PHASE 3 PRESCRIBED FIRE BURN UNIT PLAN

INDEPENDENCE LAKE PRESERVE, CALIFORNIA

THE NATURE CONSERVANCY
CALIFORNIA AND NEVADA BUSINESS UNITS

PHASE 3 BURN UNITS:
H1-14; H2-12; H2-18; H3; T1-9; T2-11; T2-13; T3-10

PREPARED BY:  **DATE: 01/04/2020**
Raymond D. Guse, RXB2 – Smoked Goose Consulting, LLC

TECHNICAL REVIEW: _____ **DATE:** _____
Phillip Dye, RXB2

APPROVED BY: _____ **DATE:** _____
Chris Fichtel, Independence Lake Project Director, Administrator

APPROVED BY: _____ **DATE:** _____
Ed Smith, California Fire Manger, Administrator

COMPLEXITY RATING: Moderate

MINIMUM RXBB REQUIREMENT: **RXB2**

Table of Contents

ELEMENT 2 A:
AGENCY ADMINISTRATOR GO/NO-GO PRE-IGNITION APPROVAL CHECKLIST

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 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 fuel loadings, drought or other climate indicators of increased risk, insect activity, new subdivisions/structures, smoke requirements, complexity analysis rating.*	YES or NO
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.*	YES or NO
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.*	YES or NO
D. Are processes in place to ensure all internal and external notifications and media releases will be completed?	YES or NO
E. Have key agency staffs been fully briefed about the implementation of this prescribed fire?	YES or NO
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*	YES or NO
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?	YES or NO
H. Have you communicated your expectations to the burn boss and FMO regarding decisions to declare the prescribed fire a wildfire?	YES or NO

Implementation recommended by:
Administrator: _____ Date: _____

Additional instructions or discussion documentation attached (optional): yes ☐ no☐
Ignition authorized by:

PMS 485 (11/13)

Amendments: *When changes to this prescribed fire plan are necessary, the plan must be amended to identify the affected sections; the reason for the change(s); and have the changes clearly identified. For amendments, the need for additional technical review will be determined and justified in writing by the Administrators. Amendments take place before ignition. Amendments to the prescribed fire plan require Fire Manager Approval. For further guidance on amending this plan review the April 2017 Interagency Prescribed Fire Planning and Implementation Procedures Guide (*https://www.nwcg.gov/publications/484*), and The Nature Conservancy's Fire Management Manual (*http://www.tncfiremanual.org/index.htm*).*

Disclaimer: *The following prescribed burn unit plan (the "Plan") was prepared by or on behalf of Smoked Goose Consulting, LLC. To the extent Smoked Goose Consulting, LLC and its employees have authorized a third party to use this Plan, the authorization is explicitly limited to the checklists and prescription set forth in the Plan. In addition, use of the Plan is not authorized if Smoked Goose Consulting, LLC gives verbal or written indication that burning is not appropriate on any given day. Any use of this Plan, or amended versions of this plan is at the user's own risk even if resulting in injury or loss, objectives not being met or damage to cultural resources that may arise from the prescribed burn activities. This plan is valid for a period of three years after the date of the last signature on the cover page or until conditions stated in this plan have changed.*

ELEMENT 2 B:
PRESCRIBED FIRE GO/NO-GO CHECKLIST
Project Name: Phase 3
Burn Units: H1-14; H2-12; H2-18; H3; T1-9; T2-11; T2-13; T3-10

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:_____

Burn Boss signature: _____date:_____

Burn Boss signature: _____date:_____

Burn Boss signature: _____date:_____

Burn Boss signature: _____date:_____

Burn Boss signature: _____ date: _____

Burn Boss signature: _____date:_____

Burn Boss signature: _____date:_____

PMS 486 (11/13)

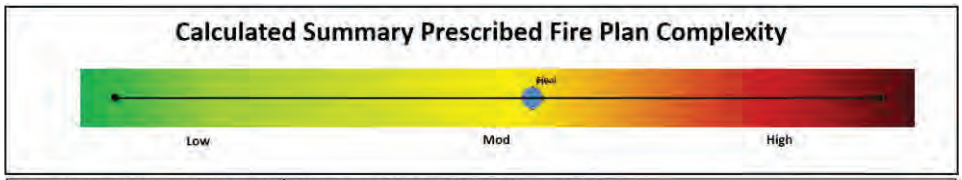
ELEMENT 3: COMPLEXITY ANALYSIS SUMMARY	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAMES:	H1-14; H2-12; H2-18; H3; T1-9; T2-11; T2-13; T3-10

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.

Independence Lake -Phase 3 Project		Quantity	Significance
Values	On-Site	Few	Low
	Off-Site	Few	Low
	Public/Political Interest	Few	Low

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



Final Complexity Determination	Final Complexity Determination Rationale
Mod	All elements in this plan rank moderate with the exception of logistics due to the primative and largely abandoned road system making access to units with equipment difficult. Advanced coordination with USFS staff to gain access to units, particularly those south of the lake would be very beneficial.

Ray Guse, RXB2, _____ 03/21/2020
Signature Date

Phillip Dye, RXB2 _____ _____
RXB2 Technical Reviewer Signature Date

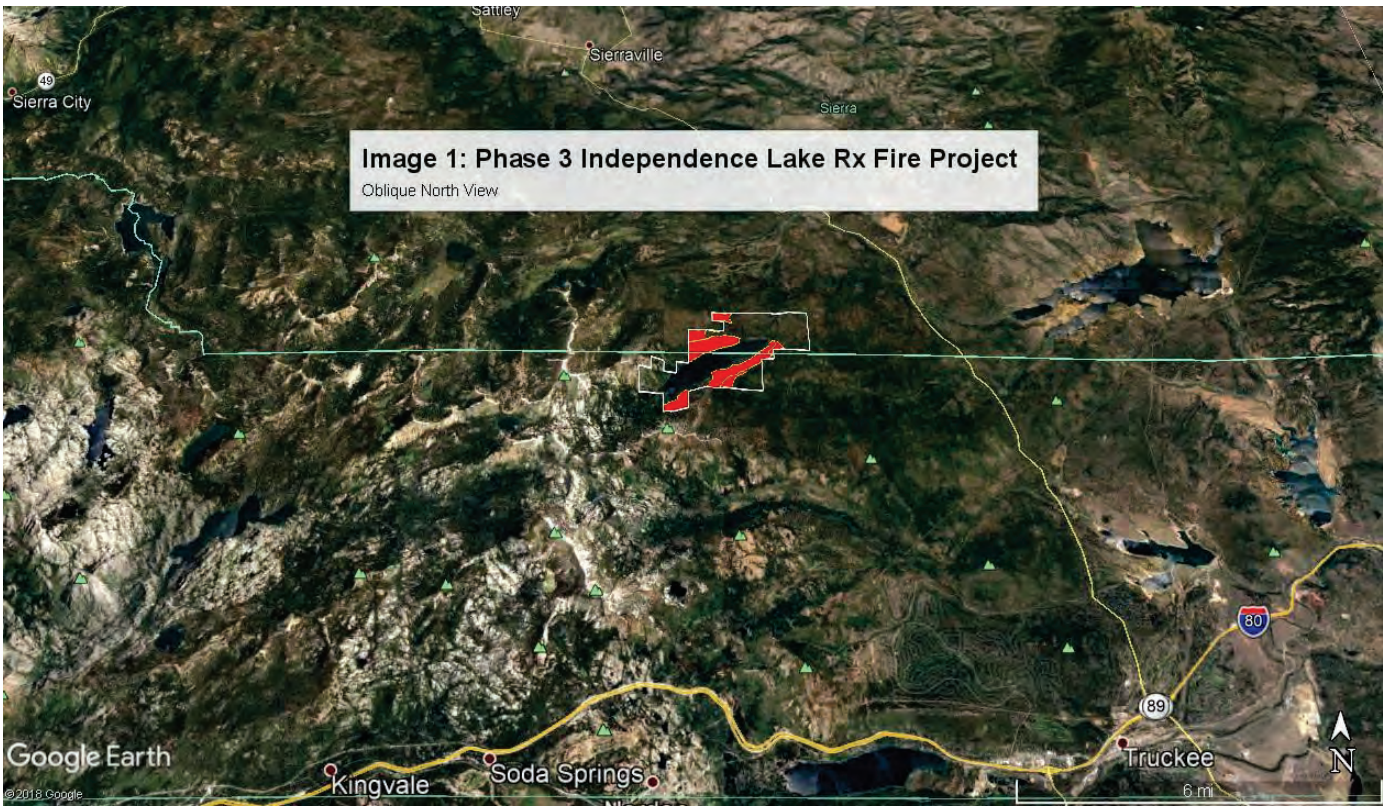
Edward Smith, CA Fire Manager _____ _____
Administrator Signature Date

ELEMENT 4.A: DESCRIPTION OF PRESCRIBED FIRE PROJECT AREA	**PROJECT NAME:**	Phase 3
	UNIT NAMES:	H1-14; H2-12; H2-18; H3; T1-9; T2-11; T2-13; T3-10
	FUNDING SOURCE:	TNC

Project Overview

The Independence Lake Preserve (2,933 acres) Phase 3 Project (Image 1, Maps 1 and 2.A) is comprised of 8 individual prescribed fire burn units that are combined within this one prescribed fire burn unit plan. Each individual burn unit is described in Sub-sections 4.B through 4.I. The overarching goals of this project are to promote and enhance biodiversity, forest resiliency to wildfires, protect and improve watershed function and wildlife habitat and provide a safe learning environment for preserve visitors and employees. Reintroducing fire as a disturbance process will result in a more natural range of variability in vegetation successional stages and provide other ecosystem functions for fire adapted or dependent plants and animals directly and indirectly. By reducing activity and naturally accumulated fuels within the burn units this project will reduce the risk and likelihood of high intensity wildfires that would negatively affect overall ecosystem health and public safety.

The preserve is owned by The Nature Conservancy, located approximately 9 miles NNE of Truckee, CA, and 25 miles E of Reno, NV.



Project Boundaries

All units within the project border the Tahoe National Forest, Sierraville Ranger District and some units border the Truckee Ranger District. Fire breaks for burn units consist of existing roads used as fire lines, hand-lines and Independence Lake (Maps 2.A thru 2.I).

Project Description

The eight units comprised this Phase 3 project have or will receive mechanical thinning treatments. If a burn unit name begins in a "T" it is intended to be treated with ground-based equipment, if it begins in an "H" biomass is intended to be removed by a helicopter.

Once the silvicultural treatments are completed and prior to burning, fuels in units will be reassessed by a qualified Type 2 Burn Boss. The Burn Boss will determine if post-activity fuels have changed to the point that Fuels Models (Scott and Burgan; RMRS-GTR-153) used in this plan are no longer representative of the post-activity fuels, and, following the guidance in Element 2, this prescribed fire burn unit plan requires amending.

If the fuel models on the ground are not as described in Element 4.B through 4.I then an amendment will be require. Behave Fire Prediction System runs will be conducted and documented in a revised Appendix E, and the environmental parameters prescription table in Element 7 will be compared to the Behave outputs ensuring the prescribed fire objectives will be met.

The 8 burn units within this Phase 3 Prescribed Fire Unit Plan can be combined or further sub-divided with check-lines as needed depending on resource capacity, operational efficiency, smoke management, and safety for firefighters and the public.

Phase 3 Physical Description

Location: The eight Phase 3 Burn Units are located on slopes surrounding Independence Lake and accessed via State Hwy 89 north of Truckee, CA and the Independence Lake Road (Map 1.2). It is possible that units south of Independence Lake may be accessed via Forest Service Rd 11, aka Sagehen Road.

Description: Legal, latitude/longitude and geographic descriptions for all 8 units are listed below in 4.B through 4.I. Unit identifiers, areas and perimeters are in Table 1.

Topography: Units sizes, slopes, elevations and aspects are described in sections 4.B through 4.I

Table 1 - Phase 3 Burn Units

Unit ID	Acres	Hectares	Perimeter Ft.
T1-9-Rx	60	24	7742
T3-10-Rx	28	11	6332
H2-12-Rx	52	21	8629
T2-11-Rx	67	27	7465
T2-13-Rx	5	2	3350
H1-14-Rx	184	74	15,102
H3-Rx	121	49	10,405
H2-18-Rx	291	118	24,148
TOTALS =	**808**	**326**	**83173**

Phase 3 Vegetation Description

Vegetation:

The project area supports a mix of conifer species including Jeffrey pine, ponderosa pine, lodgepole pine, along with white and red fir. Jeffrey, and lodgepole pine are dominant cover types. Dominant shrubs are ceanothus, manzanita and huckleberry oak and there are some grassy meadows (Map 4).

Vegetation in the Phase 3 Project area has been shaped by historic logging, but that activity is not well documented. There has been one recorded wildfire in 1926 that encompassed unit H2-12, however aside from some charring on old stumps and trees there is no other sign of this wildfire within the unit. Given the duration that char can persist it is possibly a result of other historic fires that burned over this area.

Project Fuels Description (more detail is provided in individual units descriptions (4.B thru 4.I))

Overview of Project On-Site Fuels (Map 4)	Overview of Project Adjacent Fuels
Mixed conifer fuel types consist of lodgepole, white fir, and red fir and Jeffrey pine (Map 4). Shrubs, predominantly manzanita and ceanothus can be mixed in with conifers where canopies are more open, and there are shrub fields in the units south of Independence Lake. Larger shrubs such as alder are predominant in more mesic sites and riparian areas. Small meadows do occur within the project likely best represented by GR4. Throughout the project area litter and duff depths average 1" or less, which will often inhibit ground fire spread. There are areas where cohorts of smaller conifers, predominantly white fire are present that could ladder fire into crowns of larger trees resulting individual and in some cases group torching of 2 or more trees. Generally, areas dominated by conifers are likely best represented by Fuel Model TL3 (Scott and Burgan; RMRS-GTR-153), and this fuel model may also capture the additional activity fuels expected to be present after the silvicultural treatments are completed before burning. TL1 is also present where fire will burn in a mosaic patchiness. Lodgepole pine stands may best be represented by TL7, however this fuel model likely over represents tonnage of 100-hour and larger downed woody material, and litter. Areas with dense ceanothus and manzanita may be best represented by SH5.	Fuels, and fuel models outside the project area are essentially the same as those within the burn units with fuel models TL3 being dominant with some TL1. TL7 will likely represent stands of lodgepole pine. South of the project area, on southerly aspects are shrub fields dominated by manzanita and ceanothus that is likely best represented by SH5

Description Of Unique Features (hazards, regulations, issues, constraints, etc.)

- There are no known archaeological/cultural sites within the project area to be protected from prescribed fire activities and heat from fire.
- Steep slopes with loose rock, talus and cliffs are present.
- Map 2.A depicts infrastructure in the vicinity of the preserve headquarters that are outside this project area, but do need to remain protected.
- For public safety, restrict access to burn units by closing roads and trails during implementation periods.
- When safely possible as determined by the Burn Boss and administrators, keep visitor use areas in the vicinity of the headquarters open to the public and use the management action as a learning tool. Establish detours when needed and possible.
- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.

ELEMENT 4.B: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**T1-9**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit T1-9 lies on the northern boundary of the TNC preserve and it is the northernmost unit in this Phase 3 Project. It is accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2B).
Legal: T19N, R15E, S34
County: Sierra
Lat/Long: 39.4589, -120.3069 (approximate center of unit)
Size: 60 acres
Topography: Elevation 5,421' top, 5,600 bottom; Aspect southeast; Slope 13%

Burn Unit Vegetation and Boundary Description

Vegetative type:
Mixed conifer dominated with a 10 acre stringer of Jeffrey pine. Largely discontinuous shrubs are intermixed within the trees (Maps: 2.B and 4).

