

Appendices

Appendix A: Vegetation Management-Related CEQA Categorical Exemptions

From Title 14. California Code of Regulations - Chapter 3. Guidelines for Implementation of the California Environmental Quality Act (Article 19. Categorical Exemptions)

15300. Categorical Exemptions

Section 21084 of the Public Resources Code requires these Guidelines to include a list of classes of projects which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA.

In response to that mandate, the Secretary for Resources has found that the following classes of projects listed in this article do not have a significant effect on the environment, and they are declared to be categorically exempt from the requirement for the preparation of environmental documents.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21084, Public Resources Code.

15300.2. Exceptions

- (a) **Location.** Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located—a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply all instances, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.
- (b) **Cumulative Impact.** All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.
- (c) **Significant Effect.** A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.
- (d) **Scenic Highways.** A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.
- (e) **Hazardous Waste Sites.** A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.
- (f) **Historical Resources.** A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.

15301. Existing Facilities

Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized below are not intended to be all-inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use.

Examples include but are not limited to:

(b) Existing facilities of both investor and publicly-owned utilities used to provide electric power, natural gas, sewerage, or other public utility services;

(c) Existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities (this includes road grading for the purpose of public safety).

(h) Maintenance of existing landscaping, native growth, and water supply reservoirs (excluding the use of pesticides, as defined in Section 12753, Division 7, Chapter 2, Food and Agricultural Code);

Discussion: This section describes the class of projects wherein the proposed activity will involve negligible or no expansion of the use existing at the time the exemption is granted. Application of this exemption, as all categorical exemptions, is limited by the factors described in section 15300.2. Accordingly, a project with significant cumulative impacts or which otherwise has a reasonable possibility of resulting in a significant effect does not qualify for a Class 1 exemption.

15304. Minor Alterations to Land

Class 4 consists of minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. Examples include, but are not limited to:

- (i) Fuel management activities within 30 feet of structures to reduce the volume of flammable vegetation, provided that the activities will not result in the taking of endangered, rare, or threatened plant or animal species or significant erosion and sedimentation of surface waters. This exemption shall apply to fuel management activities within 100 feet of a structure if the public agency having fire protection responsibility for the area has determined that 100 feet of fuel clearance is required due to extra hazardous fire conditions.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21084, Public Resources Code.

Discussion: This section describes the class of projects involving minor alterations to the land. The 1998 revision to the section specified that this exemption applies to fuel management activities which will not impact threatened or endangered species or result in significant erosion or sedimentation.

15333. Small Habitat Restoration Projects.

Class 33 consists of projects not to exceed five acres in size to assure the maintenance, restoration, enhancement, or protection of habitat for fish, plants, or wildlife provided that:

- (a) There would be no significant adverse impact on endangered, rare or threatened species or their habitat pursuant to section 15065,
- (b) There are no hazardous materials at or around the project site that may be disturbed or removed, and

- (c) The project will not result in impacts that are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.
- (d) Examples of small restoration projects may include, but are not limited to:
 - (4) projects to restore or enhance habitat that are carried out principally with hand labor and not mechanized equipment.

Authority cited: Section 21083, Public Resources Code. Reference: Section 21084, Public Resources Code.

Appendix B: Wildfire-Related California Public Resource Code Sections

4252. Upon the written petition of the owners or authorized agents of more than 50 percent of the land, including public land, within the exterior boundaries of any area of not less than 10,000 acres in size, upon which a fire hazard exists due to the presence of flammable material or cover, the board may designate such area as a hazardous fire area, and shall declare the period of time during which the area shall be so designated.

4253. Whenever the director determines that a fire hazard exists in any other area due to the presence of flammable material or cover, he may by regulation designate such area to be a hazardous fire area. The regulation shall declare the period of time during which the area shall be so designated.

4254. Notice of the designation of each hazardous fire area designated pursuant to Section 4252 shall be given by the posting of notices at intervals of not greater than one mile along the exterior boundaries of the area or along roads and trails passing through the area.

4255. (a) Except as provided in this section, a person shall not smoke or build a campfire or other open fire within a hazardous fire area. (b) The board may designate by regulation campgrounds or campsites within hazardous fire areas where smoking and the building of campfires are allowed. However, no campground or campsite shall be designated without the consent of the owner, or his authorized agent, of the land upon which it is located.

4256. Whenever it is necessary in the interest of public peace or safety, the director, with the consent of the owner of any lands designated as a hazardous fire area, may declare such lands closed to entry by any person. Any public highway traversing such a hazardous fire area, shall, however, be excluded from the order of closure, and the closure to entry does not prohibit or curtail the entry or use of the lands by the owner of the lands or his agent, nor the entry by any federal, state or county officer upon the closed area in the performance of his official duties. All state and county law enforcement officers shall enforce the order of closure.

4257. Any order which is issued pursuant to Section 4256 shall be published twice in at least one newspaper of general circulation in any county that is affected by the order. The publication shall be separated by a period of not less than one week and not more than two weeks. The order shall also be posted in such public places in each county as the director may direct, and along roads and trails which pass through the areas declared to be closed to camping or entry.

4258. Whenever the director determines that a fire hazard exists in any area within a state responsibility area due to the presence of flammable material or cover, the director, by regulation, may designate that area as a hazardous fire area for the purpose of prohibiting the use or possession of fireworks therein. The hazardous fire area shall include only those areas that are critical and hazardous due to the threat of wildfire to life, property, and natural resources posed by the fireworks. The hazardous fire area shall not include areas that are the responsibility of a county which is contracting for fire protection to the director. The regulation may designate areas where specified types of fireworks, not otherwise prohibited, are allowed for industrial, commercial, or agricultural use, for ceremonies, or for emergency signaling.

4259. (a) The use or possession of fireworks is prohibited within any hazardous fire area designated pursuant to Section 4252 or 4258.

However, the use of fireworks within any hazardous fire area may be allowed, if the use is determined by the director not to present a fire hazard. (b) Notwithstanding subdivision (a), fireworks may be possessed in a vehicle on any public highway traversing a hazardous fire area when not otherwise prohibited.

4260. No regulation adopted pursuant to this article shall prohibit or curtail the complete possession and use of any area by the owner of the area or the owner's agent, except that the use or possession of fireworks shall not be allowed in a hazardous fire area designated pursuant to Section 4258, other than as designated for their use or possession pursuant to that section.

4290. (a) The board shall adopt regulations implementing minimum fire safety standards related to defensible space which are applicable to state responsibility area lands under the authority of the department. These regulations apply to the perimeters and access to all residential, commercial, and industrial building construction within state responsibility areas approved after January 1, 1991... The regulations shall include all of the following:

- (1) Road standards for fire equipment access.
- (2) Standards for signs identifying streets, roads, and buildings.
- (3) Minimum private water supply reserves for emergency fire use.
- (4) Fuel breaks and greenbelts.

(b) These regulations do not supersede local regulations which equal or exceed minimum regulations adopted by the state.

4291. A person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, shall at all times:

Maintain around and adjacent to the building or structure additional fire protection or firebreak made by removing all brush, flammable vegetation, or combustible growth that is located within 100 feet from the building or structure...

Prior to constructing a new building or structure or rebuilding a building or structure damaged by a fire in such an area, the construction or rebuilding of which requires a building permit, the owner shall obtain a certification from the local building official that the dwelling or structure, as proposed to be built, complies with all applicable state and local building standards..

The director (CAL FIRE) may authorize the removal of vegetation that is not consistent with the standards of this section. The director may prescribe a procedure for the removal of that vegetation and make the expense a lien upon the building, structure, or grounds..

4291.1 (a) ...A violation of Section 4291 is an infraction punishable by a fine of not less than one hundred dollars (\$100), nor more than five hundred dollars (\$500)...

4292. Except as otherwise provided in Section 4296, any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or forest-covered land, brush-covered land, or grass-covered land shall ... maintain around and adjacent to any pole or tower which supports a switch, fuse, transformer, lightning arrester, line junction, or dead end or corner pole, a firebreak which consists of a clearing of not less than 10 feet in each direction from the outer circumference of such pole or tower. This section does not, however, apply to any line which is used exclusively as telephone ...or other line which is classed as a communication circuit by the Public Utilities Commission.

4293. Except as otherwise provided in Sections 4294 to 4296, inclusive, any person that owns, controls, operates, or maintains any electrical transmission or distribution line upon any mountainous land, or in forest-covered land, brush-covered land, or grass-covered land shall ... maintain a clearance between all vegetation and all conductors which are carrying electric current:

- (a) For any line which is operating at 2,400 or more volts, but less than 72,000 volts, four feet.
- (b) For any line which is operating at 72,000 or more volts, but less than 110,000 volts, six feet.
- (c) For any line which is operating at 110,000 or more volts, 10 feet.

4296. Sections 4292 and 4293 do not apply if the transmission or distribution line voltage is 750 volts or less.

4297. Upon the showing of the director that the unrestricted use of any grass-covered land, grain-covered land, brush-covered land, or forest-covered land is, in the judgment of the director, a menace to life or property due to conditions tending to cause or allow the rapid spread of fires which may occur on such lands or because of the inaccessible character of such lands, the Governor through the director, may, by a proclamation, which declares such condition and designates the area to which, and the period during which the proclamation shall apply, require that such area be closed to hunting and fishing and to entry by any person except a person that is within one of the following classes:

- (a) Owners and lessees of land in the area.
- (b) Bona fide residents in the area.
- (c) Persons engaged in some bona fide business, trade, occupation, or calling in the area and persons employed by them in connection with such business, trade, occupation, or calling.
- (d) Authorized agents or employees of a public utility entering such area for the purpose of operating or maintaining public utility works or equipment within the area.
- (e) Members of any organized firefighting force.
- (f) Any federal, state or local officer in the performance of his duties.
- (g) Persons traveling on public roads or highways through the area.

4421. A person shall not set fire or cause fire to be set to any forest, brush, or other flammable material which is on any land that is not his own, or under his legal control, without the permission of the owner, lessee, or agent of the owner or lessee of the land.

4422. A person shall not do any of the following:

- (a) Willfully or knowingly allow fire to burn uncontrolled on land which he owns or controls, or to escape to the lands of any person other than that of the owner.
- (b) Allow any fire kindled or attended by him to escape from his control or to spread to the land of any person other than from the land from which the fire originated.

4423. A person shall not burn any brush, stumps, logs, fallen timber, fallows, slash, grass-covered land, brush-covered land, forest-covered land, or other flammable material, in any state responsibility area, area receiving fire protection by the department by contract, or upon federal lands administered by the United States Department of Agriculture or Department of the Interior, unless the person has a written permit from the department or its duly authorized representative or the authorized federal officer on federal lands administered by the United States Department of Agriculture or of the Interior and in strict accordance with the terms of the permit:

- (a) At any time in Zone A.
- (b) At any time in Zone B between May 1st and the date the director declares, by proclamation, that the hazardous fire conditions have abated for that year...

