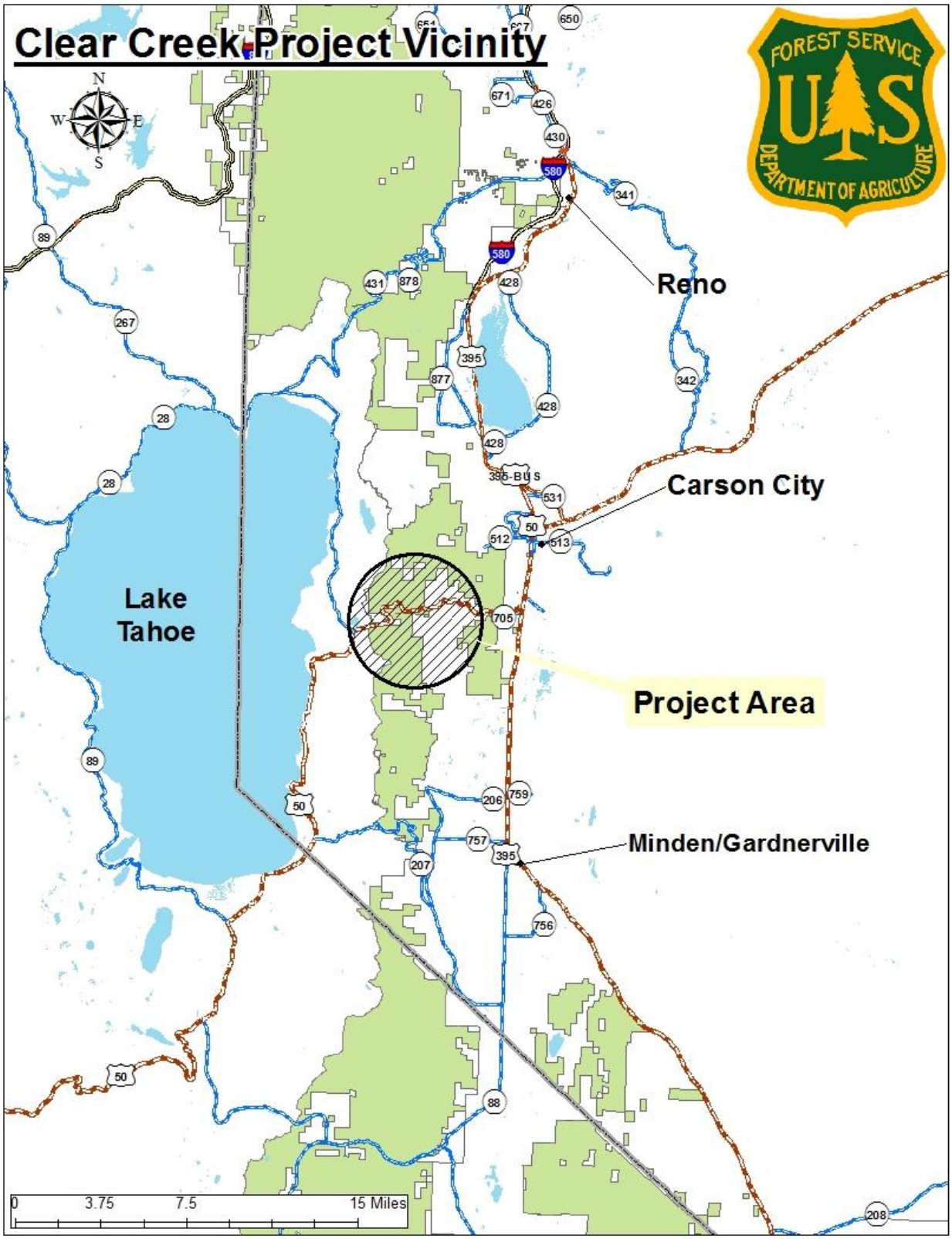

Arrowhawk
Pile Burning
A3
3 ac
A1
12 ac
A2
1 ac
Thomas Creek
Trailhead
Thomas Creek
41049
A5
1 ac
Dry Pond Trail
White's Creek
A4
36 ac
A6
7 ac
White's Creek
Trailhead
Mt. Rose Wilderness
Mt. Rose Hwy
Montreux
Community
0 0.15 0.3 0.6 Miles
N
Legend
Galena Cr. Visitor Center
Pile Burn Units - 60 acres
Mt. Rose Wilderness
Humboldt-Toiyabe National Forest
Project Analysis Boundary

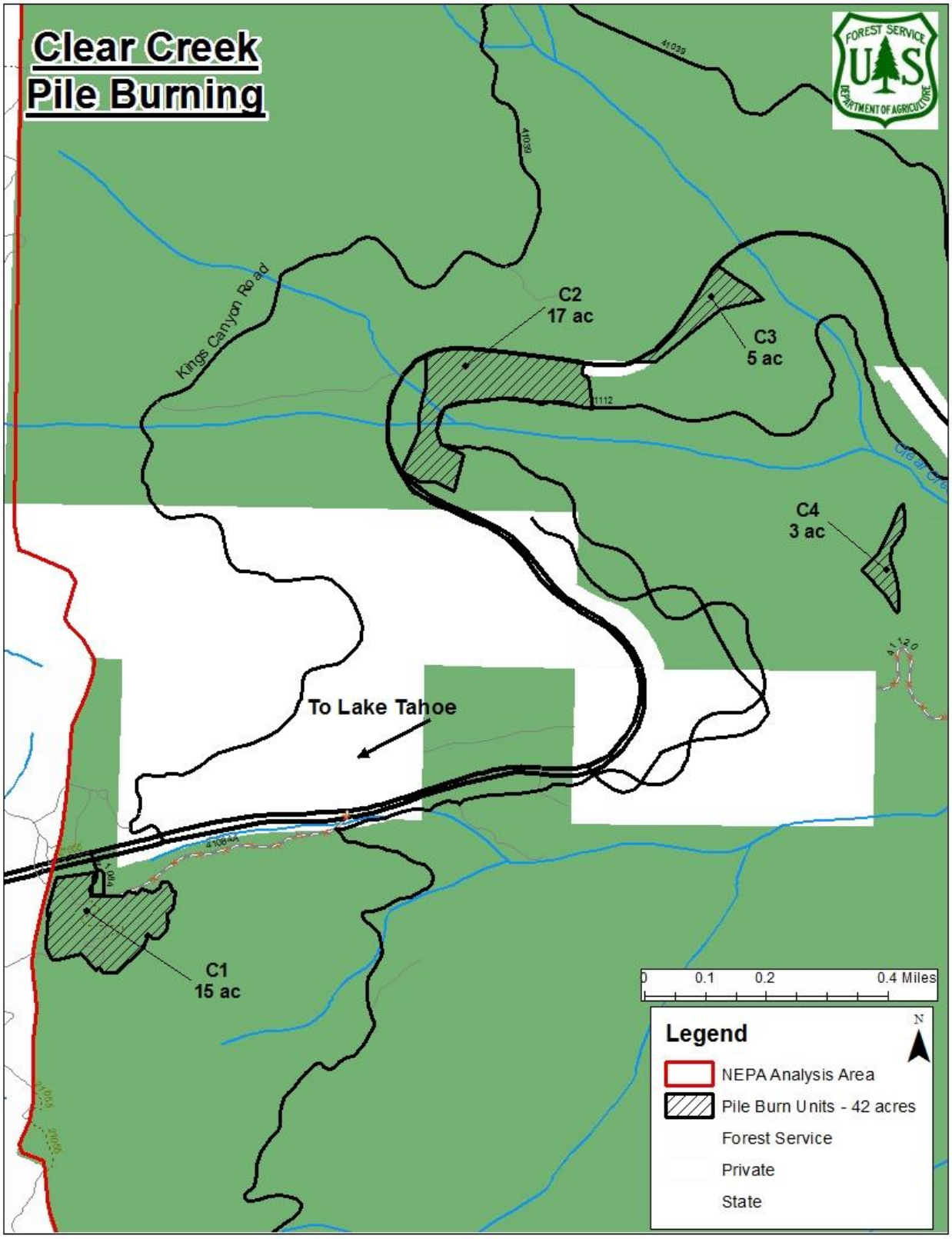

Bower's Project Area Vicinity
N
W
E
S
FOREST SERVICE
USDA
DEPARTMENT OF AGRICULTURE
Reno
Project Area
Washoe Lake
Hwy 50
Lake
Tahoe
Carson City
Hwy 395

