Hannigan, Edith@BOF

From: Martha Booz <mlbooz@calnatives.com>
Sent: Tuesday, May 31, 2016 10:09 AM
To: Vegetation Treatment Program@BOF
Cc: Beth Wurzburg
Subject: CalFire's Vegetation Treatment Program (VTP) - Comments

Hello,

I am commenting on the latest draft of the In the latest draft of the Draft Programmatic Environmental Impact Report (DPEIR) proposed by CalFire for the Vegetation Treatment Program.

I find that:
- Potential impacts are dismissed without support
- Mitigations of impacts are unenforceable and unmeasurable
- Clearance of northern chaparral is justified by logical fallacies
- Research of several scientists continues to be misrepresented (despite corrections being submitted)
- Lack of transparency remains a significant issue

Why didn't you notify environmental groups of this action. You MUST NOT Clear all the Chaparral!!! That is foolish. You must pay attention to the research results provided by the California Chaparral Institute.

As a member of the California Native Plant Society, I am deeply disappointed in your Draft Plan. It MUST be improved.

Thank you for your attention to the comments above. The Plan must be changed and improved. It will not do as it is!

Martha Booz
3823 Valley Lane
El Sobrante, CA 94803-3118
510-222-4698
mlbooz@calnatives.com

Hannigan, Edith@BOF

From: Margaret <vajrapamo@yahoo.com>
Sent: Tuesday, May 31, 2016 12:59 PM
To: Vegetation Treatment Program@BOF
Subject: Native plant destruction?

I am worried that 1/4 of California will be subjected to deforestation techniques that will be devastating for animals our soil and native plants. Not an answer for drought. Stop using water for fracking etc.. Why can't we listen to intelligent people not slash and burn types?

Margaret Bradford
Healthy Steps Hiking
Www.healthystepshiking.com
Cell: 925.451.8558

California Native Plant Society

Los Angeles / Santa Monica Mountains Chapter

15811 Leadwell Street, Van Nuys, California 91406

May 30, 2016

Edith Hannigan, Board Analyst
Board of Forestry and Fire Protection
P.O. Box 94426
Sacramento, California 94244-2460
e-mail: Vegetation Treatment PEIR <VegetationTreatment@bof.ca.gov>

RE: Program EIR for the Vegetation Treatment Program (VTP) , March 2016

Dear Edith Hannigan:

The Los Angeles / Santa Monica Mountains Chapter of California Native Plant Society (LASMM, CNPS) membership area covers the Santa Monica Mountains, western portions of the Los Angeles Basin, the San Fernando Valley west through the Simi Hills, and north to the Mojave Desert. We have commented both in writing and at public meetings over the years in the long process of updating the Board of Forestry and Fire Protection Vegetation Treatment Program.

General Comment: Why is the PEIR using a very outdated reference (DFG 1988) for defining the major plant alliances around California? The accepted reference, which took years of field surveys around California to assemble, is A Manual of California Vegetation, 2nd Edition, 2009, John O. Sawyer, T. Keeler-Wolf , J. M. Evens. It is a collaboration between CNPS and CDFW, published by CNPS.

We have many concerns with this Program Environmental Impact Report (PEIR) structure and avoidance of addressing serious issues of the 21st century, namely chaotic weather patterns, climate change, bare earth clearance in watersheds near houses in WUI zones and the serious losses of hardwoods, conifers and other trees to insect pests such as borers and to an out-of-control major plant pathogen: *Phytopthora ramorum* (Los Angeles Times, Tuesday, May 3, 2016, page B-2, “Oaks face unstoppable epidemic”).

1.) Where does this PEIR address the problem of plant pests and pathogens?

2.) Why are only invasive plants considered a problem?

3.) Why doesn’t Appendix B have proper directions for sanitizing equipment, tools, shoes, etc. when workers have been in contact with infested or infected plant material in the field?

4.) Why is Appendix B called “Biological Resources” when it is a manual on attacking invasive plants?

5.) Where does this PEIR indicate knowledge that chipping and grinding infected or infested trees also requires sterilizing the resulting mulch before it may be left onsite?

6.) Where does this PEIR indicate that California Department of Food and Agriculture (CDFA) must be included as one of the supervising agencies for any processing of cut trees or removal of those trees or understory plants when the site is in a quarantined area?

7.) Why isn't one of the VTP's primary objectives to map large occurrences of dead and dying trees with the objective of removing / thinning those trees, perhaps moving them to an open area where they can be chipped and processed in a nearby biofuel facility, with no greenhouse gas (GHG) emissions and the production of biofuel? Working with local land use jurisdictions and perhaps providing grant funding to site a biofuel facility near stressed forest areas, especially those in quarantine, and then supplying green waste from forest management activities is a far more useful vegetation treatment program than anything proposed in this PEIR.

8.) Why isn't one of the VTP's primary objectives to protect watershed health and the ability of soils in those watersheds to absorb rainwater through careful maintenance of mixed native shrubs which stabilize loose slopes with a network of deep and shallow roots, in concert with a range of soil organisms? Bare earth clearance in watershed areas near houses erodes hillsides and destroys watershed health. Why not clear from the houses in the WUI outward? We need absorptive hillsides, not runoff to storm drains.

9.) In Table ES-1 why does the PEIR assume no VTP effects on utilities or on climate change?
Does this mean the VTP will not encourage utilities with power grids crossing SRAs to install power breakers all along their system that will shut power off when a short occurs, e.g. from wind-blown limbs hitting two lines or wind causing two lines to touch or to break and hit the ground? Does this mean the VTP will not move forward with any meaningful steps to adjust to climate change?

10.) Page E-12, E-10 Areas of Known Controversy: Isn't Bullet 8 actually two bullets put together?
Bullet 8: "Impact to climate change and greenhouse gases Ability to address the ecological and social complexities of the state in a single Program."
Perhaps "Ability to address the ecological and social complexities of the state in a single Program" should have been the first bullet in this section?

11.) Page 1-11, 3rd Bullet: "The California Air Resources Board (CARB) and the California Department of Forestry and Fire Protection (CDFFP) shall work together and with federal land managers and the United States Environmental Protection Agency to expand the practice of prescribed burns, which reduce fire risk and avoid significant pollution from major wildfires, and increase the number of allowable days on a temporary basis to burn tree waste that has been removed in high hazard areas."
Why, in a time of chaotic weather patterns is CDFFP seeking more days per year to burn tree waste? Why not chip the tree waste and take it to a biofuel plant to avoid increasing the amount of GHGs created by CDFFP VTP program? There is a real chance that more prescribed burns will become major conflagrations due to increasingly unpredictable wind and weather patterns as our climate changes.

12.) Page 1-17, 1.7.4 California Forest Improvement Program (CDFIP): Aren't two suggested activities missing from this list of bullets? After bullet 4: "Release from brush competition", shouldn't there be a bullet 5: "Release from non-native grass competition" and a bullet 6: "Release from non-native tree competition"?

13.) Page 2-56, **BIO-2: "**The project coordinator shall run a nine-quad search or larger search area (maybe required if a project is on the boundary of two USGS quad maps) of the area surrounding the proposed project for special status species, using at a minimum, the California Natural Diversity Database (CNDDB) or its successor (e.g., DFW's Vegetation Classification and Mapping Program, VegCAMP)."
In this time of climate change, how, without rigorous field surveys several times during the year, can the project coordinator be sure that the species are still present in those locations? Have they migrated to a wetter, drier, colder or more shaded niche? Have they died out? Have they hybridized or otherwise changed genetically? Are they dormant in a seed bank? The databases mentioned are limited to the accuracy and timeliness of information received.

14.) Page 2-56, **BIO-3: "**The project coordinator shall write a summary of all special status species identified in the biological scoping including the CNDDB search with a preliminary analysis, identifying which species would be affected by the proposed project. A field review will then be conducted by the project coordinator to identify the presence or absence of any special status species, or appropriate habitat for special status species, within the project area." How can one field review be enough? Many special plant species are annuals or short-lived perennials. Their blooming times may be very dependent on rain and temperatures.

15.) Page 2-57, **BIO-6: "**In shrublands containing native oaks, treatments may incorporate retention of older, acorn producing oaks to create deer forage. CAL FIRE or applicants may plant other vegetation to promote species diversity and improve wildlife habitat when such practices are not in conflict with program goals." Mature oaks provide forage for birds, small mammals, etc. Why is the only excuse to "provide deer forage".? Why plant "other vegetation", perhaps non-native or not part of the natural native plant community? What is the program goal? Shouldn't the goal be to have a healthy, diverse, native plant community? Does this PEIR have two contradictory sets of goals: one set to protect the natural plant and animal resources, water and air, and the other to promote non-native (highly flammable) grasslands for grazers, low diversity tree farms for easy timber harvesting, and to eliminate the highly biodiverse shrublands? Aren't these two sets of goals incompatible in the 21st century, in a time of climate change and drought?

16.) Pages 2-56 & 2-57, Biological Standard Requirements; Where in this set of thirteen Biological Standard Requirements is there any mention of how CDFFP and Cal-Fire are going to plan and to put into action any program that covers the safe removal and decontamination of pest-killed and plant pathogen killed trees?

17.) The current VTP PEIR is not complete and is insufficient for achieving its stated mission and goals.

CDFFP and Cal-Fire must face the challenges of the 21st century with a new program capable of dealing with large populations of people, erosion of watersheds and loss of groundwater, new plant diseases and non-native plant invasions, changing climate, very erratic weather patterns, rising ocean levels and still preserve one of the world's greatest centers of biodiversity: California.

Sincerely,

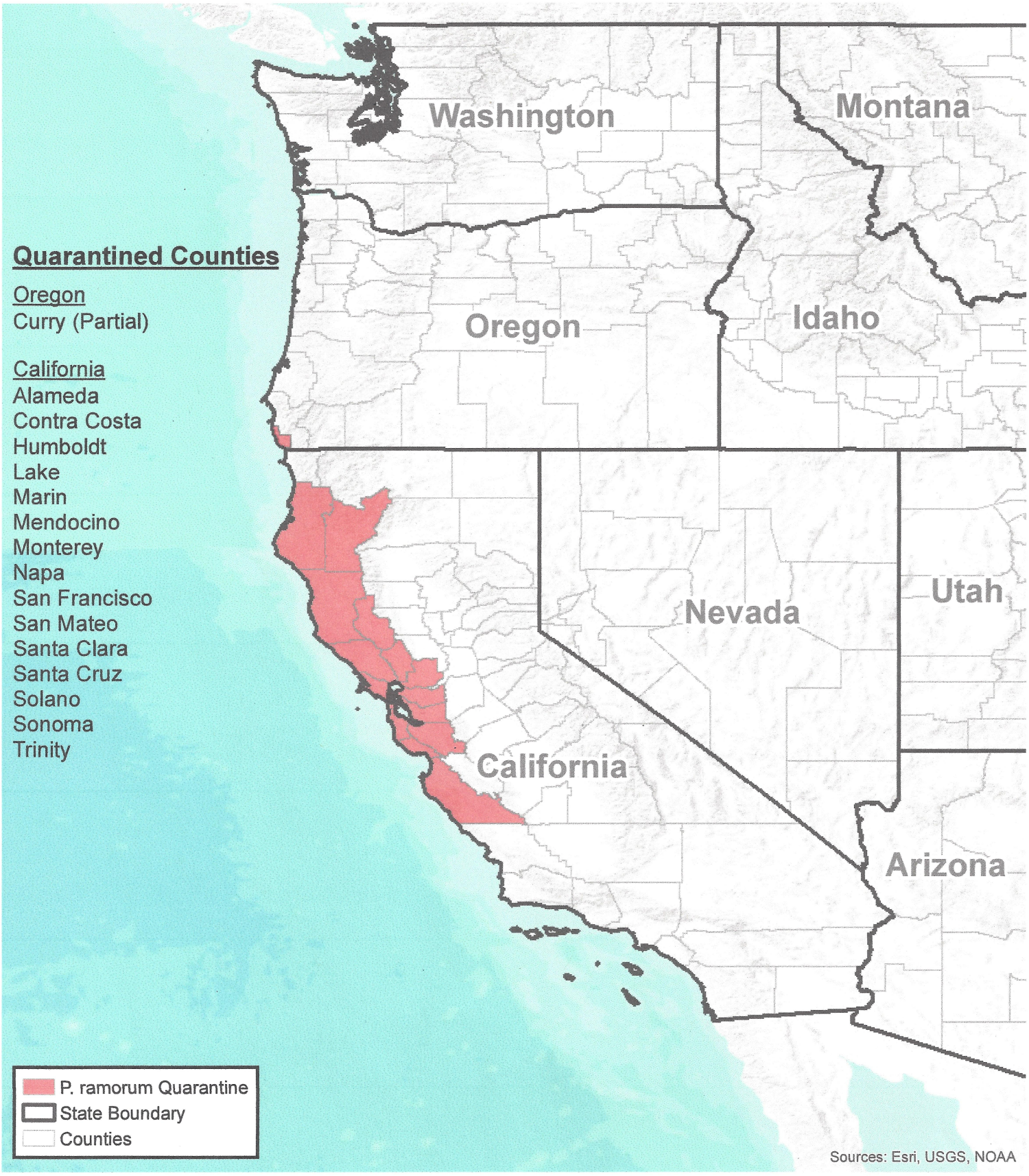
Snowdy Dodson
President
Los Angeles / Santa Monica Mountains Chapter
California Native Plant Society

Information on *Phytophthora ramorum* in California as of May, 2016 is attached.