4423.1. Burning under permit by any person on public or private lands, except within incorporated cities, may be suspended, restricted, or otherwise prohibited by proclamation. ... (P)ublic officers may issue a proclamation, which shall be applicable within their respective jurisdictions:

- 4423.2. (a) Whenever the burning under permit has been suspended, restricted, or prohibited ...the officer having jurisdiction may issue a restricted temporary burning permit...
- 4423.3. The use of a campfire is not restricted or prohibited by a proclamation issued pursuant to Section 4423.1, unless specifically restricted or prohibited in that or a subsequent proclamation. If restricted by proclamation, campfires shall be confined to facilities constructed for that purpose within the confines of a campground established, maintained, and open for public use...
- 4423.4. Outdoor smoking is not restricted or prohibited by a proclamation issued pursuant to Section 4423.1, unless specifically restricted or prohibited in that or a subsequent proclamation. If restricted by proclamation, smoking shall be confined to the following:
- (a) Within motor vehicles while operating or parked on established roads, rest stops, or parking areas cleared of flammable vegetation.
 - (b) Within established campgrounds open to the public.
 - (c) Within an area that is at least three feet or approximately one meter in diameter which has been cleared to mineral soil by removal of all flammable vegetation and duff...
- 4423.5. Use of open fire or burning under permit within an area closed by proclamation... is a misdemeanor.
4425. Any violation of the terms of a burning permit issued pursuant to Section 4423, a restricted temporary burning permit issued pursuant to Section 4423.2, or a campfire permit issued pursuant to Section 4433 renders the permit null and void.
4426. A person shall not set a backfire, or cause a backfire to be set, except under the direct supervision or permission of a state or federal forest officer, unless it can be established that the setting of such backfire was necessary for the purpose of saving life or valuable property.
4427. During any time of the year when burning permits are required in an area pursuant to this article, no person shall use or operate any motor, engine, boiler, stationary equipment, welding equipment, cutting torches, tarpots, or grinding devices from which a spark, fire, or flame may originate, which is located on or near any forest-covered land, brush-covered land, or grass-covered land, without doing both of the following:
- (a) First clearing away all flammable material, including snags, from the area around such operation for a distance of 10 feet.
 - (b) Maintain one serviceable round point shovel with an overall length of not less than forty-six (46) inches and one backpack pump water-type fire extinguisher fully equipped and ready for use at the immediate area during the operation.
- This section does not apply to portable powersaws and other portable tools powered by a gasoline-fueled internal combustion engine.
4428. No person, except any member of an emergency crew or except the driver or owner of any service vehicle owned or operated by or for, or operated under contract with, a publicly or privately owned utility, which is used in the construction, operation, removal, or repair of the property or facilities of such utility when engaged in emergency operations, shall use or operate any vehicle, machine, tool or equipment powered by an internal combustion engine operated on hydrocarbon fuels, in any industrial operation located on or near any forest, brush, or grass-covered land between April 1 and December 1 of any year, or at any other time when ground litter and vegetation will sustain combustion permitting the spread of fire, without providing and maintaining, for firefighting purposes only, suitable and serviceable tools in the amounts, manner and location prescribed in this section.
- (a) On any such operation a sealed box of tools shall be located, within the operating area, at a point accessible in the event of fire. This fire toolbox shall contain: one backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and a sufficient number of shovels so that each employee at the operation can be equipped to fight fire.

- (b) One or more serviceable chainsaws of three and one-half or more horsepower with a cutting bar 20 inches in length or longer shall be immediately available within the operating area, or, in the alternative, a full set of timber-felling tools shall be located in the fire toolbox, including one crosscut falling saw six feet in length, one double-bit ax with a 36-inch handle, one sledge hammer or maul with a head weight of six, or more, pounds and handle length of 32 inches, or more, and not less than two falling wedges.
- (c) Each passenger vehicle, used on such operation shall be equipped with one shovel and one ax, and any other vehicle used on the operation shall be equipped with one shovel. Each tractor used in such operation shall be equipped with one shovel.

4429. During any time of the year when burning permits are required in an area pursuant to this article, at any camp maintained in such area for the residence of employees, or at any local headquarters in such area of any industrial, agricultural, or other operations on or near any forest-covered land or brush-covered land, there shall be provided and maintained at all times, in a specific location, for firefighting purposes only, a sufficient supply of serviceable tools to equip 50 percent of the able-bodied, personnel, resident of such camp, or working out of such headquarters, for fighting fires. Among these tools shall be included shovels, axes, saws, backpack pumps, and scraping tools. With such tools there shall also be one serviceable headlight adaptable for attachment to at least one-half of the tractor-bulldozers used on the operation, and a sufficient number of canteens and flashlights to equip a third of the able-bodied personnel.

4430. During any time of the year when burning permits are required in an area pursuant to this article, a person, copartnership, firm, corporation or company, shall not use or operate in such area any machine equipment ...located on or near forest-covered land or brush-covered land, without providing one adequate force pump or water under pressure equivalent to a pump, and not less than 200 feet of hose not less than one inch in diameter for each (piece of) equipment. The pump or water pressure required in this section shall be capable of applying a minimum of 40 pounds pressure at the nozzle on 200 feet of hose, such nozzle to be one-fourth inch or larger in diameter.

4431. During any time of the year when burning permits are required in an area pursuant to this article, no person shall use or operate or cause to be operated in the area any portable saw, auger, drill, tamper, or other portable tool powered by a gasoline-fueled internal combustion engine on or near any forest-covered land, brush-covered land, or grass-covered land, within 25 feet of any flammable material, without providing and maintaining at the immediate locations of use or operation of the saw or tool, for firefighting purposes one serviceable round point shovel, with an overall length of not less than 46 inches, or one serviceable fire extinguisher. The Director of Forestry and Fire Protection shall by administrative regulation specify the type and size of fire extinguisher necessary to provide at least minimum assurance of controlling fire caused by use of portable power tools under various climatic and fuel conditions.

The required fire tools shall at no time be farther from the point of operation of the power saw or tool than 25 feet with unrestricted access for the operator from the point of operation.

4432. A person shall not leave a campfire, kindled or attended by him, burning or unextinguished unless one of the following requirements is satisfied:

- (a) He leaves some person in attendance.
- (b) The fire is enclosed within a stove, oven, drum, or other nonflammable container, in such manner that the fire cannot escape from the container.

No person shall allow a campfire, kindled or attended by him, to spread after it is built.

4433. A person shall not light, maintain, or use a campfire upon any brush-covered land, grass-covered land, or forest-covered land which is the property of another person unless he first obtains a written permit from the owner, lessee, or agent of the owner or lessee of the

property. If, however, campsites and special areas have been established by the property owner and posted as areas for camping, a permit is not necessary. A written campfire permit duly issued by or under the authority of the United States Forest Service is necessary for use on land under the jurisdiction and control of the United States Forest Service.

4434. The escape of any campfire from the control of any person who is maintaining the campfire is prima facie evidence that such person was negligent in maintaining the campfire.
4435. If any fire originates from the operation or use of any engine, machine, barbecue ...or any other device which may kindle a fire, the occurrence of the fire is prima facie evidence of negligence in the maintenance, operation, or use of (that device) If such fire escapes from the place where it originated and it can be determined which person's negligence caused such fire, such person is guilty of a misdemeanor.
4436. A person shall not refuse or fail to render assistance in combating a forest, brush, or grass fire at the summons of the department, or its authorized agent who is charged with the prevention or suppression of fire or the enforcement of the state fire laws, or any county firewarden, fireman, or county officer who is charged with the duty of preventing or combating forest, brush, or grass fires, or any officer of a county fire protection district, unless prevented from so doing by sickness or physical disability.
4439. (a) Flammable forest product waste material may be disposed of by means of fire in an area which is cleared of grass, grain, brush, slash, litter, snags and forest cover for a distance of 121.9 meters (400 feet) from the periphery of the fire and for any greater distance necessary to provide 30.5 meters (100 feet) of cleared area around any lumber pile or structure which may be situated within 121.9 meters (400 feet) of the fire.
- (b) Sound and living trees beyond 30.5 meters (100 feet) from the periphery of the fire may be left standing within the area required to be cleared, provided the following requirements are met:
- (1) Wildfire cannot travel into the canopy of any tree left standing.
 - (2) Any tree left standing does not pose a fire safety threat or prevent fire equipment access to and near the flammable forest waste material.
 - (3) All dead limbs, and all limbs within 3 meters (10 feet) of the ground are removed from any tree left standing.
- (c) The disposal by fire in the cleared area is the responsibility of the operator or landowner, or of the operator and landowner, jointly, and shall be in conformance with Section 4423 and all other provisions of law.
4440. (a) Flammable forest product residue may be accumulated in piles, within any state responsibility area, within any area receiving fire protection by the director by contract, or upon federal lands administered by the United States Department of Agriculture or the Department of Interior, when the area surrounding the piles is cleared and kept clear of all flammable vegetation and debris, including trees, snags, brush, grass, slash, and litter in accordance with one of the following procedures:
- (1) Clearing to a distance of 45.7 meters (150 feet) from the periphery of the piles of flammable residue and all structures and lumber piles which are situated within 15.2 meters (50 feet) of the residue piles.
 - (2) Clearing to a distance of 30.5 meters (100 feet) from the periphery of the piles of flammable residue and all structures and lumber piles which are situated within 15.2 meters (50 feet) of the residue piles, and maintaining at all times a firebreak three meters (10 feet) or more in width cleared of all flammable material and constructed in a continuous line surrounding the accumulation at a distance of not less than 15.2 meters (50 feet) nor more than 91.4 meters (300 feet) from the periphery of the clearing surrounding the accumulation. All snags and dead trees between the firebreak and the periphery of the clearing shall be felled.
 - (3) Sound and living trees may be left standing within the areas required to be cleared of flammable residue, provided the following requirements are met:
 - (A) Wildfire cannot travel into the canopy of any tree left standing.

- (B) Any tree left standing does not pose a fire safety threat or prevent fire equipment access to and near the flammable forest waste material.
- (C) All dead limbs, and all limbs within 3 meters (10 feet) of the ground are removed from any tree left standing.
- (D) Diseased or dead trees are removed entirely.
 - (b) Disposal by fire, if contemplated, is a responsibility of the operator or landowner or the operator and landowner, jointly, and shall be accomplished in conformance with Section 4423 and all other applicable provisions of law.

4441. Any person who permits or allows accumulation of waste material or residue in violation of the provisions of Sections 4437 to 4440, inclusive, is guilty of a misdemeanor...

4442. (a) Except as otherwise provided in this section, no person shall use, operate, or allow to be used or operated, any internal combustion engine which uses hydrocarbon fuels on any forest-covered land, brush-covered land, or grass-covered land unless the engine is equipped with a spark arrester, as defined in subdivision (c), maintained in effective working order or the engine is constructed, equipped, and maintained for the prevention of fire pursuant to Section 4443.

(b) Spark arresters affixed to the exhaust system of engines or vehicles subject to this section shall not be placed or mounted in such a manner as to allow flames or heat from the exhaust system to ignite any flammable material.

(c) A spark arrester is a device constructed of nonflammable materials specifically for the purpose of removing and retaining carbon and other flammable particles over 0.0232 of an inch in size from the exhaust flow of an internal combustion engine that uses hydrocarbon fuels or which is qualified and rated by the United States Forest Service.

(d) Engines used to provide motive power for trucks, truck tractors, buses, and passenger vehicles, except motorcycles, are not subject to this section if the exhaust system is equipped with a muffler as defined in the Vehicle Code.