Unit Description:
Unit T1-9 is adjacent to USFS land to the north, west and south (Maps 2.A and 2.B). The eastern boundary is interior to the preserve. As depicted on Map 2.B, a primitive road can be used as a fire line at the southeast portion of the unit, hand-lines will be used around the reminder of the unit to contain the fire. The primitive road continues through the unit and can be used to create north and south sub-units.

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Mixed conifer with intermixed shrubs. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Conifer stands are likely best represented by TL1 and TL3. Discontinuous shrub fuels may contribute to fire behavior and are likely represented by SH2 and possibly SH5.	Fuels outside unit boundaries on USFS lands differ very little from those inside the unit and should be represented by the same fuel models TL1, TL3, and SH2 and SH5 in shrubs. Much of the area east of the unit was previously burned by prescribed fire in 2018 and may be best represented by TL1 with rate of spread and flame lengths both very low.

Description Of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2
- Restrict public access to the burn area during implementation.

ELEMENT 4.C: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**T2-11**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit T2-11 lies in the northwest portion of the TNC preserve and is accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2C).
Legal: T 19 N, R 15 E, 33
County: Sierra
Lat/Long (Approx. Center of Unit): 39.4515, -120.3160
Size: 67 acres
Topography: Elevation 7800' top, 7550' bottom; Aspect south, Slope 5%

Burn Unit Vegetation and Boundary Description

Vegetative type:
Mixed conifer dominated with a 16-acre meadow in the northwest corner (Map 4).

Project description:
The unit is bounded to the north and west by USFS lands, and the south and east sides are interior to the preserve. Hand-lines will be used for containment around the entire perimeter of the unit (Maps 2.A and 2C).

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Mixed conifer with intermixed shrubs. Conifer stands are likely best represented by TL1 and TL3. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Shrubs may contribute to fire behavior and are likely represented by SH2, and possibly SH5 where shrubs are taller and more continuous. The 16-acre meadow in the northwest portion of the unit is likely best represented by GR4.	Fuels outside unit boundaries on USFS lands differ very little from those inside the unit and should be represented by the same fuel models TL1, TL3, and SH2 and SH5 in shrubs. Some of the area east of this unit was previously burned by prescribed fire in 2018 and may be best represented by TL1 with rate of spread and flame lengths both very low.

Description Of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2
- Restrict public access to the burn area during implementation.

ELEMENT 4.D: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**T2-13**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit T2-13 is located in the northwest corner of the TNC preserve (Maps 2.A and 2.D). It is accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2.D).
Legal: T 19 N, R 15 E, S33 & 34
County: Sierra
Lat/Long (Approx. Center of Unit): 34.4532; -120.3089
Size: 5 Acres
Topography: Elevation 7545' top - 7446' bottom; Aspect south; Slope 5%

Project Or Burn Unit Boundary Description

Vegetative type:
Unit T2-13 is dominated by mixed conifer with intermixed shrubs (Map 4).

Project description:
The northern boundary of the unit borders USFS land and the remaining boundaries are interior to the preserve A primitive road can be used for the southern control line, and the northern control line will be a hand-line (Maps 2.A and 2.D).

Fuels Description

On-Site Fuels Data	**Adjacent Fuels Data**
Mixed conifer with intermixed shrubs. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Conifer stands are likely best represented by TL1 and TL3. Discontinuous shrub fuels may contribute to fire behavior and are likely represented by SH2, and possibly SH5 where shrubs are taller and more continuous.	Fuels outside unit boundaries on USFS lands differ very little from those inside the unit and should be represented by the same fuel models TL1, TL3, and SH2 and SH5 in shrubs. Much of the area south and east of the unit was previously burned by prescribed fire in 2018 and may be best represented by TL1 with rate of spread and flame lengths both very low.

Description Of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2
- Restrict public access to the burn area during implementation.

ELEMENT 4.E: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**H1-14**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit H1-14 is located north of, and adjacent to Independence Lake (Maps 2.A and 2.E). It is accessed from primitive spur roads off the Independence Lake Road. It can also be accessed by boat.
Legal: T 15 N, R 15 E, S33 & 34; T18N, R15E, S4
County: Unit is divided by Sierra to the north and Nevada to the south
Lat/Long (Approx. Center of Unit): 39.4488, -120.3109
Size: 184 Acres
Topography: Elevation 7730' top - 6960' bottom; Aspect: south; Slope 36%

Project Or Burn Unit Boundary Description

Vegetative type:
Unit H1-14 is dominated by mixed conifers (Map 4).

Project description:
The eastern side of Unit H1-14 borders USFS land and the remaining boundaries are interior to the preserve. The southern boundary is Independence Lake itself, hand-lines will be used for containment on the east and north boundaries and a short section of a primitive road can be used as a fire line to tie fire to the lake (Maps 2.A and 2.E).

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Mixed conifer with intermixed shrubs. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Conifer stands are likely best represented by TL1 and TL3. Discontinuous shrub fuels may contribute to fire behavior and are likely represented by SH2, and possibly SH5 where shrubs are taller and more continuous.	Fuels outside unit boundaries on USFS lands differ very little from those inside the unit and should be represented by the same fuel models TL1, TL3, and SH2 and SH5 in shrubs. Much of the area east of the unit was previously burned by prescribed fire in 2018 and may be best represented by TL1 with rate of spread and flame lengths both very low.

Description Of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.
- Steep slopes over 36%, possibly cliffs presenting footing and rolling material hazards to firefighters. The steep slopes will increase uphill rates of fire spread.
- Restrict public access to the burn area during implementation.

ELEMENT 4.F: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**T3-10**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit T3-10 is located in the eastern portion of the preserve and accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2.F). It may also be accessed via FS Rd 11 (Sagehen Rd).
Legal: T19N, R15E, S35; T18N, R15E, S02
County: Unit is divided with Sierra to the north and Nevada to the south
Lat/Long (Approx. Center of Unit): 39.4474, -120.2859
Size: 28 Total Acres
Topography: Elevation 7340 top - 7000 bottom, Aspect northerly; Slope 15% average, 28% maximum

Project Or Burn Unit Boundary Description

Vegetative type(s):
Unit T3-10 is has a higher abundance of shrubs consisting primarily of ceanothus and manzanita with mixed conifers present in low abundance. Within the unit is a stringer of conifers dominated by Jeffrey pine (Maps 2.F and 4).

Project description:
Unit T3-10 is adjacent to USFS land to the south. Two relatively short sections of road on the west and east sides of the unit can be used as a fire line, and the reminder of the unit will be contained by hand-lines (Maps 2.A and 2.F).

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Throughout the majority of the unit, areas with continuous shrub fuels will dominate fire behavior and are likely represented by SH5, and where shrubs are less robust and less continuous fire behavior will likely be dominated by SH2. Fire behavior in the 10 acres of Jeffrey pine will likely be represented by TL1 and TL3. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees.	Fuels outside of this burn unit, both within the TNC preserve and on the adjacent USFS land remain largely the same with fire behavior in shrub dominated areas likely best represented by SH2 and SH5. In timber, TL1 and TL3 will likely best represent fire behavior.

Description of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.
- Steep slopes presenting challenging footing and rolling debris hazards.
- Fire behavior in shrub fields should not be underestimated.
- Restrict public access to the burn area during implementation. At Burn Boss and Administrator's discretion, this may include signage placed on USFS Roads that can access the burn unit from the east.

ELEMENT 4.G: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**H2-18**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit H2-18 is located in the southeastern portion of the preserve and accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2.G). It may also be accessed via FS Rd 11 (Sagehen Rd) or by boat.
Legal: T19N, R15E, S35; T18N, R15E, S02 & 03
County: Unit is divided with Sierra to the north and Nevada to the south
Lat/Long (Approx. Center of Unit): 39.4402, -120.2993
Size: 291 Acres
Topography: Elevation 7720 top - 6960 bottom, Aspect north; Slope 30%-40% average, and in excess of 45%

Project Or Burn Unit Boundary Description

Vegetative Type(s):
H2-18 is dominated by red fir. There is a stand of old growth approximately 10 acres in size within the unit. Approximately 10% of the unit, primarily along the southeast ridgeline has significant coverage of younger conifer cohorts. A drainage near the western line supports significant riparian vegetation dominated by alder and associated species (Map 2.G and 4).

Project description:
The H2-18 unit is bounded by USFS land for approximately ¾ miles on its' southernmost boarder. All other control lines are interior to the TNC preserve. The unit is steep with average slopes of about 40%, and up to 45% from the top of the ridge to the lake shore. The west boundary is very steep with a great deal of exposed rock.

Most of the south (upper) control line is a road used as a fire line. The boundary with USFS lands, and the east and west flanks tying the unit to the lake are hand-lines.

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Throughout the majority of the unit TL1 and TL3 should best approximate fire behavior. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Areas with a higher abundance of ceanothus and manzanita shrubs fuels will likely exhibit fire behavior of SH2, and where shrubs are more continuous and robust SH5 should be representative. Fire behavior in the steep drainage with 10 acres of alder is expected to be low because it is likely to be a heat-sink and may not sustain fire spread.	Fuels outside of this burn unit, both within the TNC preserve and on the adjacent USFS land remain largely the same In timber with TL1 and TL3 likely best representing fire behavior. South of the unit, on both TNC and USFS lands with southerly aspects are dense shrub fields dominated by ceanothus and manzanita that may exhibit high fire behavior similar to SH5.

Description of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.
- Steep slopes dominate this unit with pitches at or above 45%. There are steep rocky areas, primarily on the west line presenting footing and rolling material hazards to firefighters. The steep slopes will increase uphill rates of fire spread.
- Fire behavior is shrub fields should not be underestimated.
- Restrict public access to the burn area during implementation.

ELEMENT 4.H: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**H3**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit H3 is the southernmost unit in the Phase 3 Project. Access to the unit is limited to primitive roads on the preserve or possibly via FS Road 11 (Sagehen Road). The bottom of the unit can be accessed by boat (Maps 2.A and 2.H).
Legal: T18N, R15E, S9
County: Nevada
Lat/Long (Approx. Center of Unit): 39.4273, -120.3229
Size: 121 Acres
Topography: Elevation 8073 top - 7000 bottom, Aspect north; Slope in excess of 45%. The topography in H3 is complex with very steep slopes and a washed-out drainage that cannot be traversed by foot. There are numerous talus slopes along the fire line, particularly along the east fire line.

Project Or Burn Unit Boundary Description

Vegetative type(s):
H3 is characterized as lodgepole pine, however white fir in all size classes are abundant throughout the unit as well. The steep drainages carry significant water and are dominated by alder and associated shrub species (Maps 6 and 2.H).

Project description:
The H3 is bounded to the east, west and south by USFS lands that will require hand-lines to contain the fire. North of the unit is interior to the preserve where the primitive lakeshore road is to be used as a fire line.

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Fire Behavior in stands of lodgepole pine with significant dead and down may best be represented by TL7, however heavy fuels may be overrepresented in the fuel model and it is expected that observed fires may not burn with as much intensity. Throughout the remainder of the unit TL1 and TL3 should best approximate fire behavior. Primarily white fir, which is abundant, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Shrubs are generally confined to wet (mesic) areas low in the unit and fire behavior is expected to be low because these riparian areas are likely to be a heat-sinks and may not sustain fire spread except where grassy meadows are present.	Fuels outside of this burn unit, both within the TNC preserve and on the adjacent USFS land remain largely the same In timber with TL1 and TL3 likely best representing fire behavior. Steep brushy drainages are likely dominated by alder and associated species and should not express more than low fire behavior under prescribed fire conditions.

Description of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.
- Steep slopes dominate this unit with pitches at or above 45%. The washed-out drainage (Map 2.H) cannot be traversed on foot, and the talus slopes on the east line present complex topography that will slow movements of personnel. Rolling material is a hazard to personnel along with maintaining adequate footing. The steep slopes will increase uphill rates of fire spread.
- Restrict public access to the burn area during implementation.

ELEMENT 4.I: DESCRIPTION OF PRESCRIBED FIRE AREA	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**H2-12**
	FUNDING SOURCE:	**TNC**

Physical Description

Location: Unit H2-12 is located in the southern portion of the preserve and accessed by primitive spur roads off the Independence Lake Road (Maps 2.A and 2.I). It might also be accessed via FS Rd 11 (Sagehen Rd)
Legal: T 18 N, R 15 E, S03
County: Nevada
Lat/Long (Approx. Center of Unit): 39.4346, -120.3040
Size: 52
Topography: Elevation 7835' top – 7519' bottom, Aspect all; Slope averages 18% with pitches of 30%.

Project Or Burn Unit Boundary Description

Vegetative type(s):
Unit H2-12 is dominated by red fir with intermixed shrubs, primarily ceanothus and manzanita (Map 2.I and 4).

Project description:
The H2-12 unit lies along the southern boundary of the TNC preserve and borders USFS lands for approximately ¼ mile. Most of the northwest boundary is a road used as fire line that separates this unit from H2-18. The remaining boundaries of this unit will be contained with hand-lines.

Fuels Description

On-Site Fuels Data	Adjacent Fuels Data
Throughout the majority of the unit TL1 and TL3 should best approximate fire behavior. Primarily white fir, but other smaller trees as well have the potential to ladder fire into the crowns of more mature trees. Areas with a higher abundance of ceanothus and manzanita shrubs fuels will likely exhibit fire behavior of SH2, and where shrubs are more continuous and robust SH5 should be representative.	Fuels outside of this burn unit, both within the TNC preserve and on the adjacent USFS land remain largely the same In timber with TL1 and TL3 likely best representing fire behavior. Southeast of the unit, on both TNC and USFS lands with southerly aspects are dense shrub fields dominated by ceanothus and manzanita that may exhibit high fire behavior similar to SH5.

Description of Unique Features (hazards, regulations, issues, constraints, etc.)

- Prior to implementation, and upon completion of silvicultural thinning a qualified Burn Boss will reassess fuel models with the residual fuels present to determine if the fuel models described below in 4.B – 4.I are still valid in all 8 burn units. If they are not, follow the guidance in Element 2.
- Steep slopes with pitches at or above 30% present footing challenges and rolling debris hazards. The steep slopes will increase uphill rates of fire spread.
- Fire behavior in shrub fields should not be underestimated.
- Restrict public access to the burn area during implementation.

ELEMENT 5: GOALS AND OBJECTIVES	**PROJECT NAME:**	**Phase 3**
	BURN UNITS NAMES:	All Units

Purpose and Resource Management Goals:

- Promote fire effects necessary for functional fire dependent habitats by allowing fire to be the disturbance process that supports a more natural range of variability in native plant community species richness and diversity
- Build fire resiliency throughout the project area
- Reduce abundance of conifer seedlings that will become the next cohort of ladder fuels
- Maintain and increase coverage of aspen clones
- Maintain open grassland meadows by reducing encroachment of woody species
- Improve and maintain game and non-game wildlife habitat
- Maintain and enhance watershed function.
- Set the project area on the path to maintain a more natural fire regime, which throughout most of the project area is a return interval of < 35 years
- Gain public and agency support for creating an area where wildfires can be easily controlled
- Gain public acceptance for smoke impacts and the need for prescribed fires
- Reduce risk of uncharacteristic high severity fire and associated impacts to the watershed and adjacent communities.