Additional powerpoint and web references:
1) Brandeis U. show on bark beetle infestations: people.brandeis.edu/~clewis/GIS_FireSeverity.ppt
2) Pest Infestation Protocols: http://www3.calrecycle.ca.gov/organics/Threats/BarkBeetle.htm
3) WUI fire science: http://www.nrs.fs.fed.us/pubs/gtr/gtr_nrs1/stewart_1_197.pdf
4) WUI fire science: http://frap.fire.ca.gov/projects/wui/525_CA_wui_analysis.pdf

USDA United States Department of Agriculture

Phytophthora ramorum
Federal Quarantine Status



Quarantined Counties

Oregon
Curry (Partial)

California
Alameda
Contra Costa
Humboldt
Lake
Marin
Mendocino
Monterey
Napa
San Francisco
San Mateo
Santa Clara
Santa Cruz
Solano
Sonoma
Trinity

P. ramorum Quarantine
State Boundary
Counties

Sources: Esri, USGS, NOAA

0 55 110 220 Miles

USDA, APHIS, PPQ
GIS Specialist
1506 Klondike Rd Suite 306
Conyers, GA 30094

Coordinate System: GCS WGS 1984
Datum: WGS 1984

Data Source: ESRI, PPQ

Document Path: H:\GIS_Data\Hubs\2015\Maps\PPQ_PramorumQuar_20150304.mxd

Please also see Federal Domestic Quarantine 301.92 for regulations on the interstate movement of regulated articles.

3700. OAK MORTALITY DISEASE CONTROL

State Miscellaneous Ruling

Restrictions are hereby established against this pest, its hosts, and possible carriers.

A. Pest. A fungus, *Phytophthora ramorum*, which causes oak mortality disease (sudden oak death).

B. Regulated Area. The regulated area for the pest is:

(1) The entire counties of Alameda, Contra Costa, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, Sonoma and **Trinity.**

C. Articles and Commodities Covered. The following are declared to be hosts or potential carriers of the pest:

(1) Plants and plant parts (except acorns or seed and a * includes the bole) of:

Acer macrophyllum (bigleaf maple)
Acer pseudoplatanus (planetree maple)*
Adiantum aleuticum (Western maidenhair fern)
Adiantum jordanii (California maidenhair fern)
Aesculus californica (California buckeye)
Aesculus hippocastanum (horse chestnut)*
Arbutus menziesii (madrone)
Arctostaphylos manzanita (manzanita)
Calluna vulgaris (Scotch heather)
Camellia spp. (includes all species, hybrids and cultivars)
Castanea sativa (sweet chestnut)
Cinnamomum camphora (camphor tree)
Fagus sylvatica (European beech)*
Frangula californica (=*Rhamnus californica*) (California coffeeberry)
Frangula purshiana (=*Rhamnus purshiana*) (cascara)
Fraxinus excelsior (European ash)*
Griselinia littoralis (Griselinia)
Hamamelis virginiana (witch hazel)
Heteromeles arbutifolia (Toyon or Christmas berry)
Kalmia spp. (includes all species, hybrids and cultivars)
Laurus nobilis (bay laurel)
Lithocarpus densiflorus (tanoak)*
Lonicera hispidula (California honeysuckle)
Magnolia doltsopa (=Michelia doltsopa) (Michelia)
Maianthemum racemosum (=*Smilacina racemosa*, false Solomon's seal)
Parrotia persica (Persian ironwood)
Photinia fraseri (red tip or Fraser's photinia)
Pieris spp. (includes all species, hybrids and cultivars)
Pseudotsuga menziesii var. *menziesii* and all nursery grown *P. menziesii* (Douglas-fir)
Quercus agrifolia (coast live oak)*
Quercus cerris (European turkey oak)*
Quercus chrysolepis (canyon live oak)*
Quercus falcata (Southern red oak)*
Quercus ilex (Holm oak)
Quercus kelloggii (California black oak)*
Quercus parvula var. *shrevei* and all nursery grown *Q. parvula* (Shreve's oak)*
Rhododendron species (azaleas and rhododendrons)
Rosa gymnocarpa (wood rose)
Salix caprea (goat willow)
Sequoia sempervirens (coast redwood)
Syringa vulgaris (lilac)
Taxus baccata (European yew)
Trientalis latifolia (Western star flower)
Umbellularia californica (California bay laurel)
Vaccinium ovatum (huckleberry)
Viburnum spp. (All species of viburnum);

(2) Associated articles (nursery stock) of the following plants:

Abies concolor (white fir)
Abies grandis (grand fir)
Abies magnifica (red fir)
Acer circinatum (vine maple)
Acer davidii (striped bark maple)
Acer laevigatum (evergreen maple)
Arbutus unedo (strawberry tree)
Arctostaphylos columbiana (manzanita)
Arctostaphylos uva-ursi (Kinnikinnick)
Ardisia japonica (Ardisia)
Berberis diversifolia (=Mahonia aquifolium) (Oregon grape)
Calycanthus occidentalis (spicebush)
Castanopsis orthacantha (Castanopsis)
Ceanothus thyrsiflorus (blue blossom)
Cercis chinense (Chinese redbud)
Choisya ternate (Mexican orange)
Clintonia andrewsiana (Andrew's clintonia bead lily)
Cornus kousa (Kousa dogwood)
Cornus kousa x Cornus capitata (Cornus Norman)
Corylopsis spicata (*S*pike Winter hazel)
Corylus cornuta (California hazelnut)
Daphniphyllum glaucescens
Distylium myricoides (myrtle-leafed distylium)
Drimys winteri (Winter's bark)
Dryopteris arguta (California wood fern)
Eucalyptus haemastoma (Scribbly gum)
Euonymus kiautschovicus (spreading euonymus)
Fraxinus latifolia (Oregon ash)
Garrya elliptica (Silk tassel tree)
Gaultheria procumbens
Gaultheria shallon (salal, Oregon wintergreen)
Hamamelis x *intermedia* [(*H. mollis* and *H. japonica*) (hybrid witchhazel)]*Hamamelis mollis* (Chinese witchhazel)
Ilex aquifolium (European holly)
Ilex cornuta (Buford holly, Chinese holly, horned holly)
Ilex purpurea (Oriental holly)
Illicium parviflorum (Yellow anise)
Larix kaempferi (Japanese larch)
Leucothoe axillaries (fetter-bush, dog hobble)
Leucothoe fontanesiana (drooping leucothoe)
Lithocarpus glaber (Japanese oak)
Loropetalum chinense (Loropetalum)
Magnolia cavalieri (Michelia)
Magnolia denudata x salicifolia (magnolia)
Magnolia denudate (lily tree)
Magnolia ernestii (=Michelia wilsonii) (Michelia)

Magnolia figo (=Michelia figo) (banana shrub)
Magnolia foveolata (Michelia)
Magnolia grandiflora (Southern magnolia)
Magnolia kobus (kobus magnolia)
Magnolia liliiflora (=M. quinquepeta) (purple magnolia)
Magnolia maudiae (=Michelia maudiae) (Michelia)
Magnolia salicifolia (=M. proctoriana) (anise magnolia)
Magnolia stellata (star magnolia)
Magnolia x loebneri (Loebner magnolia)
Magnolia x soulangeana (saucer magnolia)
Magnolia x thompsoniana (M.tripetala and M. virginiana) (magnolia)
Mahonia nervosa (Creeping Oregon grape)
Manglietia insignis (red lotus tree)
Molinadendron sinaloense
Nerium oleander (oleander)
Nothofagus obliqua (Roble beech)
Osmanthus decorus [(*=Phillyrea decora; =P. vilmoriniana*) (Osmanthus)]
Osmanthus delavayi (Delavay Osmanthus)
Osmanthus fragrans (sweet olive)
Osmanthus heterophyllus (holly olive)
Osmorhiza berteroi (sweet Cicely)
Parakmeria lotungensis (Eastern joy lotus tree)
Physocarpus opulifolius (Ninebark)
Pittosporum undulatum (Victorian box)
Prunus laurocerasus (English laurel)
Prunus lusitanica (Portuguese laurel cherry)
Pyracantha koidzumii (Formosa firethorn)
Quercus acuta (Japanese evergreen oak)
Quercus petraea (Sessile oak)
Quercus rubra (Northern red oak)
Ribes laurifolium (bayleaf currant)
Rosa cultivars: Royal Bonica (tagged: “MEImodac”), Pink Meidiland (tagged: “MEIpoque”), Pink Sevillana (tagged: “MEIgeroka”)
Rosa rugosa (rugosa rose)
Rubus spectabilis (salmonberry)
Schima wallichii (Chinese guger tree)
Taxus brevifolia (Pacific yew)
Taxus x media (Yew)
Torreya californica (California nutmeg)
Toxicodendron diversilobum (poison oak)
Trachelospermum jasminoides (Star jasmine, Confederate jasmine)
Vaccinium myrtillus (bilberry)
Vaccinium vitis-idaea (cowberry, lingon berry, mountain cherry)
Vancouveria planipetala (Redwood ivy)
Veronica spicata Syn. Pseudolysimachion spicatum (Spiked speedwell)

(3) Unprocessed wood and wood products (including but not limited to bark chips, mulch and firewood- except when completely free of bark) of the plants listed in paragraph (C)(1) as bole hosts and plant products of the plants in paragraph (C)(1), including but not limited to dried or preserved wreaths;

(4) **Any other product**, article or means of conveyance when it is determined by the secretary, based upon generally accepted scientific principles, that it presents a risk of spreading the pest because it is a host or potential carrier of the pest.

D. Restrictions.

(1) Articles and commodities covered in subsection (C) are prohibited movement from the regulated area except as provided in paragraph (a), (b) or (c) below:

a) If accompanied by a certificate issued by an authorized agricultural official affirming that the articles and commodities have been:

1. Produced and maintained in an area which has been surveyed by an authorized agricultural official in a manner approved, based upon generally accepted scientific principles, by the secretary to detect the pest and the area has been found to be free of the pest; or,

2. Grown, produced, manufactured, stored, or handled in a manner approved by the secretary, based upon generally accepted scientific principles, by the secretary to prevent infestation by the pest; or,

3. Tested in a manner approved, based upon generally accepted scientific principles, by the secretary to detect the pest and found to be free of the pest.

b) If the article or commodity does not meet the conditions in paragraph (D)(1)(a), it may nevertheless be moved if a permit is issued by an authorized agricultural official specifying the required containment conditions necessary to prevent potential spread of the pest; the article or commodity covered; the destination; and the handling, utilization, or processing which is authorized by the official and the conditions under which this shall be conducted. If the issuance of a permit is denied, an appeal may be filed with the department as provided in subsection (E).

c) If the article or commodity is being moved from outside the regulated area and is being moved through the regulated area by direct route and without delay.

(2) At the retail level, articles and commodities covered are prohibited movement from the regulated area except when the person in possession has proof of purchase showing the commodity was purchased from a seller who is in compliance with paragraph (D)(1)(a).

E. Appeal/Hearing Procedures.

(1) An appeal pursuant to paragraph (D)(1)(b) may be filed with the department within seven (7) calendar days of the date of denial of the permit. A hearing shall be conducted within 48 hours of an appeal that is timely filed. An appeal that is not timely filed shall be denied and no hearing shall be conducted in connection therewith.

(2) Hearings shall be conducted pursuant to Chapter 4.5 (commencing with section 11400) of Division 3

of Title 2 of the Government Code and these regulations.

(3) Hearings shall be presided over and conducted by a hearing officer designated by the secretary.

(4) Hearings may be conducted by telephone, at the discretion of the secretary.

(5) The decision of the hearing officer shall be in writing. The decision shall be in minute order form, containing only a brief statement of the conclusion and findings to support the conclusion. It may be handwritten.

(6) The decision shall be issued within 24 hours after the conclusion of the hearing and may be issued orally at the conclusion of the hearing subject to written confirmation.

(7) The written decision shall be served on the appellant or designated representative either by personal service or, if available, by facsimile transmission.