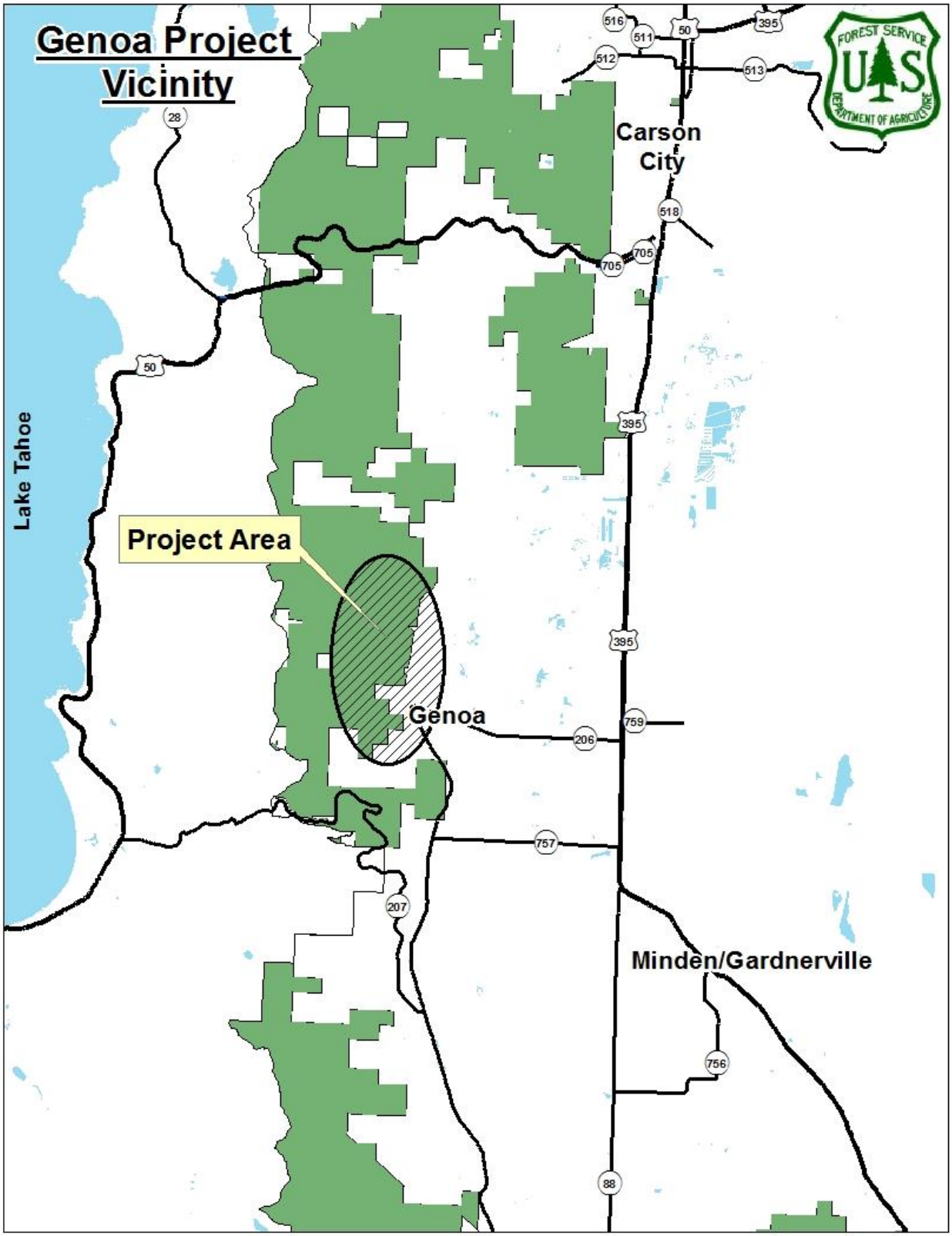

Bower's Pile Burning
FOREST SERVICE
USDA
DEPARTMENT OF AGRICULTURE
B1
18 Ac
B5
30 Ac
B2
54 ac
Residential Area
DOT Station
Davis Creek
Regional Park
Washoe Lake
I-580/Hwy 395
Old Hwy 395
Bower's Mansion
Regional Park
To Carson City
B3
3 Ac
B4
4 Ac
Will Sauer
Rd.
Rd.
0 0.325 0.65 1.3 Miles
N
Legend
Pile Burn Units - 109 ac
Project Analysis Boundary
Bureau of Land Management
Forest Service
Private
State

