

Appendix A

**Conditional Waiver of Discharge
Requirements for Timber Harvest and
Vegetation Management Activities
(General Conditions)**

21. The Water Board held a public hearing on April 10, 2014, in South Lake Tahoe, California, and considered all evidence concerning this matter.

IT IS HEREBY ORDERED that in order to be enrolled under this Timber Waiver, an enrollee must meet applicable eligibility criteria and requirements for that category of activities covered by this Waiver, including the General Provisions and all applicable general and category-specific conditions of this Timber Waiver, as set forth below.

B. GENERAL PROVISIONS

1. Pursuant to Water Code section 13269, subdivision (a), the Water Board waives requirements to submit reports of waste discharge and obtain waste discharge requirements for persons proposing or conducting activities which meet the eligibility criteria and comply with the conditions and general provisions set forth in this Timber Waiver.
2. The Water Board anticipates that most activities will proceed under a single category of the Timber Waiver. However, if a project is phased, or divided geographically, such that portions qualify under Category 1, 2, or 3; and other portions qualify under Category 4, 5, or 6; the enrollee has the option of enrolling such phases or portions under different categories. Water Board notification is only required for the portions of projects or activities that qualify under Category 4, 5, or 6.
3. The Water Board does not waive the filing of a report of waste discharge or waive waste discharge requirements for persons proposing projects that include activities with impacts that are not mitigated to less-than-significant levels, such as those identified in a CEQA environmental impact report, or a National Environmental Policy Act (NEPA) or Tahoe Regional Planning Agency (TRPA) environmental impact statement. Not all timber harvest and vegetation management activities proposed in the Lahontan Region will be eligible for this Timber Waiver. Enrollees proposing activities that are not eligible for this Timber Waiver must file a report of waste discharge with the Water Board pursuant to Water Code section 13260.
4. This Timber Waiver shall not create a vested right to discharge waste and all such discharges shall be considered a privilege, as provided for in Water Code section 13263, subdivision (g). The Water Board Executive Officer may terminate the applicability of the Timber Waiver described herein to any activity at any time when such termination is in the public interest and/or the activity could affect the quality of waters of the state for beneficial uses.
5. This Timber Waiver shall become effective on April 10, 2014 and shall expire on April 10, 2019 unless terminated or renewed by the Water Board. Discharges regulated under this Timber Waiver are not authorized, and waste discharge requirements are not waived, after April 10, 2019 unless this Timber Waiver is renewed by Water Board action.

6. Discharges currently regulated under the 2009 Timber Waiver may proceed under the conditions of that waiver, or may be re-enrolled under this 2014 Timber Waiver. After April 9, 2014 no new applications for permit coverage under Resolution No. R6T-2009-0029 (the 2009 Timber Waiver) will be accepted.
7. Timber harvest and vegetation management activities approved by CAL FIRE under an Exemption or Emergency Notice may be eligible for coverage under Timber Waiver Categories 1, 2, 3, 4, or 6, depending on the scope of the proposed activities.
8. A monitoring and reporting program is adopted in conjunction with this 2014 Timber Waiver and shall be adhered to by all waiver enrollees, using the attached monitoring forms adopted by the Water Board.
9. Pursuant to Water Code section 13269, Timber Waiver enrollees may request a waiver of monitoring or propose an alternate monitoring and reporting program, subject to approval by the Executive Officer. The Executive Officer may impose additional or revised monitoring and reporting requirements pursuant to Water Code section 13267. The Executive Officer may modify application, monitoring, and reporting forms (Attachments C through M).

C. GENERAL CONDITIONS

1. Activities must be conducted in compliance with the Basin Plan, and other applicable laws, regulations, and plans.
2. Wastes, including but not limited to, petroleum products, soil, silt, sand, clay, rock, felled trees, slash, sawdust, bark, ash, pesticides, must not be discharged to surface waters or be deposited in locations where such material may discharge to surface waters. If discharge of wastes to surface waters occurs (not previously authorized by the Water Board), the enrollee must notify the Water Board by telephone or email within 24 hours of detection of the discharge or the next business day, whichever comes first.
3. **Condition for activities within the Little Truckee River, Truckee River, or Lake Tahoe HUs only:** If timber harvest and vegetation management activities are planned within 100-year floodplains of the Little Truckee River, Truckee River, or Lake Tahoe HUs, SEZs, or high erosion hazard lands (Bailey Land Classification 1a, 1c, or 2) of the Lake Tahoe HU, waste discharge prohibitions may apply. The Water Board grants a conditional Basin Plan Prohibition Exemption in certain cases as described in Attachment N, for slash piling and burning in Lake Tahoe HU SEZs that is conducted under Waiver Category 6, and in accordance with the requirements of Attachment Q. Review Attachments N and Q to verify if any proposed activities would need a Basin Plan prohibition exemption prior to proceeding.
4. Activities conducted under the Timber Waiver must comply with the category-specific eligibility criteria and conditions, including monitoring and reporting requirements where specified. The enrollee must conduct activities in accordance

with information submitted in the application for waiver coverage, if one is required. For Categories 4, 5, and 6, the enrollee must conduct monitoring and reporting pursuant to Water Code section 13267 unless alternate monitoring and reporting requirements have been approved by the Executive Officer.

5. Timber harvest and vegetation management activities must be conducted in accordance with any design features, management actions, mitigation measures, and monitoring plans developed as part of complying with CEQA, NEPA, the FPRs, and/or TRPA environmental analysis requirements.
6. Timber harvest and vegetation management activities subject to this Timber Waiver must not create a pollution, contamination, or nuisance, as defined by Water Code section 13050, subdivisions (k), (l), and (m).
7. All equipment used must be monitored for leaks, and removed from service if necessary to protect water quality. All spills must be immediately contained and spilled materials and/or contaminated soils must be properly disposed. An emergency spill kit adequate to contain spills that could result from onsite equipment must be at the project site at all times of equipment use.
8. This Timber Waiver does not permit any illegal activity, and does not preclude the need for permits or licenses that may be required by other governmental agencies, or other approvals by the Water Board such as discharges subject to a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act, including silvicultural point sources as defined in 40 Code of Federal Regulations, section 122.27. This waiver is not a substitute for state Water Quality Certification (WQC) under section 401 of the federal Clean Water Act which is required if a federal permit, such as a Clean Water Act section 404 permit, is required. Also, persons practicing forestry must ensure that they maintain appropriate licenses and certifications pursuant to Public Resources Code sections 752 and 753.
9. Pursuant to Water Code section 13267 subdivision (b) and Water Code section 13269 subdivision (a), any proposed material change to the activities proceeding under the Timber Waiver must be reported to Water Board staff in advance of implementation of any such change. Material changes include, but are not limited to:
 - (a) Change of project location or increase in size;
 - (b) The addition of winter period operations;
 - (c) Relocation or addition of watercourse crossings; or
 - (d) Addition or relocation of roads or skid trails into a WBBZ.
10. Any proposed material change to a project that does not result in a change in qualification under this waiver to a higher Category (e.g., Category 4 to Category 4) must be reported to the Water Board prior to implementation. Material changes to Category 6 projects shall not proceed until Category 6, Condition 1 is satisfied.

Any proposed material change to a project that results in a change in qualification

under this waiver to a higher category (e.g., Category 2 to 4, or Category 4 to 6) must follow the notification requirements as if it was a new application.

11. A report of waste discharge must be filed with the Water Board pursuant to Water Code section 13260 for any proposed material change to the activities proceeding under the Timber Waiver that would result in ineligibility for Timber Waiver coverage.
12. For the purpose of performing inspections and conducting monitoring, Water Board staff must be allowed reasonable access onto property where timber harvest and vegetation management activities are proposed, are being conducted, or have been terminated or completed. Inspections and monitoring may include sample collection, measuring, and photographing/taping to determine compliance with waiver conditions and eligibility criteria. Such inspections and monitoring are consistent with Water Code section 13267, subdivision (c), PRC section 4604, subdivision (b)(1), and other applicable laws.

Prior to, or immediately upon entering the property, Water Board staff will attempt to contact the site owner, persons performing the timber harvest and vegetation management activities, or other on-site representative(s) in order to inform the landowner or persons onsite of each inspection, and to discuss any safety considerations. If consent to access to property is unreasonably withheld, the Executive Officer may terminate the applicability of the Timber Waiver.

13. **Condition for Categories 4, 5, or 6:** For the purpose of observing, inspecting, photographing, digitally recording or videotaping, measuring, and/or collecting samples or other monitoring information to document compliance or non-compliance with the eligibility criteria, conditions, or provisions of this Timber Waiver, enrollees agree to allow Water Board staff:
 - (a) Entry at any time, with or without advance notice, onto: (1) the real property where timber harvest and vegetation management activities covered under this Timber Waiver are proposed, are being conducted, or have concluded; and (2) any and all outdoor areas in the control or ownership of the enrollee, in the vicinity of and downstream of timber harvest and vegetation management activities; and
 - (b) Access to and permission to copy any record required to be kept under the conditions of this Timber Waiver, including, but not limited to, any self-monitoring records and/or equipment used to fulfill monitoring requirements.

D. TIMBER WAIVER CATEGORIES

Category 1: Defensible space, fire prevention, dead-dying-diseased tree removal, and construction activities

Eligibility Criteria:

Activities that may proceed under this category are those:

- (1) Undertaken to comply with state, local, or county defensible space requirements, including PRC section 4291 requirements, OR
- (2) Conducted on undeveloped lots (as defined in Attachment A) up to three acres in size for the purpose of fuels reduction and/or construction activities, OR
- (3) Conducted on public lands or with public funding (where a Registered Professional Forester (RPF), Federal Forestry Professional, or Natural Resource Professional has developed and oversees the plan) to provide up to a 300-foot defense zone adjacent to subdivision boundaries, private parcel lot lines, and/or around structures and facilities (not including linear features such as roads, trails, or utility corridors), OR
- (4) Conducted under a CAL FIRE issued Forest Fire Prevention Exemption and in compliance with CCR, title 14, section 1038, OR
- (5) Undertaken to remove isolated hazard trees in response to an imminent threat to life or property, OR
- (6) Conducted under a CAL FIRE issued Dead, Dying, Diseased Exemption in compliance with CCR, title 14, section 1038(b) without any exceptions to section 1038(b) condition nos. 6 or 9.

Conditions:

Enrollees conducting activities meeting the eligibility criteria listed above are not required to notify, apply, or report monitoring to the Water Board if they comply with the following conditions:

- (1) Timber harvest and vegetation management activities must not cause or create erosion, destabilization of stream banks, temperature increases in waterbodies, disturbance to non-target WBBZ (as defined in Attachment B) vegetation, or concentrated surface runoff.
- (2) All areas disturbed by activities must be stabilized (as defined in Attachment A) at the conclusion of the activity or before the winter period (as defined in Attachment A), whichever is sooner.
- (3) Chipped and masticated material must not be discharged to waterbodies, or be deposited in locations where such material may discharge to a waterbody. Within WBBZs, chipped and masticated material must not exceed an average of two inches in depth, with a maximum depth of four inches.
- (4) Slash piles must not be built or burned within WBBZs, SEZs (as defined in Attachment A), or 100-year floodplains (as defined in Attachment A).