(e) Turbocharged engines are not subject to this section if all exhausted gases pass through the rotating turbine wheel, there is no exhaust bypass to the atmosphere, and the turbocharger is in effective mechanical condition.

4445. A person shall not fire or cause to be fired from any rifle or other device capable of discharging ammunition, any bullet, projectile, or other ammunition which contains the components of thermite, magnesium, or aluminum, or any other component capable of causing a fire and commonly known as tracer or incendiary ammunition within any forest-covered area, brush-covered area, grass-covered area or grain-covered area.

4446. Every person shall exercise reasonable care in the disposal of flammable material so that the material does not cause the inception of or spread of uncontrolled fire.

4475. The director, with the approval of the Director of General Services, may enter into a contract for prescribed burning or other hazardous fuel reduction that is consistent with this chapter and the regulations of the board with (1) the owner or any other person who has legal control of any property or (2) any public agency with regulatory or natural resource management authority over any property that is included within any wild land for any of the following purposes, or any combination thereof:

- (a) Prevention of high-intensity wild land fires through reduction of the volume and continuity of wild land fuels.
- (b) Watershed management.
- (c) Range improvement.
- (d) Vegetation management.
- (e) Forest improvement.

- (f) Wildlife habitat improvement.
- (g) Air quality maintenance.

No contract may be entered into pursuant to this section unless the director determines that the public benefits estimated to be derived from the prescribed burning or other hazardous fuel reduction pursuant to the contract will be equal to or greater than the foreseeable damage that could result from the prescribed burning or other hazardous fuel reduction.

4475.5. (a) The state may assume a proportionate share of the costs of site preparation and prescribed burning or other hazardous fuel reduction conducted pursuant to this article on wild lands other than wild lands under the jurisdiction of the federal government. The state's share of those costs shall bear the same ratio to the total costs of the operation as the public benefits bear to all public and private benefits to be derived from the prescribed burning operation or other hazardous fuel reduction, as estimated and determined by the director. The state's share of the costs may exceed 90 percent of the total costs of the operation only if the director determines that no direct private economic benefits will accrue or will be utilized by a person that owns or controls any property under contract pursuant to Section 4475.

(b) The board shall adopt regulations establishing standards to be used by the director in determining the state's share of these costs and in determining whether, pursuant to Section 4475, the public benefits of a prescribed burning operation or other hazardous fuel reduction will equal or exceed the foreseeable damage therefrom.

- (c) The determination of public and private benefits pursuant to this section shall reflect any substantial benefit to be derived from accomplishing any of the purposes specified in Section 4475 and the prevention of degradation of air quality.
- (d) All or part of these costs to be borne by the person contracting with the department may be met by the value of materials, services, or equipment furnished by that person directly, or furnished by that person pursuant to an agreement with a private consultant or contractor, or furnished by a combination of both means, that are determined by the department to be suitable for the preparation for, and the conduct of, the prescribed burning operation or other hazardous fuel reduction.

4476. Any contract which is entered into pursuant to this article shall do all of the following:

- (a) Vest in the director the final authority to determine the time during which wild land fuel and structural fire hazards may be burned to minimize the risk of escape of a fire set in a prescribed burning operation and to facilitate maintenance of air quality.
- (b) Clearly state the obligation of each party to the contract to provide, maintain, and repair equipment and indicate the number of each type of equipment to be provided and the duration of its availability.
- (c) Designate an officer of the department as the fire boss with final authority to approve and amend the plan and formula applicable to a prescribed burning operation, to determine that the site has been prepared and the crew and equipment are ready to commence the operation, and to supervise the work assignments of departmental employees and all personnel furnished by the person contracting with the department until the prescribed burning is completed and all fire is declared to be out.
- (d) Specify the duties of, and the precautions taken by, the person contracting with the department and any personnel furnished by that person.
- (e) Provide that any personnel furnished by a person contracting with the department to assist in any aspect of site preparation or prescribed burning or other hazardous fuel reduction shall be an agent of that person for all purposes of workers' compensation. However, any volunteer recruited or used by the department to suppress a wild land fire originating or spreading from a prescribed burning operation is an employee of the department for all purposes of workers' compensation.

- (f) Specify the value assigned to the materials, services, or equipment furnished by the person contracting with the department in lieu of payment of all or part of that person's share of the actual costs.
- (g) Specify the total costs of the prescribed burning operation of other hazardous fuel reduction and the pro rata share thereof for each party to the contract. Any person contracting with the department shall, prior to the commencement of any work by the department, place on deposit in an interest-bearing escrow or trust account with a California-licensed financial institution an amount equal to that person's pro rata share of the costs, less the value of materials, services, or equipment specified pursuant to subdivision (e). Interest earned on the account shall accrue to the depositor and may be separately disbursed from the principal amount upon request of the depositor. Disbursement of funds on deposit in the trust or escrow account shall be authorized by the depositor within 15 days after completion, to the depositor's satisfaction, of all work specified in the contract to be done by the department.
- (h) Provide that the department may, in its discretion, purchase a third-party liability policy of insurance that provides coverage against loss resulting from a wild land fire sustained by any person or public agency, including the federal government. The amount of the policy, if purchased, shall be determined by the director. The policy shall name the person contracting with the department and the department as joint policyholders. The premium shall be included as a cost prorated as provided in subdivision (g). A certificate of insurance, if purchased, covering each policy shall be attached to or become a part of the contract. If the department elects not to purchase insurance, the department shall agree to indemnify and hold harmless the person or public agency contracting with the department with respect to liability arising out of performance of the contract.

4477. If the amount of moneys due the state are not paid as provided in subdivision (e) of Section 4476, such amount shall become a lien upon the property...

4479. Liability for any costs incurred by the department in suppressing any wildland fire originating or spreading from a prescribed burning operation conducted pursuant to a contract entered into pursuant to this article shall be governed by subdivision (b) of Section 13009 of the Health and Safety Code.

4480. In any area of the state where there are substantially more requests for prescribed burning operations or other hazardous fuel reduction pursuant to this article than can be conducted directly by the department in a single fiscal year, the director may, with the approval of the Director of Finance, enter into an agreement with private consultants or contractors or with other public agencies for furnishing all or a part of the state's share of the responsibility for planning the operation, preparing the site, and conducting the prescribed burning or other hazardous fuel reduction. The private consultant or contractor or other public agency, and the work assignments of its employees, shall be supervised by the fire boss when conducting prescribed burning operations, or designated officer of the department when conducting other hazardous fuel reduction, as provided in subdivision © of Section 4476. No agreement may be entered into pursuant to this section unless the director determines that it will enable the prescribed burning operation to be conducted at a cost equal to, or less than, the cost that would otherwise be incurred by the state.

Appendix C: CAL FIRE's Vegetation Management Program (VMP) Burn Planning Process

From CAL FIRE Vegetation Management Program Manual Section 7030 (October 2002)
VMP PROGRAM GOALS (Board of Forestry and Fire Protection) The goal of the *Vegetation Management Program* (VMP) is to reduce the chance of large, damaging wildfires by reducing fire hazards on wildlands in California. Encouraging the best 'mix' of natural resource benefits from these lands, consistent with environmental protection and landowner objectives, is the Department's intent. This includes the three broad purposes, which encompass most Vegetation Management objectives:

Reduction of conflagration fires.

Optimization of soil and water productivity.

Protection and improvement of intrinsic ecosystem values.

PLANNING THE BURN

CAL FIRE's prescribed burns under the VMP are conducted for many reasons. Most burns have hazard-reduction as a major objective coordinated under the Unit Fire Plan. However, many burns have important secondary objectives that could include:

- Fuel Reduction
- Community Defensible Space
- Range Improvement
- Weed Management
- Wildlife Habitat Enhancement

VMP projects use various techniques to accomplish program goals:

- Broadcast Burning
- Mosaic Burning in Chaparral
- Pile & Burn using Hand Crews
- Chipping and Commercial Biomass

VMP projects are conducted on a cost-share basis with private landowners. (Federal lands can be incorporated if the joint project promotes mutual objectives). During the planning process, CAL FIRE and landowners sign a standard agreement for prescribed burning (rm-75). Project details are explained in the prescribed burn plan and are regulated by law and program constraints. The burn plan also incorporates input from review agencies such as the Department of Fish and Game, Air Resources Control Board, and Regional Water Quality Control Board.

The unit VMP coordinator consults with battalion personnel during the planning phase. Advice from the battalion chief and captains is essential for success. These employees are the ones who will be conducting the project. The VMP coordinator is responsible for planning and documentation once a project has been proposed. Coordination will include identifying acceptable projects, contacting landowners, and developing or supporting the following steps on each project:

PLANNING CHECKLIST

1. Application Information · Project Name and number · List of cooperators
2. · Map and description of proposed treatment. Include APN #'s and maps.
3. · CAL FIRE and applicant loosely agree on cooperator's contribution for the project.
4. Draft Burn Plan prepared
5. Environmental Review - Agency Letters:
6. · Department of Fish and Game or relevant federal agency
7. · Local Native American Tribal Groups
8. · Water Quality Control Board
9. · Local Air Pollution Control District
10. · Information Center Archaeological Records Search
11. · Natural Diversity Data Base Report
12. · Others: _____
13. Project Burn Plan finalized
14. Cost Summary prepared
15. Environmental Checklist finalized
16. Archeological Report completed
17. Rx Burn Agreement and Project Plan Signatures
18. Project Approval (Region or Sacramento)
19. Air Pollution Permit
20. Complete pre-burn treatment as necessary:
21. Complete Incident Action Plan
22. Notify Region of proposed burn date:
23. Public notifications as per IAP
24. Site-specific weather forecast:
25. Go/No Go Checklist; Implement Project:
26. Completion report to Region:

The above order is more or less the flow of project development through completion.

NOTE: Each Ranger Unit has local considerations that may not be listed here – The VMP Manual is a living document, and MPRPD should consult the local Ranger Unit with any specific questions.

WEATHER

Most burns need a site-specific weather forecast to ensure that the project is conducted within prescribed weather limits. The IC should contact the forecaster 2-7 days ahead of the burn to request the necessary forecast. He/she will need to provide on-site weather readings from a belt weather kit or may be requested to set up a portable remote automatic weather station (P-RAWS) or provide other local information to support a dependable forecast.

BRIEFING

The IC should present a pre-ignition briefing for all crews assigned to the project. He/she should cover the burn objectives, ignition pattern, trigger points and all issues normally addressed in a standard wildland fire briefing.

INCIDENT STAFFING

Some VMP projects are more complex than others. Simple burns may involve only a single hand crew or engine. Other projects could require multiple engines, aircraft, private and agency dozers, numerous overhead and provides opportunity for media interaction and public education.

The key distinction between VMP and wildfire is that pre-planning a prescribed burn reduces uncertainty and makes the overall VMP assignment less complex. In some cases, specialized expertise in firing, weather modeling or fire behavior is needed. It is CAL FIRE's policy to use ICS in conducting prescribed fires. A simple prescribed burn operational structure is shown below.