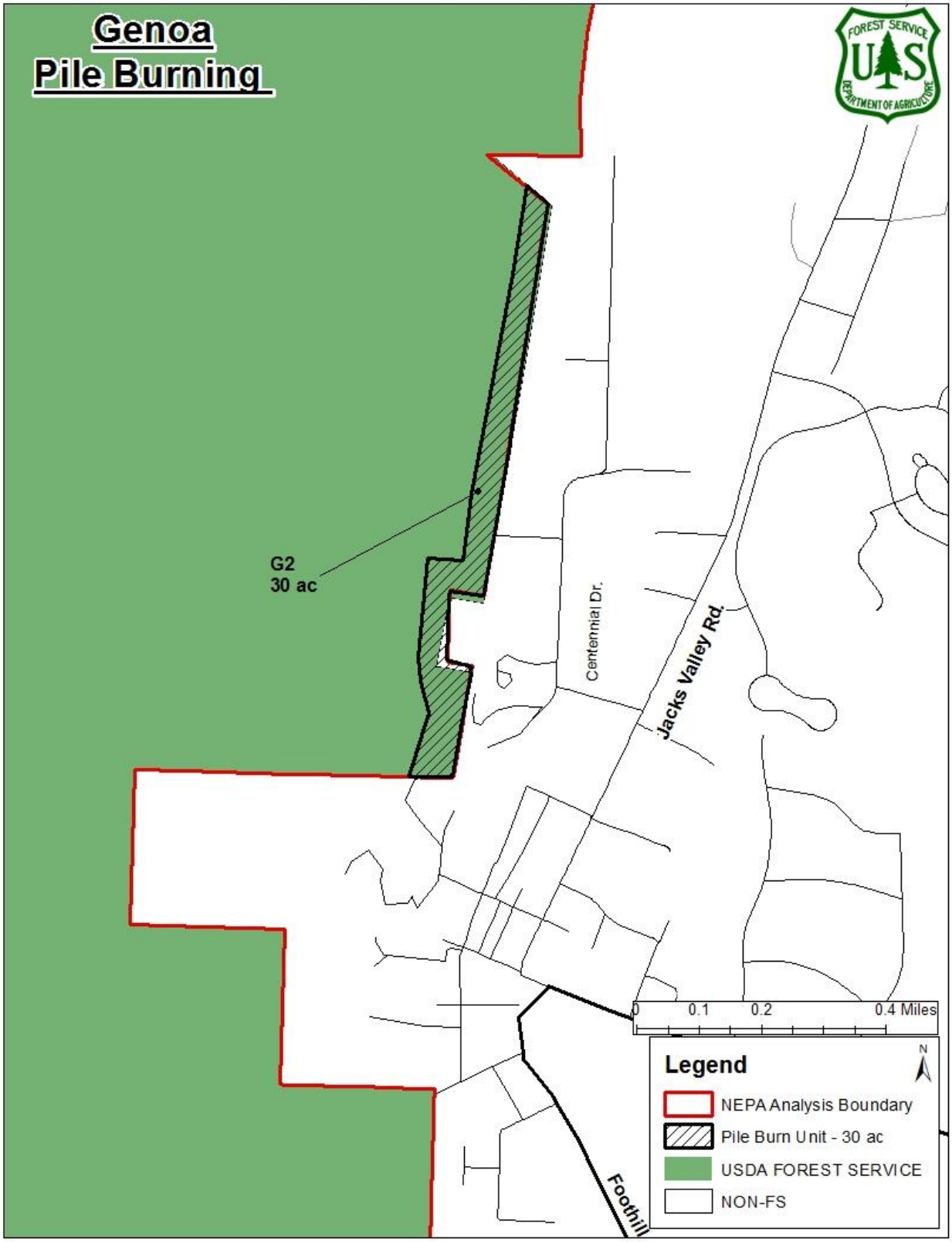

Little Valley
Vicinity Map
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
I-80
RENO
Project Area
Hwy 395/I-580
Washoe
Lake
Lake Tahoe
Hwy 50
Carson City
0 2.5 5 10 Miles
N
Legend
Humboldt-Toiyabe National Forest
Non Forest Service Land

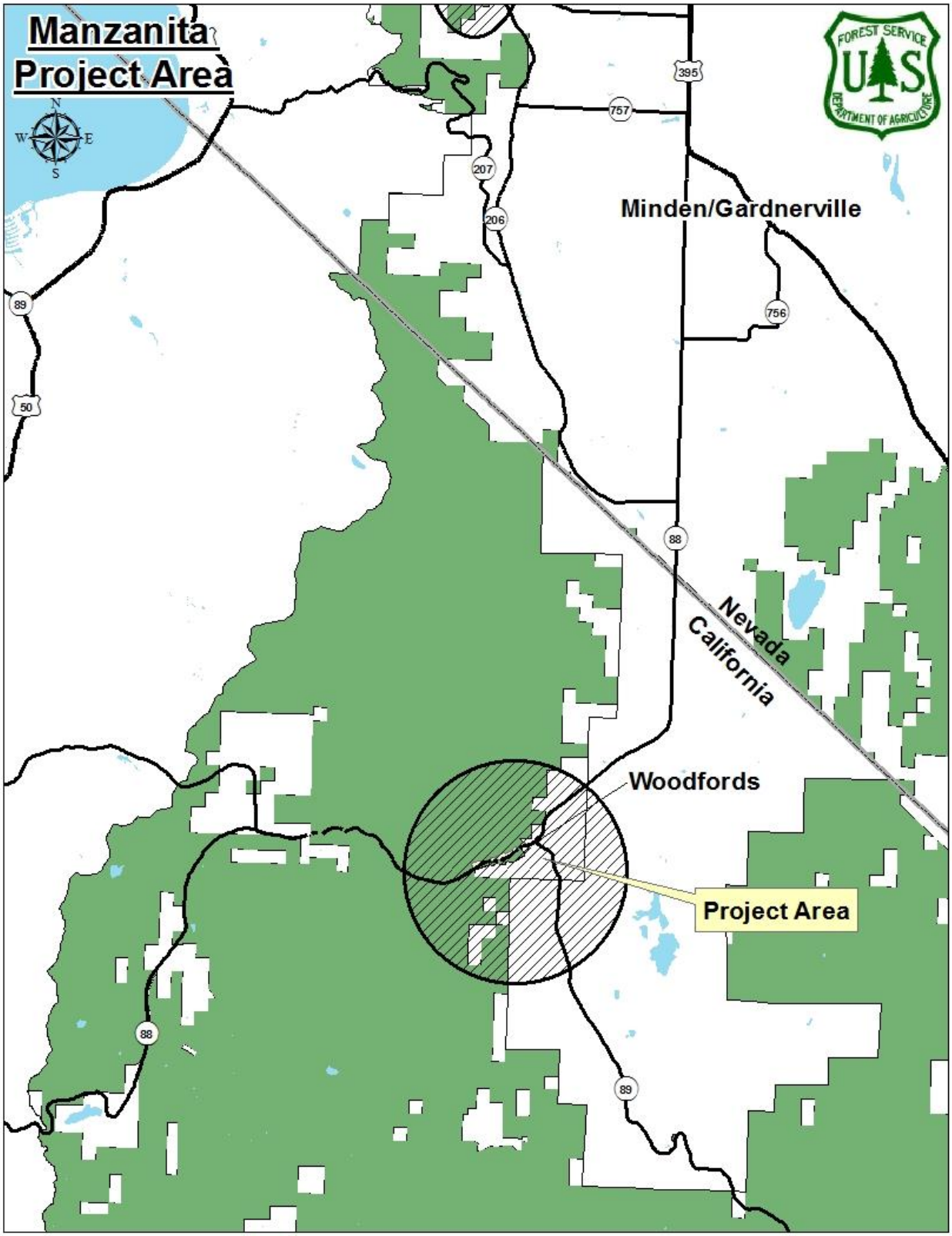

Little Valley
Pile Burning
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Frankltown Road
LV4
18 ac
LV6
25 ac
LV7
11 ac
LV3
10 ac
LV2
19 ac
LV5
12 ac
Big Canyon Rd.
LV1
11 ac
0 0.225 0.45 0.9 Miles
N
Legend
Pile Burn Units - 106 ac
Humboldt-Toiyabe National Forest
NEPA Analysis Boundary

