USDA-FOREST SERVICE FS-2500-8 (7/00)

Date of Report: July 12, 2002

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[X] 1. Funding request for estimated WFSU-SULT funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[X] 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)

[ ] 2. Interim Report
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Gondola

B. Fire Number: CA-TMU-09828

C. State: California and Nevada

D. Counties: El Dorado (CA); Douglas (NV)

E. Region: 05

F. Forest: Lake Tahoe Basin Management Unit

G. District: N/A

H. Date Fire Started: July 3, 2002

I. Date Fire Contained: July 6, 2002

J. Suppression Cost: $2,900,000

K. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 5.4 miles perimeter; 2.5 miles of foot trails
2. Fireline seeded (miles): 0 miles
3. Other (identify): 1 mile of road (waterbared and side cast replaced);
0.25 miles of previously decommissioned roads (tilled and mulched with native material);
1 acre of staging area (some seeding, all mulched with native materials)

L. Watershed Number: 16050101

M. Total Acres Burned: 673
NFS Acres(401) Other Federal (0) State - NV(249) State - CA(17) Private (6)

N. Vegetation Types: Mixed conifer - white fir, red fir, Jeffrey pine (up to 7,200 feet); red fir/western white pine (above 7,200 feet); mountain shrubs – manzanita, ceanothus, mtn. mahogany (mixed throughout).

O. Dominant Soils: Cagwin and Toem matrices with rock outcrop and rock land

P. Geologic Types: Granodiorite/quartz monzonite, non-glaciated

Q. Miles of Stream Channels by Order or Class:
Ephemeral: 5.98 miles Perennial: 1.4 miles

R. Transportation System (USFS only): Trails: 0 miles Roads: 0 miles

PART III - WATERSHED CONDITION

A. Burn Severity (acres):

	Burn Intensity			
Land Ownership	**High (# Acres)**	**Moderate (# Acres)**	**Low (# Acres)**	**Burned Acres**
USFS	**24**	**35**	**342**	**401**
California	2	13	2	17
Nevada	42	50	157	249
Private	0	0	6	6
TOTAL	**68**	**98**	**507**	**673**

B. Water-Repellent Soil (acres): 80 acres (475 acres of naturally high water repellancy)

C. Soil Erosion Hazard Rating (acres):
13 (low) 13 (moderate) 498 (high) (*149 acres of rock cover)

D. Erosion Potential: 0.068 tons/acre (20 year, one hour event)
7.7 tons/acre (one year return)

E. Sediment Potential: 34 cubic yards / square mile (20 year, one hour event)
3857 cubic yards / square mile (one year return)

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 5-7

B. Design Chance of Success, (percent): 80

C. Equivalent Design Recurrence Interval, (years): 20

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1.0

F. Design Flow, (cubic feet / second/ square mile): 30

G. Estimated Reduction in Infiltration, (percent): 12

H. Adjusted Design Flow, (cfs per square mile): 34

PART V - SUMMARY OF ANALYSIS

A. Describe Watershed Emergency:

The fire affected fedral, state, and private lands; thus, in cooperation with these landowners, the BAER team assessed all lands to make treatment recommendations for all sites. Based on field reviews and analysis, the BAER Team identified the following emergencies across all ownerships as a result of the Gondola Fire in accordance with FHS 2509.13:

1. **Threats to Water Quality:** All watersheds in the burn area have a potential for short term increases in sedimentation and associated effects on water quality. Two 7th code HUCs, Golf Course Creek and Edgewood Creek, drain the fire area and discharge into Lake Tahoe, an Outstanding Natural Resource Water (40 CFR 131.12) that is water quality limited due to sediment and nutrients as identified by EPA per Clean Water Act, section 303 (d). The beneficial uses for Lake Tahoe include irrigation; watering of livestock; non-contact recreation; contact recreation; industrial supply; propagation of wildlife; propagation of aquatic life, including cold water fisheries; municipal or domestic supply; water of extraordinary ecological and aesthetic value.

   Though the fire will accelerate natural and human-caused erosion processes, the BAER team found that needle cast in low and moderate intensity burn areas (75% of burn) will provide adequate surface cover in the short term and hillslope countour felling will stabilize the higher erosion risk areas. Natual plant regeneration is expected over most of the fire, thus seeding is not warranted.

2. **Threats to Human Life:** High occurrence of dispersed and developed recreational use exists within the burn area. Summer uses primarily include hiking, mountain biking, and site seeing. Winter uses include skiing within Heavenly Ski Resort, backcountry skiing/snowboarding, and site seeing. Hazards to recreations caused by the burn may include high stumps, falling snags and woody debris. One spring box within state of California land was plugged, affecting a few summer residences' water supply.