Resource and Prescribed Fire Objectives

Resource Objectives:	**Prescribed Fire Objectives:**
▪ Limit mortality to 10-25% in conifer species greater than 10 inches DBH as evidenced within 3 years ▪ Achieve mortality of 30% - 80% in conifer species less than 6 feet tall as evidenced within 1-week ▪ Increase abundance of aspen suckering by 10% through removal of organic material thereby increasing exposure to sunlight and soil heating by increasing exposure to sunlight as evidenced within 2 years	▪ Reduce activity ground fuel loads (1 - 1000 hour size classes) by 50% within 2-weeks ▪ Reduce litter and duff fuel loads by 50% evidenced within 2-weeks ▪ Blacken 50% of the surface area or more as evidenced within 1 week ▪ Manage ignition techniques to maintain flame lengths range of 1'-6' under conifers. If flame lengths drop below 1' then firing will be adjusted to be more aggressive and increase the flame lengths where possible ▪ Limit scorch height to less than 20 feet in in all conifer species ▪ Manage ignition to reduce torching in ≥ 10" DBH conifers, which may exceed the retention objective.
Objectives are S.M.A.R.T.	**Specific, Measurable, Attainable, Reasonable, Time Related**

Notes:

- *State Fire Manager Approval is required to deviate from objectives as per TNC protocols (http://www.tncfiremanual.org/burnplan.HTM). Some objectives may be difficult to meet when burning on the cool end of the prescription, but other objectives are being met and may take precedence. Consequently, at the Administrator's or their designee discretion an objective may be compromised to allow a burn to continue with Fire Manager Approval. This may result in revising objectives in the future.*

- *When fuels are unavailable for spreading fires such that overall objectives cannot be met, the Burn Boss may determine that sufficient fuels can be consumed through blacklining along unit perimeters to reinforce them for future more efficient burn entries and those activities are permitted under the parameters of this plan.*

- *Unburned areas of fuel will not be relit unless they present an escape risk, or the NVFO Administrator or designee requests that it be done. Unburned areas will provide a mosaic pattern of fire coverage and ecotone habitats.*

ELEMENT 6: **FUNDING**	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Cost summary:

Calculations were made using $500.00/acre. Some units may cost more or less depending upon the amount of preparation required and the number of resources needed to burn different units. Units with heavier brush components may take longer to prepare and to burn. Burning on the hotter end of the prescription may require more time investment than burning on the cooler end. Seasonality may affect costs because units burned in the spring may require more resources and time to patrol and mop-up as the season warms into late spring and summer.

Table 2 - Phase 3 Burn Costs

Unit ID	Acres	Cost @ $500/Ac
T1-9-Rx	60	$30,000.00
T3-10-Rx	28	$14,000.00
H2-12-Rx	52	$26,000.00
T2-11-Rx	67	$33,500.00
T2-13-Rx	5	$2,500.00
H1-14-Rx	184	$92,000.00
H3-Rx	121	$60,500.00
H2-18-Rx	291	$145,500.00
Totals	808	$404,000.00

ELEMENT 7: PRESCRIPTION- FIRE BEHAVIOR PARAMETERS OUTPUTS	**PROJECT NAME:**	**Phase 3**
	BURN UNITS NAMES:	**All Units**

ENVIRONMENT PRESCRIPTION:

Standard Fire Behavior Fuel Models Fuel Models (RMRS-GTR-153) are used to characterize fuels for theoretical fire behavior predictions using the Behave 5.0.5 Fire Behavior Prediction System. By inputting combinations of fuel moistures and wind speeds to the Behave model, ranges of variables defining the fire Environment Prescription Range were developed and outlined in the following Table 3. This range of environmental parameters, as well as variations in firing techniques utilized will provide fire intensities needed to achieve the prescribed fire objectives. Equally as important as the Behave model outputs is professional experience of how fire will behave in this environment under variable fuel and weather scenarios and how to manage it.

Table 3

Environmental Rx Range	Lower Intensity	Optimal	Higher Intensity
1 HR Fuel Moistures %	20	6-8	5*
10 HR Fuel Moistures %	14	8	6
Relative Humidity %	70	30	20
Temperature (F)	No bottom limit	65	90
Probability of Ignition %	20	40	60*
Wind Speed – Average Mid-Flame mph)	1	4	8*
Wind Direction (az º)	Any	Easterly	Any

*When burning at the hot end thresholds for 1-hour fuel moisture, probability of ignition and/or wind speeds the Burn Boss and administrators must carefully consider the on-site crew capacity to suppress spot fires. If 2 or more of these variables are at the hot end thresholds, continuing with ignitions may not be appropriate.

Notes:

- All Fire Behavior Documentation (BEHAVE 5.0.5 run outputs) are located in Appendix E; a separate file of this burn plan
- An optimal easterly wind will reduce risk of impacts to Hwy 89, visitor facilities and private neighbors, however these units can be burned with any wind direction.

FIRE BEHAVIOR PRESCRIPTION

The range of acceptable fire behavior in this plan (Table 4) were generated from Behave Plus 5.0.5 with inputs for theoretical head and backing fires. Fuels both inside and outside the project should be represented by TL1, TL3 and TL7 in conifer dominated fuel types. SH2 should represent areas where shrubs are not robust and continuous. SH5 is likely to represent fire behavior in the more robust shrub fields that lie south of the project boundaries, however there are smaller representations of continuous shrubs in T3-10, H2-12 and H2-18Rx.

Fire intensity is the key factor driving whether or not objectives are met, and the best surrogate of intensity that can be managed during implementation is flame length. Flame length will be managed by burning within the range of environmental parameters outlined in Table 3, but equally important to managing flame lengths are the ignition techniques that are utilized. Outputs from the Behave model indicate flame lengths of 1’ – 6’ will meet objectives, and during implementation the objective for optimal flame lengths the Burn Boss, Firing Boss and igniters should strive for is 4 feet (Table 5).

There will be variability in fire behavior that cannot be predicted by modeling, consequently, local experience of how fire behaves in this system, and how to utilize ignitions are equally if not more important to fire behavior. There will be heterogeneity in fire intensities that will provide a more natural range of variability in plant successional stages and diversity in habitats throughout the project.

Table 4

B. Fire Behavior Rx Range in Dominant Fuel Models	MINIMUM	OPTIMAL	MAXIMUM
FM GR4 (5%-14% FDFM)(5% slope) (maximum spread direction)			
Head fire Flame Length (ft)	1	9	15
Head fire Rate-of-spread (ch/hr)	4	70-90	250
Spotting Distance (mi)	N/A	N/A	N/A
FM SH2 (5%-14% FDFM) (7% slope) (maximum spread direction)			
Head fire Flame Length (ft)	0.5	6-7	10
Head fire Rate-of-spread (miles/hr)	0.5	13-15	37
Spotting Distance	N/A	N/A	N/A
FM SH5 (5%-15% FDFM) (25% slope) (up/down-slope backing spread direction)			
Head fire Flame Length (ft)	1	6-7	29
Head fire Rate-of-spread (miles/hr)	3	13-15	260
Spotting Distance	N/A	N/A	N/A
FM TL3 (5%-18% FDFM) (7% slope) (maximum spread direction)			
Head fire Flame Length (ft)	1	1	1
Head fire Rate-of-spread (ch/hr)	0.3	0.6	0.7
Mortality in ≥20" DBH Jeffrey Pine	0	0	0
Spotting Distance (mi)	.3	.3	.3

Table 5

Prescribed Fire Behavior To Meet Objectives	COOL	OPTIMAL	HOT
Rate of Spread (chains / hour)	1	3	9
Head fire Flame Length (feet)	1	4	6

.

ELEMENT 8: SCHEDULING	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Ignition time frames/duration

- Units can be burned in spring or fall.
- Units should be ignited to take advantage of optimal smoke dispersion.
- More than one unit or sub-units may be burned in an operational period with sufficient resources so the span of control is not exceeded, and the complexity analysis does not change. If the distance between units or the span of control is too great for one (1) Burn Boss then an additional Burn Boss will be necessary. The decision to burn more than one unit in a burn period will be well documented.
- Ignition of the 8 units in Phase 3 will require multiple operational periods. There is no time limit on how long the project area will continue to burn or smolder, but if residual smoke becomes problematic mop-up efforts can be increased.
- Mop-up of critical areas should be completed while adequate resources are remain on-site.

Constraints:

- Burning will occur after thinning activities are completed
- Ecological constraints to spring vs. fall burning such as plant phenology, nesting birds or other wildlife concerns that may identified in the future.
- Seasonal constraints may be significant winter snow that causes high soil and duff moisture in spring that preclude meeting fuel consumption objectives, and restrict access to units. Monitor regional and on-site fuels moistures, and current and forecasted weather while planning burn implementation.
- Smoke management issues such as potential intrusions onto highways and in communities. Project managers and Burn Bosses must conduct public outreach, maintain communications with air quality regulators, conduct smoke prediction modeling and monitor smoke at all times.
- Resources to implement this plan must be available during burn windows, which can often be challenging.
- The Burn Boss will communicate and coordinate with State and Local fire authorities prior to authorizing prescribed fire implementation if the NFDRS fire danger is “extreme” for the County or contiguous counties in which the Prescribed fire is planned.

ELEMENT 9: PRE-BURN CONSIDERATIONS	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

On-Site Considerations

- Units will be thinned prior to burning, and a qualified Type 2 Burn Boss will need to reevaluate the fuels to determine if the fuel models and prescription remain valid or if this plan will need to be amended to meet objectives (follow guidance in Element 2).
- Accessing burn units via the USFS road system may require advanced coordination with district staff. Primitive roads to access burn units, and those to be used as firelines are likely to need to be improvement, and hand-lines will need to be installed. The Burn Boss may determine the optional hose-lays marked on Maps B-I will be needed for some or all units.
- Where hose-lays are needed, a consistent and adequate water supply will need to be planned and maintained for the duration of the burn entries as determined by the Burn Boss.
- Keep the public informed for safety and education through public outreach on the preserve. Post the preserve as closed during firing operations.
- Identify any safety hazards that may need mitigation prior to ignition operations such as snags adjacent to containment lines that may need to be felled.
- Obtain on-site fuels and weather information and determine consistency with Element 7 (Prescription) and Element 19 (Smoke Management).
- Conduct a briefing at the beginning of each operational period. (Refer to Element 10: Briefing). It will be the discretion of the Burn Boss where the briefing will occur.
- Conduct test fire as described in Element 14: Test Fire. The Burn Boss will determine test fire location(s).
- Staging of equipment and fuel will occur no less than 100’ outside of riparian areas

Off-Site Considerations

- DO NOT PLAN AN IGNITION IF RED FLAG WARNINGS OR WATCHES ARE PREDICTED WITHIN 72 HOURS
- Coordination with CAL FIRE, Tahoe NF and air quality regulators must occur.
- Place signage on Highway 89.
- Public outreach will help garner support for this project and may come in the form of public meetings, press releases through print, radio and TV messaging and signage at public gathering locations.
- Make notifications as identified in Element 9 below.
- Contact the Grass Valley ECC and USFS Grass Valley Dispatch
- Check Contingency needs and coordinate availability

Method And Frequency For Obtaining Weather Forecast(s):

Daily Spot Weather Forecasts are required prior to active ignition taking place and when fire is actively burning. On site weather data will be collected prior to and on hourly basis during active ignitions using a belt weather kit or an alternate instrument (Kestrel). At their discretion, the Burn Boss may request on site weather be collected more frequently, and they can request additional spot weather forecasts if on site conditions are not representative of previous forecasts. Weather may also be obtained from the Dog Valley RAWS ((DOGC1) https://mesowest.utah.edu/cgi-bin/droman/meso_base.cgi?stn=DOGC1))

Internal And External Involvement:

The Burn Boss is responsible for ensuring that local fire protection, law enforcement and area residents are notified prior to ignition. The Burn Boss is responsible for ensuring that adequate informational and prescribed fire signage is posted along roads leading into the burn units and/or at various community centers on the day of ignitions.

Notifications:				
Agency/Individual	**Required (X) or Courtesy(C) (Days Before Burn?)**	**Phone # email**	**Burn Boss**	**Project Mngr**
Chris Fichtel, The Nature Conservancy in Nevada	(X) 14 days	775-313-8646 cfichtel@tnc.org		
Ed Smith, The Nature Conservancy in California	(X) 14 days	928-864-7113 esmith@tnc.org		
David Mandrella, Preserve Manager	(X) 14 days	775-322-4990 dmandrella@tnc.org		
Sagehen Field Station-Jeff Brown	(X) 14 days	530-587-4830 sagehen@berkeley.edu		
Bickford Ranch (Painted Rock Lodge)-Robert Graham	(X) 14 days	530-412-0610		
Truckee Meadows Water Authority-Bill Hauck	(X) 14 days	775-834-8111 bhauck@tmwa.net		
Media	(X) 14 days			
CAL FIRE – Truckee (seasonal)	(X) 14 days	530-582-9471		
Bryan Farrell Chief – Battalion 2315	(X) 14 days	530-277-2315		
CAL FIRE – Northern Region	(X) 14 days	530-224-2489		
Grass Valley Emergency Command Center	(X) 14 days	530-477-0641		
USFS Grass Valley Dispatch	(X) 14 days	530-477-7237		
Sierraville Ranger District, Tahoe National Forest	(X) 14 days	Quentin Youngblood, qyoungblood@fs.fed.us 530-994-3401 Ruby Burks (530) 414-3789 rubyburks@fs.fed.us		
Truckee Ranger District, Tahoe National Forest	(X) 14 days	Linda Ferguson (530) 587-3558 lmferguson@fs.fed.us Eric Petterson - (530) 227-6717 epetterson01@fs.fed.us		
Tim and Ray Streigle, Independence Mechanic Shop	(X) 3 days	530-414-6336 or littletruckee1@yahoo.com		
Lauren and Gary Ranz, Residents	(X) 3 days	925-639-5059 or lrranz@sbcglobal.net		
Pam and Fred Mitchell, Residents	(X) 3 days	775-427-5171 or 530/913-2804		
Ron & Lois Wifall	(X) 3 days	Ron: 559-999-1740 Lois: 530-277-5103		
Suzanne Pride Bryan, Onion Valley Resident	(X) 3 days	707-963-6064(w) 707-484-8404(c) 707-538-8806(h) 530-414-1189(lodge)		
Ralph & Dianna Wittins	(X) 3 days	530-368-2870 (Ralph cell); 530-386-2623 (Dianna cell)		
Northern Sierra Air Quality Management District	(X) 3 days	530-274-9360 or office@myairdistrict.com		
Washoe County Air Quality Management	(X) 3 days	(775) 784-7200		
NDEP (NV Dept. of Environ. Protection)	(X) 3 days	smoke@ndep.nv.gov		
Sierra County Sheriff	(X) day of	530-289-3700		
Nevada Country Sheriff	(X) day of	530-265-1471		
California Highway Patrol		530-582-7500 (7570)		
Reno Fire Weather	As needed	775-673-8100		

ELEMENT 10: BRIEFING	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Burn Organization and Assignments –An alternate RXB2, or someone qualified at minimum FFT1 will be identified to manage secondary incidents. In the event the Burn Boss becomes incapacitated, and there is no qualified back-up Burn Boss on-site, the burn will be placed in hold and contain status by lower qualified personnel.