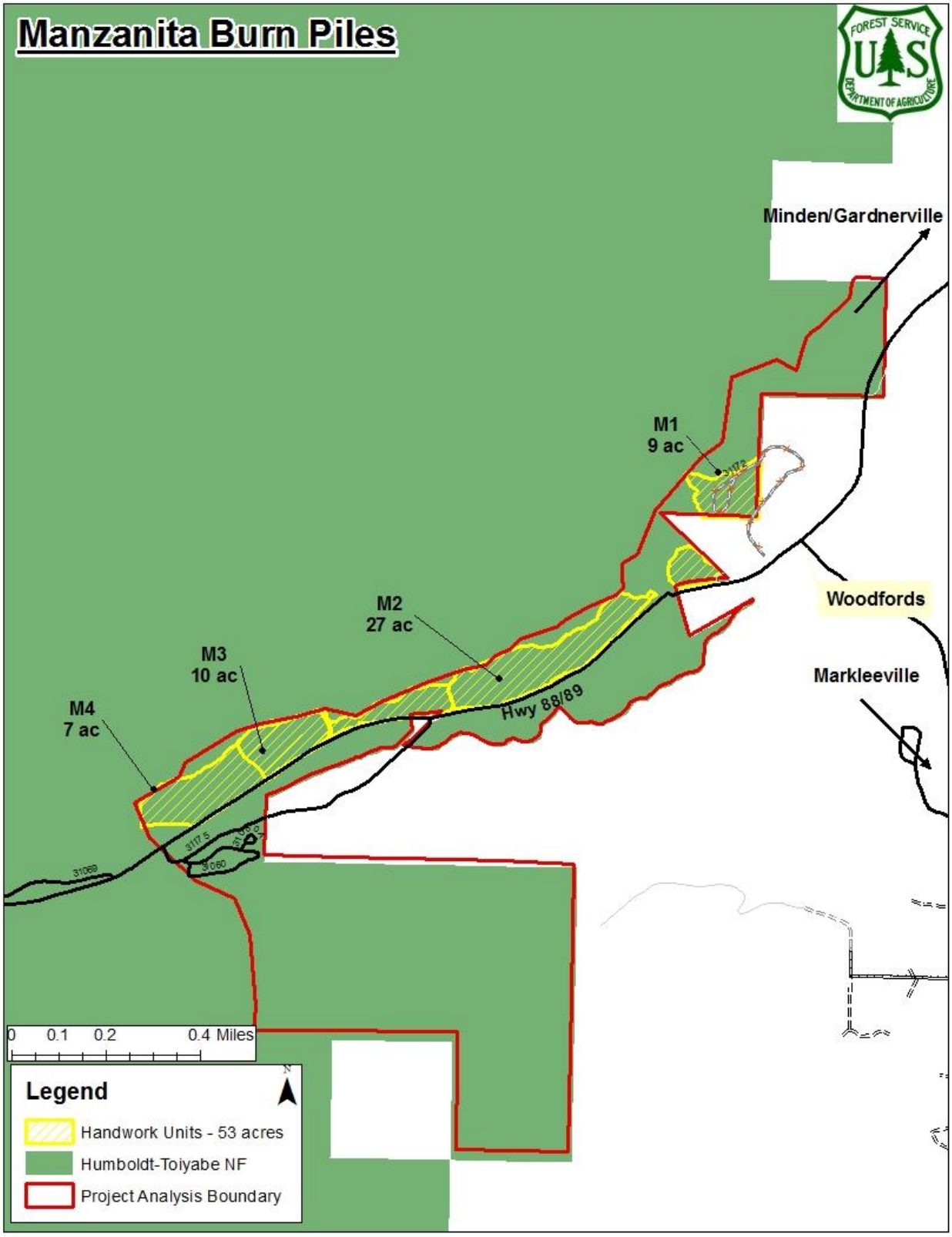

Clear Creek Project Vicinity
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
N
W
E
S
Reno
Carson City
Lake Tahoe
Project Area
Minden/Gardnerville
0
3.75
7.5
15 Miles

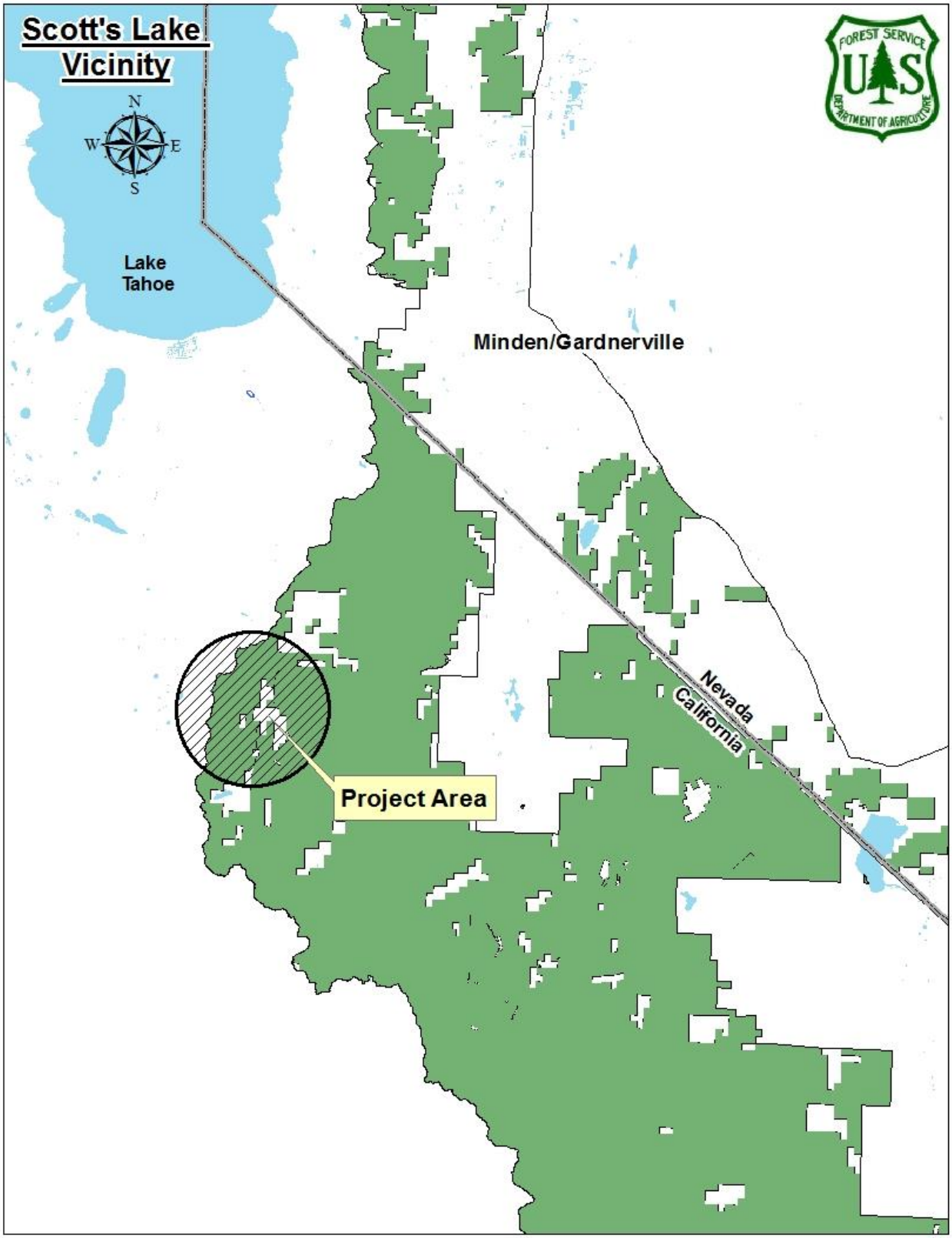

Clear Creek
Pile Burning
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Kings Canyon Road
C2
17 ac
C3
5 ac
C4
3 ac
To Lake Tahoe
C1
15 ac
0 0.1 0.2 0.4 Miles
N
Legend
NEPA Analysis Area
Pile Burn Units - 42 acres
Forest Service
Private
State