- (5) Equipment, including tractors and vehicles, must not be driven into SEZs, wet areas, or WBBZs , except over existing roads or watercourse crossings where vehicle tires or tracks remain dry.
- (6) The operation of equipment, including tractors and vehicles, shall minimize soil disturbance to the maximum extent practicable.
- (7) No tractor, vehicle, or equipment use on saturated soils (as defined in Attachment A).
- (8) All activities conducted under Category 1 must comply with the General Conditions of this Timber Waiver and meet one of the category-specific eligibility criteria listed above.

Category 2: Activities conducted by hand crews (as defined in Attachment A) including thinning operations and prescribed fire
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Eligibility Criteria:

Activities that may proceed under this category must meet all of the following eligibility criteria:

- (1) Activities shall be conducted by hand, except for low impact equipment, see Eligibility Criteria 2(a) below, to assist hand crew operations.
- (2) Tractor, vehicle, and equipment access shall be limited to existing roads with the following exceptions:
 - (a) Low impact equipment with ground pressures less than 10 psi, such as chippers, brush mowers, or similar equipment for onsite processing of materials cut by hand crews; and
 - (b) Single passenger all-terrain vehicles (ATVs) or snowmobiles.
- (3) No construction or expansion of roads, crossings, landings, staging areas, etc.

Conditions:

Enrollees conducting activities meeting the eligibility criteria listed above are not required to notify, apply, or report monitoring to the Water Board if they comply with the following conditions:

- (1) On existing roads, tractors, vehicles, low-ground-pressure chippers or other equipment shall not be operated during saturated soil conditions (as defined in Attachment A).
- (2) Operation of ATVs, chippers, brush mowers, or similar equipment off roads must always occur at distances greater than 25 feet from a waterbody and when at least one of the following conditions occurs:

Appendix B

Noise Calculations



Construction Source Noise Prediction Model

Location	Distance to Nearest Receptor in feet	Combined Predicted Noise Level (L_{eq} dBA)	Equipment	Reference Emission	
				Noise Levels (L_{max}) at 50 feet ¹	Usage Factor ¹
Noise Standard 55 Leq	1,195	55.0	Chain Saw	85	1
Noise standard w/ 15-dB protection	275	70	Dozer	85	1
Beverly Dr. in Carnelian Bay	160	76	Tractor	84	1

Ground Type	SOFT
Source Height	8
Receiver Height	5
Ground Factor ²	0.63

Predicted Noise Level ³	L_{eq} dBA at 50 feet ³
Chain Saw	85.0
Dozer	85.0
Tractor	84.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)

89.5

Sources:

¹ Obtained from the FHWA Roadway Construction Noise Model, January 2006. Table 1.

² Based on Figure 6-5 from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 6-23).

³ Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006 (pg 12-3).

$$L_{eq}(\text{equip}) = E.L. + 10 \cdot \log(U.F.) - 20 \cdot \log(D/50) - 10 \cdot G \cdot \log(D/50)$$

Where: E.L. = Emission Level;

U.F. = Usage Factor;

G = Constant that accounts for topography and ground effects (FTA 2006: pg 6-23); and

D = Distance from source to receiver.

Equipment Description	Acoustical Usage Factor (%)	Spec 721.560 Lmax @ 50ft (dBA slow)	Actual Measured Lmax @ 50ft (dBA slow)	No. of Actual Data Samples (count)	Spec 721.560 LmaxCalc	Spec 721.560 Leq	Distance	Actual Measured LmaxCalc	Actual Measured Leq
Auger Drill Rig	20	85	84	36	79.0	72.0	100	78.0	71.0
Backhoe	40	80	78	372	74.0	70.0	100	72.0	68.0
Bar Bender	20	80	na	0	74.0	67.0	100		
Blasting	na	94	na	0	88.0		100		
Boring Jack Power Unit	50	80	83	1	74.0	71.0	100	77.0	74.0
Chain Saw	20	85	84	46	79.0	72.0	100	78.0	71.0
Clam Shovel (dropping)	20	93	87	4	87.0	80.0	100	81.0	74.0
Compactor (ground)	20	80	83	57	74.0	67.0	100	77.0	70.0
Compressor (air)	40	80	78	18	74.0	70.0	100	72.0	68.0
Concrete Batch Plant	15	83	na	0	77.0	68.7	100		
Concrete Mixer Truck	40	85	79	40	79.0	75.0	100	73.0	69.0
Concrete Pump Truck	20	82	81	30	76.0	69.0	100	75.0	68.0
Concrete Saw	20	90	90	55	84.0	77.0	100	84.0	77.0
Crane	16	85	81	405	79.0	71.0	100	75.0	67.0
Dozer	40	85	82	55	79.0	75.0	100	76.0	72.0
Drill Rig Truck	20	84	79	22	78.0	71.0	100	73.0	66.0
Drum Mixer	50	80	80	1	74.0	71.0	100	74.0	71.0
Dump Truck	40	84	76	31	78.0	74.0	100	70.0	66.0
Excavator	40	85	81	170	79.0	75.0	100	75.0	71.0
Flat Bed Truck	40	84	74	4	78.0	74.0	100	68.0	64.0
Front End Loader	40	80	79	96	74.0	70.0	100	73.0	69.0
Generator	50	82	81	19	76.0	73.0	100	75.0	72.0
Generator (<25KVA, VMS s	50	70	73	74	64.0	61.0	100	67.0	64.0
Gradall	40	85	83	70	79.0	75.0	100	77.0	73.0
Grader	40	85	na	0	79.0	75.0	100		
Grapple (on Backhoe)	40	85	87	1	79.0	75.0	100	81.0	77.0
Horizontal Boring Hydr. Jac	25	80	82	6	74.0	68.0	100	76.0	70.0
Hydra Break Ram	10	90	na	0	84.0	74.0	100		
Impact Pile Driver	20	95	101	11	89.0	82.0	100	95.0	88.0
Jackhammer	20	85	89	133	79.0	72.0	100	83.0	76.0
Man Lift	20	85	75	23	79.0	72.0	100	69.0	62.0
Mounted Impact Hammer (20	90	90	212	84.0	77.0	100	84.0	77.0
Pavement Scarafier	20	85	90	2	79.0	72.0	100	84.0	77.0
Paver	50	85	77	9	79.0	76.0	100	71.0	68.0
Pickup Truck	40	55	75	1	49.0	45.0	100	69.0	65.0
Pneumatic Tools	50	85	85	90	79.0	76.0	100	79.0	76.0
Pumps	50	77	81	17	71.0	68.0	100	75.0	72.0
Refrigerator Unit	100	82	73	3	76.0	76.0	100	67.0	67.0
Rivit Buster/chipping gun	20	85	79	19	79.0	72.0	100	73.0	66.0
Rock Drill	20	85	81	3	79.0	72.0	100	75.0	68.0
Roller	20	85	80	16	79.0	72.0	100	74.0	67.0
Sand Blasting (Single Nozzl	20	85	96	9	79.0	72.0	100	90.0	83.0
Scraper	40	85	84	12	79.0	75.0	100	78.0	74.0
Shears (on backhoe)	40	85	96	5	79.0	75.0	100	90.0	86.0
Slurry Plant	100	78	78	1	72.0	72.0	100	72.0	72.0
Slurry Trenching Machine	50	82	80	75	76.0	73.0	100	74.0	71.0
Soil Mix Drill Rig	50	80	na	0	74.0	71.0	100		
Tractor	40	84	na	0	78.0	74.0	100		
Vacuum Excavator (Vac-tru	40	85	85	149	79.0	75.0	100	79.0	75.0
Vacuum Street Sweeper	10	80	82	19	74.0	64.0	100	76.0	66.0
Ventilation Fan	100	85	79	13	79.0	79.0	100	73.0	73.0
Vibrating Hopper	50	85	87	1	79.0	76.0	100	81.0	78.0
Vibratory Concrete Mixer	20	80	80	1	74.0	67.0	100	74.0	67.0
Vibratory Pile Driver	20	95	101	44	89.0	82.0	100	95.0	88.0
Warning Horn	5	85	83	12	79.0	66.0	100	77.0	64.0
Welder / Torch	40	73	74	5	67.0	63.0	100	68.0	64.0

Source:

FHWA Roadway Construction Noise Model, January 2006. Table 9.1

U.S. Department of Transportation

CA/T Construction Spec. 721.560

Appendix C

Greenhouse Gas and Air Pollutant Emission Calculations

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

Forest Thinning Activity - Criteria Pollutants Only

Placer-Lake Tahoe County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	74
Climate Zone	14			Operational Year	2020
Utility Company	Sierra Pacific Resources				
CO2 Intensity (lb/MW hr)	1328.16	CH4 Intensity (lb/MW hr)	0.029	N2O Intensity (lb/MW hr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - This model run is to estimate exhaust emissions from forest thinning activity only.

This model run is to estimate exhaust emissions of criteria air pollutants and precursors from forest thinning activity only. GHGs are estimated based on fuel consumption outside of CalEEMod.

Land Use - Forest thinning activity. Lot acreage is set to zero because no grading or excavation of earthen material would take place.

Off-road Equipment - Source of equipment list: Holmon, per. comm., October 16, 2015.

The chipper (proxied by crushing/processing equipment) would actually be 765 hp but equipment > 750 hp cannot be estimated by CalEEMod.

Construction Phase - Forest thinning only.

Grading - Forest thinning does not involve earth movement, excavation, or grading.

Demolition - Not applicable.

Trips and VMT - Emissions from worker trips and the truck hauling of chipped biomass and merchantable timber are estimated outside of CalEEMod.

On-road Fugitive Dust - Emissions from worker trips and the truck hauling of chipped biomass and merchantable timber are estimated outside of CalEEMod.

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

Architectural Coating - Not applicable.

Vehicle Trips - Not applicable. Dummy values only.

Vehicle Emission Factors - Not applicable.

Vehicle Emission Factors - Not applicable.

Vehicle Emission Factors - Not applicable.

Road Dust - Not applicable.

Woodstoves - Not applicable.

Consumer Products - Not applicable.

Area Coating - Not applicable.

Landscape Equipment - Not applicable.

Energy Use - Not applicable.

Water And Wastewater - Not applicable.

Solid Waste - Not applicable.

Stationary Sources - Emergency Generators and Fire Pumps - Not applicable.

Stationary Sources - Emergency Generators and Fire Pumps EF - Not applicable.

Stationary Sources - Process Boilers - Not applicable.

Stationary Sources - Process Boilers EF - Not applicable.

Stationary Sources - User Defined - Not applicable.

Land Use Change - Change in carbon sequestration are estimated by USFS staff using the Forest Vegetation Simulator.

Sequestration - Change in carbon sequestration are estimated by USFS staff using the Forest Vegetation Simulator.

Construction Off-road Equipment Mitigation - Off-road Equipment Mitigation - Tier rating determined by engine size and model year with table at <http://www3.epa.gov/otaq/standards/nonroad/nonraodci.chtm>.

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

Mobile Land Use Mitigation - Not applicable.

Mobile Commute Mitigation - Not applicable.

Area Mitigation - Not applicable.