   Due to the extensive use of the area by recreationists, the Forest is initiating a temporary closure order to prevent adverse risks to human life. The BAER Team found that hazard tree removal will be a necessary treatment prior to returning recreational access in the area. California state officials are in the process of developing a treatment plan to address residental water needs until a permanent solution can be implemented.

3. **Threats to Property:** The fire's eastern perimeter impacted the headwaters of Edgewood Creek, immediately upstream of Heavenly's Boulder base facilities and 2 chairlifts. Heavenly has begun identifying hazard trees along the chairlift lines and will soon begin falling them. The greatest potential risk to the base facilities is from debris flow torrents in Edgewood Creek caused by summer thundershowers. Historically, such storms have resulted in sediment deposition in the area of up to several inches. The culvert which passes flow from the ski run underneath the parking lot may be a barrier for such extreme flow events. Temporary measures to trap large volumes of debris may most effective for this creek.

   The rest of the fire area is located at least 1000 feet or greater from any developed private and state property. Consequently, the risk to other property is minimal, if any, given the distance and well vegetated riparian corridors between the fire boundary and developed areas.

4. **Threats to Long-Term Soil Productivity:** Most of the burn area is mapped as Cagwin and Toem soils with varying amounts of rock outcrop, with approximately 30% rock cover. These soils are primarily coarse-textured, derived from granodiorite, with quarternary alluvium in some of the larger riparian areas. Slopes vary from 5% to 70%, with 75% of the burn area having slopes in the 30-50% range. Erosion prevention is especially important to maintain soil and site productivity.

Moderate to severe water repellency was observed on 80 acres within approximately 40%, 25%, and 5% of the high, moderate, and low intensity burn areas, respectively. Water repellent layers were present beginning at the mineral soil surface and extending 4-8 inches further. In monderate and high intensity burn areas, a layer of mostly gray ash 2-5 inches thick will be moved downslope with the first runoff. High winds may also mobilize ash.

Generally, the fire moved quickly throughout the area, resulting in a low to moderate burn intensity where much of the seed bank remains viable. Many of the shrub species in the area will stump sprout. These species include green leaf manzanita, chinquapin, snowbrush, and willow in the riparian areas. On the higher intensity areas, BAER Team members noticed that the seed banks are likely non-existant and often had high occurrence of surface rock; however, they also noticed that cones from nearby trees had fallen in these areas, providing a possible seed source.

5. **Threats of Noxious and Invasive Weeds:** No state listed noxious weeds were found in the surveyed area near the lower central portion of the fire. No invasive species were found in the riparian areas of the burn or the unburned area immediately adjacent area. No incomming equipment was cleaned prior to entry to the burn area and surrounding staging areas. There are concerns with weed infestation by various invasive species such as cheatgrass, bull thistle, Canadian thistle, knapweed, tall whitetop, and yellow toadflax. Therefore, the treatment and staging areas, rehabilitated fire lines, urban interface areas (under the gondola, ski runs, and Edgewood Creek areas) should be monitored for two to three years in late July to August for noxious and invasive weed infestations.

B. Emergency Treatment Objectives:

To address the emergencies identified above, the following objectives were identified:

- Reduce the potential for erosion and associated sedimentation and site specific areas tributary to Lake Tahoe.
- Mitigate potential hazards to recreationists.
- Develop a plan to monitor noxious and invasive weed infestations and emergency treatment effectiveness.
- If necessary, identify areas for treatment with the highest potential to prevent accelerated soil movement and sedimentation due to the effects of the burn.

C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:

Land **95** % Channel **95** %

D. Probability of Treatment Success:

	Years after Treatment		
	1	3	5
Land	80%	90%	95%
Channel	80%	90%	90%

E. Cost of No-Action (Including Loss):

Two parameters were used to determine the cost of the resources lost on National Forest System lands if no treatments were applied**:**

1) Loss of water quality valued at $100,000
2) Loss of soil productivity valued at $20,000

Total cost of No Action $120,000

F. Cost of Selected Alternative (Including Loss):

Implementation of the proposed treatments would have the following affects on the three selected paramenters:

Loss of water quality would be mitigated to $10,120
Loss of soil due to erosion would be mitigated to $8,000
Total value of resources lost after implementation of the proposed treatments is reduced to $18,120.
Total cost of imlementing proposed treatments is $38,500 assuming an 80% treatment success, the total value of successful treatments is 0.8 x ($18,120+$38,500) for a total of $45,296. The cost of the values lost due to 20% of the treatments not being successful is (0.2) x ($120,000+$38,500),or $31,700. The total cost of this alternative is the value of successful implementation ($38,500) plus the value of unsuccessful implemenation ($45,296). Therefore, **the total cost of this alternative is $83,796**.