(8) The hearing officer's decision shall be final and not appealable to the secretary or any other officer of the Department.

(9) The appellant may seek judicial review of the hearing officer's decision by filing a petition for a writ of administrative mandamus in the appropriate court pursuant to Code of Civil Procedure section 1084 *et seq*.

(10) Hearings shall be recorded by audiotape.

NOTE: Authority: Sections 407, 5321 and 5322, Food and Agricultural Code.

Reference: Sections 24.5, 5321, and 5322, Food and Agricultural Code; Sections 11425.50 and 11440.10, Government Code; Section 1084 *et seq.*, Code of Civil Procedure.

ADDITIONAL HOSTS
APPENDIX 1 **05/07/12**

At this time, there are no additional hosts.

ADDITIONAL INFESTED AREAS
APPENDIX 2 **09/03/04**

At this time, there are no additional infested areas.

United States Department of Agriculture Treatment Manual

Domestic Treatments
Phytophthora ramorum
5-8-20 Treatment Manual 04/2015-121
PPQ

D301.89-13(c) Treatment: D301.89-13(c)—Hot water and high pressure
Clean with a solution of detergent and water at a minimum temperature of 170 °F. Apply under pressure of at least 30 pounds per square inch.

D301.92 *Phytophthora ramorum*

Soil

D301.92-10(a) Treatment: D301.92-10(a)—Heat Treatment
Heat to a temperature of at least 180 °F at the center of the load for 30 minutes in the presence of an inspector.

Wreaths, garlands, and greenery of host material

D301.92-10(b) Treatment: D301.92-10(b)—Hot water
Dip for 1 hour in water that is held at a temperature of at least 160 °F.

Bay leaves

D301.92-10(c) Treatment: D301.92-10(c)—Vacuum heat
(formerly T111-a-1)
1. Place bay leaves in a vacuum chamber.
2. Starting at 0 hour, gradually reduce to 0.133 Kpa vacuum at 8 hours.
3. Maintain the vacuum until the end of the treatment, 22 hours.
4. Gradually increase the temperature in the vacuum chamber from ambient temperature at 0 hour to 60C at 5 hours.
5. After 5 hours,gradually lower the temperature to 30C at 22 hours.
The total length of the treatment is 22 hours.

May 27, 2016

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and Members of the Board,

We, the undersigned, have found that the current Draft Programmatic Environmental Impact Report (DPEIR) for the state's proposed Vegetation Treatment Program contains many of the same errors (some with the exact wording), contradictions, and failures to identify environmental impacts that were pointed out in previous versions.

Potential impacts are dismissed without support, mitigations of impacts are unenforceable and unmeasurable, the treatment of northern chaparral is justified by non sequitur reasoning, and the research of several scientists continues to be misrepresented (despite corrections being submitted). The lack of transparency remains a significant issue – using a local newspaper to inform the public about projects is no longer adequate.

One of the most egregious examples of the DPEIR's failure is the continued use of outdated and inadequate spatial data that provides the foundation for the entire Program. Although updated data is available from Cal Fire itself, **the DPEIR ignores this rich resource** and depends instead on questionable information from decades ago.

As a consequence, the current DPEIR fails to meet the requirements of the California Environmental Quality Act (CEQA).

The DPEIR also reveals **a significant number of inconsistencies** as the document initially references current science to only qualify or ignore it later in order to support the Program's objectives. By using contradictory statements, undefined terms, and legally inadequate mitigation processes, the document is a testament in ambiguity. It appears to

be a program in search of confirming data rather than one developed from examining the actual problem.

For example, although the DPEIR indicates fires are increasing in northern California, acknowledges chaparral is vulnerable to such fires, explains that climate change is changing fire regimes, and claims the Program is based on the future, it contradicts itself by maintaining northern chaparral is not threatened by such increased fire frequencies. It then misrepresents the research (Safford and Van de Water 2014) by leaping to the conclusion that fuel treatments in northern chaparral can be used for ecological purposes. (4-113) This is a non sequitur. There is no scientific evidence to support such action.

The most concerning issue, however, relates to the failure of the document to provide a key component of a programmatic EIR - providing a more exhaustive consideration of effects and cumulative impacts than could be accomplished at the project level (14 CCR § 15168).

Instead, volumes of repetitive text are punctuated with the unsupported claim that determining impacts is impossible, pushing it off to project managers to determine with a checklist and standard project requirements that depend on subjective judgments.

How does the DPEIR justify ignoring a thorough examination of impacts as required by CEQA? The document vacillates between claiming the Program is too large and complex to analyze, or the treatment areas are too small to have an impact.

As a consequence, the current DPEIR

- fails to provide adequate support for concluding that the proposed program will not have a significant effect on the environment.
- fails to provide adequate guidance to prevent significant environmental harm.
- fails to adequately support Cal Fire's mission to protect life, property, and natural resources.

Briefly, the reasons for these failures include:

1. Circumventing CEQA

- impacts determined to be less than significant by the "Fallacy of Authority" (our conclusions are true because we say so – no evidence provided)
- lack of detail as required within a programmatic EIR
- passing on responsibility to project managers to determine potential impacts
- inadequate mitigation measures
- Significance Criteria to determine impact to biological resources dismissed without support

2. Substandard Research

- misrepresenting cited scientific literature
- dependence on anecdotal evidence
- contradictory statements

- ignoring information in the record
- cited references missing, non sequiturs

3. Inadequate Data

- outdated fire hazard analysis model/data unsuitable for project level planning
- utilizing coarse-scale maps that cannot provide sufficient detail for competent analysis
- WUI assessments based on 26-year-old information
- dependence on maps that no longer reflect current conditions

Failure to properly address climate change. With the impacts of human-caused climate change accumulating much faster than even the most severe predictions, it is imperative that every policy we implement from here on out must honestly and exhaustively examine how such policy can facilitate the reduction of carbon in the atmosphere and the protection of what natural environment remains.

The current DPEIR fails to do so.

Regarding carbon emissions, the DPEIR uses the same response it does throughout to dodge examining significant impacts – it merely states there won't be any impacts because of unsupported assumptions.

The DPEIR assumes all the projects will work out properly, and treated plant communities will not type convert to low carbon sequestering grasslands because of the Program's project requirements. These requirements are legally inadequate and unenforceable.

The DPEIR fails to account for the loss of underground carbon storage with the concomitant loss of above ground shrub cover in shrublands, an important carbon sink (Jenerette and Chatterjee 2012, Luo 2007). The DPEIR also fails to address the research that has shown vegetation treatments often release more carbon than wildfires (Mitchell 2015, Law et al. 2013, Meigs et al. 2009).

By using assumptions based on anecdotal evidence and focusing on the short term (such as how to reduce flame lengths, remove dead trees, or increase the number of clearance projects), the DPEIR will likely exacerbate climate impacts, increase the loss of habitat, and fail to adequately accomplish its primary goal – protecting life and property from wildfire loss.

Suggested DPEIR Improvements

Detail impacts. Examine possible direct and cumulative impacts and develop legally adequate mitigations for those impacts as required by CEQA.

Recognize all chaparral as potentially threatened. Chaparral in the northern part of the state will likely be threatened by higher fire frequencies as the climate continues to change. There is no ecological rationale for fuel treatments in shrub dominated ecosystems in northern or southern California.

Define terms. Define all terms utilized in the text needed to ensure consistency in use such as old growth chaparral, critical infrastructure, forest health, etc.

Redefine WUI. Establish a reasonable distance for the WUI by using science rather than anecdotal information.

Use most current Cal Fire Fire hazard data. It is inadequate to utilize a fire hazard analysis done in 2000-2003 that uses a wildland urban interface (WUI) model based on the 1990 U.S. Census. The DPEIR needs to base the Program on current, scientifically verified information available from Cal Fire.

Research support for conclusions. Conclusions in a DPEIR need to be supported by research, not by employing the Fallacy of Authority. Sweeping generalizations like the one below have no place in a science-based document.

> "*Landscape constraints, Standard Project Requirements, and Project Specific Requirements developed as a result of the Project Scale Analysis will, in the aggregate, reduce cumulative impacts to less than significant."*

Maintain consistency and research quality. Eliminate contradictions, errors in citations, and inconsistencies throughout the document.

Consultation on chaparral treatments. All projects involving chaparral should be developed in consultation and in agreement with the California Native Plant Society.

Real alternatives. Create at least one new alternative that focuses on a program that emphasizes the reduction of fire risk by using "from the house out" approach – reducing home flammability, properly maintained defensible space, community fire safe retrofits, then strategic fuel treatments within 1,000 feet if needed.

Proper account of carbon sequestration. Recalculate the loss of carbon to account for the loss of below ground carbon sequestration in chaparral communities.

Account for biodiversity in chaparral. Incorporate into the cumulative impact analysis how biodiversity may be impacted by the Program. See Halsey and Keeley (2016).

Increase transparency. Develop a web-based public notification process for projects similar to the US Forest Service SOPA website. For example: http://www.fs.fed.us/sopa/forest-level.php?110502

Plan for the future. Base project need, selection, and treatment approach, on projected climate change scenarios, not past, anecdotal experiences.

We urge the Board of Forestry and Cal Fire to produce a document that starts by responding to the following question, **"How do we protect lives and property from wildfire?"** instead of "How do we manage fuel?" These are two different questions resulting in two different answers.

Such a powerful approach will challenge everyone to leverage their own experiences, be willing to consider new paradigms, and honestly collaborate with others, especially with those who have different perspectives. Otherwise, we will continue practices that have brought us to this point – increased loss of homes, increased loss of habitat, and increasing levels of carbon in our atmosphere.

Therefore, we urge the Board to prepare a revised DPEIR by addressing and incorporating the suggested improvements above.

We owe it to ourselves and future generations to get it right this time, especially because the changing climate will not be forgiving if we squander the opportunity.

Sincerely,

Richard W. Halsey
Director
The California Chaparral Institute

Joaquín Aganza
President
Friends of Hellhole Canyon

Joyce Burk
Chair
Southern California Forests Committee
Sierra Club

Jeff Kuyper
Executive Director
Los Padres ForestWatch

Frank Landis, Ph.D.
Conservation Chair
California Native Plant Society
San Diego Chapter

Xiuhtezcatl Martinez
Youth Director
Earth Guardians

Michael J. Connor, Ph.D.
California Director
Western Watersheds Project

Dr. Sandra Ross
President
Health & Habitat, Inc.

Claire Schlotterbeck
Hills for Everyone

Bob Schneider
Senior Policy Director
Tuleyome

Citations

Jenerette, G.D. and A. Chatterjee. 2012. Soil metabolic pulses: water, substrate, and biological regulation. Ecology 93 (5): 959-966.

Luo, H. 2007. Mature semiarid chaparral ecosystems can be a significant sink for atmospheric carbon dioxide. Global Change Biology 13: 386-396.

Meigs, G.W., D.C. Donato, J.L. Campbell, J.G. Martin, and B.E. Law. 2009. Forest fire impacts on carbon uptake, storage, and emission: the role of burn severity in the Eastern Cascades, Oregon. Ecosystems 12: 1246-1267.

Mitchell, S. 2015. Carbon dynamics of mixed- and high-severity wildfires: pyrogenic CO_2 emissions, postfire carbon balance, and succession. In D.A. DellaSalla and C.T. Hansen (eds), The Ecological Importance of Mixed-Severity Fires, Nature's Phoenix. Elsevier Press. Pgs. 290-309.

Safford, H.D. and K.M. Van der Water. 2014. Using Fire Return Interval Departure (FRID) Analysis to Map Spatial and Temporal Changes in Fire Frequency on National Forest Lands in California. USDA, Forest Service. PSW-RP-266.

Hannigan, Edith@BOF

From: N.D. Fenton <nanidrew@comcast.net>
Sent: Tuesday, May 31, 2016 5:24 AM
To: Vegetation Treatment Program@BOF
Cc: nanidrew@comcast.net
Subject: PUBLIC COMMENT RE Vegetation Treatment Program

Re: Draft Programmatic Environmental Impact Report for the Vegetation Treatment Program of the California State Board of Forestry and Fire Protection (SCH #2005082054)
Notice of Completion & Environmental document Transmittal was filed with state clearing house (SCH #2005082054). Calfire 's filing proposes a project called *Vegetation Treatment Program (VTP) utilized to "Communities near Wildland" " in any zoning designation depending on local government ordinances" that will "Reduce Wildland Fuel & Restore native ecosystems"*

Dear CA State Board of forestry,

The community of San Lorenzo Valley in Santa Cruz county believes, along with others, that our state flora would be better managed and better off from fire hazards if California State Board of Forestry and Fire Protection withdrew this PEIR for Vegetation Treatment Program.