Energy Mitigation - Not applicable.

Water Mitigation - Not applicable.

Waste Mitigation - Not applicable.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	0.00	1.00
tblOffRoadEquipment	HorsePower	97.00	225.00
tblOffRoadEquipment	HorsePower	97.00	225.00
tblOffRoadEquipment	HorsePower	81.00	4.00
tblOffRoadEquipment	HorsePower	85.00	750.00
tblOffRoadEquipment	HorsePower	158.00	225.00
tblOffRoadEquipment	HorsePower	158.00	230.00
tblOffRoadEquipment	HorsePower	158.00	225.00
tblOffRoadEquipment	HorsePower	158.00	186.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Site Preparation
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tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	PhaseName		Site Preparation
tblOffRoadEquipment	UsageHours	8.00	10.00
tblOffRoadEquipment	UsageHours	8.00	10.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	WorkerTripNumber	23.00	0.00

2.0 Emissions Summary

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	1.0000e-005	0.0000	1.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000	0.0000	2.3000e-004

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2018	6/1/2018	5	1	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Concrete/Industrial Saws	1	1.00	4	0.73
Site Preparation	Crushing/Proc. Equipment	1	10.00	750	0.78
Site Preparation	Excavators	1	10.00	225	0.38
Site Preparation	Excavators	1	10.00	230	0.38
Site Preparation	Excavators	1	10.00	225	0.38
Site Preparation	Excavators	1	10.00	186	0.38
Site Preparation	Tractors/Loaders/Backhoes	1	10.00	225	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	10.00	225	0.37

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	9	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	6.3876	61.9283	27.0653	0.1177		2.0005	2.0005		1.9220	1.9220		12,682.82 18	12,682.82 18	2.0148		12,733.19 23
Total	6.3876	61.9283	27.0653	0.1177	0.5303	2.0005	2.5308	0.0573	1.9220	1.9793		12,682.82 18	12,682.82 18	2.0148		12,733.19 23

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.5303	0.0000	0.5303	0.0573	0.0000	0.0573			0.0000			0.0000
Off-Road	1.8647	21.1392	55.3120	0.1177		0.7710	0.7710		0.7710	0.7710	0.0000	12,682.8218	12,682.8218	2.0148		12,733.1923
Total	1.8647	21.1392	55.3120	0.1177	0.5303	0.7710	1.3012	0.0573	0.7710	0.8282	0.0000	12,682.8218	12,682.8218	2.0148		12,733.1923

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Recreational	0.489257	0.041257	0.220156	0.132626	0.025790	0.006586	0.027831	0.045583	0.001467	0.001229	0.006102	0.000783	0.001333

5.0 Energy Detail

Historical Energy Use: N

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr	lb/day										lb/day						
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Unmitigated	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004
Total	1.0000e-005	0.0000	1.0000e-004	0.0000		0.0000	0.0000		0.0000	0.0000		2.2000e-004	2.2000e-004	0.0000		2.3000e-004

7.0 Water Detail

Forest Thinning Activity - Criteria Pollutants Only - Placer-Lake Tahoe County, Summer

7.1 Mitigation Measures Water**8.0 Waste Detail**

8.1 Mitigation Measures Waste**9.0 Operational Offroad**

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type
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Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type
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User Defined Equipment

Equipment Type	Number
----------------	--------

11.0 Vegetation

Summary of Greenhouse Gas Emissions and Changes in Carbon Sequestration over a 20-Year Management Cycle

<u>Emission Activity</u>	<u>value</u>	<u>units</u>	<u>source/notes</u>
Forest Vegetation Management Effects			
Loss in sequestration under no-treatment scenario due to wildfire	21.4	MT CO ₂ e/acre	CTC 2014:6
Increase in carbon sequestration under treatment scenario	-17.4	MT CO ₂ e/acre	CTC 2014:6; See Note 4
Net gain in carbon sequestration over 20-year management cycle	-38.8	MT CO ₂ e/acre	summation
Forest Treatment Activities			
Thinning equipment	4.2	MT CO ₂ e/day	wksht: Thin Equip GHGs
Truck hauling of merchantable logs	1.3	MT CO ₂ e/day	wksht: Hauling Emiss
Truck hauling of chipped biomass	2.5	MT CO ₂ e/day	wksht: Hauling Emiss
Worker commute trips	0.1	MT CO ₂ e/day	wksht: Worker Trips
Subtotal	8.1	MT CO ₂ e/day	summation
Daily area treated, average	5.0	acre/day	wksht: Key Parameters
GHGs per area treated	1.6	MT CO ₂ e/acre	calculation
Net change per acre	-37.2	MT CO ₂ e/acre	summation
Operation of Biomass Power Facility	41.6	MT CO ₂ e/acre	wksht: Biomass Power Fac GHGs
Displacement of Fossil Fuels for Electricity Generation	-88.5	MT CO ₂ /acre	wksht: Fossil Fuel Displacement
Treatment Area	151.0	acres	wksht: Key Parameters
GHGs from forest thinning equipment and haul trips	1,227	MT CO ₂ e	calculation
Net GHGs during 20-year management cycle	-5,613	MT CO ₂ e/20-years	calculation

Sources/Notes

- 1 California Tahoe Conservancy. 2014. 2014/2015 Project Application to the Department of Forestry and Fire Protection's Greenhouse Gas Reduction Fund for the North Tahoe Interagency Forest Health and Bioenergy Project (Project No. 14-GHG-FMP-01-0095-FR).
- 2 U.S. Forest Service. 2015. Forest Vegetation Simulator. Available at <http://www.fs.fed.us/fmfc/fvs/>. Accessed October 29, 2015. This simulator was used in the application for the North Tahoe Interagency Forest Health and Bioenergy Project (California Tahoe Conservancy 2014). (i.e., Source 1)
- 3 Hirt, Brian, Forestry Program Supervisor, California Tahoe Conservancy. October 27, 2015—e-mail to Adam Lewandowski, Senior Planner, Ascent Environmental regarding the number of acres of forest thinned per day and other parameters of thinning activity.
- 4 The modeling of the treatment scenario conducted with the Forest Vegetation Simulator (FVS) by USFS staff accounts for the carbon contained in biomass thinnings that are masticated and spread across the forest floor, and for the carbon that remains sequestered in wood products made from merchantable logs that are hauled out of the forest. The FVS modeling does not include any of the carbon benefit associated with the shadow effect, which is the idea that the neighboring forested area becomes more protected from catastrophic wildfire as well due to the fuels reduction on the treated forestland.

Summary of Maximum Daily Criteria Air Pollutants and Precursors in the Lake Tahoe Air Basin (lb/day)

<u>Activity</u>	<u>ROG</u>	<u>NOx</u>	<u>PM₁₀</u>	<u>PM_{2.5}</u>	<u>Source Worksheet</u>
Forest Treatment Activities					
Thinning Equipment	1.9	21.1	0.8	0.8	wksht: Thin Equip CAPs
Truck-Hauling Merchantable Logs	0.0	1.3	0.1	0.0	wksht: Hauling Act & Exh Emiss
Truck-Hauling Chipped Biomass	0.1	2.3	0.1	0.1	wksht: Hauling Act & Exh Emiss
Worker Trips	0.3	0.0	0.03	0.01	wksht: Worker Trip Activity & Exh
Fugitive Road Dust	—	—	5.5	0.6	wksht: Road Dust
Total	2.2	24.8	6.5	1.4	summation
PCAPCD Threshold	82	82	82	—	PCAPCD CEQA guide

Notes

- 1 Forest thinning equipment will not be able to fully access Griff Unit 1 until the temporary crossing is installed. Thus, emissions associated with installation of the temporary crossing at Griff Creek would occur before forest thinning activity begins.
- 2 Placer County Air Pollution Control District. 2017 (June). CEQA Air Quality Handbook. Available: <http://www.placerair.org/landuseandceqa>. Accessed September 12, 2017.

Key Parameters from Project Description

	<u>value</u>	<u>units</u>	<u>source/notes</u>
Treatment Area	151	acres	project description
Daily area treated, average	5.0	acre/day	Hirt, pers. comm. 2015; project description

GHG Emissions from Thinning Equipment

	<u>value</u>	<u>units</u>	<u>source</u>
Total Average Daily Diesel Consumption	414.125	gal/day	wksht: Thin Equip Use & Fuel
CO2 emisson factor for diesel fuel combustion	10.18175	kg/gal	Table 12.1 from Source 1
CH4 emisson factor for diesel fuel combustion	0.504	g/gal	Table 13.7 from Source 1
N2O emisson factor for diesel fuel combustion	0.224	g/gal	Table 13.7 from Source 1
daily CO2 emissions	4,217	kg/day	calculation
daily CH4 emissions	209	g/day	calculation
daily N2O emissions	93	g/day	calculation
mass conversion rate	1,000	kg/MT	wksht: Unit Conversions
mass conversion rate	1,000,000	g/MT	wksht: Unit Conversions
daily CO2 emissions	4.22	MT/day	conversion calculation
daily CH4 emissions	0.0002	MT/day	conversion calculation
daily N2O emissions	0.00009	MT/day	conversion calculation
global warming potential of CH4	25	CO2/CH4	wksht: Unit Conversions
global warming potential of N2O	298	N2O/CH4	wksht: Unit Conversions
daily CO2-e emissions	4.2	MT/day	summation

Sources

- 1 The Climate Registry. 2014. *General Reporting Protocol, Version 2.0*. Available: <http://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/>. Accessed October 19, 2015.

Criteria Air Pollutant and Precursor Emissions from Thinning Equipment

Equipment	Model Year/Make/Model	Max. Daily Run Time	Power hp	EPA Emissions Tier Rating	Comperable Equipment Type in CalEEMod	Load Factor (%)
Chain Saw	2014 Husky 565	1.0	3.8	NA	Concrete/Industrial Saw	100%
Harvester	2011 John Deere 1270E	10.0	225	Tier 3	Excavator	38%
Harvester	2007 Valmet 445	10.0	230	Tier 3	Excavator	38%
Forwarder	2010 John Deere 1710D	10.0	225	Tier 4	Excavator	38%
Skidder	2010 John Deere 648H	10.0	225	Tier 4	Tractor/Loader/Backhoe	37%
Loader	2015 John Deere 2154	10.0	225	Tier 4+	Tractor/Loader/Backhoe	37%
Masticator	2006 John Deere 200C LC	10.0	186	Tier 3	Excavator	38%
Chipper	2011 Peterson 4310	10.0	765	Tier 4	Crushing/Proc. Equipment	78%
<u>Source:</u> wksht: Thin Equip Use & Fuel	wksht: Thin Equip Use & Fuel	wksht: Thin Equip Use & Fuel	wksht: Thin Equip Use & Fuel	EPA's Nonroad Compression-Ignition Engines - Exhaust Emission Standards @ http://www3.epa.gov/otaq/standards/nonroad/nonroadci.htm	assumption based on types of activities performed; and whether equipment is tracked vs. wheeled	default value in CalEEMod

Maximum Daily Exhaust Emissions of CAPs and Precursors

Summary	ROG	NOX	PM10 Exhaust	PM2.5 Exhaust	Units	Source
	1.8647	21.1392	0.7710	0.7710	lb/day	CalEEMod2016.3.1

Notes

- All the equipment is powered by diesel fuel, except for the chain saw, which uses a blend of gasoline and two-stork oil at a ratio of 1 gallon to 2.2 ounces, according to http://cdn.husqvarna.com/ddoc/HUSO/HUSO2011_USen/HUSO2011_USen__1151378-95.pdf.
- Emissions of fugitive PM10 and PM2.5 dust are estimated on wksht: Road Dust.