- Incident Commander
- Safety Officer
- Rx Fire Manager/Weather Monitor
- Public Information Officer
- Div A Div B Firing Group Contingency Group
- Eng Eng FC Copter
- Eng Eng FF1 Dozer
- Dozer (pvt) Crew FF1
- Crew

LANDOWNER (PRIVATE) PARTICIPATION

As a California cost-share program, VMP requires financial participation by the landowner. Pre and post burn participation from landowners is encouraged if it is within their capabilities. Landowners are sometimes involved in holding, firing, mopup or patrol with direction from CAL FIRE. Although non-CAL FIRE personnel supply their own equipment, PPE and liability insurance, it is prudent for CAL FIRE to provide informal oversight and look out for obvious safety concerns.

VMP TRAINING OPPORTUNITIES

VMP projects can provide a training opportunity for Unit personnel. The IC should discuss the potential for useful assignments with the Unit Training Officer and trainee. Both formal and informal training opportunities may exist. Trainees can be assigned to "shadow" another qualified individual or they may have direct line responsibility if suitable personnel are available to monitor progress or take over if necessary.

In addition to CAL FIRE-specific and general ICS fire courses that qualify CAL FIRE employees to conduct prescribed fires, the following Rx fire courses can be helpful. In complex prescribed burns, such training could be essential. The Unit Chief is responsible to advise when specialized training is needed on the fireground. Prescribed fire coursework is described in the NWCG Wildland and Prescribed Fire Qualification System Guide PMS 310-1. Although not obligatory for CAL FIRE, this guide provides for specialized training on complex projects. The NWCG Prescribed Fire Complexity guide PMS-424, NFES-2474 provides information in assessing the difficulty of a project.

Prescribed Fire IC Rx-300
Smoke Management Rx-410/Rx-450/Rx-95
Advanced Fire Behavior Calculations S-490
California Environmental Quality Act (CEQA)
Firing Methods & Procedures CAL FIRE-234/S-234
Weather Monitoring / Fire Effects

PRESCRIBED FIRE MANAGER

This position is generally the Unit VMP Coordinator. He/she may have direct operational responsibility working as IC, Firing Group Supervisor or Division Supervisor or may be an advisor to the IC as a Technical Specialist Planner or Fire Behavior Technical Specialist Monitor.

FIRE EFFECTS

The objective of prescribed burning is to create a specific fire impact on vegetation. A particular fire may be set to consume a class of fuels (such as 1-hour and 10- hour fuels) but designed to keep unburned the large diameter logs and live fuels. Some projects are intended to burn brush and underburn large trees with a minimum of damage. The intent of each project is laid out in the Burn Plan. The IC must design a plan of ignition that will achieve the objective.

CONTINGENCY PLAN

Contingency plans are an addendum to the IAP that should be prepared on complex burns within the declared fire season. If an escape occurs, a prepared contingency plan has value because it speeds expansion of the organization. A contingency plan typically identifies potential control locations, values at risk, trigger points, and resource needs.

1. Potential Exposures. Based on the project's neighborhood, surrounding fuels and topography, determine what exposures may be impacted by uncontrolled fire growth outside of the project

area. Exposures include improvements, archaeological sites, critical habitat, modified suppression areas, etc.

2. Secondary containment: Surrounding fuels and topography may indicate appropriate secondary containment strategies if the burn were to escape primary control lines. Consider resource needs, access issues for crews, equipment and aircraft, anticipated response times of additional resources, etc.

PRESCRIBED BURN CHECKLIST

Prior to ignition, the IC must confirm that the Region Duty Chief has been notified and then complete the VMP Go/No Go Checklist (contact local Unit for these forms) . These forms document that the following areas have been addressed:

1. Approval Process
2. Notifications
3. IAP Prepared
4. Resources Available
5. Weather in Prescription

DECLARING AN ESCAPED FIRE OR ‘REINFORCED ACTION’

When the potential exists for the fire to exceed desired burning characteristics and/or its boundaries, additional resources may be justified to reduce risk and complete the project with a safety margin. This decision to order resources is based on the IC’s experience and knowledge of fire behavior, weather conditions, environmental conditions, and available resources.

Reinforced Actions (Escapes). PRC 4104 defines an “uncontrolled fire”: “The term ‘uncontrolled fire’, as used in this division, means any fire which threatens to destroy life, property, or resources, and either:

- 1) is unattended by any person; 2) is attended by persons unable to prevent its unrestricted spread; or 3) is burning with such velocity or intensity that it could not be readily controlled with those ordinary tools available to private persons at the fire scene.” A prescribed fire that burns outside of control lines is not necessarily an uncontrolled fire or an escape. Circumstances such as spots over the line, flare-ups, and slopovers that can be readily controlled with holding crews on hand, do not constitute an uncontrolled fire or an escape. They are the reason that holding resources are planned. The IC **may** declare a prescribed fire to be an uncontrolled fire at any time. The following criteria will be considered:
 1. The fire burns outside the area planned for burning, into an area where reinforced suppression action is required. This may be another ownership, a vegetation type that may be damaged by fire on the same ownership, or other circumstances that call for reinforced action beyond the scope of the project budget. Fire effects that substantially exceed the limits contained in the VMP contract and will have an adverse impact on the physical conditions within the area, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance shall be considered in this determination.
 2. When the fire behavior is determined to be such that existing holding resources will not be adequate to maintain or regain control. This standard gives the IC the latitude to act before the fire actually begins to do damage based on the expected fire behavior/control problems. Fires

that develop sufficient fire behavior that will have a “significant effect on the environment” shall be considered “escaped fire”.

3. When the fire behavior is determined to be such that it does not meet the land management objectives, and/or when weather exceeds prescribed limits. This standard gives the IC the option of beginning reinforced suppression action in response to actual or predicted weather or fire behavior that exceeds planned limits. The IC **will** declare a prescribed fire to be an uncontrolled fire (escaped fire) when:
 1. Available Unit resources and readily available hand crews cannot maintain control of the fire. Regional forces (air tankers, and crews, out-of-county resources, helicopters) are ordered to suppress and/or contain prescribed fire activity. (In those areas along Unit boundaries where the closest resources to the incident would be an out-of-unit resource, use of these closest resources would not mandate a declaration of an escape).
 2. A prescribed fire burns outside the project boundary and is on lands not covered by contracts and appropriate VMP documents. All activity that leads to the burning of another’s land or property is an “escaped fire”.

If for any of these reasons, or a combination of them, the IC declares a prescribed fire to be an uncontrolled fire, that person will remain as the IC until relieved by a higher authority.

REPORTING REINFORCED ACTIONS: Region Office Duty Chief will be notified immediately that an “escaped or uncontrolled” fire has occurred.

MEDIA RELATIONS: Within the context of reinforced actions or escape fire scenarios, all requests for information from the public or media shall be referred to the Unit Chief or his/her designated media contact.

VMP CONTROL, MOPUP AND PATROL

A fire can be declared controlled when it has been maintained within firelines during a significant post-containment period. This period varies depending on the vegetation type and holdover potential. On a simple grass burn, it could be as short as an hour or two after containment. On an oak-woodland project, supervision might extend through the next day. A timberland burn would require direct supervision even longer. During the control period, mopup will continue. After being declared controlled, the control effort may continue. As is the case of the final patrol stage of a wildfire, CAL FIRE has the option of transferring patrol duties to the landowner if he is able and willing to take on the responsibility. The IC should evaluate the 7030-8 risk and consequences of an escape from a State-led prescribed burn when making this decision. In general, direct CAL FIRE supervision of a prescribed burn should last at least as long as would occur on a comparable wildfire.

Appendix D: The Use of Flaming to Control Wildland Weeds

Ken Moore . Wildlands Restoration Team . ken@wildwork.org . 831-464-2329 April 2005

NOTE: This information is provided as a reference only. NorthTree Fire makes no recommendations on the use of this technique, and takes no responsibility for its application on any lands. Safe use of open flame is the responsibility of the Park Managers. We recommend that you contact the author of this paper directly if you are interested in weed flaming on Palo Corona Park lands.

THE EQUIPMENT

There are two types of flaming equipment, based on the way fuel is delivered to the torch.

In **Vapor withdrawal systems**, the fuel, liquid propane gas (LPG), is converted to a gas in the tank, and travels through the hose to the torch as a gas. When using the larger size vapor torches, the expansion of the liquid fuel to gas causes the tank and the torch handle to get very cold. Gloves are recommended. In wet and cold weather, the tank will ice up, and the valve on the torch may not operate. If this happens, shut off the gas with the main valve on the tank. The tendency of vapor systems to frost up makes them most suitable for intermittent use. Icing can be reduced by using a smaller size torch, or by using a larger cylinder. (Fuel tanks are called cylinders.) Of course, larger cylinders are heavier and harder to handle. I use aluminum cylinders. They are expensive, but much lighter. A good source is Go2marine.com.

In **Liquid withdrawal systems** the fuel is delivered as a liquid all the way to the tip of the torch, and is vaporized there. Liquid systems do not ice up quickly, and so are better suited for continuous use. Both the cylinder and the torch are made specifically for liquid withdrawal. (You cannot use a liquid cylinder with a vapor torch, or a vapor cylinder with a liquid torch.) If you are flaming large areas on fairly level ground, a liquid system with a 40 lb cylinder mounted on a hand dolly is a good choice. Larger cylinders are available and can be mounted on trailers, tractors, or ATV's. Small torches with capacities of 50,000 to 100,000 BTU are suitable for spot flaming or small jobs. They are usually used with a 10 or 20 lb cylinder which can be carried in one hand. A set-up is available from Flame Engineering www.flameengineering.com which uses a 10 lb cylinder on a backpack frame that is handy, especially in hilly terrain. This company has a free catalog with a full range of flaming equipment. Hand held torches up to about 1,000,000 BTU can be used for wildland flaming. Larger torches will allow you to work faster, but are more difficult to control around non-target species. In addition, they use much more fuel. A 100,000 BTU torch uses 2 to 5 lbs/hr, whereas a 750,000 BTU torch can use up to about 30 lbs/hr. My current favorite torch is a PowerJet, made by Manchester Tank www.mantank.com/products/hand_torch.htm. It is a 750,000 BTU vapor torch, very light in weight, and is trigger-activated with a standing pilot light. A vapor torch this size will frost up a 20 lb cylinder in minutes, so I use quick connectors which allows me to change tanks quickly and keep working.

THE TECHNIQUE

First, and most important, **READ THE SAFETY PROCEDURES GIVEN HERE AND WITH THE EQUIPMENT BEFORE PROCEEDING.** This equipment is soundly built with user safety in mind, but careless or improper use can result in serious injury.

To avoid the risk of fire, flame only when the site is too wet to carry fire or when you have employed appropriate prescribed burn procedures for containing any fire which may start. I prefer flaming while it is actually raining. It will keep you warm, allowing you to work in

otherwise unpleasant conditions. In addition to being safer, flaming when the ground is wet transmits heat deeper into the soil, helping to kill roots.

Follow correct procedures for assembly and use of all components. Check all connections for leaks before proceeding. To light, make sure the valve on the torch handle is closed, then SLOWLY open the valve on the tank. (If you open it too fast, the safety shut-off system will activate, preventing fuel from leaving the tank.)