1 NO EXPLANATION, NECESSITY OR PURPOSE is found that is logical or science and fact based for a VTP program
2. Statutory authority is not found yet claimed by CalFire without reference to any Public Resource Code -- it claims (page E-1 of the DPEIR): "*The Board recognizes the need for a continuous fuel reduction program to ensure a high level of fire protection across the SRA in their Strategic Fire Plan, and has the statutory responsibility to establish policy for wildland resources in the SRA."*
Public Resource code section 4741 states the board shall <u>assist</u> by making its wildland fire prevention and vegetation management expertise available to local governments, not conduct it:

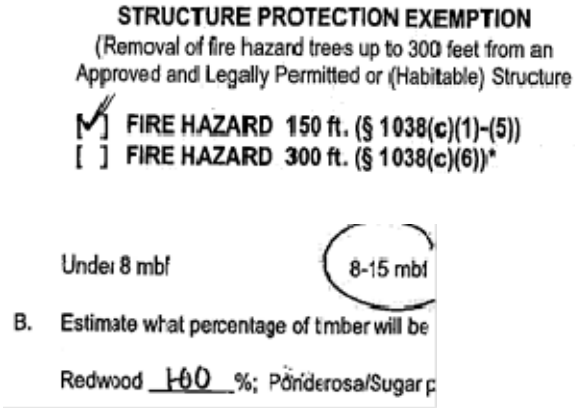
> Sec.4741: In accordance with policies established by the board, the department shall assist local governments in preventing future wildland fire and vegetation management problems by making its wildland fire prevention and vegetation management expertise available to local governments to the extent possible within the department's budgetary limitations. Department recommendations shall be advisory in nature and local governments shall not be required to follow such recommendations.

3. CalFire's VTP proposal, is voluntary, and not authorized by law, and finally not believed that it will be followed.

4. The purpose for the VTP is not based on current science, distorts the facts, threatening to the public and their safety. No biologist has recommended such activity, and must be science based, a requirement of PRC 21001 because CalFire is a "certified regulatory agency .

5. The April 1, 2016, Notice of Availability states "*Similar projects are currently undertaken by CalFire as part of the existing Vegetation management Program (VMP) The Vegetation Treatment Program (VTP) intends to lower the risk of damaging wildfires on SRA lands by managing vegetation to modify and or reduce hazardous fuels - are all parts of CalFire's comprehensive fire prevention strategy.*
CALFIRE'S CURRENT VMP includes many exemptions, one called "FIRE HAZARD TREE REMOVAL" exemption allows logging of fire retardant trees (coast redwood)

In Santa Cruz County since at least 2010, CalFire has been issuing exemption permits in a hazardous fuel reduction program on a form called REMOVAL OF FIRE HAZARD TREES WITHIN 150 FEET OF A STRUCTURE EXEMPTION (form RM-73 (1038C)(12/06) is a notice of timber ops that are exempt from THP requirements. The filings ftp://thp.fire.ca.gov/THPLibrary/North_Coast_Region/Exemption%20Notices/ have only been recently available to the public, displays the exemption is being used to cut down fire retardant Coast Redwood trees anywhere even watercourses, Class I. It is a catastrophe and ongoing. Homeowners are solicited to cut down their fire resistant redwoods for quick cash, only possible with CalFire's assistance. How can CalFire be trusted with another VTP program when a permanent loss of "rain forest" trees has permanently altered tree species, creating new fire hazard potential, increasing landscape flammability, by agency not able to be trusted to run a fire prevention programs



STRUCTURE PROTECTION EXEMPTION
(Removal of fire hazard trees up to 300 feet from an Approved and Legally Permitted or (Habitable) Structure

[✓] **FIRE HAZARD 150 ft. (§ 1038(c)(1)-(5))**
[ ] **FIRE HAZARD 300 ft. (§ 1038(c)(6))***

Under 8 mbf 8-15 mbf

B. Estimate what percentage of timber will be

Redwood 100 %; Ponderosa/Sugar p

ftp://thp.fire.ca.gov/THPLibrary/North_Coast_Region/Exemption%20Notices/2016/20160414_1-16EX-108SCR.pdf

6. All Maps are illegible.

7. The Notice of completion filed with the state clearing house is signed by someone, yet no name is typewritten. It could be signed by Matt Dias, a person who has not declared a conflict of interest, yet one is known as he is a Forester for Big Creek Lumber, among other positions.

Yours,
DREW FENTON
Boulder Creek, CA

CALIFORNIA CHAPARRAL INSTITUTE
...the voice of the chaparral

May 24, 2016

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and Members of the Board,

It is with a deep sense of disappointment to find that the current Draft Programmatic Environmental Impact Report (DPEIR) for the state's proposed Vegetation Treatment Program contains many of the same errors (some with the exact wording), contradictions, and failures to identify environmental impacts that were pointed out in previous versions.

Many of the productive suggestions provided to the Board of Forestry on how they could improve the draft DPEIR were ignored, including those from the California Legislature's required review by the California Fire Science Consortium, the Department of Fish and Wildlife, fire scientists, and environmental groups.

Potential impacts are dismissed by the DPEIR without support, mitigations of impacts are unenforceable and unmeasurable, the treatment of northern chaparral is justified by non sequitur reasoning, and the research of several scientists continues to be misrepresented (despite corrections being submitted). The lack of transparency remains a significant issue – using a local newspaper to inform the public about projects is no longer adequate.

One of the most egregious examples of the DPEIR's failure is the continued use of outdated and inadequate spatial data that provides the foundation for the entire Program. Although updated data is available from Cal Fire itself, **the DPEIR ignores this rich resource** and depends instead on questionable information from decades ago.

As a consequence, the current DPEIR fails to meet the requirements of the California Environmental Quality Act (CEQA).

The DPEIR also reveals **a significant number of inconsistencies** as the document initially references current science to only qualify or ignore it later in order to support the Program's objectives. By using contradictory statements, undefined terms, and legally inadequate mitigation processes, the document is a testament in ambiguity. It appears to be a program in search of confirming data rather than one developed from examining the actual problem.

The most concerning issue, however, relates to the failure of the document to provide a key component of a programmatic EIR - providing a more exhaustive consideration of effects and cumulative impacts than could be accomplished at the project level (14 CCR § 15168).

Instead, volumes of repetitive text are punctuated with the unsupported claim that determining impacts is impossible, pushing it off to project managers to determine with a checklist and standard project requirements that depend on subjective judgments.

How does the DPEIR justify ignoring a thorough examination of impacts as required by CEQA? The document vacillates between claiming the Program is too large and complex to analyze, or the treatment areas are too small to have an impact.

As a consequence, the current DPEIR

- fails to provide adequate support for concluding that the proposed program will not have a significant effect on the environment
- fails to provide adequate guidance to prevent significant environmental harm
- fails to adequately support Cal Fire's mission to protect life, property, and natural resources

Briefly, the reasons for these failures include:

1. Circumventing CEQA

- impacts determined to be less than significant by the "Fallacy of Authority" (our conclusions are true because we say so – no evidence provided)
- lack of detail as required within a programmatic EIR
- passing on responsibility to project managers to determine potential impacts
- inadequate mitigation measures
- Significance Criteria to determine impact to biological resources dismissed without support

2. Substandard Research

- misrepresenting cited scientific literature
- dependence on anecdotal evidence
- contradictory statements
- ignoring information in the record
- cited references missing, non sequiturs

3. Inadequate Data

- outdated fire hazard analysis model/data unsuitable for project level planning
- utilizing coarse-scale maps that cannot provide sufficient detail for competent analysis
- WUI assessments based on 26-year-old information
- dependence on maps that no longer reflect current conditions

The DPEIR also fails to properly address the impacts the Program may have on **carbon emissions and the loss of carbon sequestration** by the clearance of native habitats.

A list of **Suggested Improvements** will follow the evaluation below.

Our Hope

Having worked on the Vegetation Treatment Program since 2005, our experience with this process allows us to offer a uniquely informed evaluation of the DPEIR.

Despite addressing the same problems over and over again, after all the well-informed feedback, all the legal battles, and all the delays caused by failures to meet requirements of environmental compliance, we remain hopeful that a quality Vegetation Treatment Program will emerge in a collaborative manner.

For a quality Program to develop, however, the process must focus on **"How do we protect lives and property from wildfire?"** rather than the current priority, "How do we manage fuel?" These are different questions with very different solutions.

1. Circumventing CEQA

Failure to Determine Impacts

The lack of detail in the DPEIR is a clear violation of the California Environmental Quality Act's requirements for a programmatic EIR.

Throughout the document, the DPEIR completely ignores the necessary detail needed to determine if the Program will have significant impacts. Instead, it defers to managers at the individual project level because the Program is either too "large and complex" to consider the true environmental impacts within the DPEIR (4-116 among others), or too small because the projects average 260 acres (5-44 among others). By using the "Fallacy of Authority," the DPEIR claims without providing supporting evidence,

> *Because of the amount of acreage eligible but not receiving treatment under the VTP, the proposed Program would likely result in a less than significant cumulative effect on biological resources at the bioregional scale.* (5-27)

The DPEIR frequently follows up these claims, again without supporting evidence, with the suggestion that the Program may actually provide a net environmental gain because it may "decrease the frequency, extent, or severity of wildfire." (5-32)

Such rationales have no merit. There is a rich source of literature describing the potential impacts, both local and cumulative, of "fuel treatments" as well as the ecological benefits of high-severity fires in crown fire ecosystems. The DPEIR should adhere to the requirements of CEQA and determine the overall environmental impact of the Program, not pass the responsibility on to individual project managers via a checklist based on subjective opinions.

This failure to account for environmental impacts is troubling because it gives the impression that the DPEIR was not produced to comply with CEQA, but rather to accomplish its stated goal of streamlining the regulatory process (1-7). In fact, this is in line with the Board of Forestry's 2010 Strategic Fire Plan which endorses efforts to "remove regulatory barriers that limit hazardous fuel reduction activities" (Fire Plan Goal #5, objective "b").

While it may be within the rights of the Board of Forestry to lobby the legislature to change laws, CEQA is quite clear about what programmatic EIRs need to address. An EIR's purpose is to examine environmental impacts. The Board should produce a document that does so.

As we wrote in our comment letter on the draft 2010 Fire Plan,

> "Rather than seeking ways to circumvent proper scientific oversight and efforts to insure that scarce fire management resources are used wisely and in the most effective way, the Plan should recommend inclusive community processes that embrace environmental review and invite all stakeholders. While democracy can be inconvenient and collecting information that may question a proposed project frustrating, it is the best way to create a successful fire risk reduction strategy."

Inadequate Standard Project Requirements (SPRs)

Even if the law allowed the lead agency to pass along all the environmental impact determinations/responsibilities to local project managers, the DPEIR's project checklist and undefined "Standard Project Requirements" (SPRs) make such a task impossible.

SPRs are essentially mitigation measures. Such measures as per CEQA must be legally adequate. The DPEIR must demonstrate with solid evidence that mitigation measures are feasible, effective, and enforceable.

- Many of the Program's SPRs fail to provide enforceable procedures (via legally binding agreements) that will produce measurable effectiveness.
- Important terms are not defined, allowing for inconsistent implementation and unknown impacts of projects.
- Some SPRs are so vague and allow for so much subjectivity that they are meaningless.

For example, despite the fact that BIO-5 appears to provide a mechanism to reduce the impact of "fuel treatments" in old-growth chaparral (2-57), it essentially requires nothing of the project manager for the following reasons:

Only southern chaparral. Without justification, the DPEIR excludes all chaparral from BIO-5 except that which occurs in nine southern and central counties.

Old-growth chaparral undefined. The term "old-growth" is not defined, an issue that was pointed out to the Board after the previous draft. Is old-growth chaparral just outside the average fire return interval? Is it more than a century old? Is the presence of 135-year-old *Arctostaphylos glauca* individuals required? Is it different in San Diego County in comparison to Fresno County?

Median fire return interval undefined. Although the DPEIR discusses fire return intervals, there is no guidance in the SPR to assist the local manager in determining what this value happens to be. Given the fact that there is tremendous misunderstanding and resistance to accepting the latest science about this topic (Halsey and Syphard 2015), it is critical that the DPEIR addresses this issue.

Critical infrastructure/forest health undefined. The project manager may dismiss BIO-5 if a proposed project is not deemed necessary to protect "critical infrastructure" or "forest health." Neither term is defined, therefore a project can be approved that destroys valuable, old-growth chaparral because again, the DPEIR does not provide the necessary guidelines.

Projects causing significant environmental harm are not speculative. One such project occurred July 4, 2013 when Cal Fire conducted a prescribed burn in the San Felipe Valley Wildlife Area, San Diego County. The approximately 100-acre fire escaped and burned 2,781 acres, causing significant damage to an old-growth stand of rare desert chaparral in addition to other plant communities.