Construction

Construction Phase Off-Road Equipment Dust from Material Movement Demolition Trips And VMT On-Road Fugitive Dust Architectural Coatings

Select Construction Phase

Phase Name

<< Previous Phase

Next Phase >>

Import csv

Default

Undo

Equipment Type	Unit Amount	Hours/Day	HorsePower (HP)	Load Factor
Concrete/Industrial Saws	1	1	4	0.73
Crushing/Proc. Equipment	1	10	750	0.78
Excavators	1	10	225	0.38
Excavators	1	10	230	0.38
Excavators	1	10	225	0.38
Excavators	1	10	186	0.38
Tractors/Loaders/Backhoes	1	10	225	0.37
Tractors/Loaders/Backhoes	1	10	225	0.37
+				

<< Previous

Next >>

Remarks

Source of equipment list: Holmon, pers. comm., October 16, 2015.
 The chipper (proxied by crushing/processing equipment) would actually be 765 hp but equipment > 750 hp cannot be estimated by CalEEMod.

Load Factors of Thinning Equipment

The load factors for the thinning equipment are based on the default load factors for similar equipment provided by CalEEMod V.2013.2

Equipment	Model Year/Make/Model	hp	Comperable Equipment Type in CalEEMod	Load Factor (%)
Chain Saw	2014 Husky 565	3.8	Concrete/Industrial Saw	100%
Harvester	2011 John Deere 1270E	225	Excavator	38%
Harvester	2007 Valmet 445	230	Excavator	38%
Forwarder	2010 John Deere 1710D	225	Excavator	38%
Skidder	2010 John Deere 648H	225	Tractor/Loader/Backhoe	37%
Loader	2015 John Deere 2154	225	Tractor/Loader/Backhoe	37%
Masticator	2006 John Deere 200CLC	186	Excavator	38%
Chipper	2011 Peterson 4310	765	Crushing/Proc. Equipment	78%
Source:	wksht: raw data from Thin Contractor	wksht: raw data from Thin Contractor	assumption based on types of activities performed; and tracked vs. wheeled	Default value in construction module of CalEEMod

Notes

- The load factor for the chain saw is conservaitvely assumed to be 100%.

The screenshot displays the CalEEMod 2013.2 software interface. The main window title is "CalEEMod.2013.2". The menu bar includes "Home", "Project Characteristics", "Land Use", "Construction", "Operational", "Vegetation", "Mitigation", "Reporting", and "Help". A "Cascade Defaults" checkbox is checked.

The "Construction" section is active, with a sub-tab "Construction Phase" selected. Below this, there are navigation buttons: "<< Previous Phase", "Next Phase >>", "Import csv", "Default", and "Undo".

A table lists equipment types and their associated load factors for the "Site Preparation" phase:

Equipment Type	Unit Amount	Hours/Day	HorsePower (HP)	Load Factor
Excavators			162	0.3819
Tractors/Loaders/Backhoes	1	8	97	0.37
Crushing/Proc. Equipment			85	0.78
*				

At the bottom, there is a "Remarks" field containing the text: "These equipment are selected here only to show the default load factor used by CalEEMod." Navigation buttons "<< Previous" and "Next >>" are also present.

The Windows taskbar at the bottom shows the Start button, several open applications (Inbox, Examples, PETERSON PACIFIC, CalEEMod.2013.2, G14010103_03_005..., Emission Calculations..., Cabin Creek - Emissio...), and the system clock showing 4:32 PM on 10/22/2015.

Thinning Equipment Use and Fuel Consumption

Equipment	Model Year/Make/Model	hp	Avg. Daily Run Time (hr/day)	Max. Daily Run Time (hr/day)	Fuel Consumption (diesel) (gal/hr)	Avg. Daily Fuel Consumption (gal/day)	Max. Daily Fuel Consumption (gal/day)
Chain Saw	2014 Husky 565	3.8	0.5	1.0	0.25	0.125	0.25
Harvester	2011 John Deere 1270E	225	9.0	10.0	3.6	32.4	36
Harvester	2007 Valmet 445	230	9.0	10.0	8.5	76.5	85
Forwarder	2010 John Deere 1710D	225	9.0	10.0	3.2	28.8	32
Skidder	2010 John Deere 648H	225	9.0	10.0	4	36	40
Loader	2015 John Deere 2154	225	9.0	10.0	3.8	34.2	38
Masticator	2006 John Deere 200C LC	186	9.0	10.0	5.4	48.6	54
Chipper	2011 Peterson 4310	765	9.0	10.0	17.5	157.5	175

Source: wksht: raw data from Thin Contractor

Total Avg. Daily Fuel Consumption (gal/day) 414.125

Notes

- 1 The chain saw does not run on diesel fuel. Most chain saws are fueled with a mix of 1 gal gasoline and 2.2 oz. of two-stroke oil, according to http://cdn.husqvarna.com/ddoc/HUSO/HUSO2011_USen/HUSO2011_USen__1151378-95.pdf. However, it is assumed the emissions associated with the consumption of fuel by the chain saw would be similar to the emissions associated with the combustion of diesel fuel. This

Equipment List					
EQUIPMENT	YR/MAKE/MODEL	HP	DAILY RUN TIME	FUEL USAGE	
Chain Saw	2014 Husky 565	3.8	Rarely used	1 qt per 45 min.	
Harvester	2011 John Deere 1270E	225	8-10/hr	3.6/hr	
Harvester	2007 Valmet 445	230	8-10/hr	8.5/hr	
Forwarder	2010 John Deere 1710D	225	8-10/hr	3.2/hr	
Skidder	2010 John Deere 648H	225	8-10/hr	4/hr	
Loader	2015 John Deere 2154	225	8-10/hr	3.8/hr	
Masticator	2006 John Deere 200CLC	186	8-10/hr	5.4/hr	
Chipper	2011 Peterson 4310	765	8-10/hr	13-22/hr	
Yarder	N/A	N/A	N/A	N/A	
We would like to have a lot of detail about the fleet of equipment and crew used on a typical day of forest thinning.					
SEE ATTACHED SPREADSHEET (i.e., the above table)					
Make, model, (and model year), and horsepower rating of each piece of equipment (e.g., chain saws, mechanical harvester, skidder, cable yarder, forwarder, loader, masticator, chipper)					
Number of hours per day each equipment item operates per day					
Fuel consumption rate of each equipment item					
Number of workers, not including the truck drivers who haul away merchantable logs or chipped biomass					
6-8 depending on the difficulty of the project					
Number of full truckloads of chipped biomass hauled out of the forest each day					
8-12 depending on how many tons per acre					
Number of truckloads of merchantable logs hauled out of the forest each day					
4-8 depending on how much volume per acre					
Earliest start date when thinning would occur each year. (My guess is May 1 st .)					
Latest end date of thinning season. (My guess is October 15.)					
Could be as late as November 15th					
<u>Source</u>					
Holland, Mary. October 16, 2015—e-mail to Brett Storey, Senior Management Analyst, Placer County Planning Department (and forwarded to Austin Kerr of Ascent Environmental) regarding parameters of the equipment fleet used in forest thinning.					

Truck Hauling Activity and Exhaust Emissions

	<u>value</u>	<u>units</u>	<u>source</u>
Truckloads of merchantable logs			
Range, daily	4 to 8	trucks/day	wksht: raw data from Thin Contractor
Average daily	6	trucks/day	wksht: raw data from Thin Contractor
Max. daily	8	trucks/day	wksht: raw data from Thin Contractor
Truckloads of chipped biomass fuel			
Range, daily	8 to 12	trucks/day	wksht: raw data from Thin Contractor
Average daily	10	trucks/day	wksht: raw data from Thin Contractor
Max. daily	12	trucks/day	wksht: raw data from Thin Contractor
Total Max. daily truckloads	20	truckloads/day	summation (value used on other wksht)

Destination of merchantable logs Sierra Pacific Industries in Quincy, CA

Trip distance			
in all air basins	85.7	miles/trip	google maps
portion in LTAB	9.6	miles/trip	Dollar Point to Brockaway Summit
portion in MCAB	76.1	miles/trip	Brockaway Summit to Quincy
portion in SVAB	0	miles/trip	google maps

VMT associated with merchantable logs			
Average daily	1,028	VMT/day	calculation
Max. daily			
in all air basins	1,371	VMT/day	calculation
portion in LTAB	154	VMT/day	calculation
portion in MCAB	1,218	VMT/day	calculation
portion in SVAB	0	VMT/day	calculation

Destination of chipped biomass Sierra Pacific Industries, Lincoln, CA

Trip distance			
Total	103	miles/trip	google maps
portion in LTAB	11	miles/trip	Dollar Point to summit en route to Squaw Valley
portion in MCAB	72.2	miles/trip	summit to west side of Range 9 east, M.D.B. & M
portion in SVAB	19.8	miles/trip	SPI in Lincoln to MCAB boundary, See Note 1

VMT associated with chipped biomass			
Average daily	2,060	VMT/day	calculation
Max. daily			
in all air basins	2,472	VMT/day	calculation
portion in LTAB	264	VMT/day	calculation
portion in MCAB	1,733	VMT/day	calculation
portion in SVAB	475	VMT/day	calculation

Haul Truck Emission Rates (running exhaust, running loss, brake ware, tire ware)

	<u>ROG</u>	<u>NOx</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>	<u>units</u>
T6 instate construction heavy	0.115	3.910	0.173	0.088	1,227.795	g/mile

Source: wksht: On-Rd Veh Emiss Rates

	<u>value</u>	<u>units</u>	<u>source</u>
mass conversion rate	453.59	g/lb	wksht: Unit Conversions
mass conversion rate	1,000,000	g/MT	wksht: Unit Conversions

Haul Truck Emissions (exhaust, loss, ware)

	<u>ROG</u>	<u>NOx</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
	lb/day	lb/day	lb/day	lb/day	MT/day

Merchantable logs					
Average daily					1.3
Max. daily					
all air basins	0.3	11.8	0.5	0.3	
in LTAB	0.0	1.3	0.1	0.0	
in MCAB	0.3	10.5	0.5	0.2	
in SVAB	0.0	0.0	0.0	0.0	
Chipped Biomass					
Average daily					2.5
Max. daily					
all air basins	0.6	21.3	0.9	0.5	
in LTAB	0.1	2.3	0.1	0.1	
in MCAB	0.4	14.9	0.7	0.3	
in SVAB	0.1	4.1	0.2	0.1	

Source: calculations

Notes

- 1 According to ARB, the western boundary of the MCAB in Placer County is the west side of Range 9 M.D.B. & M. According to the Auburn Quadrangle map (7.5 minute) from USGS this line crosses I-80 at approximately 38.961732°, -121.026029°.