G. Skills Represented on Burned-Area Survey Team (USFS unless otherwise designated):

[X] Hydrology – Kristine Leep
[X] Recreation – David Allessio
[X] Wildlife – Susan Spalding
[X] Archaeology – John Maher, Karen Blom
[X] Forestry – David Fournier, Christy Daugherty (CDF), Tim Rochelle (NDF)
[**X**] Soils – Denise Downie
[X] GIS – German Whitley
[X] Botany – Gail Durham
[X] Computer Support – Leana Randall

Disciplines not formally represented but consulted as needed:

Geology	Range	Fisheries
Fire Management	Engineering	Research
Contracting	Ecology	Landscape Architecture

Team Leader: Sherry Hazelhurst and Lori Allessio (Trainee)

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lallessio@fs.fed.us 530-573-2690 530-573-2693

H. Treatment Narrative:

See Attached Map for Treatment Locations. Heritage Resource surveys will be conducted on 180 acres of the burn where treatments are prescribed on National Forest System lands (Cost = $1800).

*NOTE: Treatment Areas #1 and #2 are within California and Nevada state lands. Both states are still in the restoration/rehabilitiation planning process. However, four treatments currently being explored include 40 acres of contour felling; 30 acres of seeding/fertilizing/mulching; 2000 alders planted on a riparian area; and 1 spring box mitigation (cost = ±$58,000). Heavenly Ski Resort is responsible for hazard tree and stump removal within their permit boundary, so we anticipate them completing about 23 acres of treatment (cost = ±$6,325).

Land Treatments:

Contour Felling (Estimated cost = $600/acre):

TREATMENT AREA 3 (4 acres, central portion along ephemeral tributary to Edgewood Creek)

This treatment area contains an ephemeral drainage with buried channel characteristics indicated, i.e. sediment accumulation from earlier events has buried stumps and shrub branches. The area experienced moderate intensity burning, leaving the preexisting sediment vulnerable to further movement onto Nevada State Park lands that experienced high intensity burn areas. **Contour-felling on 4 acres** above this channel will prevent additional soil from moving into it.

TREATMENT AREA 4 (8 acres, high intensity fire area, eastern portion)

The high intensity burn area is 15.5 acres. Ground fuels in this area have been completely burned and more than three-quarters of the standing tree stems have been burned to their tops. The average live crown ratio on the remaining live trees rarely extends beyond 20 percent. The majority of needles in the live crowns have browned as a result of heat stress. The terrain in this area is steep with slopes from 40 to 60 percent. In general, an abundance of granite rock covers portions of the area either as individual boulders or as clusters of boulders.

Contour Felling of existing sound mortality trees is prescribed (20 inches diameter or less) on approximately **8 acres** at a spacing of 100 feet (+/-) of slope distance shingled across the slope. Approximately **ten limbed logs per acre** will be secured flush to the ground and perpendicular to the slope. Location of contour felling will be determined based on rockiness of the site, i.e., not falling trees directly onto rocks, but below rocky areas. Felling of snags or hazardous trees could compliment this treatment, but due to the rocky and steep nature of the slopes, these stems would likely break apart.

TREATMENT AREA 5 (3 acres, Edgewood Creek Headwaters Area, Eastern portion)

Approximately 60% of the treatment area was moderately to severely burned. Spot fires created a mosaic of burned and unburned areas. Slopes in the uplands are mostly in the 30-50% range. In the moderate and severely burned areas, a layer of ash 2-5 inches thick will move downslope with the first runoff. Soil water-repellency is patchy, but some of the surface soils also have non-fire-induced water repellency, so infiltration rates will be lower than one might expect in coarse-textured granitic soils, and overland flow may be higher, increasing erosion potential.

This situation will be partially mitigated by rock and shrub cover, except where burned uplands are directly connected to the creek. Slash from onsite sources could be used to prevent erosion and trap sediment in the riparian corridor. Approximately 15% of the treatment area has rock cover, and prostrate manzanita is common, and will resprout where it has been burned. Needle cast from lightly burned trees will provide ground cover later in the season, but may not provide protection during the first runoff event.