Point the torch in the air, and slowly open the valve on the torch handle just enough to hear a little gas being released. Then light the torch from the back of the bell. I use a trigger activated butane lighter. Open the valve further until the flame has little or no trace of yellow. This is the optimum temperature. Hold the torch 6" to 12" from the plant. This is where the flame is hottest. Torches vary in their output, and you will quickly learn the most efficient distance to keep the torch tip from the target. Keep the torch moving. The object is to use just enough heat to produce wilting. If you burn the plant, you are wasting time and fuel, and may actually get less kill! A leaf pressed between the fingers will show a fingerprint when flamed properly. Flaming is most effective from the time that plants are at the dicotyledon stage up to when they have produced about 5 or 6 true leaves. When flaming taller plants, concentrate heat on the lower portion of the stem. If the torch blows out frequently, you may be holding it too close to the ground. If it's windy, it helps to keep the torch pointed downwind. Do not flame under trees or shrubs with low overhanging branches, especially conifers!

The torch tip gets very hot, so be careful where you set it down. When you are finished flaming, hold the lit torch in the air and shut off the gas first at the valve on the tank, letting all the gas in the hose burn off. Then shut off the valve on the torch, and disconnect the hose from the tank. Do not vent unburned fuel into the air. Never transport the equipment without first disconnecting the hose from the tank, and do not transport an LPG cylinder in a closed vehicle.

Checklist For Safe LP Gas Use (From Flame Engineering)

1. DO NOT use torches on or near combustible materials.
2. Inspect equipment daily.
3. Secure cylinders in a level, upright position. DO NOT invert or lay cylinders on their sides.
4. Use only vapor equipment on cylinders equipped with vapor withdrawal valves. Use only liquid equipment on cylinders designed for liquid withdrawal. DO NOT invert vapor cylinders to dispense liquid.
5. DO NOT apply flame to cylinders to increase pressure.
6. DO NOT operate torches or any equipment if the odor of LP Gas (butane/propane) is evident. Immediately shut off all valves and, using soapy water, check all equipment for leaks.
7. LP Gas (butane/propane) is heavier than air which causes it to accumulate in low areas. Check low areas for accumulation and ventilate. Be certain all work areas are well ventilated.
8. Keep torches, open flame, and sources of ignition away from cylinders, regulators, and hose.
9. Cylinder valves must be protected. DO NOT hoist cylinder by the valve.
10. Gloves should be used at all times. Long sleeves, long pants, and boots are recommended.
11. Never leave a lighted torch unattended.
12. For more detailed information, consult your local LP dealer, Flame Engineering, NPGA, NRCA, or NFPA Pamphlet 58. This information is provided as a general guide for safe LP-Gas use and in no way constitutes a complete safety program.

Daily Equipment Checklist

1. Be sure you have a fire extinguisher (type ABC) on the job, easily accessible to each worker.
2. Check LP cylinders for dents, damage to collar, damage to valve or corroded foot ring. Never hoist a cylinder by the valve. Secure cylinders in an upright position. Know whether you are using LIQUID or VAPOR WITHDRAWAL.
3. Visually inspect all parts for damage and wear.
4. Using soapy water, check all connections and fittings for leaks. DO NOT use a match or open flame.
5. Ignite torch. Check operation of valve and other adjustable parts.

SAFETY NOTES:

When extinguishing a torch, shut off cylinder valve and allow gas to burn out of lines. Be certain to comply with all safety guidelines and local ordinances regarding the use of an open flame. Please contact Flame Engineering, your local LP-Gas dealer or fire officials if you have questions regarding proper operating procedures and safety guidelines. Propane is heavier than air which causes it to accumulate in low areas. Be certain all areas are well ventilated. Propane has a distinct odor. If you smell it, immediately discontinue work, extinguish all flames, find the leak and correct it.

WARNING:

Use extreme caution at all times. You are using an intense open flame. Disregard of safe practices can result in severe fire damage, serious personal injury or death!!!

Appendix E: Palo Corona Fuel Loading Photoseries

Adapted from Scott, Joe H.; Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

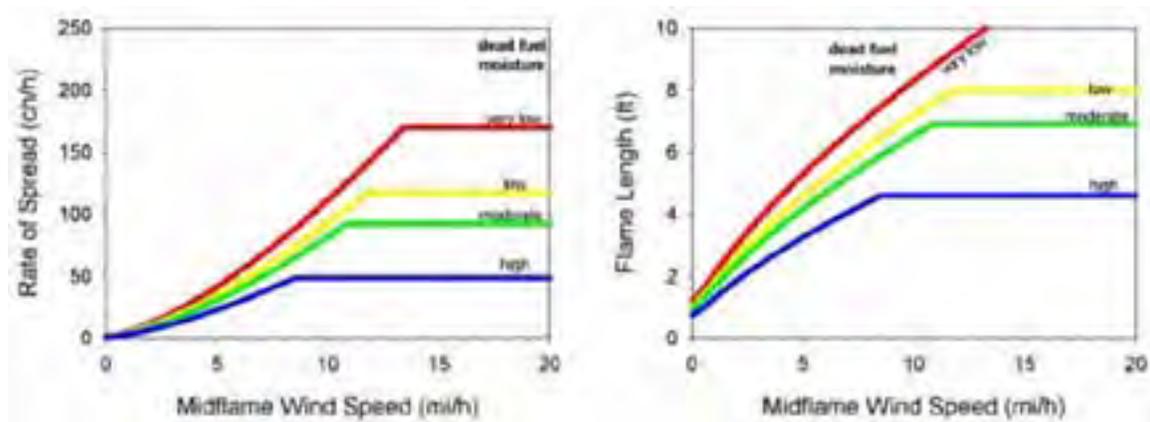
GR2 (102)
Low load, dry climate grass (dynamic)

Description: The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.

Fine fuel load (t/ac) 1.10
Extinction moisture content (percent) 15



Ridge grassland, Malpasos Ridge – Palo Corona Regional Park



Adapted from: Scott, Joe H.; Burgan, Robert E. 2005. **Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model.** Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

SH7 (147)
Very high load, dry climate shrub

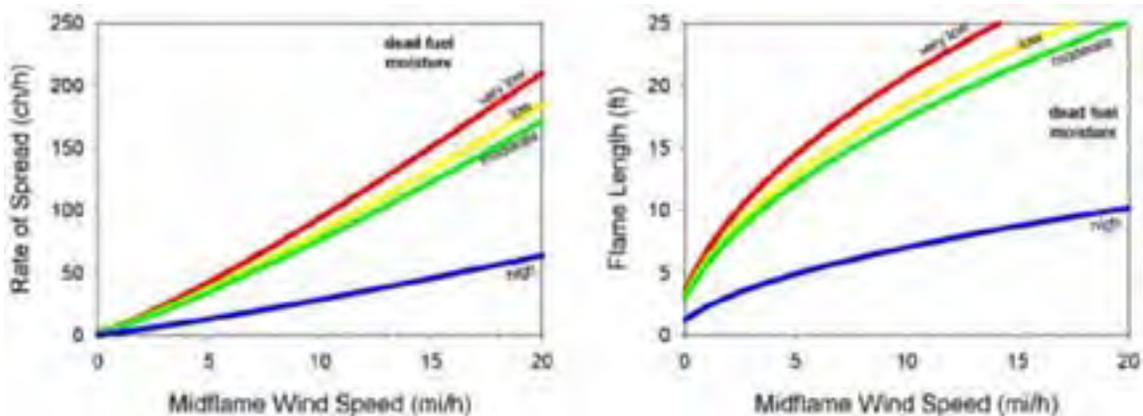
Description: The primary carrier of fire in SH7 is woody shrubs and shrub litter. Very heavy shrub load, depth 4-6 feet. Spread rate lower than SH9, but flame length similar. Spread rate is high; flame length very high.

Fine fuel load (t/ac) 6.9

Extinction moisture content (percent) 15



Maritime chaparral, Seneca Ridge – Palo Corona Regional Park



Adapted from: Scott, Joe H.; Burgan, Robert E. 2005. **Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model.** Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

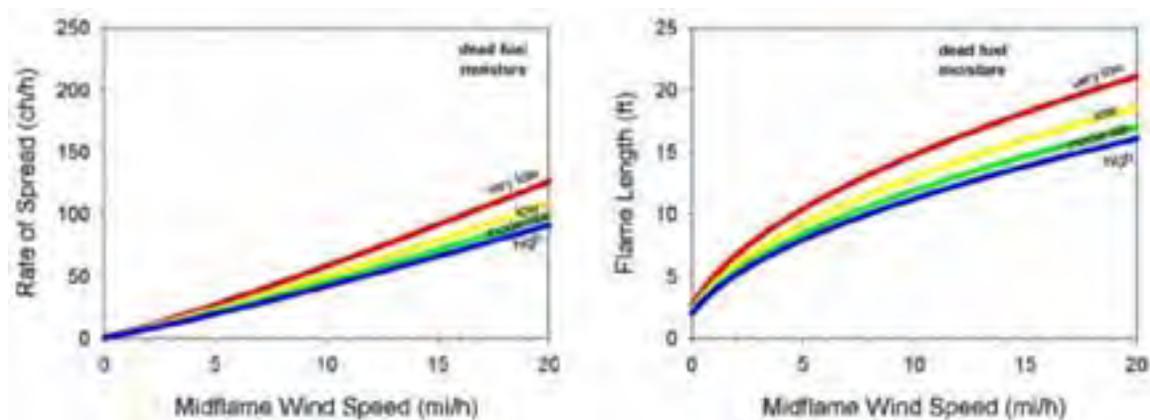
SH6 (146)
Low load, humid climate shrub

Description: The primary carrier of fire in SH6 is woody shrubs and shrub litter. Dense shrubs, litter or no herbaceous fuel, fuelbed depth about 2 feet. Spread rate is high; flame length high.

Fine fuel load (t/ac) 4.3
Extinction moisture content (percent) 30



Coastal Scrub, Seneca Ridge – Palo Corona Regional Park



Adapted from: Scott, Joe H.; Burgan, Robert E. 2005. **Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model.** Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

TL2 (182)
Low load broadleaf litter

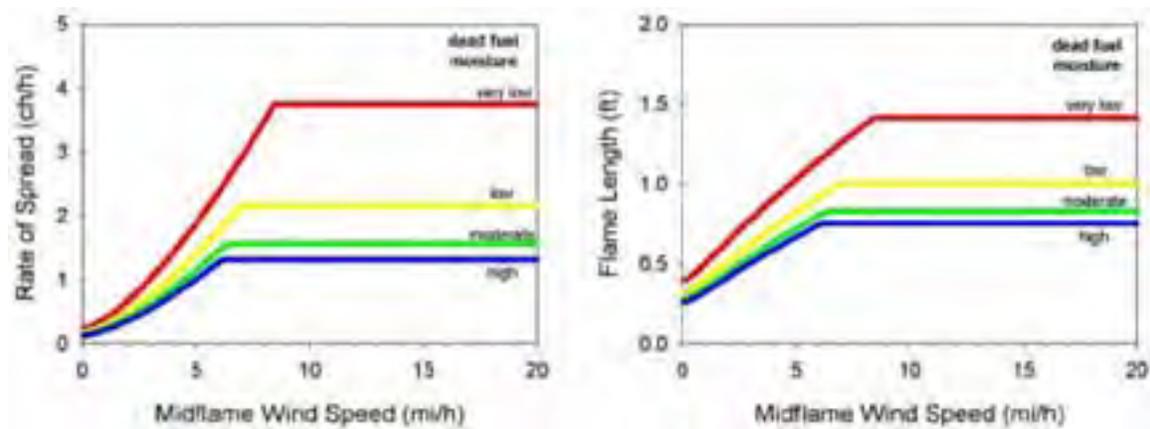
Description: The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low.