Dust Emissions from Vehicle Travel on Unpaved Roadways during Forest Thinning

Trucks Hauling Merchantable Timber and Chipped Biomass

Emission Factor (EF) Calculation for Travel on Unpaved Roads

	<u>value</u>	<u>units</u>	<u>source</u>
Truck Type	T6 instate constr heavy	NA	EMFAC 2014
gross vehicle weight rating	26,000	lb	EMFAC 2014
mass conversion rate	2,000	lb/ton	wksht: Unit Conversions
truck total weight	13.00	tons/truck	conversion calculation

Emission Factor Calculation (Based on formula 1a in AP-42 Section 13.2.2., EPA 2006)

Variables	PM10 EF Calc	PM2.5 EF Calc	Unit	Source
a	0.9	0.9	constant	Source 1, Table 13.2.2-2 Constants for Equations 1a and 1b AP-42 Section 13.2.2
b	0.45	0.45	constant	
k	1.5	0.15	constant (lbs/VMT)	CalEEMod2013.2, Mobile module, Road Dust tab Calc'ed above based on truck size anticipated for project
s	4.3%	4.3%	surface material silt content (%)	
W	13.00	13.00	mean vehicle weight (tons)	
Emission Factor	0.018	0.0018	lb/VMT	calculation

Maximum Daily VMT by Surface Type

	<u>value</u>	<u>units</u>	<u>source</u>
Total Max. daily truckloads	20	truckloads/day	wksht: Hauling Act & Exh Emiss
trips per truckload	2	trip/truckload	one-ways
Avg. distance of truck trip on unpaved road	5.0	miles/trip	assumption
Max. Daily truck VMT on unpaved roads	200	VMT/day	calculation

	<u>PM10</u>	<u>PM2.5</u>	<u>units</u>	<u>source</u>
Truck Fugitive Dust Emissions	3.7	0.4	lb/day	calc using emission factor

Worker Trips

Emission Factor (EF) Calculation for Travel on Unpaved Roads

	<u>value</u>	<u>units</u>	<u>source</u>
Vehicle Type	LDT2	NA	EMFAC 2014
gross vehicle weight rating	6,000	lb	EMFAC 2014
mass conversion rate	2,000	lb/ton	wksht: Unit Conversions
vehicle total weight	3.00	tons/veh	conversion calculation

Emission Factor Calculation (Based on formula 1a in AP-42 Section 13.2.2., EPA 2006)

Variables	PM10 EF Calc	PM2.5 EF Calc	Unit	Source
a	0.9	0.9	constant	Source 1, Table 13.2.2-2 Constants for Equations 1a and 1b AP-42 Section 13.2.2
b	0.45	0.45	constant	
k	1.5	0.15	constant (lbs/VMT)	CalEEMod2013.2, Mobile module, Road Dust tab Calc'ed above based on truck size anticipated for project
s	4.3%	4.3%	surface material silt content (%)	
W	3.00	3.00	mean vehicle weight (tons)	
Emission Factor	0.009	0.0009	lb/VMT	calculation

Maximum Daily VMT by Surface Type

	<u>value</u>	<u>units</u>	<u>source</u>
Chipped Biomass	8	truckloads/day	wksht: Worker Trip Activity & Exh Emiss
daily trips per worker	2	trips/worker	one-ways
Avg. distance of truck trip on unpaved road	5.0	miles/trip	assumption
Max. Daily worker VMT on unpaved roads	80	VMT/day	calculation

	<u>PM10</u>	<u>PM2.5</u>	<u>units</u>	<u>source</u>
Worker Trip Fugitive Dust Emiss.	1.9	0.2	lb/day	calc using emission factor

	<u>PM10</u>	<u>PM2.5</u>	<u>units</u>	<u>source</u>
Total Max. Daily Vehicle Fugitive Dust Emissions	5.5	0.6	lb/day	summation

Sources

- 1 U.S. Environmental Protection Agency 2006 (November). Emission Factors & AP 42, Compilation of Air Pollutant Emission Factors-Section 13.2.2 Unpaved Roads. Available <http://www.epa.gov/ttnchie1/ap42/>. Accessed May 5, 2012

Worker Trip Exhaust Emissions

Commute Trips by Workers on Thinning Crew

	<u>value</u>	<u>units</u>	<u>source</u>
Number of workers on thinning crew			
Range, daily	6 to 8	workers/day	wksht: raw data from Thin Contractor
Average daily	7	workers/day	wksht: raw data from Thin Contractor
Max. daily	8	workers/day	wksht: raw data from Thin Contractor
Trip rate for crew workers	2	trips/day	assumption
Avg. worker commute trip length	16.8	miles/trip	default worker trip length in construction module of CalEEMod V2013.2 (see screenshot below)
Daily VMT by crew workers			
Average daily	235	VMT/day	calculation
Max. daily	269	VMT/day	calculation

Mix of passenger vehicles used in employee commutes

breakdown of passenger car VMT in Placer County	<u>value</u>	<u>units</u>	<u>source</u>
light duty autos - gasoline	4,326,004	VMT/day	wksht: On-Rd Veh Emiss Rates
light duty autos - diesel	45,333	VMT/day	wksht: On-Rd Veh Emiss Rates
light duty trucks 1 - gasoline	407,924	VMT/day	wksht: On-Rd Veh Emiss Rates
light duty trucks 1 - diesel	465	VMT/day	wksht: On-Rd Veh Emiss Rates
light duty trucks 2 - gasoline	2,046,941	VMT/day	wksht: On-Rd Veh Emiss Rates
light duty trucks 2 - diesel	3,114	VMT/day	wksht: On-Rd Veh Emiss Rates
Total, all passenger vehicle types	6,829,781	VMT/day	summation

relative portion of passenger car VMT by veh type	<u>value</u>	<u>units</u>	<u>source</u>
light duty autos - gasoline	63.3%	%	calculation
light duty autos - diesel	0.7%	%	calculation
light duty trucks 1 - gasoline	6.0%	%	calculation
light duty trucks 1 - diesel	0.01%	%	calculation
light duty trucks 2 - gasoline	30.0%	%	calculation
light duty trucks 2 - diesel	0.05%	%	calculation
Total, all passenger vehicle types	100.0%	%	summation

Emission Rates (running exhaust, running loss, brake ware, tire ware)

	<u>ROG</u>	<u>NOx</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>	<u>units</u>	<u>source</u>
light duty autos - gasoline	0.298	0.065	0.046	0.019	317.264	g/mile	wksht: On-Rd Veh Emiss Rates
light duty autos - diesel	0.028	0.190	0.063	0.035	275.596	g/mile	wksht: On-Rd Veh Emiss Rates
light duty trucks 1 - gasoline	1.267	0.155	0.047	0.020	371.344	g/mile	wksht: On-Rd Veh Emiss Rates
light duty trucks 1 - diesel	0.192	1.152	0.188	0.155	369.773	g/mile	wksht: On-Rd Veh Emiss Rates
light duty trucks 2 - gasoline	0.542	0.107	0.046	0.019	428.666	g/mile	wksht: On-Rd Veh Emiss Rates
light duty trucks 2 - diesel	0.016	0.070	0.051	0.024	347.466	g/mile	wksht: On-Rd Veh Emiss Rates
Composite emiss rates - all pass vehicles	0.427	0.084	0.047	0.019	353.623	g/mile	Sumproduct calculation

	<u>value</u>	<u>units</u>	<u>source</u>
mass conversion rate	453.59	g/lb	wksht: Unit Conversions
mass conversion rate	1,000,000	g/MT	wksht: Unit Conversions

Worker Commute Emissions (exhaust, loss, ware)

	<u>ROG</u>	<u>NOx</u>	<u>PM10</u>	<u>PM2.5</u>	<u>CO2</u>
	lb/day	lb/day	lb/day	lb/day	MT/day
Average daily					0.1
Max. daily	0.3	0.0	0.03	0.01	

Source: calculations

Running Exhaust Emission Rates for On-Road Vehicles

Source: These emission rates were provided by the California Air Resources Board's Mobile Source Emissions Inventory (EMFAC2014), which is available at <http://www.arb.ca.gov/emfac/2014/>.

It is assumed that emission rates for vehicles in the portion of Placer County that is also part of the Lake Tahoe Air Basin are also representative of emission rates in other mountainous areas of Placer County and Nevada County.

EMFAC2014 (v1.0.7) Emission Rates

Region Type: County Model Year: Aggregated

Region: Placer Speed: Aggregated

Calendar Year: 2018

Season: Summer

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

VehClass	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_RUNLOSS	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW
			VMT/day	trips/day	g/mile	g/veh/day	g/trip	g/mile	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/veh/day	g/trip	g/mile	g/mile	g/mile	g/veh/day	g/trip	g/mile	g/mile
LDA	GAS	115,859	4,326,004	729,370	0.018	0.000	0.114	0.280	0.065	0.000	0.118	317.264	0.000	66.389	0.002	0.000	0.002	0.008	0.037	0.002	0.000	0.002	0.002	0.016
LDA	DSL	1,165	45,333	7,151	0.028	0.000	0.000	0.000	0.190	0.000	0.000	275.596	0.000	0.000	0.018	0.000	0.000	0.008	0.037	0.017	0.000	0.000	0.002	0.016
LDT1	GAS	11,906	407,924	71,979	0.047	0.000	0.290	1.220	0.155	0.000	0.242	371.344	0.000	78.082	0.003	0.000	0.004	0.008	0.037	0.002	0.000	0.004	0.002	0.016
LDT1	DSL	25	465	120	0.192	0.000	0.000	0.000	1.152	0.000	0.000	369.773	0.000	0.000	0.143	0.000	0.000	0.008	0.037	0.137	0.000	0.000	0.002	0.016
LDT2	GAS	51,845	2,046,941	325,651	0.023	0.000	0.149	0.519	0.107	0.000	0.215	428.666	0.000	90.043	0.002	0.000	0.002	0.008	0.037	0.001	0.000	0.002	0.002	0.016
LDT2	DSL	64	3,114	412	0.016	0.000	0.000	0.000	0.070	0.000	0.000	347.466	0.000	0.000	0.007	0.000	0.000	0.008	0.037	0.006	0.000	0.000	0.002	0.016
LDA	ELEC	1,365	67,186	8,830	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.037	0.000	0.000	0.000	0.002	0.016
LDT1	ELEC	8	260	49	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.037	0.000	0.000	0.000	0.002	0.016
T6 instate construction heavy	DSL	81	5,763	0	0.115	0.097	0.000	0.000	3.910	7.408	0.000	1227.795	747.752	0.000	0.031	0.023	0.000	0.012	0.130	0.030	0.022	0.000	0.003	0.056

EMFAC2014 only provides idling exhaust emissions for large trucks, but not for passenger vehicles.