Cal Fire's partial justification for the project was that it would provide "indirect community protection to Julian and Shelter Valley." This justification was erroneous. Julian is 4.5 miles distant to the project location and 2,000 feet higher in elevation. Shelter Valley is 6 miles distant with extremely light, arid vegetation between it and the project. The project also violated the land management plan for the site and was out of prescription when ignited (CCI 2013).

Clear, unambiguous definitions are required to prevent this type of incident from occurring again. In addition, it would be helpful if the San Felipe escaped burn could be highlighted in a case study to help managers avoid similar situations.

Preventing type-conversion unspecified. There are no guidelines on how to prevent the type conversion of native shrublands. In fact, the concept appears to be misunderstood in the document. It is not the instant conversion of shrublands ("brush fields") to non-native grasslands ("range") as the DPEIR discusses, but is typically a

gradual process. It begins with the loss of biodiversity by the elimination of obligate seeding shrubs leading to a combination of resprouting shrubs and native sage scrub species or resprouters and alien grasses (Halsey and Syphard 2015). While still appearing to be "chaparral" to the casual observer, it is in fact a seriously compromised habitat.

Vague consultations. The purpose and outcomes of consultations with the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS) are not specified. What will happen if CNPS indicates the project will cause significant environmental harm or if it rejects the project on grounds that several 135-year-old manzanita specimens will be destroyed? Will Cal Fire cancel the project? Reduce the size? Again, since old-growth chaparral is not defined, the consultation becomes fraught with subjective opinions and uncertain impacts.

Inadequate transparency/public notification. Publishing a notice about a project workshop in "a newspaper that is circulated locally" may have been adequate public notice twenty-five-years ago, but no longer.

The need for greater transparency and communication was emphasized as important in the DPEIR. The subject was raised previously by CNPS and us in both written and oral testimony. It was also a key recommendation in the California Fire Science Consortium's Panel Review Report of the previous VTP draft (CFSC 2014) whereby,

Projects should include a general description of what is expected to be done. This should be announced at least six weeks before the project takes place. A more detailed description of the project, including project goals ***and scientifically-grounded rationale*** *as to why and how these goals will be met, should be released prior to the project implementation. The monitoring plan and its results should be made publically available when completed.*

At minimum, the above information should be posted on a website database **(emphasis ours).** *Additional outreach via newsletters, TV, radio, or events may be included.*

There are additional suggestions from the Panel Review Report concerning transparency that the DPEIR ignored that need to be incorporated into the Program.

Outcome of public workshops unknown. If people show up to such a workshop, how will the information gathered on the "potential for significant impacts" be incorporated in the project planning phase? If a group or organization provides evidence that a project has serious environmental impacts, what recourse will the public have if the evidence is ignored and the project proceeds? Considering the current DPEIR process and the time that has been required to include current science, we are not optimistic that the public's input will be seriously considered.

BIO-5 is a prime example of how the DPEIR allows the project manager to make subjective decisions that may cause significant impacts without a reasonable opportunity for mitigation or independent oversight to assist in preventing such environmental harm.

Inadequate Analysis of Significance Criteria

The entirety of Chapter 5 regarding the dismissal of cumulative impacts can be summed up with the following (parentheses/bold added) (5-41):

> *Landscape constraints, Standard Project Requirements, and Project Specific Requirements developed as a result of the Project Scale Analysis will, in the aggregate, reduce cumulative impacts to* --- **(fill in the biological resource in question)** --- *to a less than significant level as assessed at the scale of the bioregion. Reduction in the occurrence of high severity wildfire as a result of vegetation treatment technique application is expected to provide additional benefits to aquatic resources although to a degree not presently determinable.*

Without supporting evidence, Chapter 5 goes through all the possible biological resources and dismisses the possibility of significant impacts by again employing the Fallacy of Authority. The repeated claim that the Program will reduce high-severity wildfire is added here too, and again the DPEIR defers supporting evidence because it is "not presently determinable."

In summary, the DPEIR is stating that there is not enough research to determine the environmental impact of the Program. This is contrary to available information in the record.

2. Substandard Research

Another key recommendation of California Fire Science Consortium's Panel Review Report (CFSC 2014) was to, "Include additional scientific findings throughout," and that,

> *… **a sound scientific foundation** should be reflected with each vegetation management plan providing a clear rationale for the selected action. This should be done by providing additional references to support claims in the VTDPEIR and including additional scientific concepts that are relevant to the planned actions.*

The DPEIR has improved its review of the chaparral's fire regime. However, as to developing a sound scientific foundation for the plan, the DPEIR fails to do so.

Research misrepresented

There are numerous examples of scientific research being misrepresented in order to support the goals of the Program.

Northern chaparral fires are increasing (Safford and Van de Water 2014). The DPEIR claims northern chaparral is not threatened by increased fire frequencies like southern chaparral (4-113). It cites Safford and Van de Water 2014 as support. This is a fallacy of incomplete evidence ("cherry picking"). While Safford and Van de Water do indeed note this condition, they also warn that,

> ...recent trends in fire activity, burned area, and fire severity suggest that the situation is rapidly changing as climate warms and fuels continue to accumulate.

The Safford and Van de Water paper also notes that increasing fire frequencies appear to be spreading into the northern Santa Lucia Range. It is likely this trend will continue to spread northward as climate change and population growth increase the potential for ignitions in the northern part of the state.

While dismissing increasing fire threats to northern chaparral in Chapter 4, the document's Introduction presents a contradiction by emphasizing the fact that fires in northern California are indeed increasing.

> *These types of anthropogenic alterations are some of the reasons why wildfire frequency in Northern California has increased 18 percent in the period from 1970 to 2003...* (1-2)

If the Board desires the DPEIR to be a plan for the future, as the DPEIR explicitly states it is doing, it should plan for that future rather than depend on conditions of the past. It would also be helpful for the DPEIR to be internally consistent. In descriptions of the fire hazard severity zone analysis Cal Fire repeatedly states that the goal is to model fire hazard based on potential future (NOT current) conditions.

Non Sequitur. The DPEIR follows its misrepresentation of the Safford and Van de Water paper by leaping to the conclusion that fuel treatments in northern chaparral can be used for ecological purposes. This is a non sequitur. There is no scientific evidence to support such action.

The failure to correct this section is perplexing since CNPS and we offered testimony specifically discussing these errors. We wrote in our letter of October 27, 2015 (Appendix C),

> "There is NO research that supports this claim (treating northern chaparral for ecological purposes). In fact, a study just released by the Joint Fire Science

> Program indicates that there are indeed ecological trade-offs in reducing chaparral fire hazard in northern California (Wilkin, et al. 2015). Clearance of chaparral has also been recently suspected of increasing the spread of Lyme disease in vertebrates (Newman et al. 2015).
>
> The Draft EIR also appears to be assuming that climate change will not modify northern California in a way that will replicate increased fire patterns found in southern California chaparral. This is in opposition to USFS research. Safford and Van de Water (2014) suggest chaparral type conversion is spreading northward into the northern Santa Lucia Range and may likely continue to spread as climate change and population growth increase the potential for ignitions."

It is gratifying that this version of the DPEIR recognizes that every ecosystem has its own special relationship to fire. However, **the artificial truncation of northern and southern California chaparral is not based on research or ecological realities.** The DPEIR needs to correct this error and recognize that chaparral, California's most extensive plant community, can be threatened by increasing fire frequencies throughout the state. In addition, the DPEIR needs to recognize that any treatment of chaparral should be viewed as a **resource sacrifice** unless proven otherwise.

Ironically, the issue of "cumulative impacts to chaparral communities from program treatments and wildfires" is cited as an Area of Controversy in the DPEIR. As such, the topic should have been addressed in a thorough, scientific manner.

Claiming that chaparral in northern California can be treated for ecological benefit is one of the most significant errors in the DPEIR

Infrequent, large fires are the pattern (Lombardo et al. 2009). After recognizing the problems with short fire return intervals in chaparral, the DPEIR appears to hopefully suggest that science may yet find that short fire returns are not a problem by misrepresenting Lombardo et al. (2009).

> *"... chaparral does not need more fire, it needs less (Safford and Van de Water, 2014). However, new scientific information could modify that conclusion in the future as it becomes available. For example tree-ring data collected by Lombardo et al. (2009) in bigcone Douglas-fir stands surrounded by chaparral indicate that both extensive and smaller fires were present in historical time."*(4-111)

This is the exact wording used in the last version of the DPEIR. The Board consequently ignored testimony and a letter from the lead author of this paper that the DPEIR was misrepresenting the cited research (Appendix D).

The Board is ignoring information in the record in violation of CEQA.

Prescribed fire and seeds (Keeley and Fotheringham 1998). (3-18) The DPEIR incorrectly uses this paper to support the positive benefits of prescribed fire for restoration. This paper actually deals with seed germination of chaparral plant species in southern California, the very same region that the DPEIR acknowledges as being threatened by too much fire, stating correctly that, *"burning in chaparral may lead to adverse ecological results."* (4-112)

This citation is another example of the DPEIR's internal inconsistency and failure to provide a proper interpretation of literature being cited.

References inadequate for a science-based document

A significant number of references used to support statements in the DPEIR are from testimony or reports to Congress. While such references can provide overviews, many are too broad or political in nature to be of any use in developing a scientific foundation. And because such references are not peer-reviewed, there is no mechanism for determining how factual, evidence-based, or scientifically accurate they are.

McKelvey et al. 1996, a report to Congress on the forest of the Sierra Nevada, is cited out of context to support the notion that, "prescribed fire is believed to benefit the overall health of fire adapted ecosystems" (4-151). While true for some Sierra Nevada forests, this is not true for chaparral. This represents a chronic problem in the DPEIR – citing papers that are not applicable to the statement being made, but are used to support the general objectives of the Program.

Bonnickson 2003 (2-11) was testimony provided during a politically charged Congressional hearing after the 2003 fires. Much of the contents are opinion, not scientific fact.

Although used to support a statement in the DPEIR, the Bonnickson paper does not appear in the reference list. In fact, there are other papers cited but not listed in the references, or in the reference list and not cited in the text (e.g. Countryman 1972 – a speculative narrative, not scientific research). A simple editing program could resolve this problem.

Incorrect citations

The Sugihara et al. 2006 citation, an introductory chapter in a book about fire in California is used 12 times within Chapter 4. We searched for the specific DPEIR point the citation was supposed to be supporting within the Sugihara et al. work, but were unable do so in most instances. In other words, the statement the DPEIR is using the citation to support does not exist within the Sugihara et al. reference.

Using an introductory book chapter multiple times to establish a scientific foundation for the DPEIR is inappropriate. Original peer-reviewed research needs to be used and the research needs to be double checked to verify that cited references are in fact relevant to the point in question.

Anecdotal evidence

Unsupportable WUI definition. In several instances, the DPEIR depends on anecdotal, rather than scientific evidence to support its conclusions.

For example, the DPEIR claims a 1.5 mile wide WUI is necessary because this is assumed to be the approximate distance embers can be carried from the fire front (4-36). The DPEIR dismisses concerns that its definition of the Wildland Urban Interface is too large an area because Cal Fire staff overheard USFS representatives from the Cleveland National Forest talk about a 6 mile wide WUI buffer. (4-36) Casual conversations are not legitimate scientific references.

The only citation the DPEIR uses for support is the Sierra Nevada Forest Plan Amendment. (3-39) This is a serious misrepresentation. The Amendment does not provide any evidence for a 1.5 mile WUI, but rather is a management document that established an arbitrary distance to determine the number of homes/communities affected by the Plan.

Ironically, the DPEIR discounts a smaller WUI, such as the 1,000 foot version in one of the alternatives (3-39), because, "A review of the literature found no scientific basis to limiting WUI treatments to 1,000 feet."

This perspective is more appropriate for the DPEIR's 1.5 mile WUI as there is significant evidence indicating fuel treatments even beyond 300 feet (the length of a football field) are excessive for the purpose of reducing fire risk to communities (see Cohen's extensive research).

The DPEIR appendix, "Characterizing the Fire Threat to Wildland-Urban Interface Areas in California" is equally unscientific and does not provide the necessary information to properly assess the characteristics of the WUI.

For example, Figure 1 does not distinguish fuel types, slope conditions, how heat per unit area and rate of spread is estimated/modeled/calculated. The axes are not mentioned in the descriptions. Another important point omitted from this section is that flame length as an indicator of fire risk varies by vegetation type – 12 foot flame lengths in conifer forests are routine, but not in grasslands.

As a tool, Figure 1 is not useful.

Considering the expense and extensive environmental damage that can occur with fuel treatments, the Board should base the size of the WUI on available science, not arbitrary numbers (see Appendix A: Ember Behavior: Why the 1.5 mile WUI is Excessive).