Log erosion barriers could be used to decrease runoff velocity and retain sediment on open, burned hill slopes. **Contour felling is prescribed on approximately 15% of the treatment area, or 3 acres.** Slash generated by log barrier construction should be spread on hill slopes to prevent further erosion.

<u>Channel Treatments</u>:

Straw Wattle Dams:

TREATMENT AREA 3 (4 acres, central portion along ephemeral tributary to Edgewood Creek).

In addition to the contour felling on the slopes as described above in Hillslope Treatments, about **15 straw wattle dams, 40 to 50 feet wide,** will be installed to prevent additional sediment from entering the main, perennial channel immediately below.

Silt Fence:

TREATMENT AREA 5 (3 acres, Edgewood Creek Headwaters Area, Eastern portion)

The lower channel has experienced past deposition, causing meandering across the lower bowl. In some places, the channel has been filled with logs and stumps. These conditions have created subsurface flow in sections of this reach. Where the stream flows beneath the parking lot, The culvert capacity of Heavenly's Boulder parking lot, downstream of this reach, is minimal due to

existing sediment and dense willows. Consequently, this channel cannot accommodate further increased flow and sediment likely to result from the fire.

The upper 800 feet of channel is V-shaped and approximately 3 to 7 feet deep, with largely un-vegetated banks of loose, granitic soils. **Two 20-foot rows of silt fencing** placed across the channel where the road comes down near the channel at the top of the Boulder lift **is prescribed to prevent any catastrophic debris torrents resulting from thundershowers**. The channel gradient flattens and direction changes just below this area, contributing to the site's suitability for sediment storage.

I. **Monitoring Narrative:**

A detailed Monitoring Plan will be submitted to the Regional Office by August 1, 2002.

Noxious and Invasive Weeds

The treatment areas, staging areas, rehabilitated fire lines, urban interfaces (under the Gondola, ski runs, and Edgewood Creek areas) should be monitored for two to three years in late July to August for noxious and invasive weed infestations. The initial monitoring will begin this field season with initial inspection of all materials used for on site treatment. This monitoring will require a seasonal employee to spend approximately 3 weeks a year visually inspecting and inventorying these areas for 3 years (9 weeks total). If weeds are found, an eradication/control plan will be implemented to prevent spread and reduce the infestation into adajacent areas.

BAER Treatment Effectiveness

Treatment effectiveness monitoring in selected areas is recommended for 3 years. Monitoring should include 1) photo points on hill slopes and in channels, and 2) measurement or estimation of the sediment volume collected in silt fences and log barriers. Water quality monitoring should measure turbidity, nutrients, and suspended sediment at selected sites and established stations during the first runoff event, subsequent high intensity events for three years, and spring runoff for one year.