EMFAC2014 (v1.0.7) Emission Rates

Region Type: County

Region: Placer

Calendar Year: 2018

Season: Summer

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	ROG_RUNEX	ROG_IDLEX	ROG_STREX	ROG_HOTSOAK	ROG_RUNLOSS	ROG_RESTLOSS	ROG_DIURN	TOG_RUNEX	TOG_IDLEX	TOG_STREX	TOG_HOTSOAK	TOG_RUNLOSS	TOG_RESTLOSS	TOG_DIURN
Placer	2018	LDA	Aggregated	Aggregated	GAS	115859.4398	4326003.576	729370.2259	0.01787673	0	0.114019078	0.175794719	0.279824431	0.602841796	0.895225063	0.025564776	0	0.124802323	0.175794719	0.279824431	0.602841796	0.895225063
Placer	2018	LDA	Aggregated	Aggregated	DSL	1165.276078	45333.02066	7151.405039	0.028394329	0	0	0	0	0	0	0.032325056	0	0	0	0	0	0
Placer	2018	LDA	Aggregated	Aggregated	ELEC	1365.022325	67185.65723	8829.904002	0	0	0	0.004883985	0	0.032078743	0.067191344	0	0	0	0.004883985	0	0.032078743	0.067191344
Placer	2018	LDT1	Aggregated	Aggregated	GAS	11906.12117	407923.6697	71978.87194	0.046614147	0	0.289711599	0.455246283	1.220278334	1.565066247	2.550951444	0.065394915	0	0.317011072	0.455246283	1.220278334	1.565066247	2.550951444
Placer	2018	LDT1	Aggregated	Aggregated	DSL	25.11829794	465.2195397	120.273686	0.191743803	0	0	0	0	0	0	0.218287572	0	0	0	0	0	0
Placer	2018	LDT1	Aggregated	Aggregated	ELEC	8.031107315	260.3373635	49.40504331	0	0	0	0.004883985	0	0.032765017	0.068373973	0	0	0	0.004883985	0	0.032765017	0.068373973
Placer	2018	LDT2	Aggregated	Aggregated	GAS	51844.5125	2046941.346	325651.3021	0.02318819	0	0.149175997	0.197433628	0.518751039	0.751858035	1.06779827	0.033355561	0	0.163295449	0.197433628	0.518751039	0.751858035	1.06779827
Placer	2018	LDT2	Aggregated	Aggregated	DSL	64.48017181	3113.939467	412.3985354	0.016283967	0	0	0	0	0	0	0.018538213	0	0	0	0	0	0
Placer	2018	T6 instate construction heavy	Aggregated	Aggregated	DSL	81.4976181	5763.236596	0	0.1154889	0.097390039	0	0	0	0	0	0.131475321	0.110871146	0	0	0	0	0

CO_RUNEX	CO_IDLEX	CO_STREX	NOx_RUNEX	NOx_IDLEX	NOx_STREX	CO2_RUNEX	CO2_IDLEX	CO2_STREX	PM10_RUNEX	PM10_IDLEX	PM10_STREX	PM10_PMTW	PM10_PMBW	PM2_5_RUNEX	PM2_5_IDLEX	PM2_5_STREX	PM2_5_PMTW	PM2_5_PMBW	SOx_RUNEX	SOx_IDLEX	SOx_STREX
0.951875301	0	1.600477113	0.065081192	0	0.11835981	317.264	0	66.38895904	0.001648115	0	0.00243636	0.008000002	0.036750011	0.001515994	0	0.002241979	0.002000001	0.015750005	0.003182533	0	0.000691569
0.28045292	0	0	0.190495936	0	0	275.5962949	0	0	0.017755172	0	0	0.008000002	0.036750011	0.016987091	0	0	0.002000001	0.015750005	0.002631013	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0	0	0.002000001	0.015750005	0	0
2.096086216	0	3.951879575	0.155057483	0	0.241987041	371.3441491	0	78.08221837	0.002629726	0	0.004270447	0.008000002	0.036750011	0.002421163	0	0.003935943	0.002000001	0.015750005	0.003741462	0	0.000851
1.089281886	0	0	1.151550528	0	0	369.7731871	0	0	0.142937289	0	0	0.008000002	0.036750011	0.136753885	0	0	0.002000001	0.015750005	0.003530084	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0.008000002	0.036750011	0	0	0	0.002000001	0.015750005	0	0
1.238731125	0	2.155596156	0.106801061	0	0.214612214	428.6657789	0	90.04325558	0.001564322	0	0.002291726	0.008000002	0.036750011	0.001438908	0	0.002108878	0.002000001	0.015750005	0.004299246	0	0.000937556
0.133433125	0	0	0.069755489	0	0	347.4658515	0	0	0.006580705	0	0	0.008000002	0.036750011	0.006296026	0	0	0.002000001	0.015750005	0.003317124	0	0
0.345534352	0.605801465	0	3.910327858	7.408137263	0	1227.794934	747.7522694	0	0.030917442	0.022723285	0	0.012000003	0.130340037	0.029579967	0.021740286	0	0.003000001	0.055860016	0.011713738	0.007133906	0

Unit Conversion Rates

Global Warming Potential (rates)

	<u>CO₂</u>	<u>CH₄</u>	<u>N₂O</u>	<u>units</u>
global warming potential	1	25	298	unitless

Source: Table B-1—Global Warming Potential Factors for Required Greenhouse Gases (100-Year Time Horizon) from 40 CFR 98 (page 722-723), as required by ARB's Regulation for the Mandatory Reporting of GHGs (http://www.theclimaterestory.org/wp-content/uploads/2014/11/2014.06.30_GRP_2.0_Updates_and_Clarifications1.pdf)

Mass Conversion Rates

<u>value</u>	<u>units</u>	<u>source</u>
1,000	kg/MT	onlineconversion.com/weight_common.htm
1,000,000	g/MT	onlineconversion.com/weight_common.htm
2,000	lb/ton	onlineconversion.com/weight_common.htm
2,204.62	lb/MT	onlineconversion.com/weight_common.htm
453.59	g/lb	onlineconversion.com/weight_common.htm
1.1023	ton/MT	onlineconversion.com/weight_common.htm
2204.62	lb/MT	onlineconversion.com/weight_common.htm

Distance/Length

5,280	ft/mile	onlineconversion.com/length.htm
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Area

43,560	sq ft/acre	onlineconversion.com/area.htm
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Power

1.341022092	hp/kW	onlineconversion.com/power.htm
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Appendix D

Species List

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
Botanical Species				
Galena Creek rockcress <i>Arabis rigidissima</i> var. <i>demota</i>	SI	CRPR-1B	Rocky areas along edges of conifer and/or aspen stands. Usually found on moderate to steep northerly aspects in moisture accumulating microsites; 7,400–8,400 ft. elev.	Low. No known occurrences in the project area. The project area is located below the elevation range of this species. Suitable upper montane habitat not present in the project area.
Threetip sagebrush <i>Artemisia tripartita</i> ssp. <i>tripartita</i>	—	CRPR-2B	Openings in upper montane coniferous forest, on rocky/volcanic soils; 7,200–8,530 ft. elev.	Low. No known occurrences in the project area. Suitable upper montane habitat not present in the project area.
Tiehm's rock cress <i>Boechnera tiehmii</i>	—	CRPR-1B	Granitic alpine boulder and rock fields; 9,700 to 12,000 ft. elev.	None. The project area is located below the elevation range of this species; no alpine rocky habitats present.
Tulare rockcress <i>Boechnera tularensis</i>	—	CRPR-1B	Bogs and fens, meadows and seeps, marshes and swamps in lower montane and upper montane coniferous forest; 4,200 to 10,700 ft. elev.	None. No known occurrences in the project vicinity. Suitable alpine and upper montane habitat not present in the project area.
Upswept moonwort <i>Botrychium ascendens</i>	—	CRPR-2B	Wet or moist soils, mostly of meadows and riparian areas in lower montane coniferous forest; 5,000–10,200 ft. elev.	Moderate. No known occurrences in the project area. Potential habitat is present in montane riparian, freshwater wetland, and stream habitat.
Scalloped moonwort <i>Botrychium crenulatum</i>	—	CRPR-2B	Bogs, fens, meadows, and seeps, in upper montane coniferous forest, primarily moist meadows near creeks; 4,000–11,000 ft. elev.	Moderate. No known occurrences in the project area. Potential habitat is present in montane riparian, freshwater wetland, and stream habitat.
Common moonwort <i>Botrychium lunaria</i>	—	CRPR-2B	Wet or moist soils, mostly of meadows, seeps, and springs in subalpine and upper montane coniferous forest; 6,400–11,200 ft. elev.	Moderate. No known occurrences in the project area. Potential habitat is present in montane riparian, freshwater wetland, and stream habitat.
Mingan moonwort <i>Botrychium minganense</i>	—	CRPR-2B	Wet or moist soils, mostly of riparian areas, small streams, or fens in upper and lower montane coniferous forest; 5,000–10,000 ft. elev.	Moderate. No known occurrences in the project area. Potential habitat is present in montane riparian, freshwater wetland, and stream habitat.
Western goblin <i>Botrychium montanum</i>	—	CRPR-2B	Wet or moist soils, mostly of meadows and seeps in upper and lower montane coniferous forest; 5,000–7,000 ft. elev.	Moderate. No known occurrences in the project area. Potential habitat is present in montane riparian, freshwater wetland, and stream habitat.
Davy's sedge <i>Carex davyi</i>	-	CRPR-1B	Subalpine and upper montane coniferous forests; 4,800–10,600 ft. elev.	Moderate. Could occur in coniferous forest habitat in the project area.
Woolly-fruited sedge <i>Carex lasiocarpa</i>	-	CRPR-2B	Bogs and fens, and lake margin marshes and swamps at elevations; of 1,980–6,850 ft. elev.	Low. No suitable habitat within the project area.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
Mud sedge <i>Carex limosa</i>	-	CRPR-2B	Upper montane coniferous forest, lower montane coniferous forest, bogs and fens, meadows and seeps, marshes and swamps (in floating bogs and soggy meadows, often at edges of lakes); 4,000-9,000 ft. elev.	Low. Boggy habitats preferred by this species are not present.
Tahoe draba <i>Draba asterophora</i> var. <i>asterophora</i>	SI	CRPR-1B	Alpine boulder and rock fell field in rock crevices and open granite talus slopes, subalpine coniferous forest, usually on northeast-facing slopes; 8,200-10,500 ft. elev.	None. No documented occurrences in vicinity of project area. Project area is located below the elevation range of this species. No suitable habitat present.
Cup Lake draba <i>Draba asterophora</i> var. <i>macrocarpa</i>	SI	CRPR-1B	Subalpine coniferous forest on steep, gravelly or rocky slopes; 8,200-9,200 ft. elev.	None. No documented occurrences in vicinity of project area. project area is located below the elevation range of this species. No suitable habitat present.
Mineral King draba <i>Draba cruciate</i>	-	CRPR-1B	Subalpine coniferous forest, on gravelly soils, 8,200 - 10,900 ft elev.	None. No documented occurrences in vicinity of project area. project area is located below the elevation range of this species. No suitable habitat present.
Starved daisy <i>Erigeron miser</i>	-	CRPR-2B	Cracks or clefts in granite outcrops; 6,000-8,500 ft. elev.	Low. No known occurrences in the project area. Suitable rocky outcrop microsites within upper montane habitat are limited.
Jack's wild buckwheat <i>Eriogonum luteolum</i> var. <i>saltuarium</i>	-	CRPR-1B	Great Basin scrub, upper montane coniferous forest on sandy, granitic soils, 5,600 -7,900 ft. elev.	Low. No known occurrences in project vicinity. Suitable upper montane habitat not present on site.
Donner Pass buckwheat <i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	-	CRPR-1B	Highly erosive, shallow, rocky volcanic soils with sparse vegetation; 6,000-8,600 ft. elev.	Low. No known occurrences in the project area. Suitable upper montane habitat not present on site.
American manna grass <i>Glyceria grandis</i>	-	CRPR-2	Bog, fens, meadows, seeps, marshes, and swamps; streambanks and lake margins; 50-6,500 ft. elev.	Low. Potential habitat is limited in the project area.
Blandow's bog moss <i>Helodium blandowii</i>	-	CRPR-2B	Bogs and fens with calcareous groundwater in subalpine coniferous forest; 5,000-9,500 ft. elev.	Low. No known occurrences in the project vicinity. No suitable habitat present in the project area.
Short-leaved hulsea <i>Hulsea brevifolia</i>	-	CRPR-1B	Upper and lower montane coniferous forest, primarily red fir forests, on volcanic or granitic gravel or sand, or on slate; 4,200-10,500 ft. elev.	Moderate. No known occurrences in the project vicinity. However, potential habitat exists in conifer forest in the project area.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
Plumas ivesia <i>Ivesia sericoleuca</i>	—	CRPR-1B	Vernally wet portions of meadows and alkali flats, and in vernal pools within sagebrush scrub or lower montane coniferous forest, often on volcanic soils; 4,300-7,200 ft.	Low. No known occurrences in the project vicinity. No suitable habitat present in the project area. Species occurs west of the project area in Martis Valley.
Santa Lucia dwarf rush <i>Juncus luciensis</i>	—	CRPR-1B	Wet, sandy soils in riparian habitats, meadows and seeps, and vernal pools within chaparral, sagebrush scrub, and lower montane coniferous forest; 1,000-6,700 ft. elev.	Moderate. Could occur in riparian and freshwater wetland habitats in the project area.
Long-petaled lewisia <i>Lewisia longipetala</i>	SI	CRPR-1B	Northerly exposures on slopes and ridge tops in alpine boulder and rock field, subalpine coniferous forest; often found near the margins of persistent snow banks in wet soils 8,200-9,400 ft. elev.	None. No documented occurrences in vicinity of project area. No suitable habitat present in the project area; and, project area is located below the elevation range of this species.
Broad-nerved hump-moss <i>Meesia uliginosa</i>	—	CRPR-2B	Bogs and fens, and permanently wet meadows, typically spring fed, in subalpine and upper montane coniferous forest; 4,200-8,200 ft. elev.	Low. No known occurrences in the project vicinity. Suitable habitat is not present in the project area.
Whitebark pine <i>Pinus albicaulis</i>	FC	—	Thin, rocky, cold soils at or near timberline in subalpine forests; 7,000-12,000 ft. elev.	None. No suitable habitat present in the project area. The project area is located below the elevation range of this species.
Alder buckthorn <i>Rhamnus alnifolia</i>	—	CRPR-2B	Meadows, seeps, and riparian scrub within lower and upper montane coniferous forests; 4,500-7,000 ft. elev.	Moderate. Potential habitat is present riparian and freshwater wetland habitats in the project area.
Tahoe yellow cress <i>Rorippa subumbellata</i>	SI	CE, CRPR-1B	Decomposed granitic beaches on Lake Tahoe; species is endemic to Lake Tahoe Basin beaches; 6,217-6,234 ft. elev.	None. Species only occurs on beaches of Lake Tahoe.
Marsh skullcap <i>Scutellaria galericulata</i>	—	CRPR-2B	Meadows, seeps, marshes, and swamps in sunny openings in lower montane coniferous forest; 0-7,000 ft. elev.	Moderate. Potential habitat is present in freshwater wetland and riparian habitats in the project area.
Munro's desert mallow <i>Sphaeralcea munroana</i>	—	CRPR-2B	Sagebrush scrub; 6,560 ft. elev.	None. No known occurrences in the project vicinity. Suitable great basin scrub habitat for this species is not present on the project area.
Fish				
Cui-ui <i>Chasmistes cujus</i>	E	—	Occurs in Pyramid Lake, spawns in lower Truckee River.	None. Project area is outside of the known range of this species.
Lahontan Lake tui chub <i>Gila bicolor pectinifer</i>	—	C-SSC	Pelagic fish that feed on zooplankton in the open water of Lake Tahoe.	None. No suitable aquatic habitat is present. Species occurs in Lake Tahoe; spawns in shallow near-shore environments with aquatic vegetation.
Lahontan cutthroat trout <i>Oncorhynchus clarkii henshawi</i>	FT, SI	—	Only trout species native to lakes and streams in the Tahoe Basin. Found in both lake and stream habitats, but spawn	Low. The one perennial stream in the project area – Dollar Creek – is not known or currently expected to support this species due to limited habitat