CREW BRIEFING

☐Each crew leader has a map

Each item below has been discussed with crew:

☐Burn unit size and boundaries
☐Expected Weather and anticipated Fire and Smoke Behavior
☐Burn unit hazards and safety issues, including **LCES and SA**

- Smoke (learn to avoid and step out of it when possible)
- Driving (steep rough roads, backing - use spotters)
- Burns from drip torch fuel and stump holes (described technique to extinguish pant legs)
- Snags, rolling rocks, logs and other debris at all times when on unit
- Cuts from chainsaws and other tools
- Impacts from flying hose brass
- Fall hazards: cliffs, tripping, climbing on equipment
- Animals: bees (ask about allergies..???), snakes
- Unfamiliar crew (notify Burn Boss of any new arrivals and ensure they are in-briefed)
- Lifting and pulling strains
- Losing sight of each other
- Damage to eyes - wear safety glasses at all times. Hands - you won't have time to put gloves on
- Do not trust roads marked on maps, also there's many 2-tracks on the unit not marked on maps.
- 500 gallon propane tank at manager's cabin

☐Purpose of burn

Resource Objectives Summary:

- Less than 10% mortality in conifers more than 10" DBH as evidenced within 3 years
- Achieve 30%-80% mortality in conifers <6 feet tall within 1 week
- Promote aspen suckering by 10% through heating the soil and removing organic material to for more exposure to sunlight as evidenced within 2 years
- Reduce activity fuels (1 - 1000 hour size classes) by 50% within 2-weeks
- Reduce litter and duff fuel loads by 50% as evidenced within 2-weeks

Prescribed fire objectives Summary:

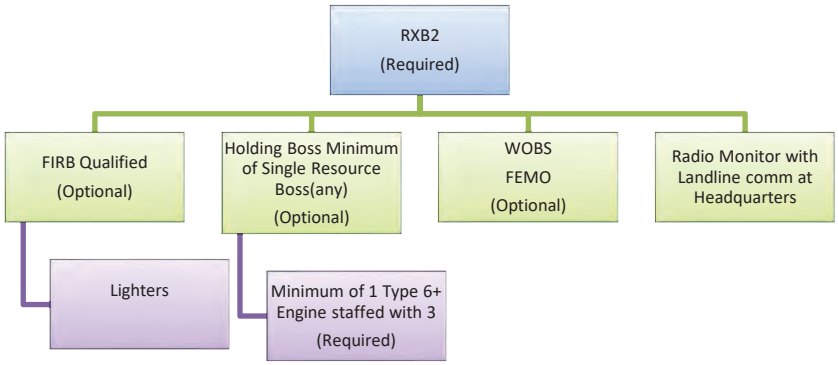
- Flame lengths under conifers should not exceed 6', if below 1' change firing. Grass can flare up to 15', brush up to 10'
- Keep scorch height to less than 20 feet in in all conifer species
- Some conifers are expected to torch, but manage firing techniques to minimize flame contact and convective heat to meet retention objectives
- Unburned areas of fuel will not be relit unless they present an escape risk, or if the project manager requests that it be done. This will provide a mosaic pattern of fire coverage and ecotone habitats
- Achieve 50% or more of blackened ground throughout the entire unit

☐Organization of crew and assignments
☐Communications (channels, frequencies, cell phones, 911)
☐Methods of ignition, holding, mop-up
☐Contact with the public; traffic concerns
☐Location of main roads, vehicles, keys, and nearest phone
☐Location of back-up equipment, supplies, and water
☐Contingencies for escaped prescribed fire
☐Contingencies for medical emergency
☐WUI concerns
☐Persons identified to manage secondary incidents
☐Answer questions from crew and whether or not they wish to turn down an assignment or participation (IRPG)

The prescribed fire burn boss or designee, will ensure that any new personnel arriving to the prescribed fire receives an in-briefing prior to assignment.

ELEMENT 11: ORGANIZATION AND EQUIPMENT	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Minimum Staffing Requirements for Ground (Hand) Ignition



- Based on BEHAVE runs and Resource Line Production Rates, a minimum of **5** people and **1** engine are required for black-lining, but larger units burned at hotter end of the prescription requires additional resources at Burn Boss discretion. It is required to have one person monitoring the radio at the headquarters with a landline telephone. Per the BEHAVE runs found in Appendix E, on scene staffing levels provide for the containment of a spot fire in FM TL3 at under 1 acre within 2 hours of reported spot outside of the unit at the hot end of prescription with a response of less than 10 min. Quick response to attack spot fires is key to containment when burning with minimum resources.

Required On Scene Personnel/ Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
RXB2	1	1	1
Radio/Landline monitor	1	1	N/A
FFT2 (ignitions or holding as needed)		3	3
Engine	1	As needed	3 ch/hr with 1 FFT; 8 ch/hr with 2 FFT's, 12 ch/hr with 3 FFT's
Additional Recommended On Scene Personnel/Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Holding Boss	1	1	1
Firing Boss	1	1	1
Wx Observer	1	1	1
Engine	1	3	3 ch/hr with 1 FFT; 8 ch/hr with 2 FFT's, 12 ch/hr with 3 FFT's
Recommended Contingency Resources (2 hour response time)	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Engine	1	3	3 ch/hr with 1 FFT; 8 ch/hr with 2 FFT's, 12 ch/hr with 3 FFT's

Minimum Staffing Requirements for Areal Ignitions

For Aerial Ignitions, a minimum of 12 people are required to complete the under burn. These additional personnel and equipment will only effect the staffing requirements for the burn organization and not the fire behavior. The following positions must be filled:

Helicopter Ignition Operations

Required On Scene Personnel/ Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
RXB2	1	1	1
FIRB(1)	1	1	1
Holding Boss	1	1	1
HEMG	1	1	
PLDO	1	1	
Helicopter T2 or T3	1		
Engine T3	2	6	24
Wx Observer(1)	1	1	1
Additional Recommended On Scene Personnel/Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Crew T1 or T2	1	20	7 or 5
Engine T3	1	3	12
Recommended Contingency Resources (30 min. response time)	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Engine T3	1	3	12

Unmanned Aircraft System Ignitions (Drone)*

Required On Scene Personnel/ Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
RXB2	1	1	1
FIRB	1	1	1
Holding Boss	1	1	1
UASP*	1	1	
UAS L	1	1	
UAS	1		
Engine T3	2	6	24
Wx Observer	1	1	1
Additional Recommended On Scene Personnel/Equipment	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Crew T1 or T2	1	20	7 or 5
Engine T3	1	3	12
Recommended Contingency Resources (30 min. response time)	**Quantity**	**Personnel**	**Line Production Rate (Ch/Hr)**
Engine T3	1	3	12

*Confirm The Nature Conservancy's position qualifications and protocol for UAS prescribed fire ignitions.

- If there is a sufficient number of resources and there are no span of control issues, trainee positions will be implemented at the discretion of the Burn Boss. On all units crew members from the equipment may be utilized for firing, holding, patrol and mop-up as needed.
- Staffing levels will be decided prior to the pre-burn briefing for each unit.
- The actual organization will be specified by the Burn Boss on day of burns.

ELEMENT 12: COMMUNICATIONS	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Identify and assign command, tactical and air operations frequencies as needed.

System	Rx Freq.	Rx Tone	Tx Freq.	Tx Tone	Assignment	Remarks
TNC National	151.625	------	151.625	----------	Command	TBD
					Tac	TBD
					Tac	TBD
					Air to Grnd	TBD
Dispatch/ Grass Valley ECC	151.40000 151.32500	192.8	151.40000 151.32500	192.8	Dispatch	TBD
						TBD
						TBD
						TBD

Project Phone Numbers	
Personnel Name & Title:	**Phone Number:**
GVECC	530-477-0641
USFS GV Dispatch	530-477-7237
Sierra County Sheriff	530-289-3700
Nevada County Sheriff	530-265-1471
CA Highway Patrol	530-582-7500 (7570)
North Sierra Air Quality Management District	530-274-9360
Sierraville Ranger District	530-994-3401
Truckee Ranger District	530-587-3558
Ed Smith, CA Fire Manager, TNC California	928-864-7113
Chris Fichtel, TNC Nevada	775-313-8646
David Mandrella, I-Lake Preserve Manager	775-322-7990
Ray Guse, Burn Planner	509-322-5542

ELEMENT 13: PUBLIC, PERSONNEL SAFETY	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Safety Hazards:

- All common hazards experienced in fire management operations (i.e. burns, slips, trips, fall, snakes, bees, etc.) as well as public use during implementation exist. Known hazards are addressed in the JHA located in Appendix D.
- If aviation resources are utilized this may increase hazardous exposures, and specialized firing equipment and support vehicles/personnel will be needed.
- Working around aviation resources
- Smoke will be produced from burning material. Smoke may reduce visibility on nearby roads. If reduced visibility becomes a traffic hazard, traffic controls will be put into place.
- Exposing firefighters to smoke that can result in reduced cognitive abilities and long-term health risks. See attached job hazard analysis (Appendix D).
- Steep complex topography with rock slides, cliffs and the potential for rolling debris
- Hazard snags
- Communications

Measures Taken To Reduce The Hazards:

- To mitigate these and other hazards, follow the steps listed in the JHA, utilize the Ten Standard Fire Orders, the Eighteen Situations That Shout Watch Out, LCES, and other common safety practices. To mitigate risks associated with the public, post signs informing of burn operations and limit access where appropriate. If smoke limits visibility on roadway and creates unsafe driving conditions, personnel can be placed on impacted roads to direct traffic. Hazards and mitigations will be discussed during daily briefings and situational updates.
- Road hazard signs will be placed on the road prior to operations. Roads may need to be restricted to one-way traffic, or temporarily closed if smoke becomes an issue. Contact law enforcement.
- Instruct firefighters to avoid smoke when possible and seek out clean air. Rotate firefighters out of heavy smoke when possible.
- All personnel will wear required personal protective equipment (PPE) at all times during firing operations. PPE will include at minimum nomex clothing, 8” boots, fire shelter, gloves, hard hat and eye protection.
- See Appendix D: Job Hazard Analysis (separate file).
- See Appendix H: Project Aviation Safety Plan (separate file).
- Scout areas where firefighters will travel. Ensure stable footing. Maintain personal and team awareness of the environment firefighters are working in.
- Pre-treat hazard snags before implementation. Flag off areas where dangerous snags exist and make them known to leadership and other firefighters. Consult with Burn Boss on the need to fell snags. Do not exceed faller qualifications.
- Ensure clear communications and confirm they are understood
- All maps are available in geo-referenced format to use in Avenza PDF Maps. All shapefiles are available to use in ArcGIS Collector

ELEMENT 13: EMERGENCY MEDICAL PLAN	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Emergency Medical Procedures: *Reference Emergency Medical Care Guidelines in IRPG. In the event of a medical emergency provide the following information to the communications unit/grass valley communication*

1. Declare the nature of the emergency.
2. Medical injury/illness?
3. Is injury/illness life threatening?
4. If life threatening, then request that the designated frequency be cleared for emergency traffic.
5. Identify the on-scene point of contact (POC) by resource and last name (i.e. POC is TFLD smith).
6. Identify nature of incident, number injured, patient assessment(s) and location (geographic and GPS coordinates).
7. Identify on-scene medical personnel by position and name (i.e. EMT Jones).
8. Identify preferred method of patient transport.
9. Request any additional resources and/or equipment needed
10. Document all information received and transmitted on the radio or phone.
11. Identify any changes in the on-scene point of contact or medical personnel as they occur.

Emergency Evacuation Methods:

All requests for medical aid will be made through 911 and/or GVECC

Nearest Landing Zone for Air Ambulance is the Meadow at Headquarters:

Degrees Decimal Minutes: 39°27.290'; 120°17.604'

Decimal Degrees: 39.4534; -120.2905

Ambulance:	**Phone Number:**	**Equipment**	**Staffing**
CALSTAR 6 (RW) Reach – Air Medical Services	530-544-2339 916-865-6622	In-flight ICU	Advanced
Truckee Fire Department	530-582-7850	Life support	Unknown

Emergency facilities:	
Trauma Level 4 Tahoe Forest Hospital 10121 Pine Ave, Truckee, CA 96161	530-587-6011
Trauma Level 2 Renown Regional Emergency Room 1155 Mill St., Reno, NV 89502	775-982-4342
Trauma Level 1 UC Davis Medical Center/ Sacramento, CA 2315 Stockton Blvd. Sacramento, CA 95817	916-734-2011
UC Davis Burn Center 4251 X Street Sacramento, CA 95817	916-734-3636

Directions From Nearest Medical Facility To Project Via Ground: Transportation

Medical transportation and travel routes will be established between the Burn Boss and District Fire Management Officer prior to ignitions. The Burn Boss must factor in the location, access, and seasonality of the planned burn operations.

ELEMENT 14: **TEST FIRE**	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Planned Location & Specific Instructions:

A test fire will be conducted in representative fuels in an area that can be easily controlled. This would preferably be at an uphill and downwind starting point for the area intended to be burned during that operational period. The location should provide an assessment of fire behavior, fire effects, and smoke production and dispersal while not compromising safety, control or damaging resources. Pending the results of the test fire, the Burn Boss will decide if firing will commence.

Burn Day Documentation

Weather Conditions Onsite:	**Test Fire Results:**
The burn boss will check on-site weather observations and weather forecast to ensure they are within prescribed fire prescription elements prior to ignition of the test fire.	Fuel consumption, flame lengths, and smoke dispersal within this test fire will be used to determine if the prescribed fire will meet objectives (fuel reduction, soil cover, smoke dispersal, etc.). Results of the test fire will be recorded in the project folder.

Does The Test Fire Meet Prescription Parameters?	**Yes**		**No**	

Comments:

ELEMENT 15: IGNITION PLAN	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Narrative for Ignition Plan:

Firing method(s)*:
Ground and aerial ignitions (may include UAV).

Devices:
Drip torches, fusee, other hand-held ignition devices. Aerial Plastic Sphere Dispenser or Unmanned Aerial System (See Appendix H: Project Aviation Safety Plan. Confirm TNC policy for UAV's)

Techniques:
Units will be ignited using strip-head, point-source, and/or other firing techniques to manage fire behavior to meet objectives. Ring-firing individual mature trees may reduce mortality and reduce torching potential.

Sequences:
Patterns, holding strategies, and personnel utilization will be decided upon prior to the daily briefing based on the SPOT weather forecast and expected fire behavior. Ignition strategies will be adjusted through the day based on fire behavior and weather observations, holding concerns and prescribed fire objectives

Anticipated patterns:
Minimize fire behavior near windward containment lines by utilizing backing/ flanking fires. Utilize burners to keep fire edges even and work to keep them on contours to reduce fatigue.

ELEMENT 16: HOLDING PLAN	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

General Procedures Narrative For Prescribed Fire Holding:

The Burn Boss will:

1. Designate a Holding Boss qualified at the NWCG Firefighter 1 or higher prior to the briefing.
2. Monitor holding operations and assess needs to activate contingency resources.
3. Ensure frequent patrols to assure prompt detection of any ignition outside the project area.
4. Ensure all personnel assigned meet NWCG requirements for training and experience.

The Holding Specialist will:

1. Participate in briefing and advise all personnel of expectations and location of equipment.
2. Identify planned control lines and evaluate the need for hose lays and other equipment.
3. Ensure holding resources are familiar with road access and unit control lines.
4. Supervise and assess holding operation's needs.
5. Advise the Burn Boss of need to activate contingency resources.
6. Ensure holding resources take suppression action on ignitions outside the project area in a timely manner. During containment efforts, it may become necessary for lighters to be used as holders.
7. Establish regular patrols for previously burned units.

Critical Holding Points And Mitigation Actions:

- **Public use areas:**
  In this area that can have high public use, both the frequency and duration of patrols must be diligent until the unit is declared out.
- **Hot Fire-lines/Above Ground Ignition Sources**:
  The Burn Boss will scout unit control lines and determine mop-up standards, and if felling trees or snags is needed for containment.

General Procedures Narrative For Prescribed Fire Mop-Up And Patrol:

- The Burn Boss will determine the need for patrol of the prescribed fire area. Regular patrols will continue until the units are declared out.
- When patrol of the prescribed fire area occurs, resources should walk all perimeter lines to ensure the prescribed fire remains within control lines and secure lines to the degree necessary to prevent escape
- Frequency of patrol, and an increase or decrease in holding resources will be determined by the Burn Boss as conditions in the fire environment change, or are anticipated to change
- Identify and mitigate potential hazard trees that may threaten control lines.

At night the Burn Boss may leave the prescribed fire unattended when weather parameters and fire behavior observations are favorable to ensure that:

- Resource management goals and objectives would continue to be met
- The prescribed fire would remain within the burn unit boundaries and the risk of escape is unlikely.
- Smoke production will remain within the planned and permitted parameters.

Prior to making the decision to leave the prescribed fire unattended, the Burn Boss must ensure that the following weather parameters exist:

- The Spot Weather Forecast predicts that the forecasted weather parameters (minimum nighttime humidity/maximum nighttime temperatures) for that period remain within or below the calculated POI parameters.
- Weather observations from not less than the previous 72 hours demonstrate a trend from which the Burn Boss could reasonably expect that the weather parameters would remain with the required POI.

Prescribed fire declared out by:

The prescribed fire will be declared out by the Burn Boss after discussions with the CA TNC Fire Manager based on the number of days of no smoke or heat being detected by patrol resources, predicted fuel conditions, weather forecasts, and other factors that may guide the decision.