3. Outdated/Inadequate Data

Ignoring Cal Fire Data

Inexplicably, **the DPEIR is based on decades old data** even though Cal Fire's GIS analysts have completed two updated fire hazard analyses since, and are now working on a third. The current document is based on products from a fire hazard analysis done in 2001-2003 which is used a wildland urban interface WUI model based on the 1990 U. S. Census. (2-17)

The U. S. Census is conducted every ten years. GIS analysts at the University of Wisconsin-Madison have produced block housing density maps and derived WUI maps serially using the 1990, 2000, and 2010 Census data. They are free to the public. Cal Fire uses these datasets as input for their new fire hazard analyses.

The DPEIR does not mention that Cal Fire has produced an updated, revised version of the 2003 fire hazard analysis in 2007 using the 2000 U. S. Census data. They issued revised fire hazard analysis maps that were reviewed and in some cases amended by local firefighting agencies in every county:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones

The DPEIR does not mention that Cal Fire updated fire hazard maps again in 2010, apparently adding some new fire history data inputs:
http://frap.cdf.ca.gov/data/assessment2010/pdfs/2.1wildfire_threat.pdf

The DPEIR does not mention that a Cal Fire webpage dated April 2016 says the agency is currently gathering updated data to do another wildfire hazard analysis:
http://cdfdata.fire.ca.gov/fire_er/fpp_planning_severehazard

There is a significant amount of information about the fire hazard analyses and planning based on them on the Cal Fire webpage. It's been there for years (most of it dates to the 2007 update). The current DPEIR ignores much of this.

Legal origins of the program:
http://cdfdata.fire.ca.gov/fire_er/fpp_planning_severehazard

Non-technical overview of the program and analysis:
http://osfm.fire.ca.gov/codedevelopment/pdf/Wildfire%20Protection/FHSZ%202007%20fact%20sheet.pdf

Discussion of methods including a flowchart of the GIS analysis:
http://osfm.fire.ca.gov/codedevelopment/pdf/Wildfire%20Protection/FHSZ%20model%20primer%20Fact%20Sheet%202007.pdf

Discussion of applying the analysis to natural resources on wildlands:
http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_zones_development

Minimal fire hazard predictability. The input data and analysis the DPEIR is based on remain woefully inadequate for project level planning.

Syphard et al. (2012) proved this point by comparing Cal Fire's 2003 final fire hazard analysis products (Fire Threat, Fire Threat People, and Communities at Risk) to actual structure loss data from 2003 and 2007 wildfires. They found that the Cal Fire fire hazard analysis had **no value in predicting the likelihood of structure loss.**

As per the California Fire Science Consortium Panel Report, the DPEIR should be informed by findings of modern fire science. But the DPEIR still proposes to base the entire Program on an old and flawed fire hazard analysis that has been proven in peer-reviewed fire science publications to have no predictive value. It is our understanding that this finding supports the professional opinion of the Cal Fire GIS staff that performed the analysis back in 2003.

Cal Fire acknowledges the limitations of the data on their Wildfire Hazard Real Estate Disclosure web page (http://frap.cdf.ca.gov/projects/hazard/hazard#VHFHSZdatalim).

> "… the map data showing VHFHSZ is out-of-date, incomplete, and reflects an inconsistent application of decision rules reflecting physical conditions contributing to hazard."

The DPEIR should not be allowed to cite an outdated analysis as a valid or credible tool for decision-making.

Cal Fire's GIS staff is very competent and should be utilized. They can provide a useful, statistically valid spatial analysis fire hazard model with good data, especially when following the best probability-based methodology as outlined in Scott (2006).

Inadequate maps. The maps provided in the DPEIR cannot provide enough information to properly assess the Program. They do not reflect data-rich research nor Cal Fire's expertise.

As in previous drafts, the DPEIR presents fuzzy, indistinct graphics reduced far beyond the point of legibility. The effective scale of these maps onscreen or printed is about 1:16

million. At 72dpi screen resolution each fuzzy indistinct pixel represents about 3.5 miles (approximately 8,000 acres) on the ground.

However, despite the extremely pixilated quality of the maps, significant contradictions can still be seen. For example, the three maps of the state in the Executive Summary and elsewhere, comparing State Responsibility Areas (SRA), Treatable Vegetation Formations, and Treatable Acres in the VTP. (E-7) The graphic appears to convey the treatable areas within SRAs, excluding some vegetation types as inappropriate to treat. And yet it is clear that the treatable areas in the third map include some areas that fall outside the SRA footprint shown in the first map.

This is not just about illegible maps, but one example of a much larger, systemic problem. The Program must be based on a solid, statistically valid technical analysis, undertaken in good faith, based on appropriately solid, modern data, and peer-reviewed fire science. CEQA requires it. The current DPEIR does not follow this standard.

Suggested Improvements to the Draft DPEIR

- Detail impacts. Examine possible direct and cumulative impacts and develop legally adequate mitigations for those impacts as required by CEQA.

- Recognize all chaparral as potentially threatened. Chaparral in the northern part of the state will likely be threatened by higher fire frequencies as the climate continues to change. There is no ecological rationale for fuel treatments in shrub dominated ecosystems in northern or southern California.

- Define terms. Define all terms utilized in the text needed to ensure consistency in use such as old growth chaparral, critical infrastructure, forest health, etc.

- Redefine WUI. Establish a reasonable distance for the WUI by using science rather than anecdotal information (see Appendix A and B).

- Use most current Cal Fire Fire hazard data. It is inadequate to utilize a fire hazard analysis done in 2000-2003 that uses a wildland urban interface (WUI) model based on the 1990 U.S. Census. The DPEIR needs to base the Program on current, scientifically verified information available from Cal Fire.

- Research support for conclusions. Conclusions in a DPEIR need to be supported by research, not by employing the Fallacy of Authority. Sweeping generalizations like the one below should not be in a science-based document.

> "*Landscape constraints, Standard Project Requirements, and Project Specific Requirements developed as a result of the Project Scale Analysis will, in the aggregate, reduce cumulative impacts to less than significant."*

- Maintain consistency and research quality. Eliminate contradictions, errors in citations, and inconsistencies throughout the document.

- Consultation on chaparral treatments. All projects involving chaparral should be developed in consultation and in agreement with the California Native Plant Society.

- Real alternatives. Create at least one new alternative that focuses on a program that emphasizes the reduction of fire risk by using "from the house out" approach – reducing home flammability, properly maintained defensible space, community fire safe retrofits, then strategic fuel treatments within 1,000 feet if needed.

- Account for biodiversity in chaparral. Incorporate into the cumulative impact analysis how biodiversity may be impacted by the Program. See Halsey and Keeley (2016).

- Increase transparency. Develop a web-based public notification process for projects similar to the US Forest Service SOPA website. For example: http://www.fs.fed.us/sopa/forest-level.php?110502

- Plan for the future. Base project need, selection, and treatment approach, on projected climate change scenarios, not past, anecdotal experiences (Please see Appendix E: Global Warming and Future Fire Regimes).

- Proper account of carbon sequestration. Recalculate the loss of carbon to account for the loss of below ground carbon sequestration in healthy chaparral communities.

With the impacts of human-caused climate change accumulating much faster than even the most severe predictions, it is imperative that every policy we implement from here on out must honestly and exhaustively examine how such policy can facilitate the reduction of carbon in the atmosphere and the protection of what natural environment remains.

The current DPEIR fails to do so.

Regarding carbon emissions, the DPEIR uses the same response it does throughout to dodge examining significant impacts – it merely states there won't be any impacts because of unsupported assumptions.

> *While there is not a direct correlation between implementation of a vegetation treatment project and a proportionate reduction in numbers of fires or acres burned, it is reasonable to acknowledge that while the VTP program would result in emissions of GHGs as a result of prescribed fire, it would likely result in some reduction in the numbers of fires and/or burned acres from wildfires and, therefore, would avoid some emissions associated with those fires. The VTPs contribution to cumulative GHG emissions would not result in a considerable contribution to GHGs and would result in a less than significant impact.*

The DPEIR assumes all the projects will work out properly, and treated plant communities will not type convert to low carbon sequestering grasslands because of the Program's project requirements. These requirements are legally inadequate and unenforceable.

The DPEIR fails to account for the loss of underground carbon storage with the concomitant loss of above ground shrub cover in shrublands, an important carbon sink (Jenerette and Chatterjee 2012, Luo 2007). The DPEIR also fails to address the research that has shown vegetation treatments often release more carbon than wildfires (Mitchell 2015, Law et al. 2013, Meigs et al. 2009).

By using assumptions based on anecdotal evidence and focusing on the short term (such as how to reduce flame lengths, remove dead trees, or increase the number of clearance projects), the DPEIR will likely exacerbate climate impacts, increase the loss of habitat, and fail to adequately accomplish its primary goal – protecting life and property from wildfire loss.

- Reduce fire risk from the house out. As we have written many times over the past decade, the most effective way to prevent the loss of life and property from wildland fires is to work from the house out, rather than from the wildland in. In other words, focus on reducing home flammability first (ember-resistant vents, replacing flammable features, cleaning roof gutters, etc.). Properly maintained defensible space is the other important half of the fire risk reduction equation. Wildland fuel treatments (beyond the defensible space zone) offer the least effective strategy to protect communities from wildfire.

All fire science points to this. Many county fire programs support "from the house out" concept. Cal Fire promotes this strategy too, and has since at least 2007. http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

Unfortunately, DPEIR ignores these facts and focuses exclusively on vegetation management. This bias is reflected in Cal Fire's and the Board's public messages as well.

During Wildfire Awareness Week (May 1- 8, 2016), Cal Fire made 8 posts on their official Facebook page about protecting your home from fire. None mentioned the importance of home flammability. All focused on vegetation clearance.

On April 21, 2016, Cal Fire began a #ShareYourDefensibleSpace photo challenge on their Facebook page. We are submitted a photo of an ember-resistant attic vent to the contest with the suggestion to begin a companion #ShareYourFireSafeHome photo challenge to emphasize the main reasons homes actually ignite and burn down - unsafe structure design and flammable, non-vegetative materials around the home. Our photo was deleted shortly thereafter.

We resubmitted the photo and it remained online for several weeks. The Cal Fire Facebook moderator (Heather) thanked us for pointing out the importance of home

flammability. Unfortunately, it appears the original contest post and the photo entries have now been deleted.

We urge the Board to reconfigure the DPEIR so that it incorporates the entire fire risk reduction equation, not just vegetation management. Suggestions on how to do so, and examples of programs that have worked, can be found in Appendix B: An Appeal to California's Fire Agencies.

- Reassess the efficacy of remote fuel modifications. Current research makes it clear that strategic fuel modification has only helped stop fires in fire weather if fire suppression forces can quickly and safely access them. Remote, back country fuel modifications are generally not effective in stopping fires and, as a consequence, haven't generated any significant reductions in total annual area burned in southern California (Keeley et al. 2009, Syphard et al. 2011).

Global surveys concerning fuel modifications have also demonstrated that even very large amounts of strategic fuel modification are not very effective in reducing total areas burned. This research makes a compelling case that constructing and maintaining large fuel treatments is not the most effective use of fire risk reduction resources (Price et al. 2015, Price et al. 2015b).

Conclusion

As we have in the past, we urge the Board of Forestry and Cal Fire to produce a document that starts by responding to the following question, **"How do we protect lives and property from wildfire?"** instead of "How do we manage fuel?" These are two different questions resulting in two different answers.

Such a powerful approach will challenge everyone to leverage their own experiences, be willing to consider new paradigms, and honestly collaborate with others, especially with those who have different perspectives. Otherwise, we will continue practices that have brought us to this point – increased loss of homes, increased loss of habitat, and increasing levels of carbon in our atmosphere.

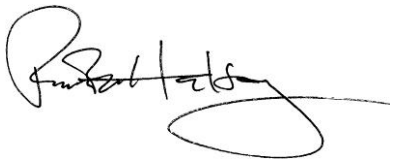
It was suggested to us after our testimony to the Board on August 26, 2015, that, "scientists used to believe a lot of things that we've learned were wrong. So we can't just wait around for science to find the correct answer. We need to move forward."

We do need to move forward, but we need to do so by utilizing *all the information available to us today,* not depend on outdated models, poor research, and incorrect assumptions.

Therefore, we urge the Board to prepare a revised DPEIR by addressing and incorporating the suggested improvements above.

We owe it to ourselves and future generations to get it right this time, especially because the changing climate will not be forgiving if we squander the opportunity.