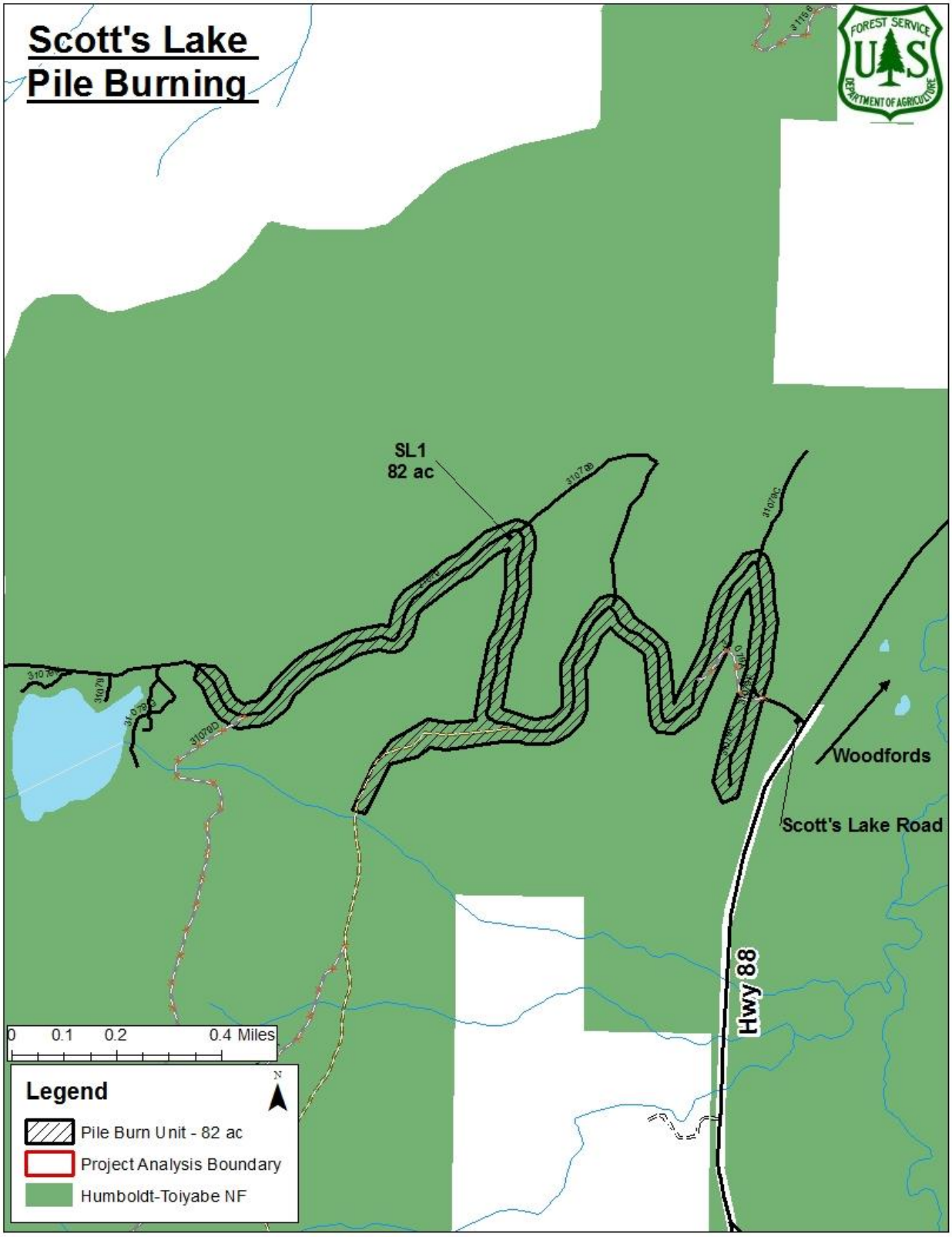

Genoa Project Vicinity
Carson City
Lake Tahoe
Project Area
Genoa
Minden/Gardnerville
FOREST SERVICE
DEPARTMENT OF AGRICULTURE
28
50
516
511
512
50
395
513
518
705
705
395
395
759
206
757
207
756
88

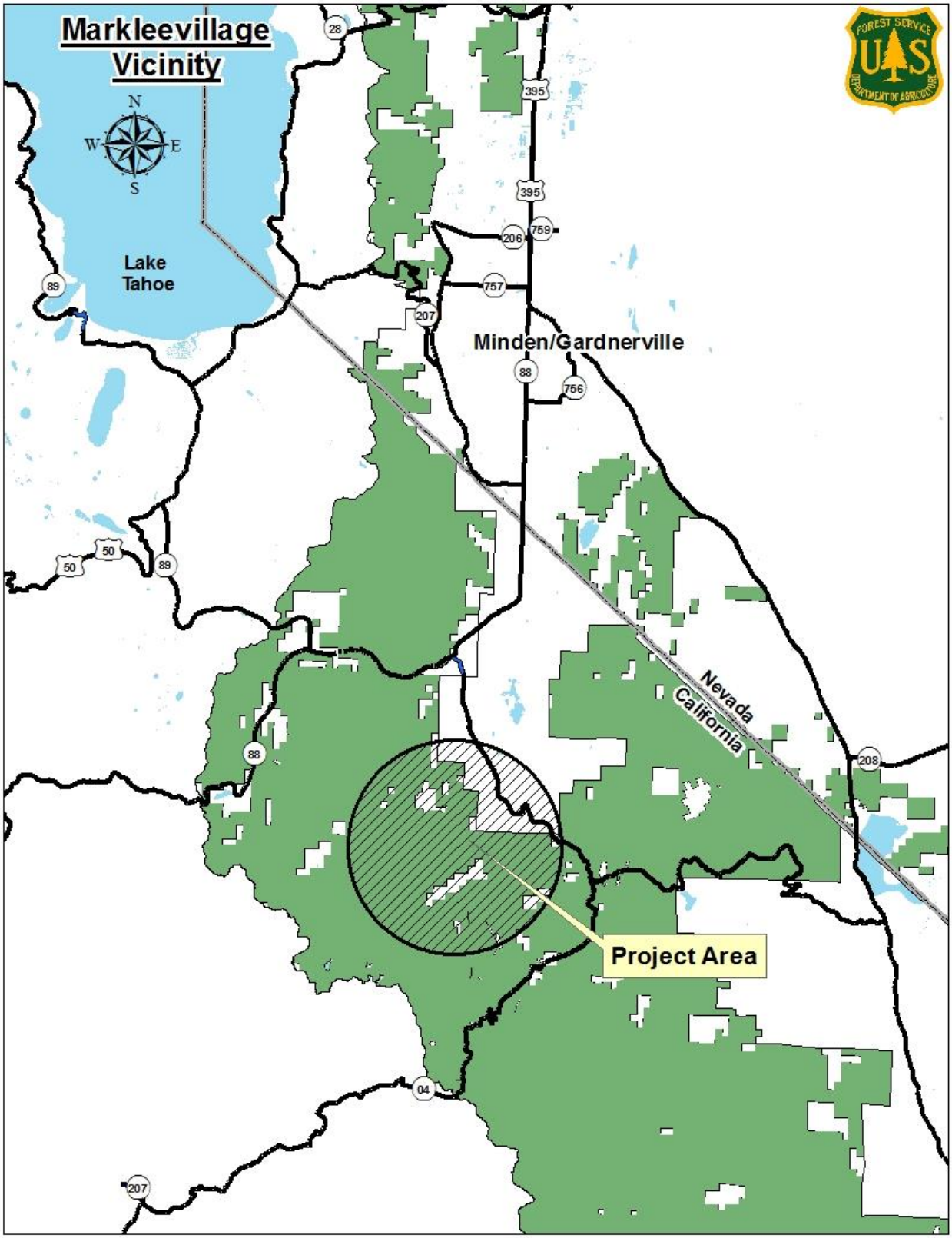

Genoa
Pile Burning
G2
30 ac
Centennial Dr.
Jacks Valley Rd.
Foothill
0 0.1 0.2 0.4 Miles
N
Legend
NEPA Analysis Boundary
Pile Burn Unit - 30 ac
USDA FOREST SERVICE
NON-FS