ELEMENT 17: CONTINGENCY PLAN	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Minimum Contingency Resources And Maximum Response Time(s):

The minimum number and type of contingency resources may vary depending on the location, implementation phase and applicable Management Action Point (MAP) or limit. The Burn Boss will verify and document availability of contingency resources and response time throughout each phase of implementation as described in the plan.

Management Action Points(MAP) Or Limits:

MANAGEMENT ACTION POINT - DOCUMENTATION ELEMENT	**MANAGEMENT ACTION POINT NARRATIVE**
Designator And Description:	***Prescription parameters/fire behavior is exceeding or nearing the maximum thresholds.***
Condition:	Increased fire behavior, spotting, creeping outside of the unit boundaries.
Management Intent:	Maintain fire within the burn unit and project boundary Reduce fire behavior to keep fire effects within objectives
Recommended Action(S) To Consider:	Weather observations will be taken at 30 minute to 1 hour intervals to watch the weather parameter trend. Cease firing and place burn in Hold and Control, or adjust firing techniques and patterns based on the weather parameters and desired fire effects Available holding forces will perform initial attack on spot fires or slop-overs. Initial size-up will determine the suppression actions
Recommended Resources:	Available holders will perform initial attack on spot fires or slop-overs. Initial size-up will determine the appropriate suppression action. Additional holding resources can be gleaned from firing crew.
Time Frame:	Variable based on weather parameters
Describe The Consequences Of Not Taking The Recommended Action(S) (Optional):	Possibility of losing control.
Responsibility:	Burn boss
Date Each Action Is Initiated (Optional):	

MANAGEMENT ACTION POINT - DOCUMENTATION ELEMENT	**MANAGEMENT ACTION POINT NARRATIVE**
Designator And Description:	***Smoke impacting local roads or sensitive areas***
Condition:	Smoke impacting local roads or sensitive areas
Management Intent:	Keep roads and sensitive areas as clear of smoke as possible based on the forecasted weather
Recommended Action(S) To Consider:	Additional mop-up Patrol roads and sensitive areas often Erect smoke hazard signs If necessary call Placer County Air Pollution Control District for assistance.
Recommended Resources:	Available resources can check the roads and sensitive areas. If needed, call Placer County Sheriff's Office. Patrol to check and monitor the roads.
Time Frame:	Variable based on changing weather parameters
Describe The Consequences Of Not Taking The Recommended Action(S) (Optional):	Worst case is smoke lays down along busy roads and sensitive areas causing low visibility on roads and problems with breathing for sensitive persons
Responsibility:	Burn boss
Date Each Action Is Initiated (Optional):	

(if you need to include more maps, copy and paste the above template)

ELEMENT 17: CONTINGENCY PLAN	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Management Action Points(MAP) Or Limits:

MANAGEMENT ACTION POINT - DOCUMENTATION ELEMENT	**MANAGEMENT ACTION POINT NARRATIVE**
Designator And Description:	***Spot fires exceed holding resources***
Condition:	Multiple spot fires exhausting capabilities of holding resources
Management Intent:	Consider use of full suppression strategy
Recommended Action(S) To Consider:	Contain fires and reassess conditions
Recommended Resources:	Assign available on-site resources to holding
Time Frame:	Immediate when identified
Describe The Consequences Of Not Taking The Recommended Action(S) (Optional):	Potential for an escape fire to occur
Responsibility:	Burn Boss/ Holding Boss
Date Each Action Is Initiated (Optional):	

MANAGEMENT ACTION POINT - DOCUMENTATION ELEMENT	**MANAGEMENT ACTION POINT NARRATIVE**
Designator And Description:	***Forecasted weather event after ignition is completed (i.e. Wind event; poor overnight RH recovery)***
Condition:	Red flag warning/watch; anticipated wind event or significant drying trend leading to above normal fire potential
Management Intent:	Review potential risk for spot/slop-overs
Recommended Action(S) To Consider:	Request spot weather forecast. Increase patrols and mop-up to secure lines.
Recommended Resources:	Engine module/Crewmembers
Time Frame:	Prior to forecasted weather event
Describe The Consequences Of Not Taking The Recommended Action(S) (Optional):	Potential for an escape fire to occur
Responsibility:	Burn Boss in consultation with CA TNC Fire Manager
Date Each Action Is Initiated (Optional):	

ELEMENT 18: WILDFIRE DECLARATION	PROJECT NAME:	Phase 3
	BURN UNIT NAME:	All Units

Actions for Prescribed Fire Projects That Exceed Burn Plan Parameters

- The CA TNC Fire Manager should be notified if off site Contingency Resources are activated if the contingency actions are successful at bringing the project back within the scope of the Prescribed Fire Plan the project may continue.
- The prescribed fire may be converted to a wildfire by the Burn Boss once it has been determined that the contingency actions have failed, or are likely to fail, and cannot be mitigated by the end of the next burning period.
- A prescribed fire may be declared a wildfire when the fire has spread outside the project boundary, or is likely to do so, and cannot be contained by the end of the next burning period. A prescribed fire can be converted to a wildfire for reasons other than an escaping the unit boundaries.
- After a wildfire declaration, an escaped prescribed fire cannot be returned to prescribe fire status.
- The Burn Boss should immediately ensure the notifications listed in the burn plan are made.
- All escaped prescribed fires will be suppressed.
- Preparation for transition of command should commence once the decision to declare the prescribed fire a wildfire is made. The Burn Boss can assume the Incident Commander role if qualified.
- All prescribed burn operations personnel should be informed, in person or on the assigned project frequency that the fire has escaped intended parameters and the new command structure is announced.
- Only personnel that have passed the WCT at the Arduous Level will be used in active suppression of any prescribed burn that is declared an escape.
- The CA TNC Fire Manager will notify state personnel and the TNC Director of Fire Management.

ELEMENT 19: **SMOKE MANAGEMENT AND AIR QUALITY** ***See Appendix F – Smoke Management Plan***	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Compliance And Permits To Be Obtained:

Describe how the project will comply with local community, county, state, tribal, and federal air quality regulations.

All prescribed burning will comply with local, state, and federal air quality restrictions and regulations.

Compliance:

- All burn entries will require authorization from the Northern Sierra Air Quality Management District Smoke Management Program (NSAQMD).

Permits to be Obtained:

- Prior to burning, the Daily Authorization Request and Information Reporting Form from Northern Sierra Air Quality Management District (NSAQMD (contact info in Element 9-D)) will be completed by a project manager and/or Burn Boss. The project manager and/or Burn Boss will also obtain Burn Permits and Air Pollution Permits from NSAQMD as well.

Smoke-Sensitive Features And Receptors:

Receptor	Distance Mi.	Direction
I-Lake HQ	0.1	E
Private Residences	1.25	N
Highway 89	3	E
Truckee	9	S
Interstate Hwy 80	9	S
Sierraville	9	N
Granite Chief Wilderness	17	S

Potential Impacted Areas:

Identify Class 1 air sheds, restricted areas, non-attainment areas (designated areas), and population centers that may be impacted.

- Recreation sites at the Independence Lake Headquarters
- Private residences north of the project
- Campgrounds on USFS lands
- Non-attainment areas of Nevada County
- Cities of Sierraville, Truckee and within the Lake Tahoe Basin
- Granite Chief Wilderness

The Independence Creek drainage may channel smoke during nightly inversions and impact sensitive receptors. Historically, public recreation is not high during seasons appropriate for prescribed fires.

Mitigation Strategies And Techniques To Reduce Impacts:

***Acceptable* Wind Directions**	**Any**
***Preferred* Wind Direction (az °)**	**Easterly**

Coordinate multiple burn day activities with the Northern Sierra Air Quality Management District.

- Visually monitor smoke transport direction and lift; utilize personnel to scout upwind/drainage to determine local smoke effects.
- Monitor weather conditions and modify firing patterns or slow ignitions if conditions become unfavorable.
- Optional: Document Smoke Management by requesting a HYSPLIT Model Run from the National Weather Service with the Spot Weather Request Comments Box, and/or use the USFS BlueSky Framework to determine Emissions and Dispersion and make determinations of acceptable wind directions and atmospheric parameters

See Smoke Management Plan (Appendix F – Separate File).

ELEMENT 20: MONITORING	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Monitoring:

1) Fuels Monitoring:

- Deploy 10-hour fuels sticks in burn units a minimum of 1 week prior ignitions and if possible checked daily.
- Obtain 1 and 10 hour fuel moistures from onsite locations and local RAWS data prior to implementation.

2) **Weather Monitoring (Forecast and Observed) Required and Procedures:**

The daily spot fire weather forecast are required prior to ignition and will be monitored during firing, holding, and patrol operations.

- Utilize a belt weather kit or remote Automated Weather Station to collect weather data
- Document weather parameters:
  - Temperature (Dry/Wet)
  - Relative Humidity
  - Wind Speed
  - Wind Direction

Utilize the IRPG (or other methods) to obtain fine dead fuel moisture and probability of ignition value for use in determining staffing requirements for holding and contingency resources.

3) Fire Behavior Monitoring Required And Procedures:

- The Burn Boss or their designee will observe and document Rate of Spread and Flame Length to compare with modeled predictions to determine that holding resources onsite are adequate for observed fire behavior

Any unexpected fire behavior will be reported to the burn boss. Ignition will be altered or discontinued to ensure that objectives are being met and the fire contained.

4) **Fire Effects Monitoring Required To Ensure That Prescribed Fire Plan Objectives Are Met:**

- The Burn Boss or their designee will review prescribed fire objectives throughout burn periods and document the related fire effects
- Monitoring objectives will occur within their defined time spans by the burn boss or project manager to determine if they were met. These evaluations will be documented in the project folder and used to guide development of future prescriptions.
- GPS tracklog the perimeters of actual burn areas

5) Smoke Dispersal Monitoring Required And Procedures:

- Visually observe and document smoke lift and dispersion until emissions are negligible.
- Document when the inversion sets in during the evening hours and disperses in the morning.
- The smoke column may be observed and/or photographed from a strategic points for documentation.

ELEMENT 21: **POST-BURN ACTIVITIES**	**PROJECT NAME:**	**Phase 3**
	BURN UNIT NAME:	**All Units**

Post-Burn Report:

The Burn Boss will write Post-Burn Summary Reports for each operation, which will include:

- Burn organization
- Summary of operations from IQS 214
- Weather Observations
- Ignition methods
- Holding issues
- Fire behavior summary
- Fire effects related to each burn objective
- Smoke observations and concerns
- Lessons learned for the future

Other: *Describe other post-burn activities that must be completed. This may include: safety mitigation measures, and rehabilitation needs including those as a result of pre-burn activities undertaken.*

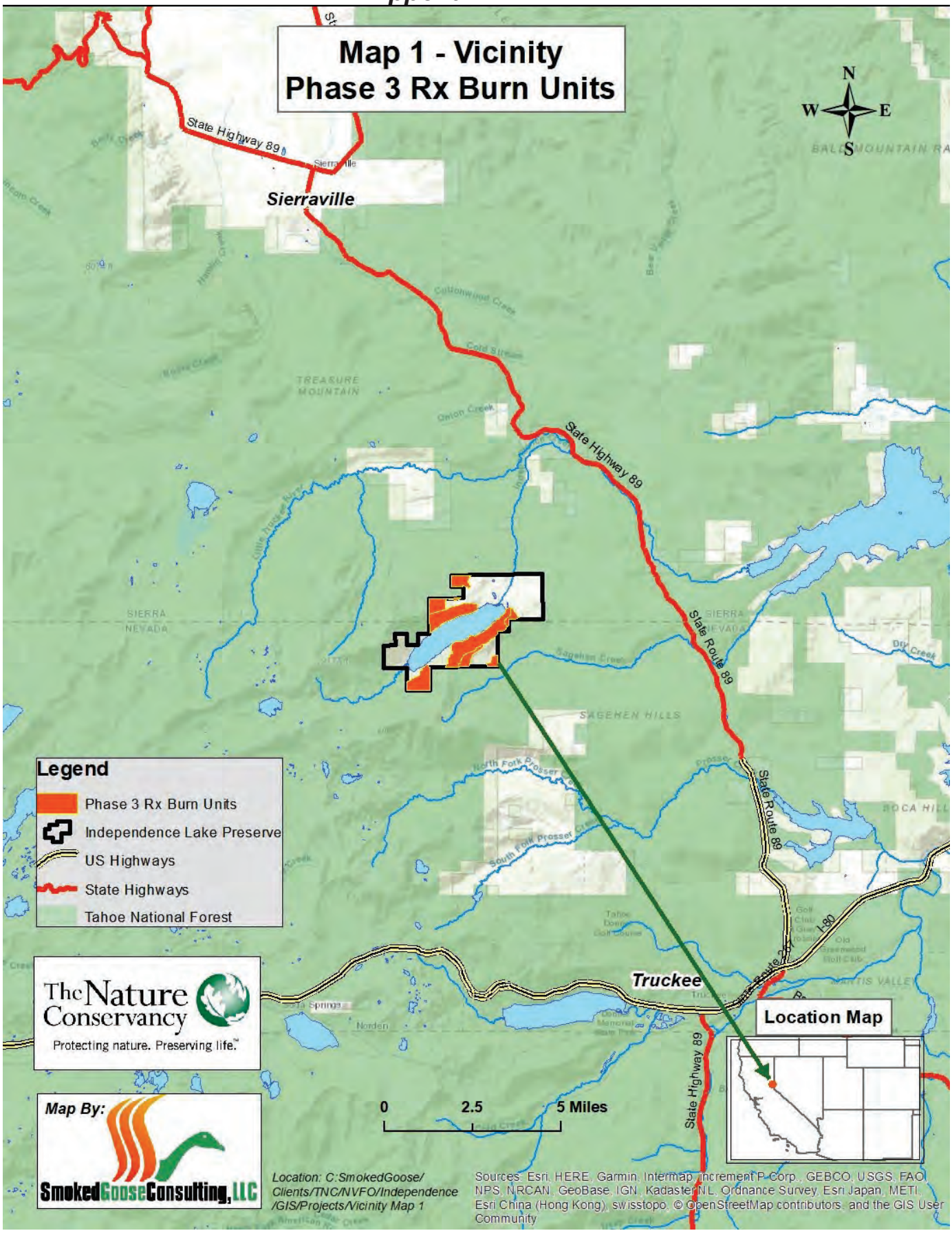
- Continue to patrol the project area until the burn is declared out.
- Rehab control lines to minimize erosion and to discourage off road/trail travel
- Identify hazard trees that are a threat to public safety along roadways and trails within and adjacent to the burn area.
- The Project Director will reference the burn objectives and complete monitoring as scheduled and supplement the Post-Burn Summary Report with the results.