Sincerely,



Richard W. Halsey
Director
The California Chaparral Institute

Attachments:
Appendix A. Ember Behavior: Why the 1.5 mile WUI is Excessive
Appendix B. An Appeal to California Fire Agencies
Appendix C. Resubmission of our letter of October 30, 2015
Appendix D. Understanding the Relationship between Fire/Chaparral - K.J. Lombardo
Appendix E. Global Warming and Future Fire Regimes

Citations

CCI. 2013. Escaped Cal Fire Prescribed Burn, San Felipe Valley Wildlife Area. The California Chaparral Institute, July 4, 2013.

CFSC. 2014. Panel Review Report of Vegetation Treatment Program Environmental Impact Report Draft. California Fire Science Consortium. 69 p.

Halsey, R.W. and J.E. Keeley. 2016. Conservation issues: California chaparral. Reference Module in Earth Systems and Environmental Sciences. Elsevier Publications, Inc.

Halsey, R.W. and A.D. Syphard. 2015. High-severity fire in chaparral: cognitive dissonance in the shrublands. In D.A. DellaSalla and C.T. Hansen (eds), The Ecological Importance of Mixed-Severity Fires, Nature's Phoenix. Elsevier Press. Pgs. 177-209

Jenerette, G.D. and A. Chatterjee. 2012. Soil metabolic pulses: water, substrate, and biological regulation. Ecology 93 (5): 959-966.

Keeley, J. E. and C. J. Fotheringham. 1998. Smoke-Induced Seed Germination in California Chaparral. *Ecology* 79.7: 2320-2336.

Keeley, J.E, H. Safford, C.J. Fotheringham, J. Franklin, and M. Moritz 2009. The 2007 Southern California wildfires: lessons in complexity. Journal of Forestry, September: 287-296.

Law, B.E., T.W. Hudiburg, and S. Luyssaert. 2013. Thinning effects on forest productivity: consequences of preserving old forests and mitigating impacts of fire and drought. Plant Ecology & Diversity 6(1): 73-85.

Lombardo, K.J., T.W. Swetnam, C.H. Baisan, and M.I. Borchert. 2009. Using bigcone Douglas-fir fire scars and tree rings to reconstruct interior chaparral fire history. Fire Ecology 5: 32-53.

Luo, H. 2007. Mature semiarid chaparral ecosystems can be a significant sink for atmospheric carbon dioxide. Global Change Biology 13: 386-396.

Meigs, G.W., D.C. Donato, J.L. Campbell, J.G. Martin, and B.E. Law. 2009. Forest fire impacts on carbon uptake, storage, and emission: the role of burn severity in the Eastern Cascades, Oregon. Ecosystems 12: 1246-1267.

Mitchell, S. 2015. Carbon dynamics of mixed- and high-severity wildfires: pyrogenic CO_2 emissions, postfire carbon balance, and succession. In D.A. DellaSalla and C.T. Hansen (eds), The Ecological Importance of Mixed-Severity Fires, Nature's Phoenix. Elsevier Press. Pgs. 290-309.

Newman, E.A., L.Eisen, R.J. Eisen, N. Fedorova, J.M. Hasty, C. Vaughn, and R.S. Lane. *Borrelia burgdorfei* sensu lato spirochetes in wild birds in northwestern California: associations with ecological factors, bird behavior and tick infestation. PLoS ONE 10 (2): e0118146. Doi:10.1371/journal.pone.0118146.

Price, O.F., J.G. Pausas, N. Govender, M.D. Flannigan, P.M. Fernandes, M.L. Brooks, and R.B. Bird G. 2015. Global patterns in fire leverage: the response of annual area burnt to previous fire. International Journal of Wildland Fire 24(3): 297-306.

Price, O.F., T.D. Penman, R.A. Bradstock, M. M. Boerand, and H. Clarke. 2015b. Biogeographical variation in the potential effectiveness of prescribed fire in south-eastern Australia. Journal of Biogeography, Vol 42 #11: 2234–2245.

Safford, H.D. and K.M. Van der Water. 2014. Using Fire Return Interval Departure (FRID) Analysis to Map Spatial and Temporal Changes in Fire Frequency on National Forest Lands in California. USDA, Forest Service. PSW-RP-266.

Scott, J.H. 2006. An analytical framework for quantifying wildland fire risk and fuel treatment benefit. USDA Forest Service Proceedings. RMRS-P-41: 169-184.

Syphard, A.D., J.E. Keeley, A. Bar Massada, T.J. Brennan, and V.C. Radeloff. 2012. Housing arragement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7(3): e33954. doi: 10.1371/journal.pone.0033954

Syphard, A.D., J.E. Keeley, and T.J. Brennan. 2011. Comparing fuel breaks across southern California national forests. Forest Ecology and Management 261: 2038-2048.

Wilkin, K.M, L.C. Ponisio, D.L. Fry, C. Tubbesing, J. Potts, S.L. Stephens. Trade-offs of Reducing Chaparral Fire Hazard. Final Report JFSP Project Number 11-1-2-12.

Appendix A

Ember Behavior: Why the 1.5 mile WUI is Excessive

The likelihood of an ember travelling 1.5 miles from a flaming front and igniting any single given house (or any other given small, discretely located type of potential receptive fuel) downwind is likely quite small. However, ignition by a single ember is usually not how most houses burn down.

If a structure lies downwind of a weather-driven wildfire, chances are excellent that a large number of shorter range embers will ignite everything that can burn between here and there, creating more embers all along the way, and allowing the head fire to blow hopscotch over, across, and through just about anything to reach that house. The collective fire spreading effect of all the embers makes the head fire's downwind progress all but unstoppable while the fire weather lasts.

Tracked in real time, the instantaneous rates of ember production and subsequent transport by turbulent, gusty winds must be very transient and highly dynamic. In general, averaged over time, it is likely most embers fall near the flaming front in a decay curve as you move further and further downwind of the instantaneous location of any flaming front. At 1.5 miles, the tail of the decay curve is likely quite small. Chances are a structure will burn when the flaming front is close and the site is under the “thicker” part of that ember distribution curve.

The rationale for fuel treatments in areas a long way upwind of a community is that they will produce some additional fire safety even if they can't stop the fire because they will reduce the density of embers falling on a structure or community. **Such a claim is conjectural at best.**

Since fires produce embers by the millions, and ignition probabilities likely approach 100% in very dry fire weather, it is not at all clear what value reducing ember density might actually have in protecting structures or helping firefighters reduce fire spread.

We are unaware of any recorded quantitative data on ember density-by-distance.

Firefighter experience and the research have shown that weather-driven wildfires tend to spread across landscapes with very little regard to fuel type, or age (Mortiz et al. 2004). This spread is mostly through a large number of separate spotting events that start a large number of new fires running out ahead of any fire's flaming front. If structures are in the way, then fire will spread up to them, go over, and around them, and then move on downwind.

Like the onset of a coming rainstorm, at a given location one might experience a single ember, then another, then two, then more and more, until the main flaming front comes through and the ember density gets heavy. Ember density will decline as the fire passes by and continues downwind.

Once there is a modest amount of defensible space around a structure to make the surface fire stop short of direct flame impingement (varies with terrain, often no more than 30ft) and to

prevent ignition by radiant heating (100ft max), and to be safe in case of potential turbulent convective heating so firefighters can feel safe enough to stay and defend (up to 150ft?), then it's all about ember ignition. Whether any given structure burns or not has everything to do with **how receptive it is to ignition by windborne embers** when that unstoppable fire comes through.

That NIST report on structure loss during the 2007 Witch Creek Fire, and much of their subsequent work, documents very clearly that lots of structures with good defensible space of up to 100 or more feet can and do get ignited by embers. Firefighters or civilians onsite defending a structure do so primarily by extinguishing spot fires on and in the structure before they can get big.

http://www.nist.gov/el/fire_research/wildland/project_wui_data.cfm

http://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.1796.pdf

This is exactly why risk reduction must work from the “house out.” All fire science points to this. Many county fire programs support this concept as well. Cal Fire promotes the "house out" strategy too, and has since at least 2007.

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01

Unfortunately, vegetation management gets the primary focus (please see Appendix B: An Appeal to California’s Fire Agencies).

Fire agencies, firefighters, fire scientists, and environmental groups are on the same page about this. What we've been fighting about all these years are questions about the efficacy of doing anything to “fuels” beyond the home ignition zone and beyond the largest plausible defensible space buffer.

The WUI as a concept should be determined by fire operation concerns of fighting fire at the edge of town. So WUI as a concept is all about defensible space and how much of that do we need.

USFS fire scientist Jack Cohen has clearly demonstrated that about 100ft is all any structure needs to avoid ignition by radiant heating from even the hottest wildfire on flat ground with little wind. Add those factors drive heat and convection horizontally and more space will be needed.

Let’s assume for discussion that a 300 ft defensible space would be desirable for doing point protection versus long, completely sideways flames that might be expected in the very most hazardous fire terrain imaginable. Three hundred feet of defensible space would be very excessive in all but the most pathological cases of structures built in terrain where no one should be living and no firefighters should be asked to make a stand against fire.

Three hundred feet is only 5% of the way to the 8,000ft (=1.5miles) that the DPEIR currently proposes everywhere.

So the 1.5 mile definition of WUI everywhere is excessive.

Ember travel distance

As far as we know, the longest distance spotting event documented in fire literature occurred on Feb 7, 2009 ("Black Saturday") during the 2009 Victoria, Australia firestorms. Spot fire ignitions from Bunyip Park were documented at 20km (approx 12 miles).

Below are two annotated references concerning that event and another from the recent Fort McMurray Fire in Alberta, Canada.

Campbell, Peter. 2010. 2009 Victorian bushfires.
Greenlivingpedia.org
http://www.greenlivingpedia.org/2009_Victorian_bushfires

Local weather stations on "Black Saturday" 2/7/2009 recorded sustained winds of approximately 30mph blowing nonstop from the N and NW for about 12 hours during the worst of the fires. The winds reversed direction during the course of the incident, blowing from the SE. This would be quite typical for a major Santa Ana wind event in southern California. In fact, Santa Ana winds often blow even stronger than this. The duration and the reversal are also typical of Santa Ana winds.

Daily high temperature was a record-setting 46.4degC (114degF). Relative humidity was as low as 5%. This is a higher temperature than we are ever likely to see in southern California, but our relative humidity often goes lower than this (to near zero) during our worst fire weather.

The area of Victoria State, Australia, had gone for a record-setting 38 days without any rain. Southern California's seasonal drought is commonly 5-6 months.

Widespread and very long distance spotting was observed. Fire spread rates of up to 100km/hr (62 miles/hr) were observed. Fire spread through all types of land cover, including farmland, and forests where extensive fuel modification by Rx burning had been performed for fire safety. Fire officials emphasized that this fire was driven primarily by weather, not fuels.

The main fire at Bunyip Park was started by lightning. Several other fires in the area were confirmed or suspected to be arson.

Egan, Carmel and Steve Holland. 2009. Inferno terrorizes communities as it rages out of control. The Age, Feb 8, 2009.
http://www.theage.com.au/national/inferno-terrorises-communities-as-it-rages-out-of-control-20090207-80fw.html

> *The Bunyip Ridge inferno lived up to its menacing threat yesterday, bearing down on one tiny Gippsland community after another and forcing firefighters to retreat ahead of its towering fire head.*
>
> *More than 300 firefighters battled the three-kilometre-wide fire front before being forced to pull back as it made its run out of the state forest around 4pm towards the*

villages and towns of Labertouche, Tonimbuk, Longwarry, Drouin and Jindivick.

By 6pm, fanned by gale-force north-westerly winds, it had burnt 2400 hectares of forest and farmland and unknown numbers of homes and outbuildings.

Flaming embers started spot fires up to 20 kilometres to the south and threatened homes as far away as Warragul.

Ha, Tu Thanh. 2016. The perfect storm of conditions: here's how the blaze reached Fort McMurray, and why it spread so fast. The Globe and Mail. http://www.theglobeandmail.com/news/alberta/albertas-highway-of-fire/article29863650/

The fire that jumped over the Athabasca River was a spot fire, Mr. Schmitte said.

Mr. Burnett said he had seen situations where spotting enabled a forest fire to leap eight to 10 kilometres ahead of its main line.

Spot fires are also troublesome when they are near urban areas, he said, because embers ignite rooftops or rain gutters clogged with dead leaves and pine needles.

Cited Reference

Moritz, M.A., J.E. Keeley, E.A. Johnson, and A.A. Schaffner. 2004. Testing a basic assumption of shrubland fire management: Does the hazard of burning increase with the age of fuels? Frontiers in Ecology and the Environment. 2:67-72.

Appendix B

An Appeal to California's Fire Agencies

Emphasizing home flammability, as well as vegetation management, can save more homes during wildfires.

Local, state, and federal fire agencies are urged to expand their fire education efforts. Currently, the primary, and sometimes the only message citizens hear is to clear native vegetation ("brush") from around their homes. While creating defensible space is a critical component of fire risk reduction, it fails to address the main reason homes burn - embers landing on flammable materials in, on, or around the home, igniting the most dangerous concentration of fuel available, the house itself.