Fine fuel load (t/ac) 1.4

Extinction moisture content (percent) 25



Oak woodland, San Jose Creek – Palo Corona Regional Park



Adapted from: Scott, Joe H.; Burgan, Robert E. 2005. **Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model.** Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

TL3 (183)
Moderate load conifer litter

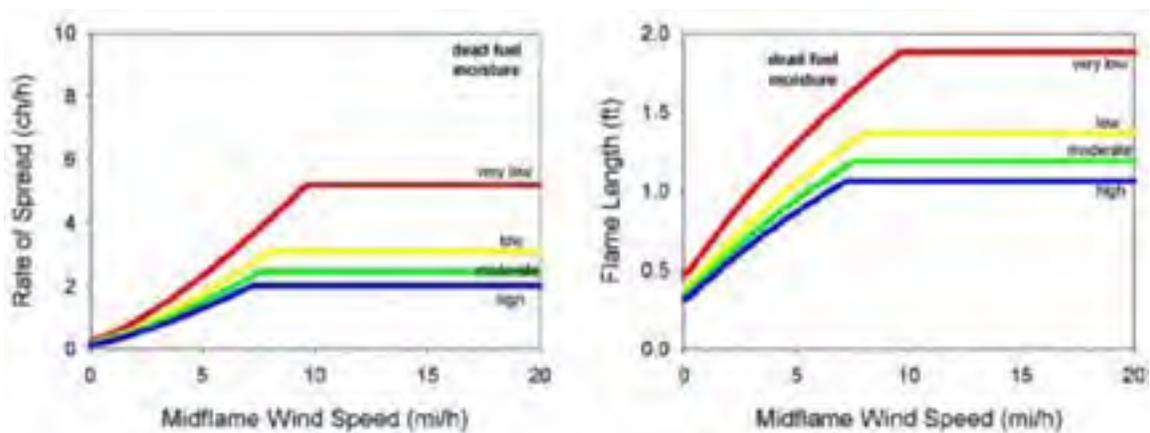
Description: The primary carrier of fire in TL3 is moderate load conifer litter, light load of coarse fuels. Spread rate is very low; flame length low.

Fine fuel load (t/ac) 0.5

Extinction moisture content (percent) 20



Monterey Pine Forest



Adapted from: Scott, Joe H.; Burgan, Robert E. 2005. **Standard fire behavior fuel models: a comprehensive set for use with Rothermel's surface fire spread model.** Gen. Tech. Rep. RMRS-GTR-153. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Appendix F: Monterey Pine (*Pinus Radiata*) Fire Ecology

Adapted from:

Cope, Amy B. 1993. *Pinus radiata*. In: Fire Effects Information System, [Online].

U.S. Department of Agriculture, Forest Service,

Rocky Mountain Research Station, Fire Sciences Laboratory (Producer).

Available: <http://www.fs.fed.us/database/feis/> [2007, December 12].

Regeneration and Successional Status

The minimum seed-bearing age for Monterey pine is between 5 and 10 years. Maximum seed production begins at 15 or 20 years of age if trees are open-grown, and later if stands are dense [11,25,35]. Cones are produced annually, with good cone crops produced every other year [25]. Mature cones remain attached to the branch. They may remain closed for several years, depending upon temperature and humidity. Cones open and release seed during warm, dry periods and close rapidly when temperature drops and relative humidity increases. This results in a constant but meager seed rain [52]. The cones of native populations open infrequently because their habitat is typically cool and moist. Seedfall is heaviest in warm, dry years [35]. Unreleased seed remains viable for decades. Seeds from cones up to 24 years of age have germinated; however, germinative capacity appears to fall off with progressing years [52]. Seeds can be exposed to a temperature of 203 degrees Fahrenheit (95 deg C) before germination is significantly reduced [29]. Seedling recruitment is best on mineral soil [52]. Details of growth are discussed in the literature [11].

Monterey pine does not reproduce by sprouting [14,35].

Monterey pine normally invades dry sites with poor, shallow soils. It also invades oldfields after land clearance, grazing, fire, or logging [48]. Trees establish in even-aged stands [52].

Monterey pine has intermediate shade tolerance [6,35]. As it matures it becomes even less tolerant of shade, and shows optimal growth in full sunlight [5].

Seasonal Development

Pollination occurs from January to February but may be extended due to high temperatures [15,25,35]. Cones open and seeds are dispersed in the first warm, moist days of late winter and early spring. Cones may open and close several times as moisture and temperature conditions fluctuate [35].

Fire Ecology

Monterey pine cones are serotinous; seeds are released when cones are exposed to heat such as fire or high air temperature [19,31,37,53]. Fire is particularly effective for opening cones and releasing seeds. It also creates a favorable seedbed. Reproduction rates are greatest after surface fire in which the parent trees survive [52].

The foliage of Monterey pine is low in volatile terpenes [10].

Postfire regeneration - Crown residual colonizer (on-site, initial community)

Fire Effects

Monterey pine is killed by severe surface or crown fire. Trees survive crown scorch unless it is extensive. In South Africa Monterey pine survived a surface wildfire except where crown scorch was greater than 90 percent [13,14]. Trees are damaged by direct heat. Exposure to a temperature of 424 degrees Fahrenheit (200 deg C) for more than half a minute resulted in

cambium death wherever heat was applied [13,52]. Such localized burning or scorching of bark of mature trees causes scarring but may not result in tree death [52].

Young, thin-barked Monterey pine are often killed by fire, particularly when stands are dense and crown fire occurs [52].

Monterey pine cones open and release seed after fire [19]. In California, White [in 52] reported a seedling density of 196 per acre (490/ha) the January following a spring wildfire. Seedlings were 12 to 22.4 inches (30-56 cm) tall.

Management Considerations

Thinning and pruning in Monterey pine plantations result in accumulation of flammable fuels [8]. Crown scorch and cambium damage are reduced when slash is mechanically reduced before burning [8].

References

5. Baker, Frederick S. 1945. Effects of shade on coniferous seedlings grown in nutrient solutions. *Journal of Forestry*. 43: 428-435. [9935]
6. Baker, Frederick S. 1949. A revised tolerance table. *Journal of Forestry*. 47: 179-181. [20404]
8. Burrows, N. D. 1980. Crushing the thinning slash problem. Research Paper 62. Perth, Australia: Forests Department of Western Australia. 4 p. [17004]
9. Clinnick, P. F.; Willatt, S. T. 1981. Soil physical and chemical properties measured in an "ashbed" following windrow burning. *Australian Forestry*. 44(3): 185-189. [19644]
11. Cremer, K. W. 1992. Relations between reproductive growth and vegetative growth of *Pinus radiata*. *Forest Ecology and Management*. 52: 179-199. [19651]
13. de Ronde, C. 1982. The resistance of *Pinus* species to fire damage. *South African Forestry Journal*. 122: 22-27. [9916]
14. DeRonde, Neels. 1990. How to minimize losses after wildfire by the application of damage evaluation techniques in pine stands. In: International Conference of Forest Fire Research; 1990 November 19 - November 22; Coimbra, Portugal. Coimbra, Portugal: International Conference on Forest Fire Research: B.22 - 1-9. [17888]
19. Fiske, John N.; DeBell, Dean S. 1989. Silviculture of Pacific coast forests. In: Burns, Russell M., compiler. *The scientific basis for silvicultural and management decisions in the National Forest System*. Gen. Tech. Rep. WO-55. Washington, DC: U.S. Department of Agriculture, Forest Service: 59-78. [10246]
25. Kalmbacher, R. S.; Martin, F. G.; Terry, W. S.; [and others]. 1985. Effects of clipping on burned and unburned creeping bluestem. *Journal of Range Management*. 38(6): 531-535. [1308]
29. Linhart, Yan B. 1978. Maintenance of variation in cone morphology in California closed-cone pines: the roles of fire, squirrels, and seed output. *Southwestern Naturalist*. 23(1): 29-40. [19166]
31. Little, Elbert L., Jr. 1975. Rare and local conifers in the United

- States. Conservation Research Rep. No. 19. Washington, DC: U.S. Department of Agriculture, Forest Service. 25 p. [15691]
35. McDonald, Philip M.; Laacke, Robert J. 1990. *Pinus radiata* D. Don Monterey pine. In: Burns, Russell M.; Honkala, Barbara H., technical coordinators. *Silvics of North America. Volume 1. Conifers. Agric. Handb. 654.* Washington, DC: U.S. Department of Agriculture, Forest Service: 433-441. [13401]
37. Menke, John W.; Villasenor, Ricardo. 1977. *The California Mediterranean ecosystem and its management.* In: Mooney, Harold A.; Conrad, C. Eugene, technical coordinators. *Proc. of the symp. on the environmental consequences of fire and fuel management in Mediterranean ecosystems;* 1977 August 1-5; Palo Alto, CA. Gen. Tech. Rep. WO-3. Washington, DC: U.S. Department of Agriculture, Forest Service: 257-270. [4847]
52. Vogl, Richard J.; Armstrong, Wayne P.; White, Keith L.; Cole, Kenneth L. 1977. *The closed-cone pines and cypress.* In: Barbour, Michael G.; Major, Jack, eds. *Terrestrial vegetation of California.* New York: John Wiley and Sons: 295-358. [7219]
53. Warren, Richard; Fordham, Alfred J. 1978. *The fire pines.* *Arnoldia.* 38(1): 1-11. [18709]

Appendix G: Preproject Survey Species

Survey Species Before Vegetation Modification Projects in Palo Corona Park

NATURAL COMMUNITY	PLANT NAME	NOTES	STATUS
MONTEREY PINE FOREST			ESHA in Coastal Zone
	<i>Actostaphylos hookeri</i>	generally a Maritime Chaparral indicator, may be present under pine canopy	CNPS 1B
	<i>Pinus radiata</i>		CNPS 1B, ESHA in Coastal Zone
	<i>Piperia yadonii</i>		FE
MARITIME CHAPARRAL			ESHA in Coastal Zone
	<i>Arctostaphylos hookeri</i>		CNPS 1B
	<i>Ceanothus cuneatus rigidus</i>		CNPS 4
	<i>Eriogonum nortonii</i>	scattered in roadbed, Chamise Ridge	CNPS 4
	<i>Lomatium parvifolium</i>		CNPS 4
	<i>Piperia michaelii</i>		CNPS 4
	<i>Piperia yadonii</i>		FE
GRASSLAND			
	<i>Calochortus uniflorus</i>	fronting Highway 1	PC rare
	<i>Castilleja densiflora</i> var. <i>noctoriana</i>	fronting Highway 1	PC rare
	<i>Chorizanthe douglasii</i>		CNPS 4
	<i>Clarkia lewisii</i>		CNPS 4
	<i>Iris longipetala</i>	fronting Highway 1	PC rare
	<i>Linanthus grandiflorus</i>		CNPS 4
	<i>Lotus formosissimus</i>	in road	CNPS 1B
	<i>Microseris paludosa</i>		locally rare
	<i>Plagiobothrys (diffusus?) reticulatus</i> var. <i>rossianborum</i>	fronting Highway 1	CE
COASTAL SCRUB			
	<i>Delphinium hutchinsoniae</i>	also in grasslands, though uncommon	CNPS 1B
	<i>Eriogonum parvifolium</i>	Host plant for FE Smith's blue butterfly. Can also occur at edge of Grasslands. DO NOT MOW OR THIN	
	<i>Piperia elegans</i>		PC rare
MIXED EVERGREEN FOREST			