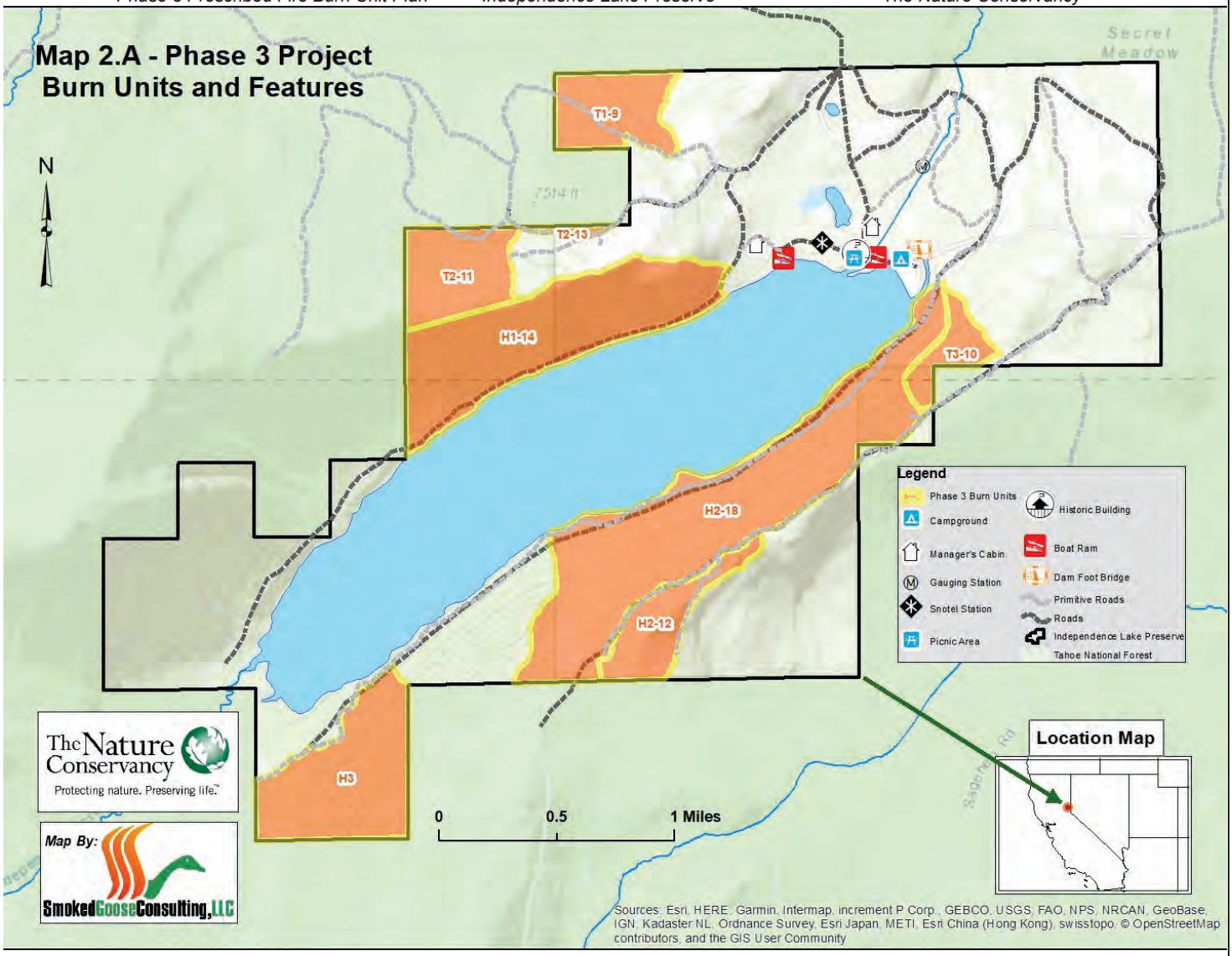
APPENDICES

A. Maps:
- Map 1 -Project Vicinity,
- Map 2.A -Project Burn Units
- Maps: 2.B thru 2.I -Project Operations
- Map 3 -Smoke Screening
- Map 4 -General Vegetation Types

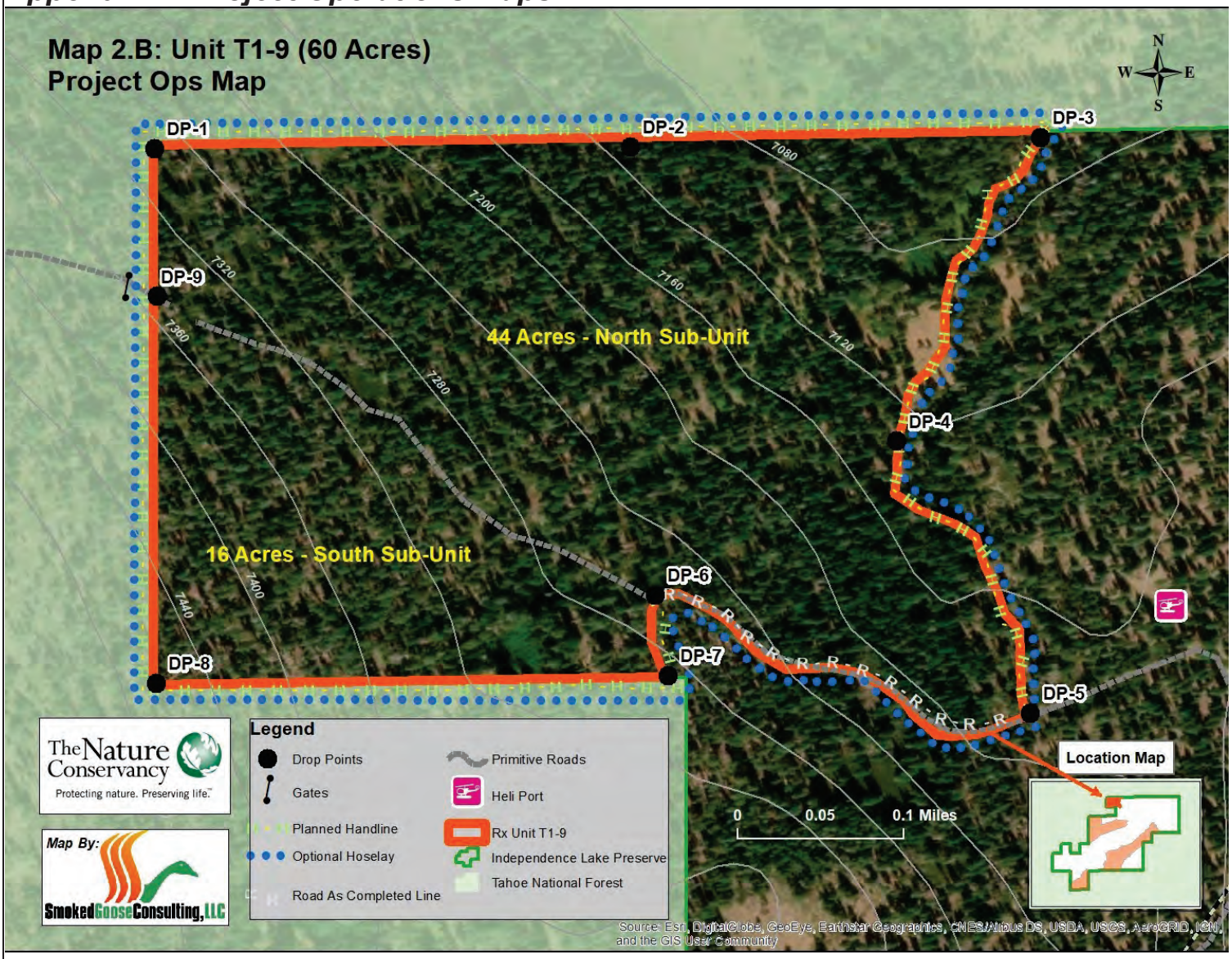
B. Technical Reviewer Checklist -Separate File
C. Complexity Analysis -Separate File
D. Agency-specific Job Hazard Analysis -Separate File
E. Fire behavior modeling documentation or empirical documentation -Separate File
F. Smoke Management Plan and smoke modeling documentation -Separate File
G. Forms - -Separate File
H. Project Aviation Safety Plan -Separate File

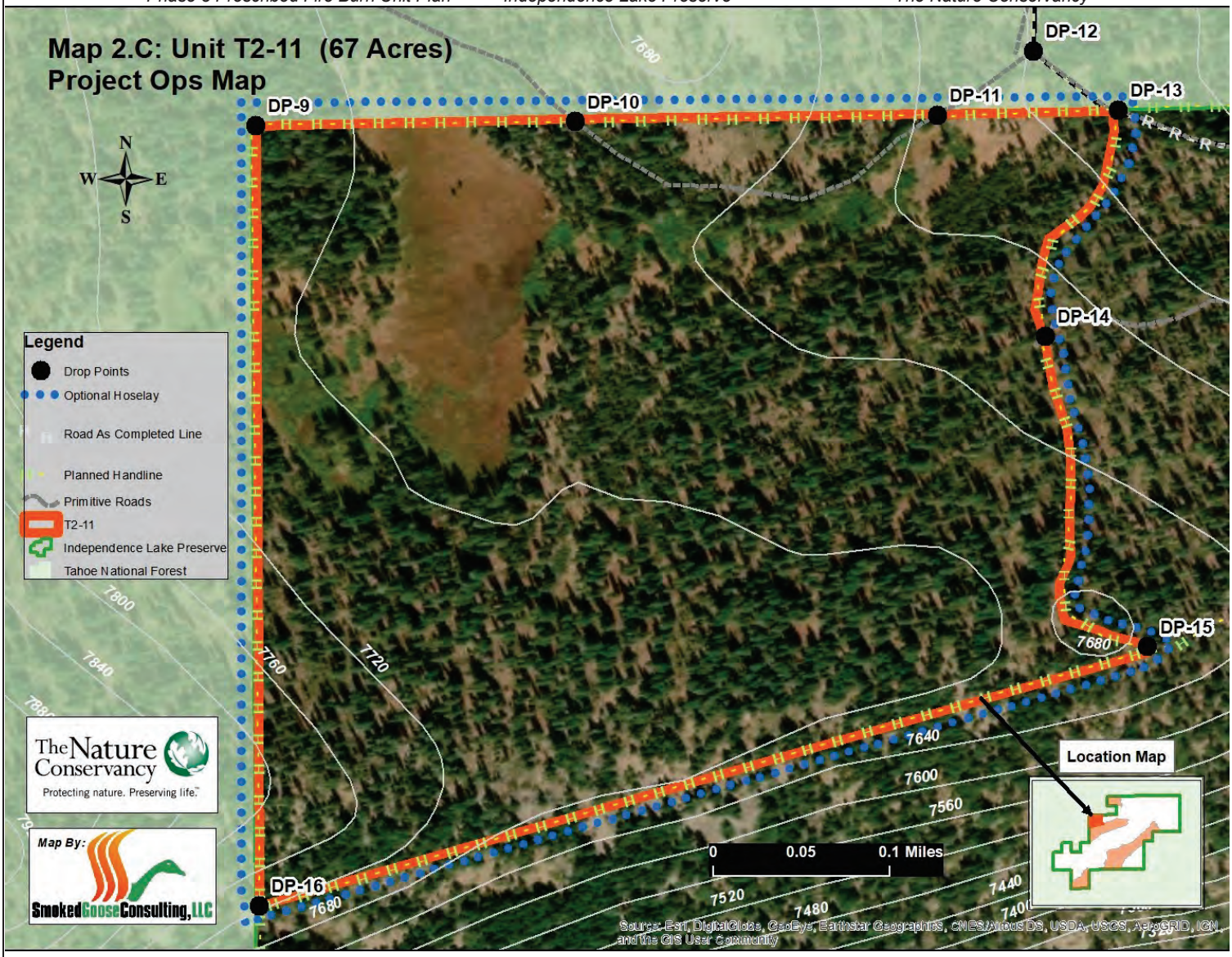
Appendix A:

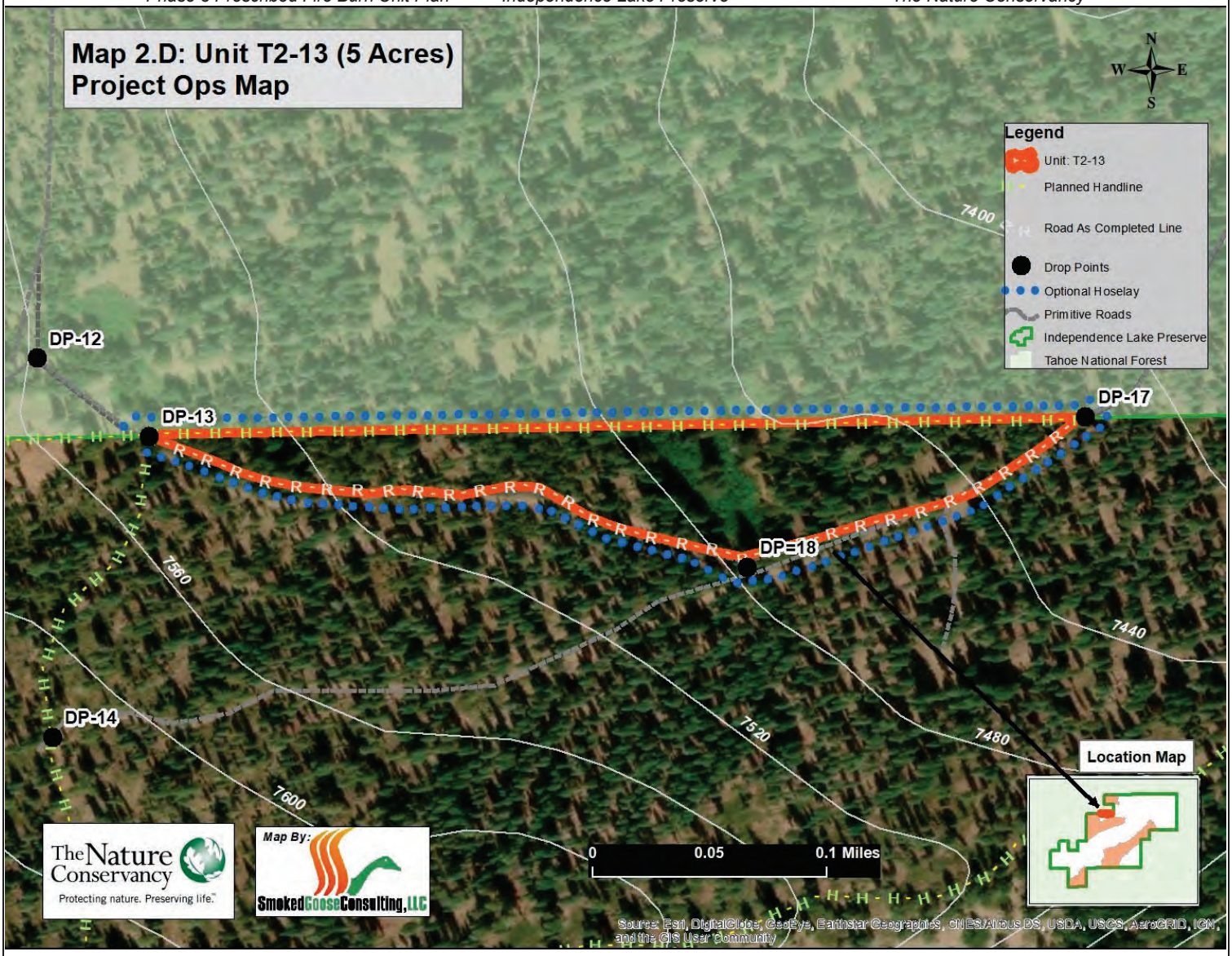

Map 1 - Vicinity
Phase 3 Rx Burn Units
N
W
E
S
State Highway 89
Sierraville
Sierraville
Cottonwood Creek
Cold Stream
TREASURE MOUNTAIN
Onion Creek
State Highway 89
SIERRA NEVADA
Sagehen Creek
SAGEHEN HILLS
State Route 89
North Fork Prosser Creek
South Fork Prosser Creek
State Route 89
I-80
Truckee
State Highway 89
Legend
Phase 3 Rx Burn Units
Independence Lake Preserve
US Highways
State Highways
Tahoe National Forest
The Nature Conservancy
Protecting nature. Preserving life.™
Location Map
Map By:
SmokedGooseConsulting, LLC
0
2.5
5 Miles
Location: C:SmokedGoose/
Clients/TNC/NVFO/Independence
/GIS/Projects/Vicinity Map 1
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