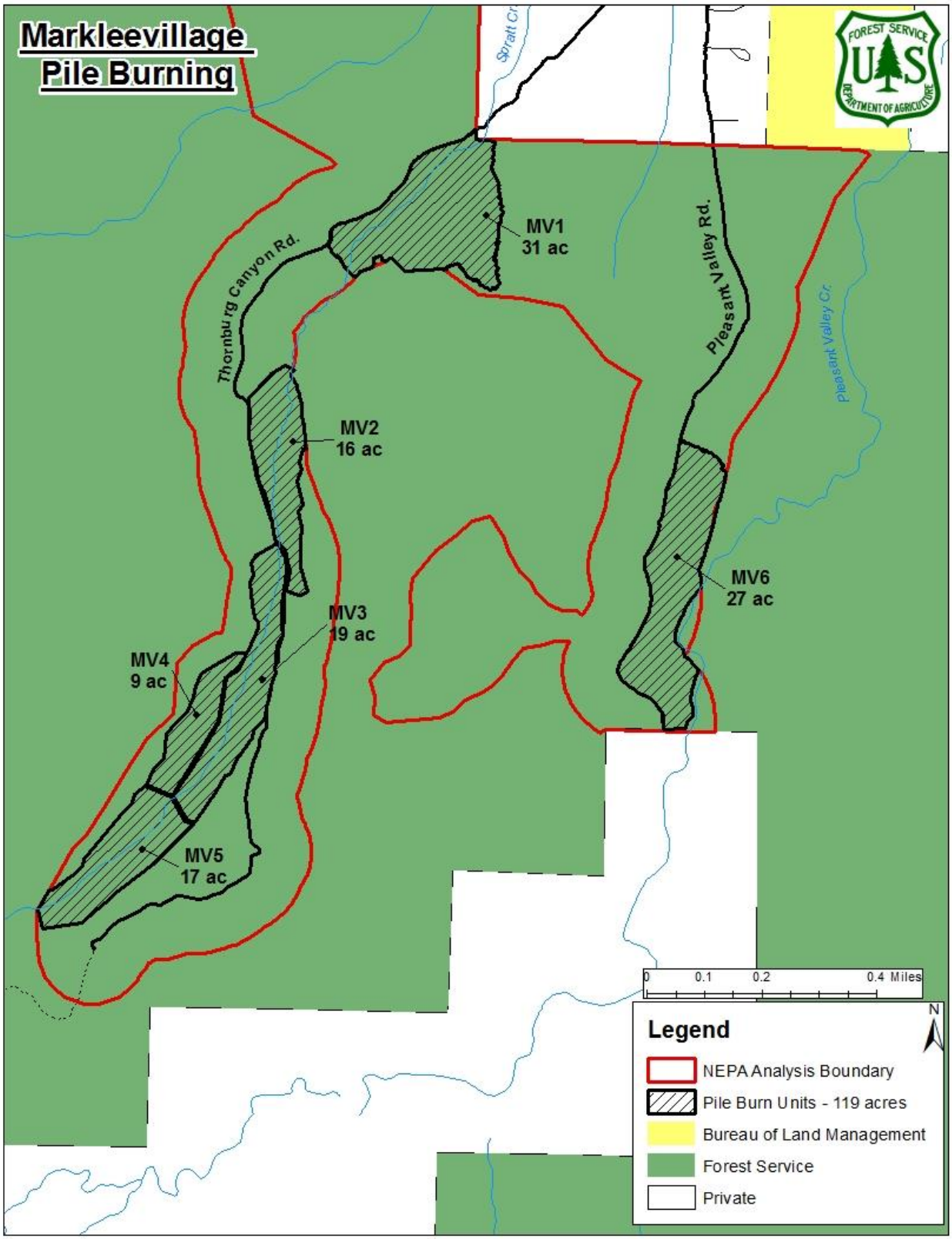

Manzanita
Project Area
N
W
E
S
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
395
757
207
206
Minden/Gardnerville
89
756
50
88
Nevada
California
Woodfords
Project Area
88
89


Manzanita Burn Piles
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Minden/Gardnerville
M1
9 ac
M2
27 ac
M3
10 ac
M4
7 ac
Hwy 88/89
Woodfords
Markleeville
3117 S
31069
3060
0 0.1 0.2 0.4 Miles
Legend
Handwork Units - 53 acres
Humboldt-Toiyabe NF
Project Analysis Boundary


Scott's Lake Vicinity
N
W
E
S
Lake Tahoe
Minden/Gardnerville
Nevada
California
Project Area
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


Scott's Lake
Pile Burning
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
SL1
82 ac
Woodfords
Scott's Lake Road
Hwy 88
0 0.1 0.2 0.4 Miles
N
Legend
Pile Burn Unit - 82 ac
Project Analysis Boundary
Humboldt-Toiyabe NF


Markleevillage
Vicinity
N
W
E
S
Lake
Tahoe
Minden/Gardnerville
Nevada
California
Project Area
28
395
206
759
757
207
88
756
89
50
208
04


Markleevillage
Pile Burning
Spratt Cr
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
MV1
31 ac
Thornburg Canyon Rd.
Pleasant Valley Rd.
Pleasant Valley Cr.
MV2
16 ac
MV6
27 ac
MV3
19 ac
MV4
9 ac
MV5
17 ac
0 0.1 0.2 0.4 Miles
N
Legend
NEPA Analysis Boundary
Pile Burn Units - 119 acres
Bureau of Land Management
Forest Service
Private

Appendix B: Technical Reviewer Checklist

Fill out this checklist based on the guidance provided in the Technical Review section in the *Interagency Prescribed Fire Planning and Implementation Procedures Guide*, PMS 484.

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

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

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

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

Technical Reviewer Signature: /s/ Carol Carlock

Qualification and Currency: RXB!-Current

Date Signed: January 25, 2018

Appendix C: Complexity Analysis

Appendix D: Agency-Specific Job Hazard Analysis or Risk Assessment

					FS-6700-7 (08/12)
U.S. Department of Agriculture **Forest Service**	**1. WORK PROJECT/ACTIVITY** **Prescribed Burning**	**2. LOCATION** **Humboldt-Toiyabe NF**	**3. UNIT** **Carson RD**		
JOB HAZARD ANALYSIS (JHA)	**4. NAME OF ANALYST**	**5. JOB TITLE**	**6. DATE PREPARED**		
References-FSH 6709.11 and -12 **(Instructions on Reverse)**	**Anna Belle Monti**	**Forester**	**3.24.2016**		
7. TASKS/PROCEDURES	**8. HAZARDS**	**9. ABATEMENT ACTIONS** **Engineering Controls * Substitution * Administrative Controls * PPE**	**10. POST ABATEMENT ACTION RISK RATING** **(from the Severity/Probability Matrix)**		
			Severity	**Probability**	**Risk Code**
1. Driving to work site **(*See Driving JHA in addition to these listed hazards*)**	**A. Unsecured loads**	• A. Check loads for security before departing – use tie downs.	**I**	**B**	**1**
	B. Hauling flammable or explosive substances	• B. Use appropriate containers. Keep potentially explosive substances well separated. Consider hauling gasoline and glycol in separate vehicles.			
	C. Transporting sharp tools	• C. Use guards, cages, boxes, or tool mounts.			
	D. Loading Vehicles	• D. Use proper lifting techniques and team lifting.			
2. Driving at or near the work site **(*See Driving JHA in addition to these listed hazards*)**	**A. Heavy truck traffic between units and water sources**	• A. Maintain radio communications and alert other drivers in the area. Always have lights on.	**II**	**B**	**2**
	B. Smoke, poor visibility	• B. Place a guide on foot ahead of the vehicle. Wait until smoke is less dense. Lights on. Use light bars and/or warning lights.			
	C. Parking near a prescribed burn	• C. Avoid parking in the potential path of fire activity. Use parking brake. Leave keys in ignition; avoid leaving exposed flammable or explosive materials in the bed of the vehicle. All windows remain closed.			
	D. ATVs / UTV's	• D. Operated by trained and licensed operators only. Lights on. Avoid steep slopes.			
	E. Public Safety	• E. Post signs and/or use roadblocks if needed.			