	<i>Corrallorhiza maculata</i>	under canopy	PC rare
REDWOOD FOREST			ESHA in Coastal Zone
	<i>Fritillaria affinis</i>	under canopy along road to San Jose Creek	PC rare

Federal Status:

FE - Federally Endangered

State of California Status:

CE = California Endangered

CR = California Rare

California Native Plant Society Status:

1B = Rare or Endangered in California and elsewhere

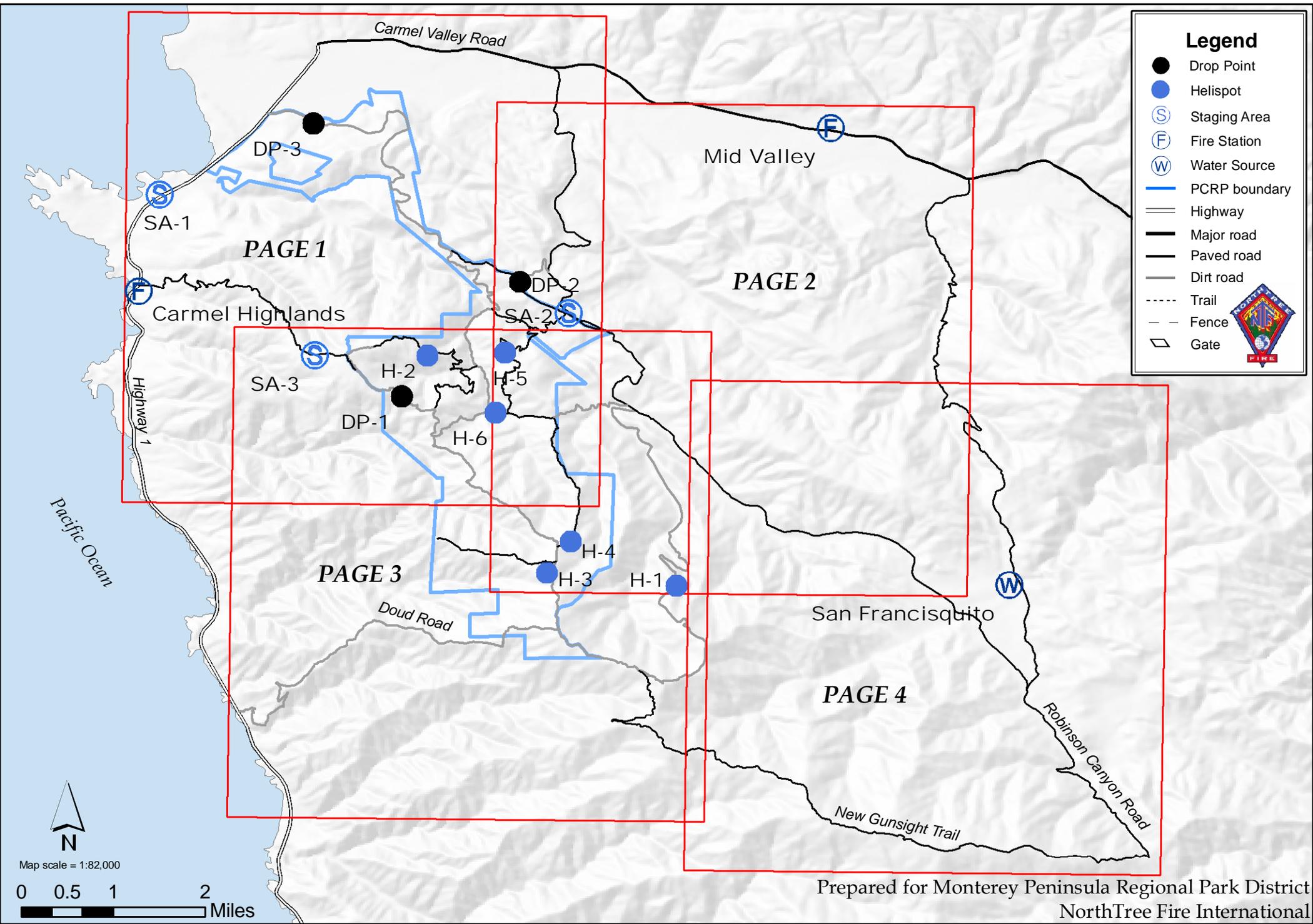
4 = Limited Distribution

ESHA = Environmentally Sensitive Habitat Area, Coastal Zone

Locally Rare/Uncommon and PC (Palo Corona) Rare = plants uncommon in the Palo Corona Regional Park and generally in the region.