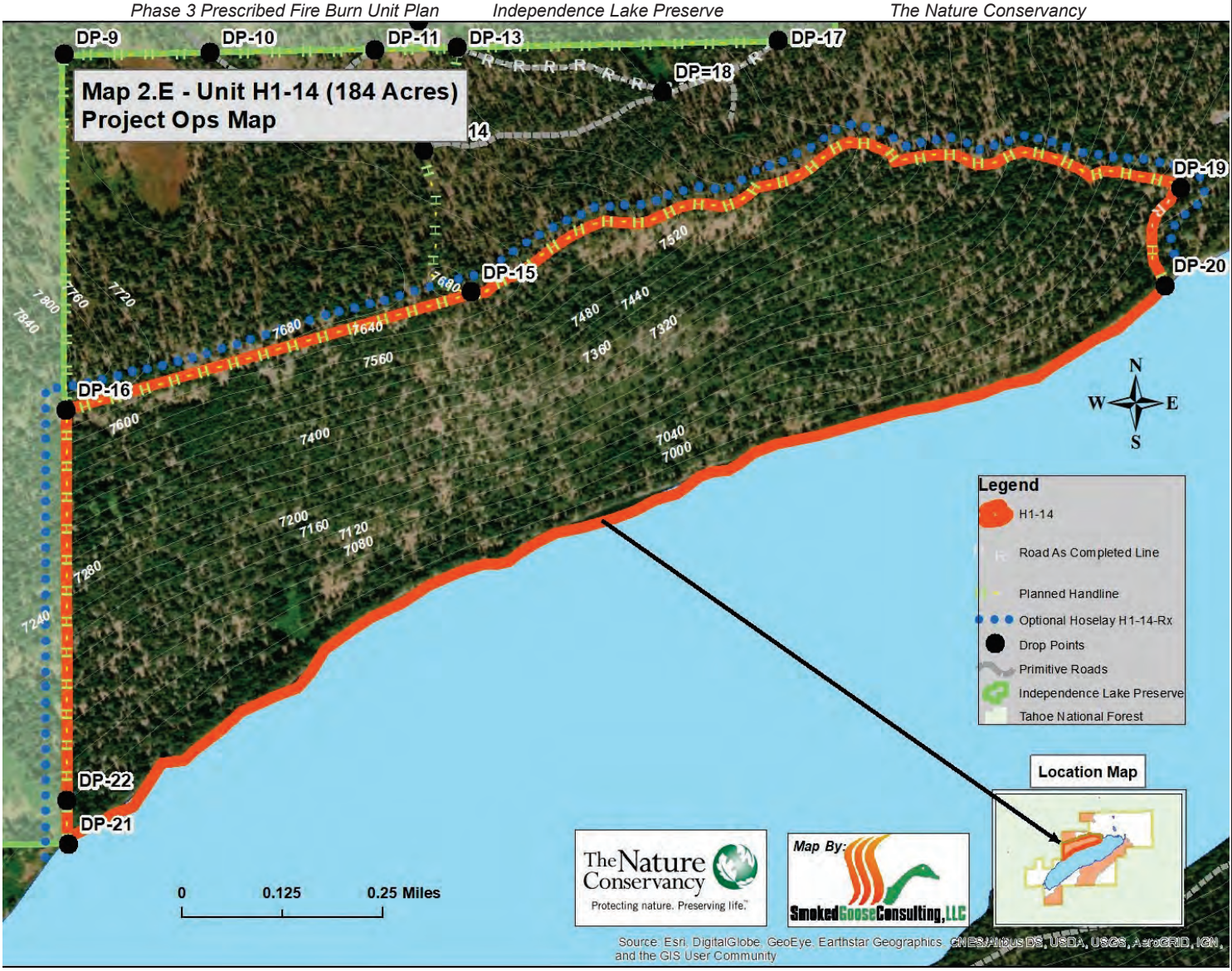

Map 2.A - Phase 3 Project Burn Units and Features
N
T1-9
T2-13
T2-11
H1-14
T3-10
H2-18
H2-12
H3
Legend
Phase 3 Burn Units
Campground
Manager's Cabin
Gauging Station
Snotel Station
Picnic Area
Historic Building
Boat Ram
Dam Foot Bridge
Primitive Roads
Roads
Independence Lake Preserve
Tahoe National Forest
Location Map
0
0.5
1 Miles
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting,LLC
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

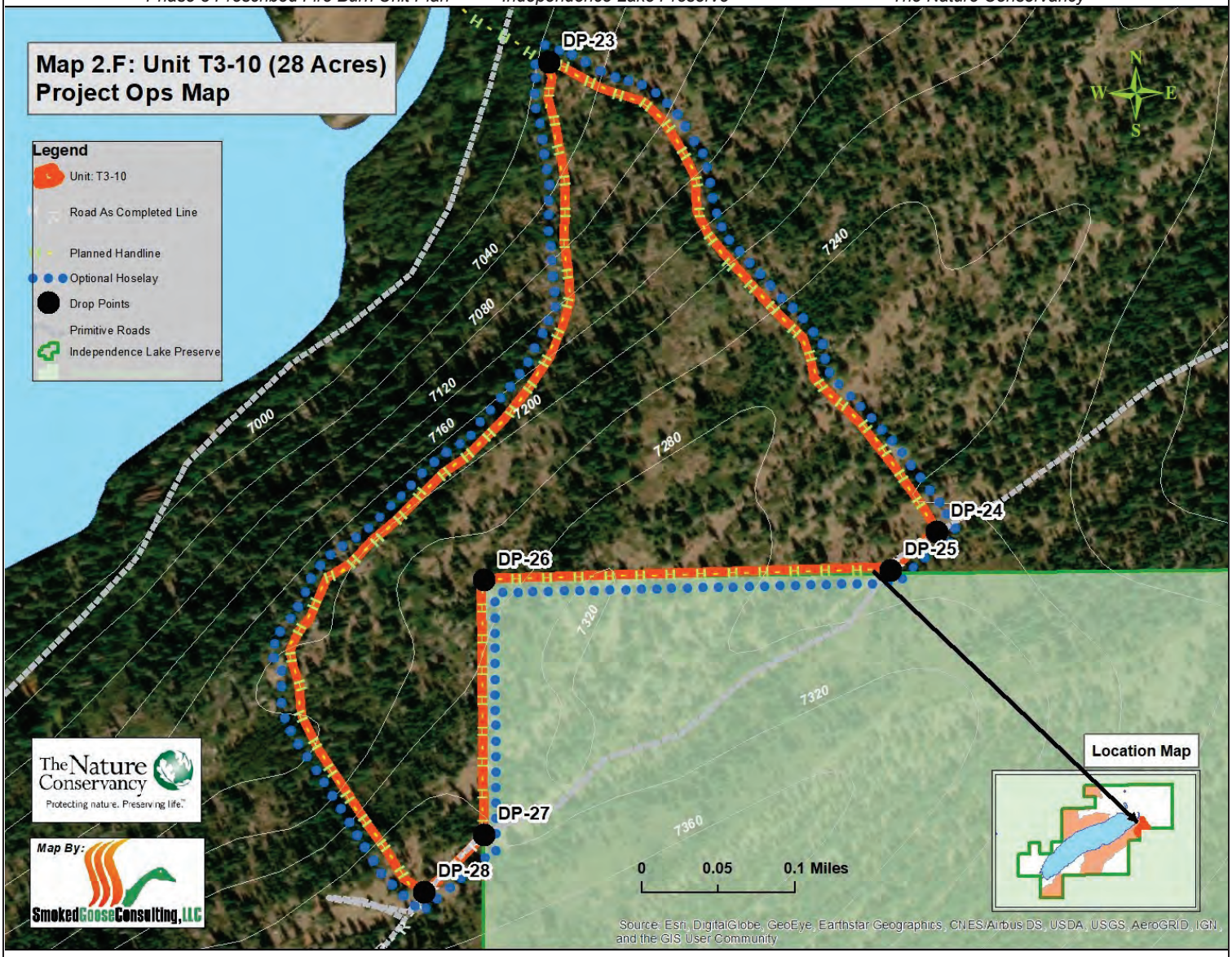
Appendix A: Project Operations Maps

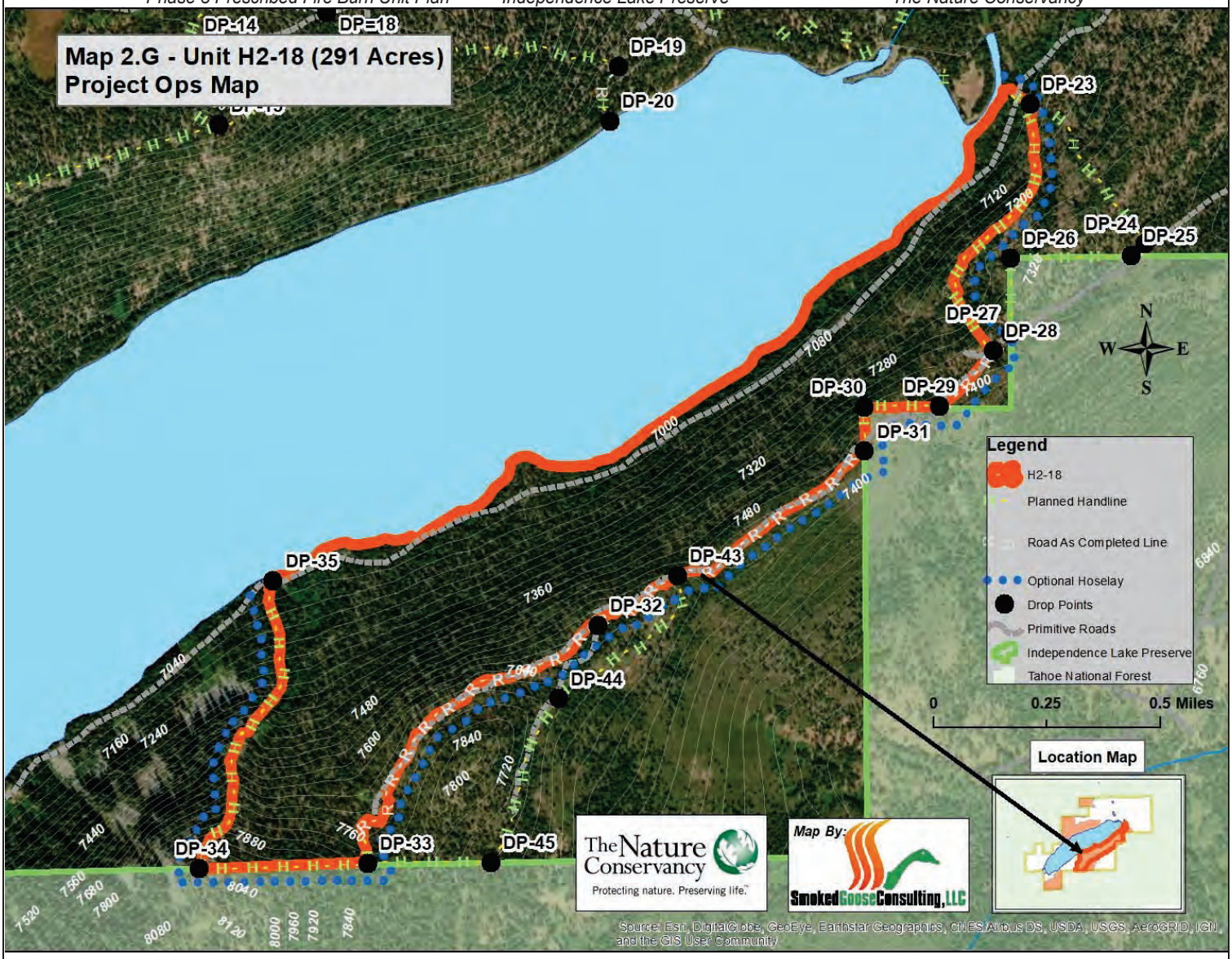


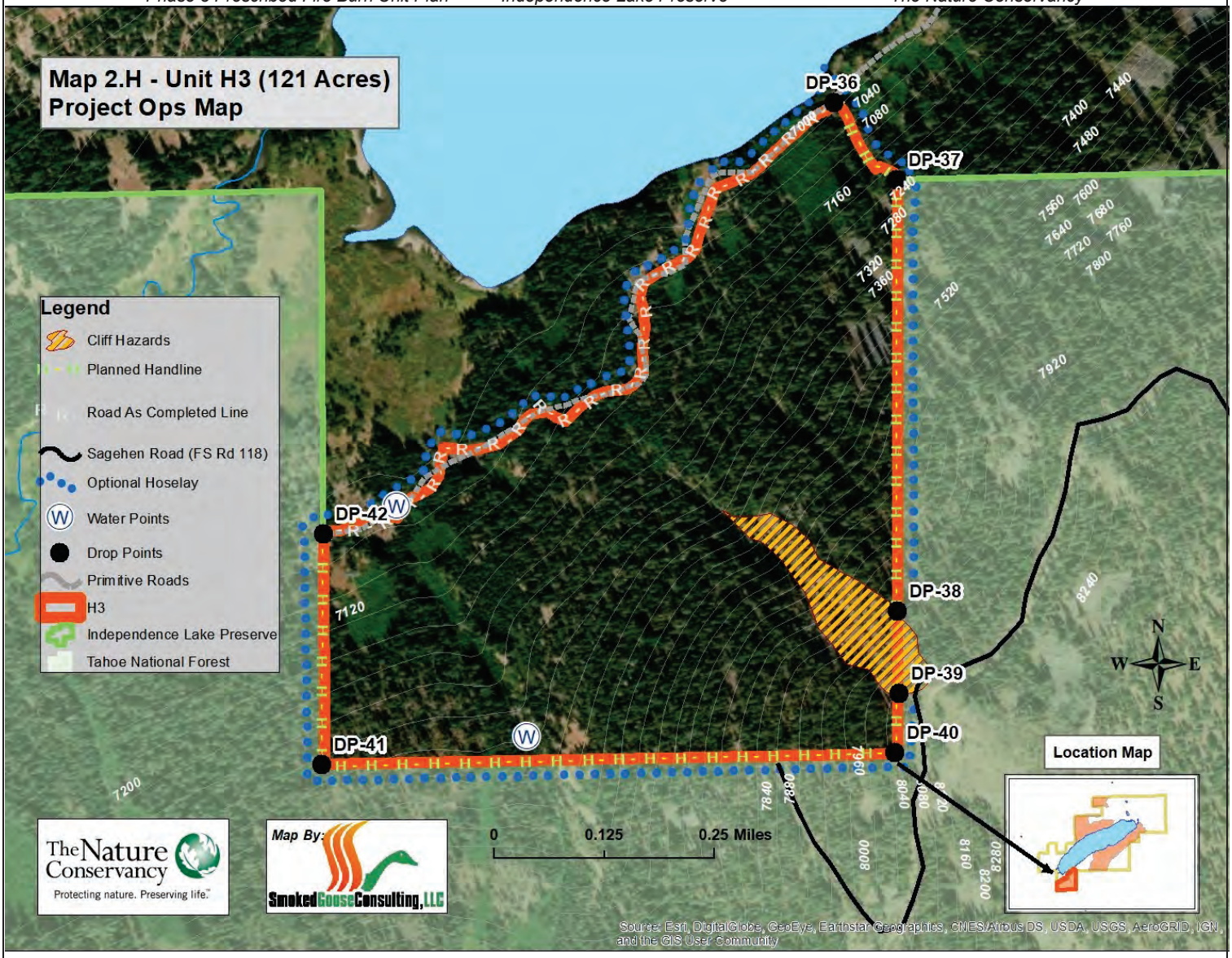

Map 2.C: Unit T2-11 (67 Acres)
Project Ops Map
N
W
E
S
DP-9
DP-10
DP-11
DP-12
DP-13
DP-14
DP-15
DP-16
Legend
Drop Points
Optional Hoselay
Road As Completed Line
Planned Handline
Primitive Roads
T2-11
Independence Lake Preserve
Tahoe National Forest
7680
7800
7840
7760
7720
7640
7600
7560
7520
7480
7440
0
0.05
0.1 Miles
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting, LLC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