	F. Entrapment or narrow un-maintained roads	• F. When possible, ensure that 2 routes out are available. Post lookouts. Leave area "early" if fire appears to threaten the escape route.			
3. Handling flammable materials	**A. Exposure to sparks**	• A. Use proper containers, move away from hot area. No Smoking.	**II**	**B**	**2**
	B. Eye or skin contamination from Fuel	• B. Gloves, goggles, or other eye protection, leather lace-up boots.			
	C. Leaking containers or torches	• C. Empty and tag in field, have repairs made before the next use.			
	D. Improper gas/diesel ratios for drip torch fuel	• D. Use labels on containers, field test small amounts before use.			
	E. Slippery surfaces from spilled fuel	• E. Make every effort to avoid spilling fuel, where and when feasible. Install non-slip material on fuel truck beds. Clean up spills as soon as possible.			
4. Equipment set-up	**A. Muscle or back strain lifting heavy objects**	• A. Use of proper lifting techniques. Get help if too heavy.	**III**	**C**	**3**
	B. Operating pumps and mechanized equipment exhaust burns, loose clothing	• B. Tuck in shirttails; remove jewelry. Proper clothing, gloves, and boots.			
	C. Application of slippery retardant, poor footing	• C. Eight-inch lug sole, lace-up boots. Avoid slick areas if possible.			
	D. Crew people working up hill from each other (rolling debris)	• D. Post lookout. Shout warnings.			
	E. Operating high –pressure nozzles	• E. Maintain visual contact with pump operator and other crewmembers. Use backup person behind nozzle person. Use eye protection.			
	F. Traversing rocky terrain	• F. Eight-inch lug boots. Slow, cautious movements.			
	G. Noise from pumps and saws	• G. Use hearing protection (ear plugs or muffs).			
	H. Foam concentrate on skin, foam in eyes	• H. Follow manufacture's first aid recommendations. Wear eye protection when working around foam and foam concentrate. Change clothing if heavily contaminated by foam concentrate.			

5. Hand Ignition	**A. Rolling debris.**	• A. Use hand held radios, close supervision, lookouts. Consider aerial ignition.	**II**	**B**	**2**
	B. Close proximity to intense heat and erratic fire behavior	• B. Same action as in A. Use PPE and LCES.			
	C. Smoke, sparks, and cinders	• C. Avoid very dense smoke. Wear PPE, alter firing patterns. Rotate personnel out of worst areas.			
	D. Poor footing, steep slopes, heavy fuels	• D. Constant awareness, learn to identify hazard area. Slow down.			
	E. Noise of fire obscures verbal warnings	• E. Hand held radios for all lighting personnel.			
	F. Burning fuel dripping from torches. Burns from drip torches	• F. Lighters stay alert to location of torch head; do not point directly at another person. Close air vent when not actually lighting. Proper PPE.			
	G. Lighting wrong area, lighting fire downslope and ahead of others	• G. Know location of others. Radios for all lighting personnel, if possible; for every other person at minimum. Close supervision.			
5-1. Fusees	**A. Firing projectiles or flares**	• A. Basic firearm safety rules followed; separation of ammo by type and size, access to launchers limited to trained personnel or authorized trainees.	**II**	**B**	**2**
	B. Inadvertent firing over/under shot resulting in activity outside project boundaries	• B. Post lookouts. Notify ignition specialist and holding specialist. Halt ignition until holding crews extinguish spot.			
6. Mechanical (ATV / UTV)	**A. Vehicle maintenance**	• A. Thorough inspection of vehicles and ignition equipment.	**II**	**B**	**2**
	B. Close proximity to the fire, intense heat, and erratic fire behavior	• B. Same as above. Know escape routes.			
	C. Noise of ATV / UTV and fire obscures verbal warnings	• C. Hand held radios required of all ignition personnel. Hard hats or half helmets may be used in place of standard helmets and ear piece adaptors for radios should be used to facilitate communications. • Visual signals for communication should be agreed upon in a briefing prior to prescribed fire implementation.			
	D. Accidentally ignite vehicle	• D. Ensure that fuel does not drip or leak onto vehicle. Stay particularly alert when side-hilling on steeper slopes.			

7. Mop-Up (*also includes all of item 4. Equipment Setup*)	**A. Carrying sharp tools**	• A. Keep tool guards on while traveling. Remove only when in use.	**III**	**C**	**3**
	B. Tool use	• B. Proper crew training, with close supervision by crew boss.			
	C. Snag Falling	• C. Falling and bucking to be done only by trained personnel.			
8. Working in Winter Conditions **(*See Working in Winter Conditions JHA*)**			**II**	**B**	**2**
		13. DATE			
11. LINE OFFICER SIGNATURE		**12. TITLE**			

Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation

Inputs: SURFACE, IGNITE

Description		Carson RD Pile Burn
Fuel/Vegetation, Surface/Understory		
Fuel Model		tu1
Fuel Moisture		
1-h Moisture	%	7
10-h Moisture	%	8,9,10,11,12,13,14
100-h Moisture	%	9
Live Herbaceous Moisture	%	30
Live Woody Moisture	%	50
Weather		
Midflame Wind Speed (upslope)	mi/h	2,4,6,8,10,12,14,15,16
Air Temperature	oF	69
Fuel Shading from the Sun	%	25
Terrain		
Slope Steepness	%	30

Run Option Notes

Maximum reliable effective wind speed limit IS imposed [SURFACE].

Calculations are only for the direction of maximum spread [SURFACE].

Fireline intensity, flame length, and spread distance are always for the direction of the spread calculations [SURFACE].

Wind is blowing upslope [SURFACE].

Output Variables

Surface Rate of Spread (maximum) (ch/h) [SURFACE]

Flame Length (ft) [SURFACE]

Probability of Ignition from a Firebrand (%) [IGNITE]

Notes

Carson RD Pile Burn

Surface Rate of Spread (maximum) (ch/h)

10-h Moisture %	Midflame Wind Speed (upslope) mi/h 2	4	6	8	10	12
8	2.3	4.3	6.7	9.4	12.4	15.5
9	2.3	4.3	6.6	9.3	12.3	15.4
10	2.3	4.2	6.6	9.3	12.2	15.4
11	2.3	4.2	6.6	9.2	12.1	15.3
12	2.2	4.2	6.5	9.2	12.1	15.2
13	2.2	4.2	6.5	9.1	12.0	15.1
14	2.2	4.1	6.5	9.1	12.0	15.0

Carson RD Pile Burn

Surface Rate of Spread (maximum) (ch/h)

10-h Moisture %	Midflame Wind Speed (upslope) mi/h 14	15	16
8	18.9	20.7	22.5
9	18.8	20.6	22.4
10	18.7	20.4	22.2
11	18.6	20.3	22.1
12	18.5	20.2	22.0
13	18.4	20.1	21.9
14	18.3	20.0	21.8

Carson RD Pile Burn

Flame Length (ft)

10-h Moisture %	Midflame Wind Speed (upslope) mi/h 2	4	6	8	10	12	14
8	1.7	2.2	2.7	3.2	3.6	4.0	4.4
9	1.7	2.2	2.7	3.2	3.6	4.0	4.4
10	1.7	2.2	2.7	3.2	3.6	4.0	4.4
11	1.7	2.2	2.7	3.2	3.6	4.0	4.4
12	1.6	2.2	2.7	3.1	3.6	4.0	4.3
13	1.6	2.2	2.7	3.1	3.5	3.9	4.3
14	1.6	2.2	2.7	3.1	3.5	3.9	4.3

Carson RD Pile Burn

Flame Length (ft)

10-h Moisture %	Midflame Wind Speed (upslope) mi/h 15	16
8	4.6	4.8
9	4.6	4.8
10	4.6	4.7
11	4.5	4.7
12	4.5	4.7
13	4.5	4.7
14	4.5	4.7

Carson RD Pile Burn

Probability of Ignition from a Firebrand (%)