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			in stream environments. Lahontan cutthroat trout (LCT) requires gravels and riffles for spawning and generally does not persist or occur with nonnative salmonids.	function, barriers to movement, presence of introduced species, and overall rarity of LCT in the watershed. Current population within the Tahoe Basin is restricted to introduced populations in the headwater streams and lakes of the Upper Truckee River watershed, and Fallen Leaf Lake. Lahontan cutthroat trout released into Lake Tahoe in 2011 are not expected to have survived this long due to predation from non-native species.
Delta smelt <i>Hypomesus transpacificus</i>	FT	C-SE	Upper estuarine areas in or just upstream of the mixing zone between fresh and salt water in the San Francisco Bay-Delta.	None. Outside of the known range of the species.
Central Valley steelhead <i>Oncorhynchus mykiss</i>	FT	—	Anadromous or resident inland; rivers in the Sacramento and San Joaquin Valley and their tributaries; needs cold water and gravel substrates.	None. Outside of the known range of the species.
Amphibians				
Sierra Nevada yellow-legged frog <i>Rana sierrae</i>	FE	C-ST	Occurs in upper elevation lakes, ponds, bogs, and slow-moving alpine streams. Most Sierra Nevada populations are found between 6,000–12,000 feet elevation. Almost always found within 3.280853 feet of water, and associated with montane riparian habitats in lodgepole pine, ponderosa pine, Jeffrey pine, sugar pine, white fir, whitebark pine, and wet meadow vegetation types. Alpine lakes inhabited by mountain yellow-legged frogs generally have grassy or muddy margin habitat, although below treeline sandy and rocky shores may be preferred. Suitable stream habitat can be highly variable, from high gradient streams with plunge pools and waterfalls, to low gradient sections through alpine meadows. Low-gradient streams are preferred because breeding and tadpole development cannot occur in streams with fast-moving water. Small streams are generally unoccupied and have no potential breeding locations because of the lack of depth for overwintering and refuge. Although Sierra Nevada yellow-legged frogs have been observed successfully breeding in shallow locations less than 7 feet deep, typically depth is an important factor for breeding	Low. The only known population in the Tahoe Basin occurs at Hell Hole bog, in the southern end of the Lake Tahoe Basin, over 25 miles south of the project area. The closest known population is outside of the Tahoe Basin in the vicinity of Five Lakes near Squaw Valley. There are also limited records of the species on the Tahoe National Forest, with the largest known population in the Soda Springs area more than 12 miles northwest of the project area. Suitable breeding and wintering habitat necessary for persistence of a population includes perennial waters of sufficient depth to avoid freezing. There are no deep perennial waters in the project area. Therefore, the species is not expected to occur in the project area.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			locations since adults and larvae require overwintering habitat. For up to nine months, adults and larvae will live/hibernate below ice, or in nonfrozen portions of ponds or lakes, so adequate depth (greater than 2 m) is necessary to avoid having the pond or lake freeze through.	
Yosemite toad <i>Bufo canorus</i>	FT	C-SSC	Endemic California toad found in wet meadows between 4,000 and 12,000 feet in the Sierra Nevada from Alpine County south to Fresno County.	None. Project area is outside of the known range for the species.
Birds				
Northern goshawk <i>Accipiter gentilis</i>	SI	C-SSC	In the Sierra Nevada, this species generally requires mature conifer forests with large trees, snags, downed logs, dense canopy cover, and open understories for nesting; aspen stands also are used for nesting. Foraging habitat includes forests with dense to moderately open overstories and open understories interspersed with meadows, brush patches, riparian areas, or other natural or artificial openings. Goshawks reuse old nest structures and maintain alternate nest sites.	High. Northern goshawk has not been documented in the project area. In 2011, focused surveys for goshawk were conducted in a portion of the project area by Hauge Brueck Associates biologists for the Dollar Creek Shared-Use Trail Project (Placer County and TRPA 2012). However, suitable foraging and nesting habitat for northern goshawk is present in conifer forest throughout much of the project area, and multiple detections and goshawk nesting have been documented in the vicinity west and north of the project area. Additionally, a small amount of the southwest corner of the project area is located just within a TRPA-designated goshawk disturbance zone.
Golden eagle <i>Aquila chrysaetos</i>	BGEPA, SI	C-FP	Mountains and foothills throughout California. Nest on cliffs and escarpments or in tall trees.	Low. Golden eagle has been documented within the Lake Tahoe Basin, however this species generally prefers to nest on or near rock outcrops and cliffs, and prefers more open habitats for foraging than occurs in the project area.
Long-eared owl <i>Asio otus</i>	—	C-SSC	Found in a variety of habitat types throughout its range. Nest in woodland, forest, and open settings (e.g., grassland, shrub-steppe, and desert). Occupy wooded and nonwooded areas that support relatively dense vegetation (e.g., trees, shrubs) adjacent to or within larger open areas such as grasslands or meadows (i.e., habitat edges) (Bloom 1994; Marks, Evans, and Holt 1994). This species also has been documented breeding in contiguous conifer forest habitat with heavy mistletoe infestation (Bull, Wright, and Henjum 1989). Trees and shrubs used for	Low (Nesting). Habitat with some attributes suitable for this species are present (wooded areas); however, species is not known to nest in or near the project area.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			nesting and roosting include oaks, willows, cottonwoods, conifers, and junipers (Marks, Evans, and Holt 1994).	
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	FT	C-ST	Willow and cottonwood riparian habitats along the Sacramento and San Joaquin Rivers in the Central Valley of California.	None. Outside of the known range of the species, and no suitable riparian forest present in the project area.
Olive-sided flycatcher <i>Contopus cooperi</i>	—	C-SSC	Summer resident and migrant that breeds primarily in late-succession conifer forest with open canopy. Species prefers to forage near forest openings or edges.	High. Olive-sided flycatcher has not been documented in the project area, but conifer forest in the project area provides suitable foraging and nesting habitat, and the species is not uncommon in the vicinity.
Yellow warbler <i>Setophaga petechia</i>	—	C-SSC	In the Sierra Nevada, yellow warbler typically breeds in wet areas with dense riparian vegetation. Breeding habitats primarily include willow patches in montane meadows, and riparian scrub and woodland dominated by willow, cottonwood, aspen, or alder with dense understory cover. Localized breeding has been documented in more xeric sites including chaparral, wild rose (<i>Rosa</i> spp.) thickets, and young conifer stands (Siegel and DeSante 1999, RHJV 2004).	Moderate. Yellow warbler has not been documented in the project area. In 2011, focused surveys for yellow warbler were conducted in a portion of the project area along Dollar Creek by Hauge Brueck Associates biologists for the Dollar Creek Shared-Use Trail Project (Placer County and TRPA 2012). However, riparian habitat along Dollar Creek provides suitable habitat for yellow warbler; other riparian areas in the project area may also provide potential habitat. Because treatment activities and crossings would not occur on Class I (e.g., Dollar Creek) or Class II (intermittent) waterways, or within riparian areas and SEZs (except for the potential for stream crossings on dry, Class III watercourses), forestry treatments would not be implemented within suitable yellow warbler nesting habitat.
Willow flycatcher <i>Empidonax traillii brewsteri</i>	—	C-SE	In the Sierra Nevada, suitable habitat typically consists of montane meadows that support riparian deciduous shrubs (particularly willows) and remain wet through the nesting season (i.e., midsummer). Important characteristics of suitable meadows include a high water table that results in standing or slow-moving water, or saturated soils (e.g., “swampy” conditions) during the breeding season; abundant riparian deciduous shrub cover (particularly willow); and riparian shrub structure with moderate to high foliar density that is uniform from the ground to the shrub canopy. Most breeding occurrences are in meadows larger than 19 acres, but the average size of occupied meadows is approximately 80 acres. Although less common in the Sierra Nevada, riparian habitat along streams also can function as suitable habitat for willow flycatcher. However,	Low. No riparian areas that contain the necessary hydrology and floodplain characteristics to provide suitable breeding habitat for willow flycatcher are present in the project area.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			those areas must support the hydrologic and vegetation characteristics described for suitable meadows (e.g., standing or slow-moving water, and abundant and dense riparian vegetation).	
Peregrine falcon <i>Falco peregrinus anatum</i>	TRPA	C- FP	Nest and roost on protected ledges of high cliffs, usually adjacent to water bodies and wetlands that support abundant avian prey.	Low. Suitable nesting habitat not present in the project area. However, peregrine falcons could occasionally forage in the study area.
Bald eagle <i>Haliaeetus leucocephalus</i>	De-listed; SI	C-SE, C- FP	Use ocean shorelines, lake margins, and river courses for both nesting and wintering. Most nests are within 1 mile of water, in large trees with open branches. Roost communally in winter.	Low. Bald eagle does not nest in or near the project area. This species is known to nest in only two areas of the Tahoe Basin (Emerald Bay and Marlette Lake), which are several miles from the project area. Bald eagle is not expected to regularly use the area due to the lack of foraging habitat (no large waterbodies or streams). Any bald eagle occurrence and habitat use in the area would be most likely during winter, when the species is more abundant in the Tahoe region.
Osprey <i>Pandion haliaetus</i>	TRPA	—	Associated with large fish-bearing waters. Nest usually within 0.25 mile of fish-producing water, but may nest up to 1.5 miles from water. In the Tahoe Basin, osprey nests are distributed primarily along the Lake Tahoe shoreline, at the northern portion of the east shore and southern portion of the west shore. Other osprey nest sites in the Tahoe Basin occur along the shorelines of smaller lakes (e.g., Fallen Leaf Lake) and in forest uplands up to 1.5 miles from lakes.	Low. Osprey nests and forages in suitable habitat throughout the Tahoe region; however, osprey is not known to nest in the project area. A small portion of the southeast corner is located just within a TRPA-designated osprey 0.25-mile nest buffer; this nest site was not considered active in 2015 (TRPA mapping). Potential perch and nest sites are present in the project area. However, use of the project area by osprey would likely be limited due to the presence of more suitable habitat located nearby on Lake Tahoe. Additionally, proposed fuels and vegetation treatments in the project area are not expected to degrade osprey habitat.
Great gray owl <i>Strix nebulosa</i>	—	C-SE	Found in Central Sierra mature mixed conifer forests near meadows. Scattered along the west slope of the Sierra, between 4,500 and 7,500 feet elevation, from Plumas County to Yosemite National Park.	None. Suitable habitat is not present in the project area, and the species has not been documented in the area.
California spotted owl <i>Strix occidentalis occidentalis</i>	—	C-SSC	Occur in several forest vegetation types including mixed conifer, ponderosa pine, red fir, and montane hardwood. Nesting habitat is generally characterized by dense canopy closure (i.e., greater than 70 percent) with medium to large trees and multistoried stands (i.e., at least two canopy layers). Foraging habitat can include intermediate to late-	High. Spotted owl has not been documented in the project area. In 2011, focused surveys for spotted owl were conducted in a portion of the project area by Hauge Brueck Associates biologists for the Dollar Creek Shared-Use Trail Project (Placer County and TRPA 2012). However, suitable foraging and nesting habitat for spotted owl is present in conifer forest throughout much of the project area, and multiple detections of spotted