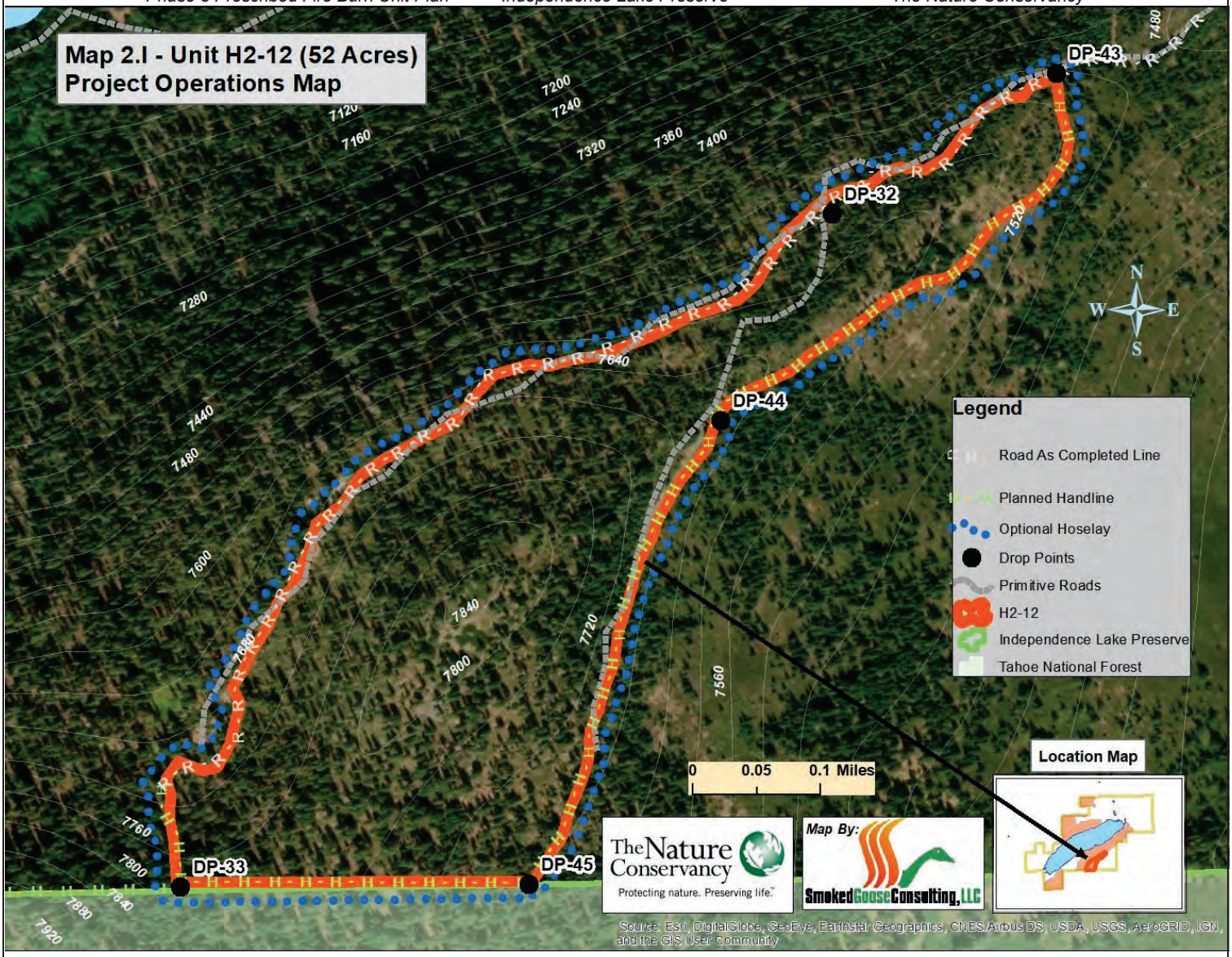

Map 2.D: Unit T2-13 (5 Acres)
Project Ops Map
N
W
E
S
Legend
Unit: T2-13
Planned Handline
Road As Completed Line
Drop Points
Optional Hoselay
Primitive Roads
Independence Lake Preserve
Tahoe National Forest
DP-12
DP-13
DP-14
DP-17
DP-18
7400
7440
7480
7520
7560
7600
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting, LLC
0
0.05
0.1 Miles
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

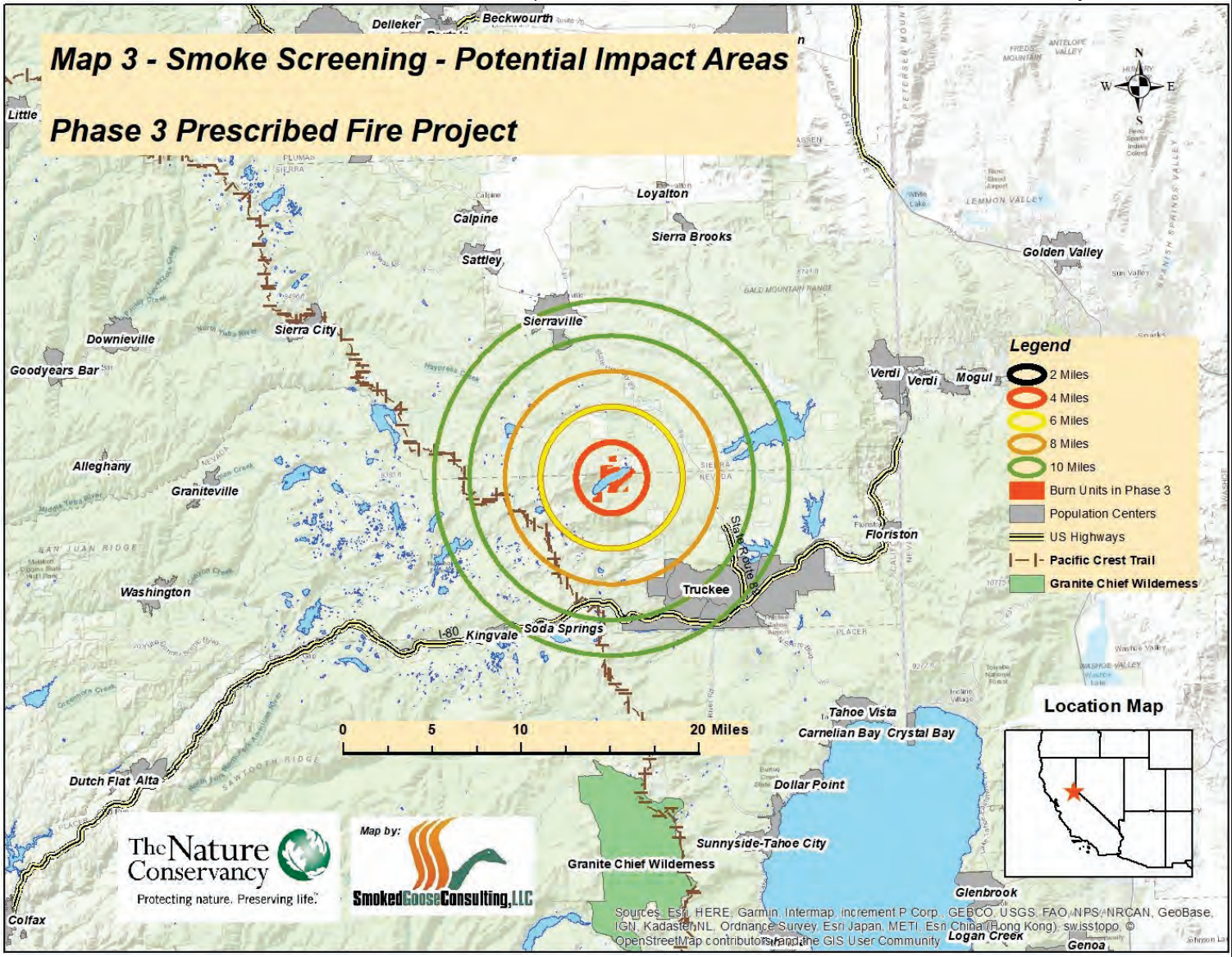

Map 2.E - Unit H1-14 (184 Acres)
Project Ops Map
DP-9
DP-10
DP-11
DP-13
DP-17
DP-18
DP-19
DP-20
DP-15
DP-16
DP-22
DP-21
14
7520
7760
7720
7800
7840
7680
7640
7480
7440
7320
7360
7560
7600
7400
7040
7000
7200
7160
7120
7080
7280
7240
N
W
E
S
Legend
H1-14
Road As Completed Line
Planned Handline
Optional Hoselay H1-14-Rx
Drop Points
Primitive Roads
Independence Lake Preserve
Tahoe National Forest
Location Map
0
0.125
0.25 Miles
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting,LLC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

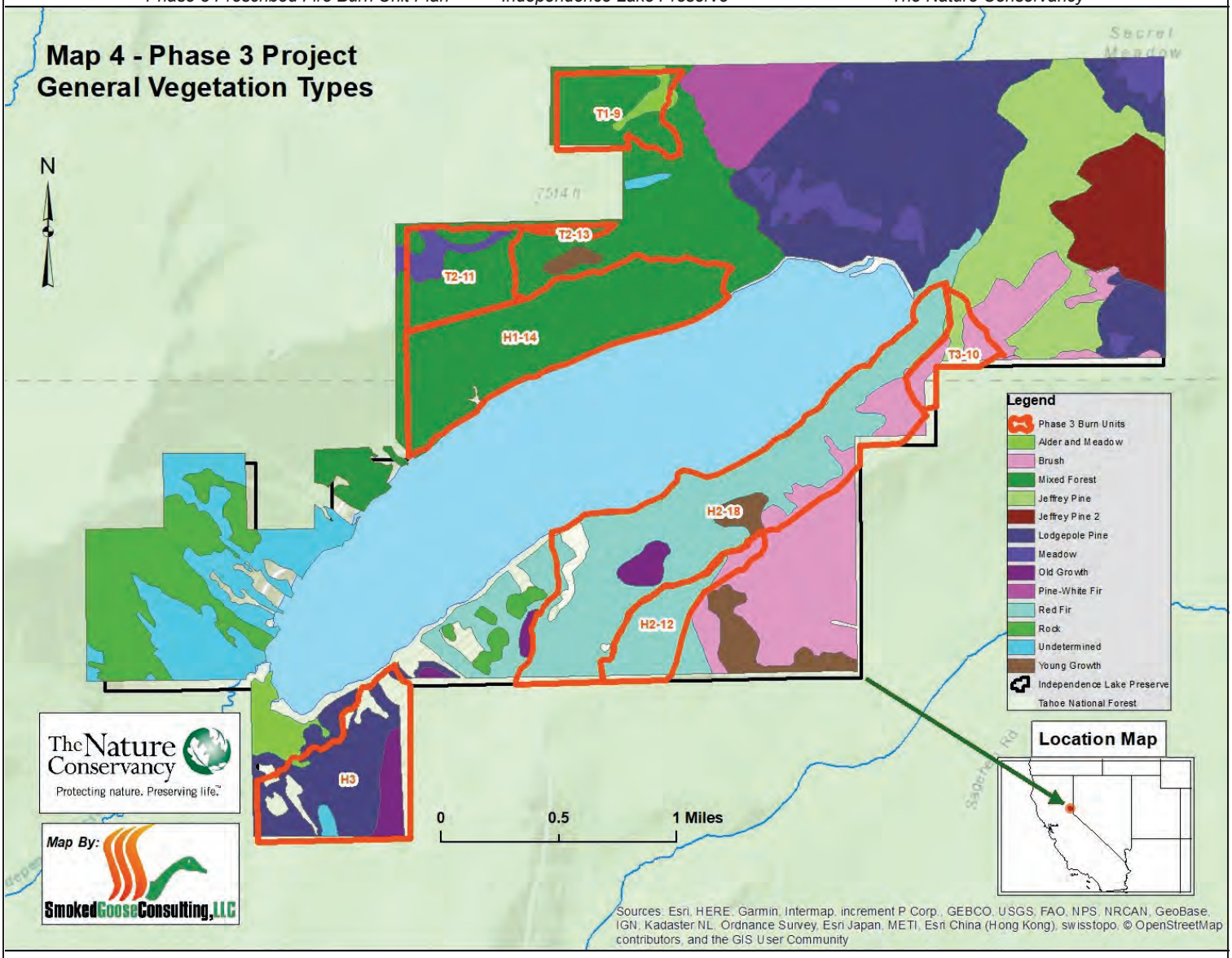

Map 2.F: Unit T3-10 (28 Acres)
Project Ops Map
Legend
Unit: T3-10
Road As Completed Line
Planned Handline
Optional Hoselay
Drop Points
Primitive Roads
Independence Lake Preserve
DP-23
DP-24
DP-25
DP-26
DP-27
DP-28
7000
7040
7080
7120
7160
7200
7240
7280
7320
7360
N
W
E
S
0
0.05
0.1 Miles
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting,LLC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Map 2.G - Unit H2-18 (291 Acres)
Project Ops Map
DP-14
DP-18
DP-19
DP-20
DP-23
DP-24
DP-25
DP-26
DP-27
DP-28
DP-29
DP-30
DP-31
DP-32
DP-33
DP-34
DP-35
DP-43
DP-44
DP-45
N
W
E
S
Legend
H2-18
Planned Handline
Road As Completed Line
Optional Hoselay
Drop Points
Primitive Roads
Independence Lake Preserve
Tahoe National Forest
0
0.25
0.5 Miles
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting, LLC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Map 2.H - Unit H3 (121 Acres)
Project Ops Map
Legend
Cliff Hazards
Planned Handline
Road As Completed Line
Sagehen Road (FS Rd 118)
Optional Hoselay
Water Points
Drop Points
Primitive Roads
H3
Independence Lake Preserve
Tahoe National Forest
DP-36
DP-37
DP-38
DP-39
DP-40
DP-41
DP-42
Location Map
N
S
E
W
0
0.125
0.25 Miles
Map By:
SmokedGooseConsulting, LLC
The Nature Conservancy
Protecting nature. Preserving life.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Map 2.I - Unit H2-12 (52 Acres)
Project Operations Map
DP-43
DP-32
DP-44
DP-45
DP-33
N
W
E
S
Legend
Road As Completed Line
Planned Handline
Optional Hoselay
Drop Points
Primitive Roads
H2-12
Independence Lake Preserve
Tahoe National Forest
0 0.05 0.1 Miles
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting, LLC
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community


Map 3 - Smoke Screening - Potential Impact Areas
Phase 3 Prescribed Fire Project
Legend
2 Miles
4 Miles
6 Miles
8 Miles
10 Miles
Burn Units in Phase 3
Population Centers
US Highways
Pacific Crest Trail
Granite Chief Wilderness
Location Map
0 5 10 20 Miles
Map by:
SmokedGooseConsulting,LLC
The Nature Conservancy
Protecting nature. Preserving life.
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community
Delleker
Beckwourth
Little
Loyalton
Calpine
Sierra Brooks
Sattley
Golden Valley
Sierraville
Sierra City
Downieville
Goodyears Bar
Verdi
Mogul
Alleghany
Graniteville
Floriston
Truckee
Washington
I-80
Kingvale
Soda Springs
Tahoe Vista
Carnelian Bay
Crystal Bay
Dollar Point
Dutch Flat
Alta
Sunnyside-Tahoe City
Granite Chief Wilderness
Glenbrook
Colfax
Logan Creek
Genoa


Map 4 - Phase 3 Project
General Vegetation Types
N
T1-9
T2-13
T2-11
H1-14
T3-10
H2-18
H2-12
H3
Legend
Phase 3 Burn Units
Alder and Meadow
Brush
Mixed Forest
Jeffrey Pine
Jeffrey Pine 2
Lodgepole Pine
Meadow
Old Growth
Pine-White Fir
Red Fir
Rock
Undetermined
Young Growth
Independence Lake Preserve
Tahoe National Forest
Location Map
The Nature Conservancy
Protecting nature. Preserving life.
Map By:
SmokedGooseConsulting,LLC
0
0.5
1 Miles
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

SECTION VI - CONFIDENTIAL

Contents **Page**