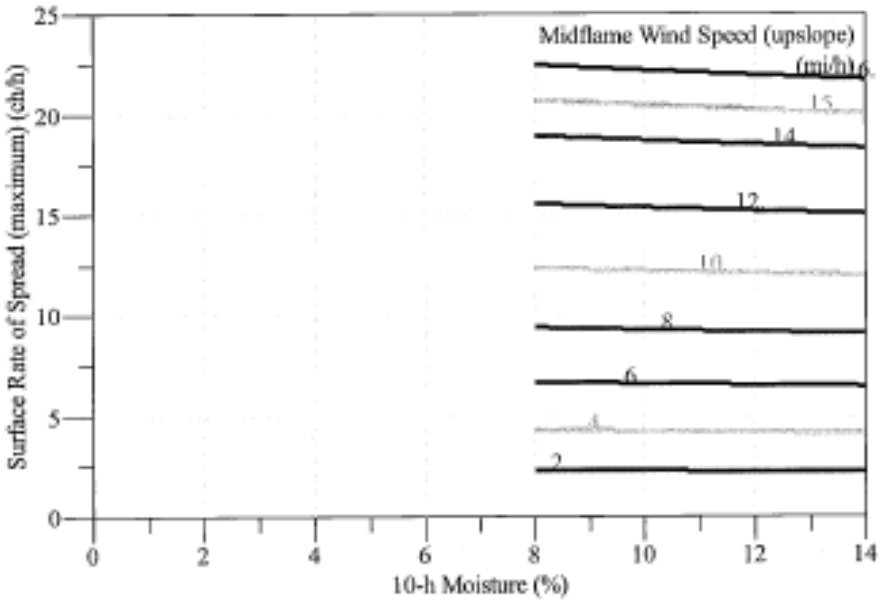
10-h Moisture	Midflame Wind Speed (upslope) mi/h							
%	2	4	6	8	10	12	14	15
8	46	46	46	46	46	46	46	46
9	46	46	46	46	46	46	46	46
10	46	46	46	46	46	46	46	46
11	46	46	46	46	46	46	46	46
12	46	46	46	46	46	46	46	46
13	46	46	46	46	46	46	46	46
14	46	46	46	46	46	46	46	46

Carson RD Pile Burn

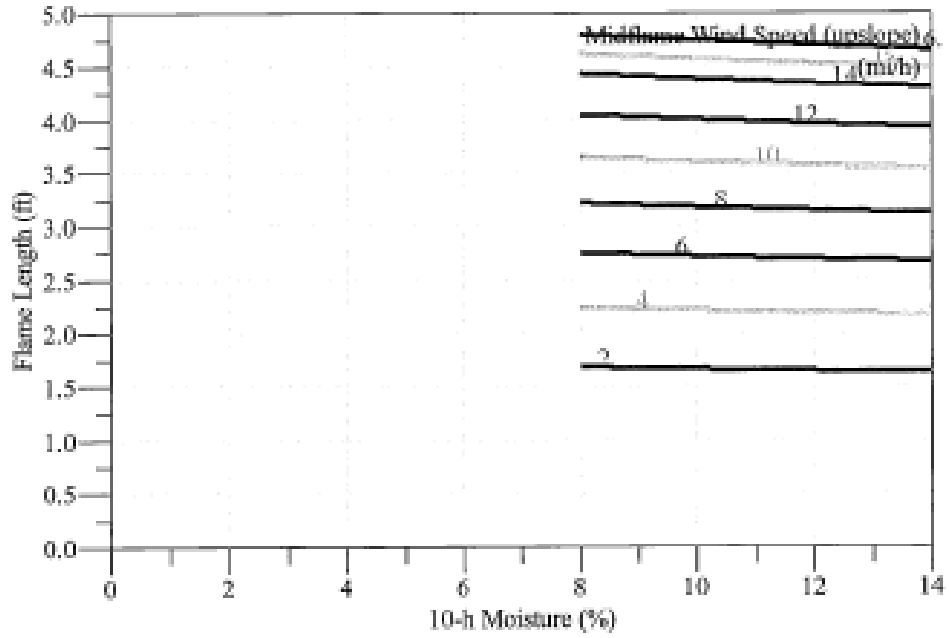
Probability of Ignition from a Firebrand (%)

10-h Moisture	Midflame Wind Speed (upslope) mi/h
%	16
8	46
9	46
10	46
11	46
12	46
13	46
14	46

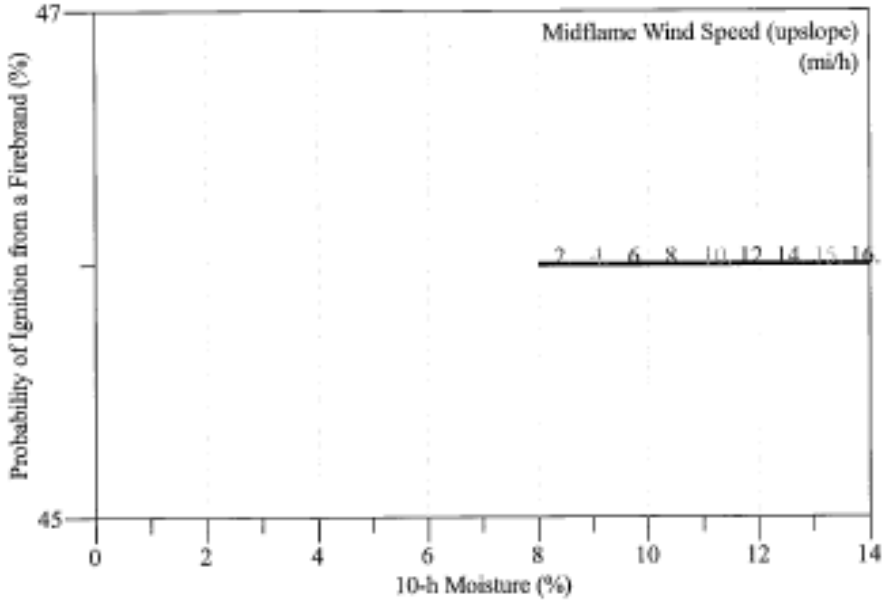
Carson RD Pile Burn



Carson RD Pile Burn



Carson RD Pile Burn



Discrete Variable Codes Used
Carson RD Pile Burn

Fuel Model
tu1 Light load, dry climate timber-grass-shrub (D) (161)

Appendix F: Smoke Modeling Documentation

Weather and Fuels									
OBSERVATION TIME (24 HR)									
SLOPE (%)									
ASPECT									
ELEVATION (FEET)									
FUEL MODEL (1-13)									
SHADING (<50% or >50%)									
DRY BULB TEMPERATURE (°F)									
WET BULB TEMPERATURE (°F)									
RELATIVE HUMIDITY (%)									
EYE LEVEL WIND SPEED (MPH)									
WIND DIRECTION									
CLOUD COVER (%)									
1-HR FUEL MOISTURE (%)									
Fire Behavior									
FIRE (HEAD, FLANK, BACKING)									
AVERAGE FLAME LENGTH (FT)									
MAX. FLAME LENGTH (FT)									
RATE OF SPREAD (CH/HR)									
TORCHING/CROWNING (Y or N)									
FIRE WHIRLS (Y or N)									
SPOTTING (Y or N)									
SMOKE DIRECTION									
SMOKE RISE									

Notes:			
OBSERVER NAME:		**DATE**	

Appendix G: Prescribed Fire Post Burn Evaluation

Burn Unit	**Date(s) Burned**	**Acres Burned**	**Ignition Start Time**
Weather and Fuel Conditions			
	Time of Ignition	**Low**	**High**
Temperature			
Relative Humidity			
1-hr Fuel Moisture			
10-hr Fuel Moisture	**100-hr Fuel Moisture**	**1000-hr Fuel Moisture**	**Days Since Significant Precipitation**
Wind Direction (Average)	**Wind Speed (Average)**	**Percent of Fuel Consumed**	**Ignition Duration (min.)**
Accomplishment of Fuels Treatment Objectives			
Overall Objectives Achieved:		**Yes**	**No**
Short Term Results (include changes in fuel profile and fire regime condition class)			
Cost Evaluation			
Burn Plan Preparation	**Site Preparation**	**Burn Operation**	**Total Burn Costs**	**Cost/Acre**
$	$	$	$	$
Narrative – Prescribed Fire Burn Boss Comments			
i.e. operations, safety, fire behavior, personnel & equipment performance, logistics, smoke management			

Prescribed Fire Burn Boss		**Date**	