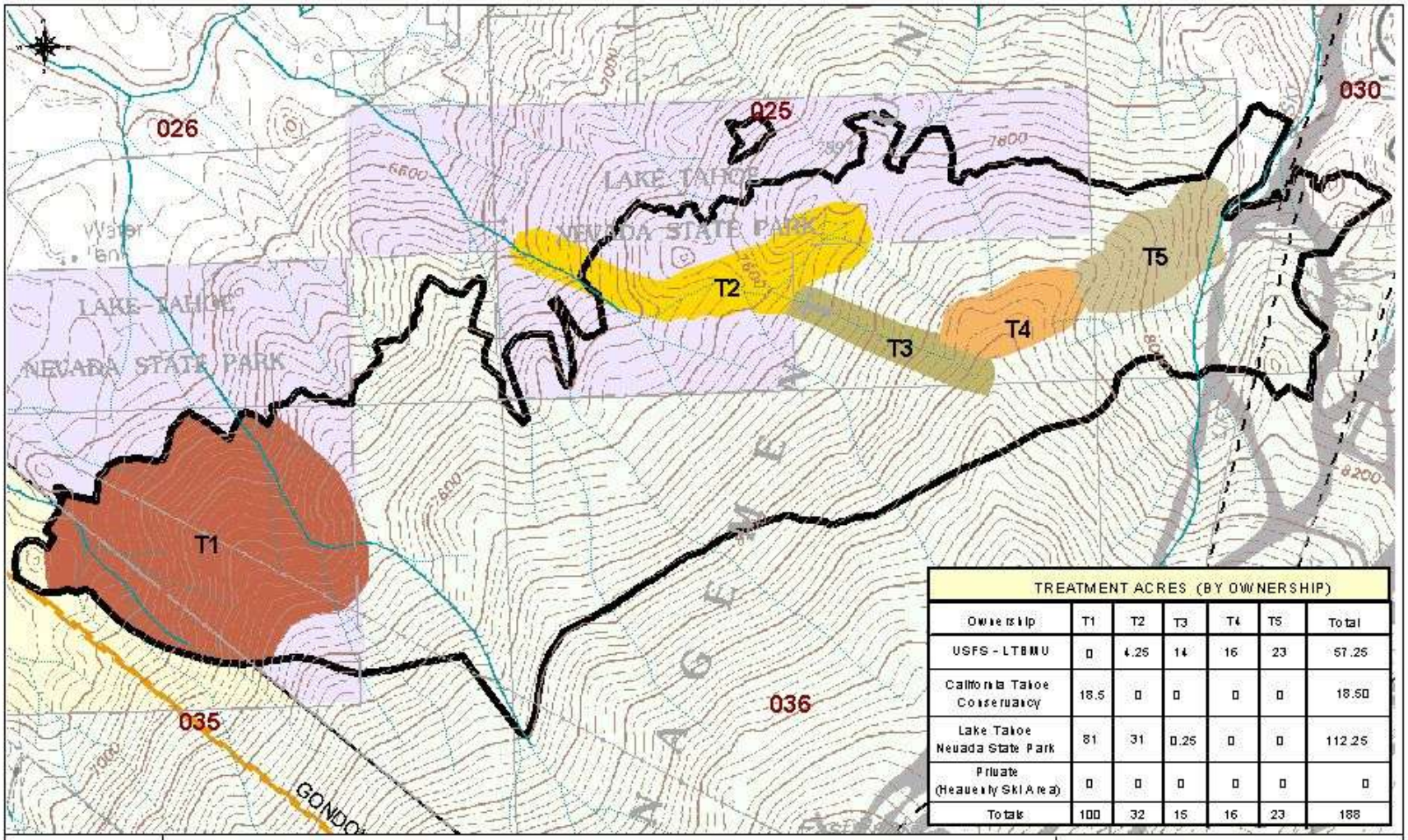
Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Other Lands				All
		Unit	# of	WFSU	Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT $	$	units	$	Units	$	$
A. Land Treatments										
Contour felling	Acres	600	15	$9,000			$0	40	$24,000	$33,000
Hazard tree removal	Each	25	0	$0			$0	253	$6,325	$6,325
Alder planting	Each	3	0	$0			$0	2000	$6,000	$6,000
Seed/fertizer/mulch	Acres	500	0	$0			$0	30	$15,000	$15,000
Subtotal Land Treatments				$9,000			$0		$51,325	$60,325
B. Channel Treatments										
Straw Wattle Dams	Feet	3	750	$2,250			$0		$0	$2,250
Silt Fence	Feet	10	40	$400			$0		$0	$400
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Channel Treat.				$2,650			$0		$0	$2,650
C. Road and Trails										
None				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Road & Trails				$0			$0		$0	$0
D. Structures										
Spring Box Mitigation	Each	5000	0	$0			$0	1	$5,000	$5,000
				$0			$0		$0	$0
				$0			$0		$0	$0
				$0			$0		$0	$0
Subtotal Structures				$0			$0		$5,000	$5,000
E. BAER Evaluation										
Assessment Team	Days	450	35	$15,750			$0	10	$4,500	$20,250
Imp. Team Admin	Days	350	30	$10,500			$0	30	$10,500	$21,000
Archaeology Survey	Acres	10	180	$1,800			$0	17	$170	$1,970
F. Monitoring	Days	300	2	$600			$0		$0	$600
G. Totals				**$38,500**			**$0**		**$71,325**	**$109,225**

PART VII - APPROVALS

1. /s/ Maribeth Gustafson — July 12, 2002
   Forest Supervisor (signature) — Date

2. /s/ Bernie Weingardt — 7/18/02
   Regional Forester (signature) — Date



TREATMENT ACRES (BY OWNERSHIP)

Ownership	T1	T2	T3	T4	T5	Total
USFS - LTBMU	0	4.25	14	16	23	57.25
California Tahoe Conservancy	18.5	0	0	0	0	18.50
Lake Tahoe Nevada State Park	81	31	0.25	0	0	112.25
Private (Heavenly Ski Area)	0	0	0	0	0	0
Totals	100	32	15	16	23	188

VICINITY MAP
Lake Tahoe Basin

Proposed Treatment Areas
- T1
- T2
- T3
- T4
- T5

Streams
- Ephemeral
- Intermittent
- Perennial

SCALE: 1:15000

GONDOLA FIRE
BAER Report
July 2002

USDA Forest Service
Lake Tahoe Basin Management Unit