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			successional forest with greater than 40 percent canopy cover.	owls have been documented in the vicinity west and north of the project area.
Mammals				
Sierra Nevada mountain beaver <i>Aplodontia rufa californica</i>	—	C-SSC	Uses riparian habitats with soft, deep soils for burrowing, lush growth of preferred food sources such as willow and alder, and a variety of herbaceous species for bedding material. Vegetation types preferred include wet meadows and willow-alder-dominated riparian corridors typically near water sources. Suitable riparian habitats are characterized by dense growth of small deciduous trees and shrubs near permanent water. Mountain beaver is generally solitary, except during its short breeding season; beavers spend a high proportion of their time in extensive underground burrow systems with multiple openings, tunnels, and food caches.	Moderate. Sierra Nevada mountain beaver has not been documented in the project area; however, surveys for the species have not been conducted. Riparian habitat along Dollar Creek provides suitable habitat for Sierra Nevada mountain beaver; and, an occurrence of the species along Dollar Creek upstream of the project area is reported in the CNDDDB. Because treatment activities and crossings would not occur on Class I (e.g., Dollar Creek) or Class II (intermittent) waterways, or within riparian areas and SEZs (except for the potential for stream crossings on dry, Class III watercourses), forestry treatments would not be implemented within suitable habitat for Sierra Nevada mountain beaver.
Sierra Nevada snowshoe hare <i>Lepus americanus tahoensis</i> .	—	C-SSC	In the Sierra Nevada, found in boreal zones, typically inhabiting riparian communities with thickets of deciduous trees and shrubs such as willows and alders.	Low. Optimal habitat is not present in the project area where vegetation and fuels treatments would occur.
California wolverine <i>Gulo gulo luteus</i>	FPT	C-ST, C-FP	Inhabit upper montane and alpine habitats of Sierra Nevada, Cascades, Klamath, and north Coast Ranges. Need water source and denning sites. Rarely seen. Sensitive to human disturbance.	Low. Suitable habitat is not present in the project area, and there have been very few documented occurrences in the region.
Mule deer <i>Odocoileus hemionus</i>	SI	—	Year-long resident or elevational migrant that prefer a wide distribution of various-aged vegetation for cover, meadow, and forest openings, and free water. In the Sierra Nevada, early to mid-successional forests, woodlands, and riparian and brush habitats are preferred because of the greater diversity of shrubby vegetation and woody cover. In addition to forage, vegetative cover is critical for thermoregulation. Suitable habitats include a mosaic of vegetation such as forest or meadow openings, dense woody thickets and brush, edge habitat, and riparian areas. Fawning habitat, used by does during birth and by newborn fawns, is of critical importance for reproductive success. A diversity of thermal cover, hiding cover, succulent forage, and water are	Present. The project area includes suitable foraging habitat and deer are present there. The project area includes potential fawning habitat for mule deer in riparian and wet meadow areas; however, the suitability of these areas for deer fawning is limited due to the existing levels of human disturbance and lack of dense vegetation in some areas.

Table D-1 Special-Status Species Evaluated for the Dollar Creek Forest Health and Biomass Project

Species	Regulatory Status ¹		Habitat Associations	Potential to Occur or Be Affected in the Project Area ²
	Federal/ TRPA	State/ Other		
			needed during fawning. Optimal deer fawning habitat has been described as having moderate to dense shrub cover near forest cover and water, such as riparian zones. A source of surface water (e.g., creek or river) is especially important to mule deer. Typical fawning habitat varies in size, but an area of 5–26 acres is adequate, with optimal fawn-rearing habitat of around 400 acres.	
Townsend’s big-eared bat <i>Corynorhinus townsendii</i>	—	C-SSC, WBWG-H	Range throughout California, mostly in mesic habitats. Limited by available roost sites (i.e., caves, tunnels, mines, and buildings).	Low. This species has been detected only infrequently in the Tahoe Basin, and optimal roosting habitat is not present in the project area.
Pallid bat <i>Antrozous pallidus</i>	—	C-SSC, WBWG-H	Locally common at lower elevations in California and occurs in grassland, shrubland, woodland, and mixed conifer forests. Absent from highest elevation locations in the Sierra Nevada. Rocky outcrops, caves, crevices, and occasional tree cavities or buildings provide roosts.	Moderate. No documented occurrences in the project area; however, conifer forest habitat in the project area could provide foraging or roosting habitat. Large trees and snags may provide suitable roosting sites.
Western red bat <i>Lasiurus blossevillii</i>	—	C-SSC, WBWG-H	Day roosting common in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. An association with intact riparian habitat may exist (particularly willows, cottonwoods, and sycamores).	Moderate. In the project area, western red bat has not been documented but potential habitat is present and the species could occur, particularly along the Dollar Creek riparian zone.

¹ Regulatory Status Definitions:

TRPA/Federal:

- SI = TRPA sensitive/special interest (threshold) species
- FT = Threatened species under the Federal Endangered Species Act
- FE = Endangered species under the Federal Endangered Species Act
- FPT = Proposed for listing as Threatened under the Federal Endangered Species Act
- FC = Candidate for listing under the Federal Endangered Species Act
- BGEPA = Protected under the Bald and Golden Eagle Protection Act

State:

CA (California Department of Fish and Wildlife)

- C-SE = California Endangered
- C-ST = California Threatened
- C-FP = California Fully Protected
- C-SSC = California Species of Special Concern
- CRPR = California Rare Plant Rank
- 1A = Plants presumed extinct in California
- 1B = Plants considered rare or endangered in California and elsewhere
- 2 = Plants considered rare or endangered in California, but more common elsewhere.

Other:

- WBWG = Western Bat Working Group
- H = Bats with high priority

² Potential for Occurrence Definitions

- Present** – Species was observed during site visits conducted for this analysis or was documented on the site by another reputable source.
- High** – All of the species’ specific life history requirements can be met by habitat present on the site, and populations/occurrences are known to occur in the immediate vicinity.
- Moderate** – Some or all of the species life history requirements are provided by habitat on the site; populations/occurrences may not be known to occur in the immediate vicinity, but are known to occur in the region (Tahoe Basin).
- Low** – Species not likely or expected to occur due to marginal habitat quality or distance from known occurrences.
- None** – None of the species’ life history requirements are provided by habitat on the site and/or the site is outside of the known distribution or elevation range for the species.