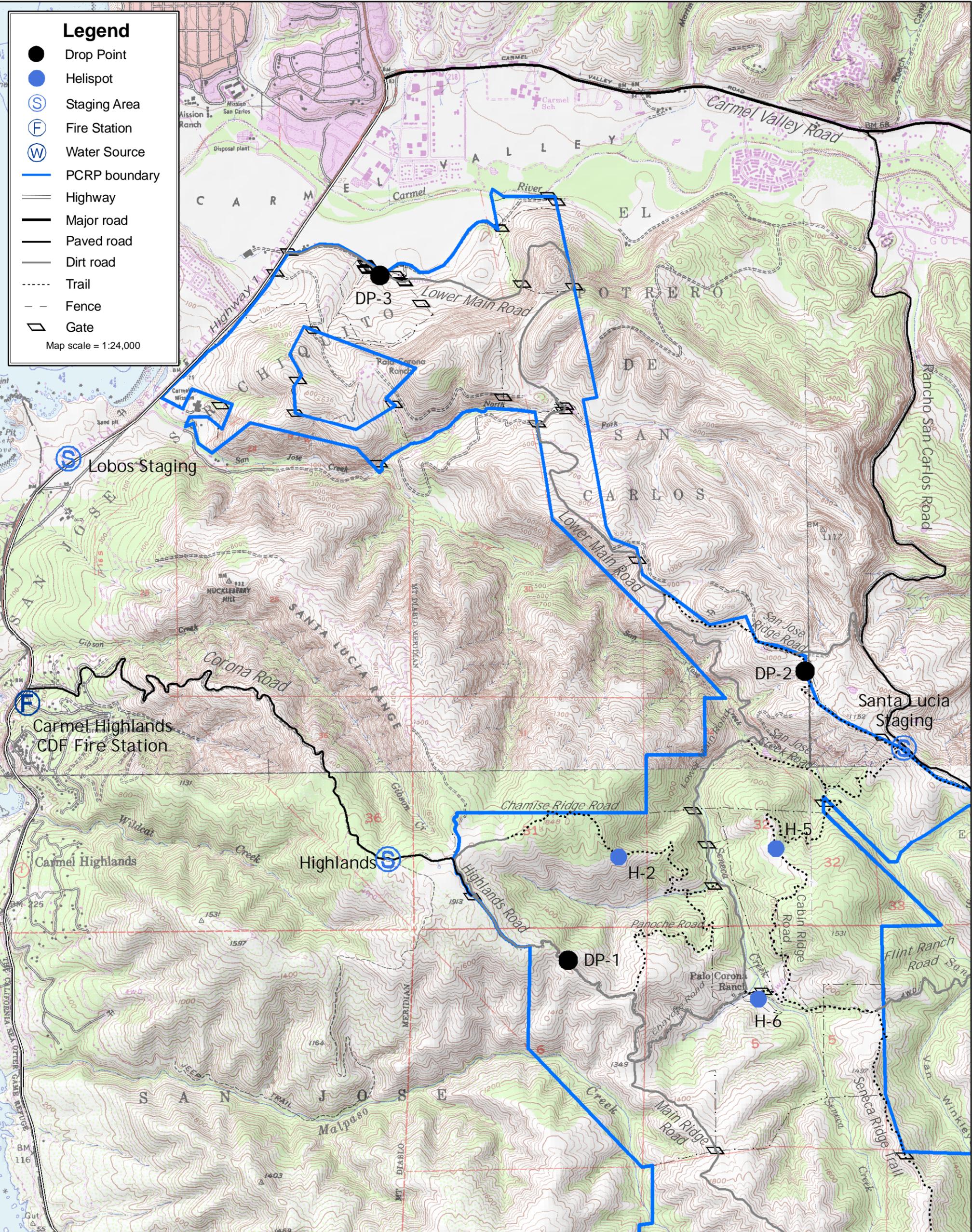
Appendix H: Prefire Response Maps

PCRP Prefire - IAP map page index



Palo Corona Regional Park

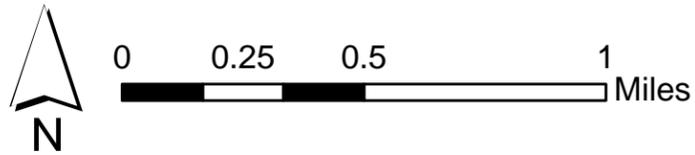
Prefire Response Atlas Page 1



Legend

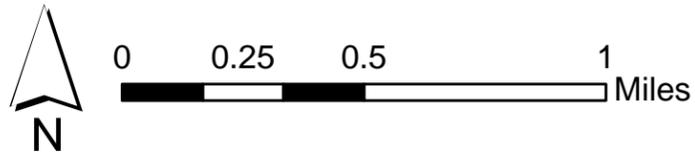
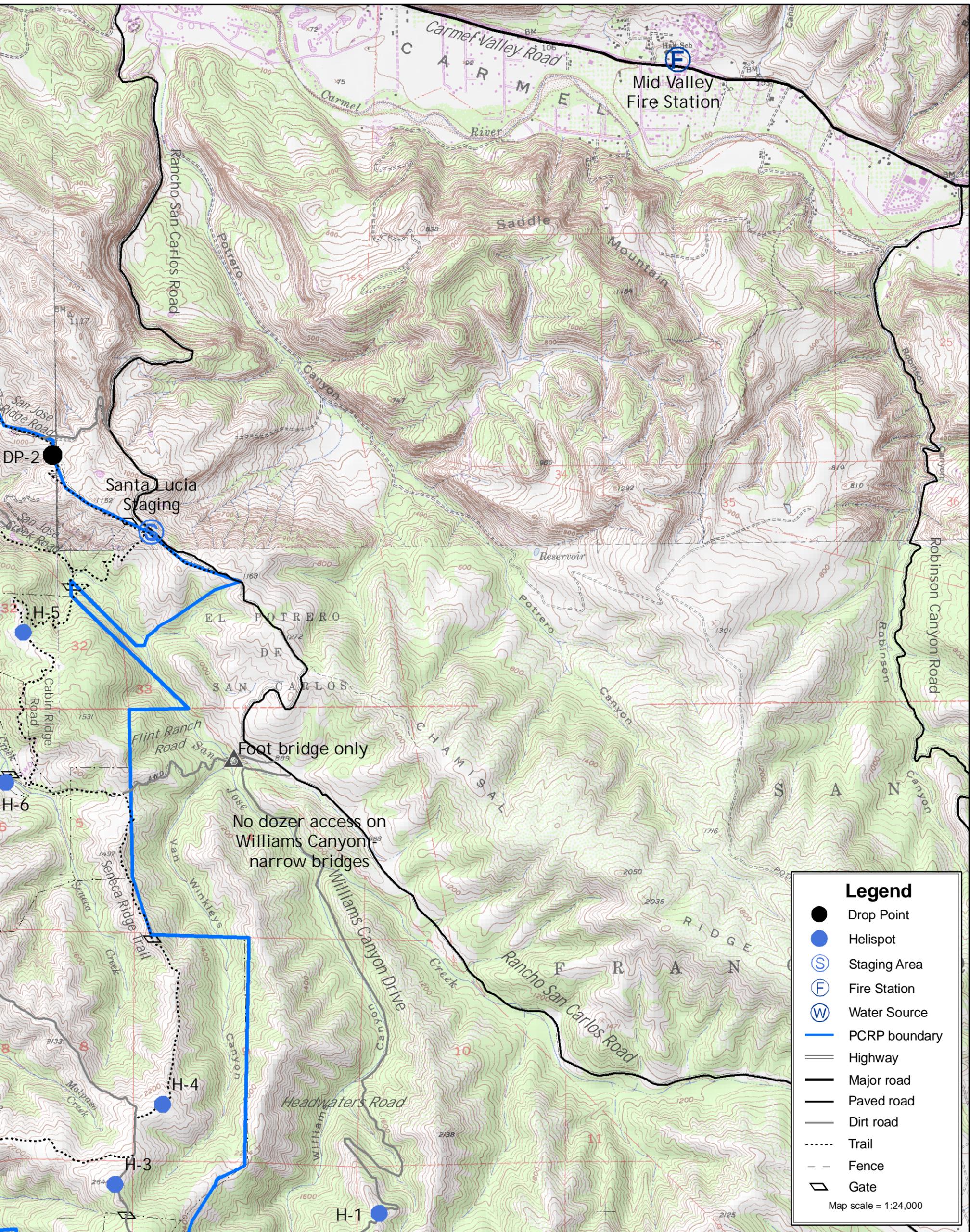
- Drop Point
- Helispot
- Ⓢ Staging Area
- ⓕ Fire Station
- Ⓜ Water Source
- ▭ PCRP boundary
- ▬ Highway
- ▬ Major road
- ▬ Paved road
- ▬ Dirt road
- ⋯ Trail
- - - Fence
- ▭ Gate

Map scale = 1:24,000



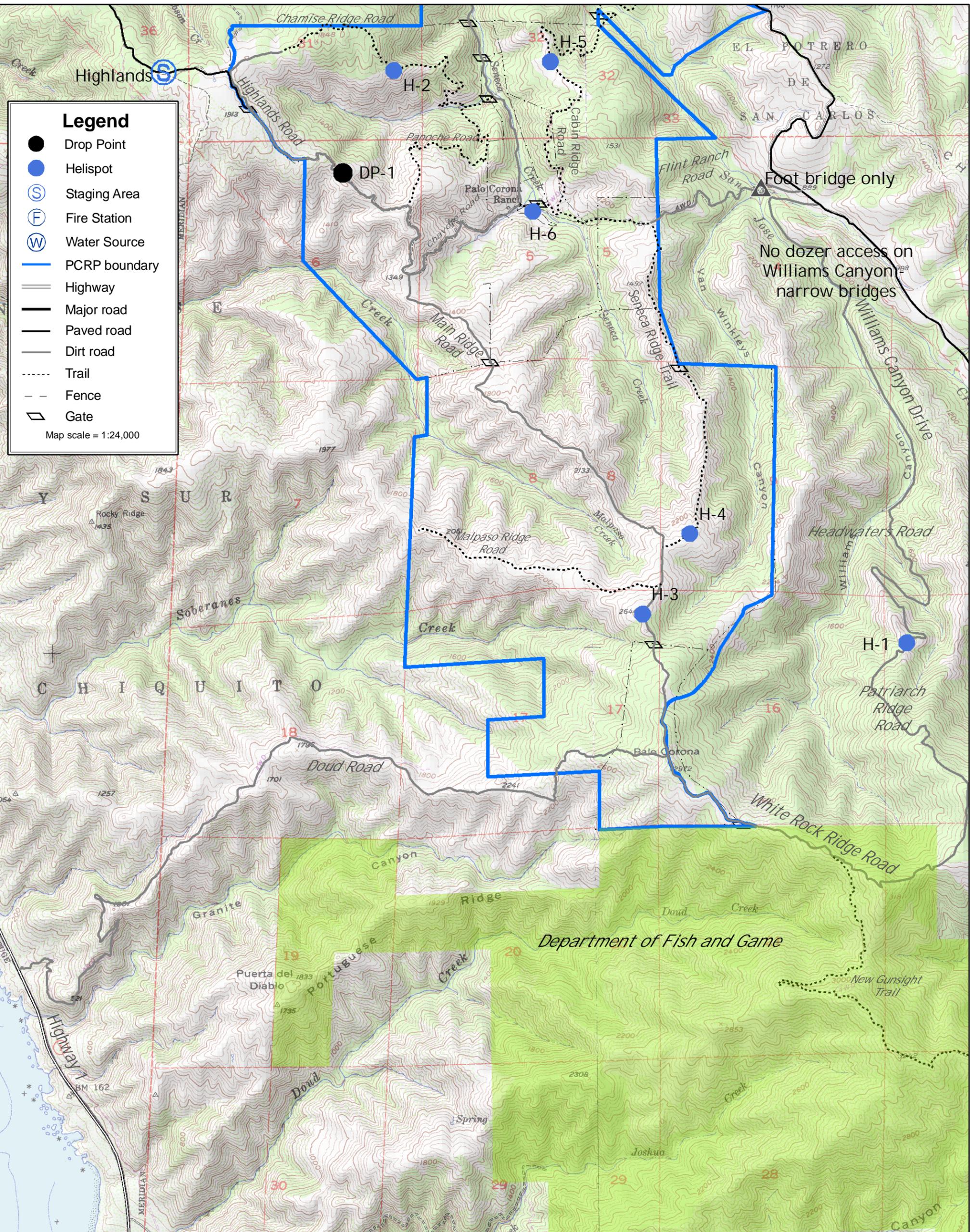
Palo Corona Regional Park

Prefire Response Atlas Page 2



Palo Corona Regional Park

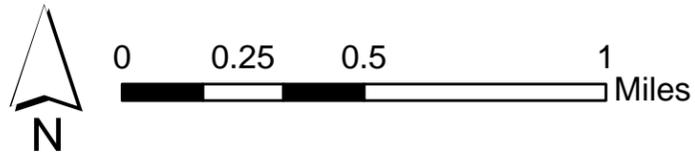
Prefire Response Atlas Page 3



Legend

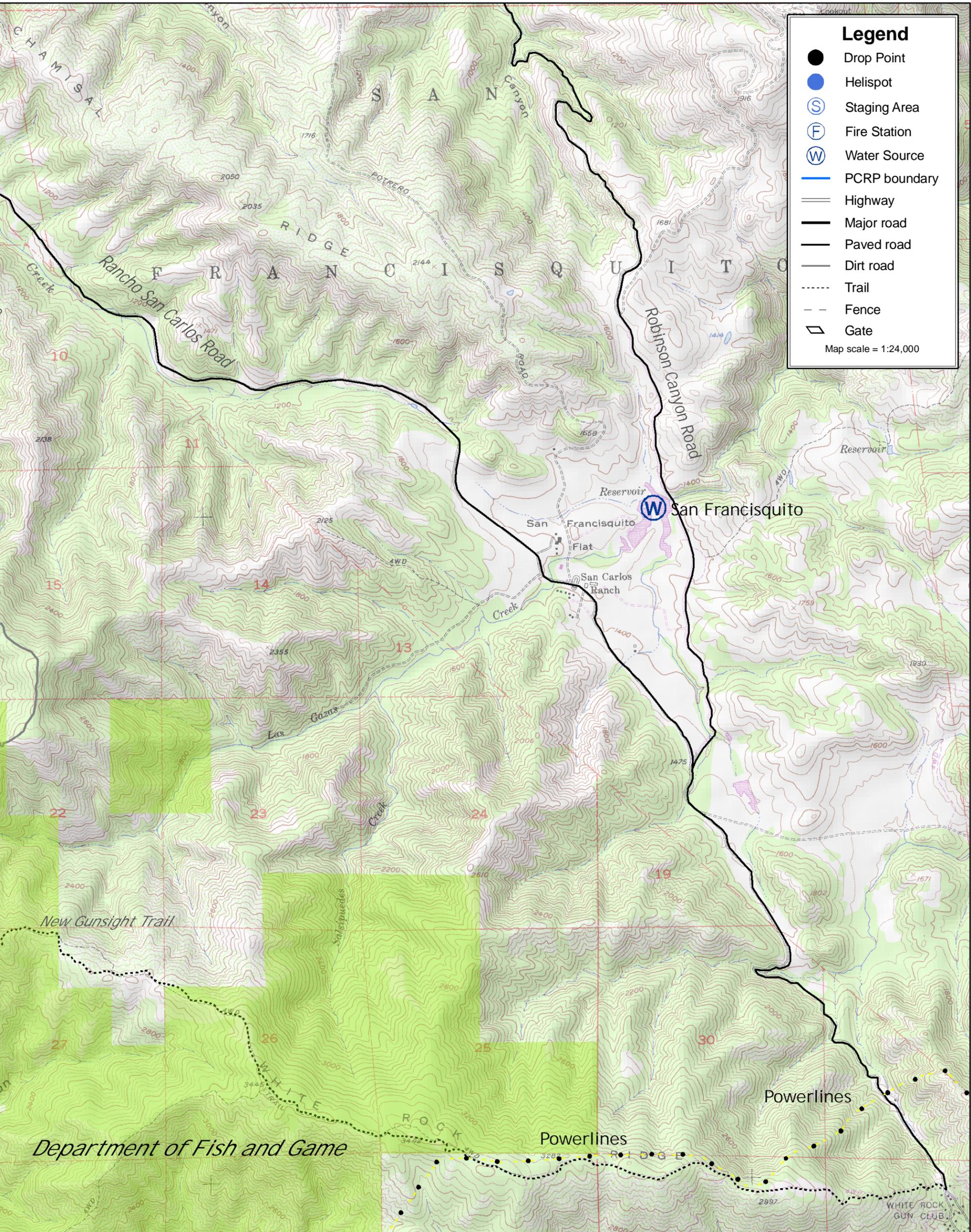
- Drop Point
- Helispot
- Ⓢ Staging Area
- ⓕ Fire Station
- Ⓜ Water Source
- PCRP boundary
- Highway
- Major road
- Paved road
- Dirt road
- Trail
- - - Fence
- ▭ Gate

Map scale = 1:24,000



Palo Corona Regional Park

Prefire Response Atlas Page 4



Legend

- Drop Point
- Helispot
- Ⓢ Staging Area
- ⓕ Fire Station
- Ⓜ Water Source
- PCRP boundary
- Highway
- Major road
- Paved road
- Dirt road
- Trail
- - - Fence
- ▭ Gate

Map scale = 1:24,000