Fire risk reduction education must emphasize BOTH how to reduce home flammability and how to create defensible space. As seen in the photo on the next page, **many homeowners have complied with defensible space regulations only to see their homes burn in a wildfire.**

Educational materials and public announcements must make clear that without addressing the entire fire risk reduction equation, your home has a greater chance of burning in a wildfire. This includes creating defensible space AND retrofitting flammable portions of homes such as,
- the replacement of wood shake roofing and siding
- installation of ember resistant attic vents
- removal of flammable landscaping plants such as Mexican fan palms and low-growing acacia
- removal of leaf litter from gutters and roofing
- removal of flammable materials near the home such as firewood, trash cans, wood fences, etc.
- roof/under eave low-flow exterior sprinklers

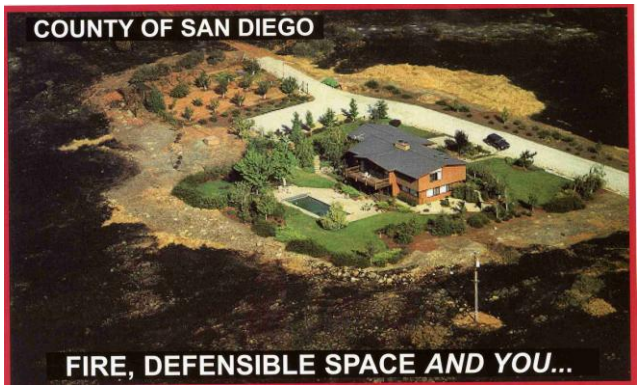
It also must be made clear to homeowners that by having well maintained and lightly irrigated vegetation within the outer 70 foot portion of the defensible space zone can play an important role in protecting the home from flying embers and radiant heat. Bare earth clearance creates a bowling alley for embers and can actually increase fire risk if invaded by flammable, non-native weeds.

We urge Cal Fire to address the full fire risk reduction equation when revising the draft of their proposed Vegetation Treatment Program.

A comprehensive approach to home protection can be found here:
http://www.californiachaparral.org/bprotectingyourhome.html

The New Message. The photo above shows a home with extensive defensible space and proper vegetation management that burned during the May 14, 2014, Poinsettia Fire in Carlsbad, California. Addressing the entire fire risk reduction equation is essential.

The Old Message. The photo to the right, distributed widely after the 2003 California firestorm, creates a false sense of security by implying that defensible space is adequate to protect a home from wildfire.



Mountain communities learning to use federal grants to eliminate wood roofs, a lead cause of home loss in wildfire

David Yegge, a fire official with the Big Bear Fire Department, is about to submit his fourth grant proposal to the FEMA pre-disaster mitigation grant program to pay up to 70% of the cost of re-roofing homes with fire-safe materials in the Big Bear area of San Bernardino County. Yegge has also assisted the towns of Idyllwild and Lake Tahoe to do the same. The grant includes the installation of non-ember intrusion attic vents.

Yegge's first grant was for $1.3 million in 2008. He identified 525 wooden-roofed homes in need of retrofits in the community of Big Bear Lake. Only 67 remain. Helping to push homeowners to take advantage of the program is a forward-thinking, "no-shake-roof" ordinance passed by the Big Bear City Council in 2008 requiring roofing retrofits of all homes by this year. San Bernardino County passed a similar ordinance in 2009 for all mountain communities. Homeowners have until next year to comply. Such "future effect clause" ordinances can be models for other local governments that have jurisdiction over high fire hazard areas. "The California Legislature should adopt such an approach and Cal Fire should incorporate such retrofit programs into its new Vegetation Treatment Program," Halsey said.

In order to qualify for the FEMA grant, a cost/benefit analysis must be completed. "Our analysis indicated that $9.68 million would be saved in property loss for every $1 million awarded in grant funds," Yegge said. "FEMA couldn't believe the numbers until they saw the research conducted by then Cal Fire Assistant Chief Ethan Foote in the 1990s. There's a 51% reduction in risk by removing wooden roofs."

"The FEMA application process is challenging, but well worth it," said Edwina Scott, Executive Director of the Idyllwild Mountain Communities Fire Safe Council. "More than 120 Idyllwild homes are now safer because of the re-roofing program."

Additional Information

The state agency that manages the grants is the California Governor's Office of Emergency Services (Cal OES), Hazard Mitigation Grants Division. Cal OES is the go between agency and they decide what grants get funded based upon priority established by the State Hazard Mitigation Plan. Without the help and assistance of Cal OES, it is not likely the FEMA grants would have be funded.

David Yegge given fire leadership award:
http://kbhr933.com/current-news/david-yegge-awarded-firewise-leadership-award/

The Mountain Area Safety Taskforce re-roofing program:
http://www.thinisin.org/shake/

The Big Bear re-roofing ordinance:
http://www.thinisin.org/home/images/stories/downloads/Ord_2008-383.pdf

The San Bernardino County re-roofing ordinance:
http://www.thinisin.org/shake/images/DOWNLOADS/ORDINANCES/ord_4059.pdf

FEMA grant program:
http://www.fema.gov/pre-disaster-mitigation-grant-program

Appendix C

Resubmission of our letter of October 30, 2015

Dear Ms. Hannigan and Board Members,

We have been contributing to the development of a new Vegetation Management Program since 2005.

While we believe the current draft being developed is a vast improvement over previous attempts, it still contains significant contradictions and scientifically unsupportable statements that compromise the achievement of our common goal: protecting life, property, and the natural environment from wildland fire.

Thank you for the opportunity to provide the following comments and recommendations.

1. Ecological Restoration/resource goals
There are very few ecological communities or resource values that can be improved with the sorts of treatments the current Draft EIR proposes, with the exception of some mid-elevation (under 7,000 feet), mixed coniferous and pine forests where fire suppression has had an impact and altered ecological conditions outside the natural range of variability. Solid scientific justification, by experts in ecology and restoration, must be required for any project purporting to further natural resource goals.

2. Acres Treated rather than need
Project justification still appears to be based more on acreage quotas rather than actual need. The Draft EIR should ensure a project justification process that starts with a clear need to reduce risks, rather than the attainment of a certain number of treated acres. The 2013 San Felipe Valley prescribed burn provides an example of why this issue needs to be clearly addressed. Not only were the justifications for the project invalid, but the ecological damage caused by the burn's escape was significant. Details on this escaped burn can be found on our website here:
http://www.californiachaparral.org/threatstochaparral/dprescribedfire.html

3. Citizen Oversight lacking within the WUI
Although the Draft EIR attempts to cover this issue with Objective #5 and indicating that the "Unit/Contract County CEQA Coordinators would seek public input and engage with stakeholders," such engagement is not spelled out other than saying the Unit will be doing it. What will the exact role be for interested stakeholders? Will they be able to see how their influence will be reflected in the final plan? After the plan is finalized, is there a mechanism that will allow stakeholders to provide additional input or object?

The Draft EIR also states that, "Each vegetation treatment project proposed would

require the preparation of a Project Scale Analysis (PSA) that would document the project's consistency with the requirements and findings of this Program EIR."

However, we could not find any opportunity for the public at large to review these PSAs unless the project falls outside the 1.5 mile wide WUI. The Draft EIR dismisses concerns that this is too large an area because Cal Fire staff heard USFS representatives on the Cleveland National Forest suggested a 6 mile wide WUI buffer (4-30). We consider this inadequate support for one of the fundamental principles that is apparently guiding the document.

The explanation as to why the 1.5 mile wide WUI is necessary is based on the approximate distance embers can be carried from the fire front (4-29). We suggest the Board refer to USFS scientist Jack Cohen's work. His conclusions do not support such a rationale.

4. Public Meetings for projects outside the WUI?

The Draft PEIR says the "project proponent" will provide a public meeting for projects outside the WUI. What role will Cal Fire play in making sure a meeting will occur, how it will be organized, and how comments made during the public meeting will be (or not) considered. The document also does not make clear how much State Responsibility Area is actually outside the 1.5 mile wide WUI that would require a public meeting. (2-46)

5. High-severity fire - all forests are not the same

One of the Draft EIR's key program objectives is to reduce the potential for high-severity fire within "appropriate vegetation types" (2-8). The document appears to mean "many forests in California" and only cites Bonnicksen's political Congressional testimony in 2003 to support this objective.

The document states,

"Coniferous forests in California have long been subject to frequent low-intensity fires, which played an important role in reducing hazardous fuels and maintaining ecosystem processes." (2-9)

The Draft EIR makes no distinctions for forest types. Presumably projects could thin lodgepole pine forests that do not have unnaturally high vegetation build-ups due to fire suppression because they have a 100 year plus natural fire return interval.

6. Contradictions concerning the chaparral fire regime

Although the Draft EIR recognizes the chaparral's natural fire regime as being characterized by infrequent, high-intensity fires, it later contradicts itself.

For example, the document first indicates that chaparral species are lost at short fire return intervals (immaturity risk), then reverses itself by stating that chaparral is resilient to short fire return intervals.

"*Over time, instances of the loss or significant reduction of species that were victims of immaturity risk began to accumulate. In addition, the study of chaparral ecosystems began to reveal that chaparral,* ***in addition to being resilient to fire at shorter intervals****, was also resilient to fire at long intervals (Sampson, 1944; Horton and Kraebel, 1955).*" (4-12)

Later in the document, after again recognizing the problems with short fire return intervals in chaparral, the document suggests that science may yet find that short fire returns are not a problem by misrepresenting Keith Lombardo's research (2009).

"... chaparral does not need more fire, it needs less (Safford and Van de Water, 2014). However, new scientific information could modify that conclusion in the future as it becomes available. For example tree-ring data collected by Lombardo et al. (2009) in bigcone Douglas-fir stands surrounded by chaparral indicate that both extensive and ***smaller fires were present in historical time****."*(4-14)

We are attaching the statement from Dr. Lombardo that we also submitted during the August, 2015 Board of Forestry meeting that makes clear his research was being misrepresented. His research does NOT suggest that short fire return intervals in chaparral were typical in historical time.

7. Erroneous Ecological Restoration treatments for northern chaparral

The Draft EIR falsely claims that chaparral in northern California is different enough from the south that the *"**ecological rationale** for fuel treatments"* can be used. (4-15)

There is NO research that supports this claim. In fact, a study just released by the Joint Fire Science Program indicates that there are indeed ecological trade-offs in reducing chaparral fire hazard in northern California (Wilkin, et al. 2015). Clearance of chaparral has also been recently suspected of increasing the spread of Lyme disease in vertebrates (Newman et al. 2015).

The Draft EIR also appears to be assuming that climate change will not modify northern California in a way that will replicate increased fire patterns found in southern California chaparral. This is in opposition to USFS research. Safford and Van de Water (2014) suggest chaparral type conversion is spreading northward into the northern Santa Lucia Range and may likely continue to spread as climate change and population growth increase the potential for ignitions.

8. Biased Case Studies/Faulty Generalization
It is critical that the Draft EIR does not ignore contrary data. The current draft does so by selecting only affirming case studies, rather than objective research, to prove a particular point.

For example, using the one-year-old prescribed burn conducted at Poppet Flats to demonstrate control of the 2006 Esperanza Fire (2-55) illustrates a failure to recognize that it is not practical to establish and maintain black ground around every vulnerable community.

The Esperanza Fire was able to be controlled at the referenced location. However, vegetation grows back, and it did in the Esperanza area, leading to the 2013 Silver Fire that re-burned a huge portion of the Esperanza scar (destroying 24 homes in the process).

Additional details concerning the 2013 reburn can be found here:
http://californiachaparral.org/wordpress1/2013/08/12/silver-fire-defies-popular-beliefs-about-wildfire/

The Draft EIR must use research that examines the entire picture and how *all the fuel treatments* impact fire spread. Anecdotal stories can lead to misleading conclusions. The following research offers a more comprehensive approach.

Home Loss
Syphard, AD, JE Keeley, A Bar Massada, TJ Brennan, VC Radeloff. 2012. Housing arragement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7(3): e33954. doi: 10.1371/journal.pone.0033954

Rather than examining a narrow set of case studies, Syphard and her coauthors gathered data on 700,000 addresses in the Santa Monica Mountains and part of San Diego County. They then mapped the structures that had burned in those areas between 2001 and 2010, a time of devastating wildfires in the region.
The authors found:
- Nearby vegetation was not a big factor in home destruction.
- Grasses that often sprout in areas cleared of native habitat like chaparral could be more of a fire hazard than the shrubs.
-Geography is most important—where is the house located and where are houses placed on the landscape.

Defensible Space
Syphard, A.D., T.J. Brennan, and J.E. Keeley. 2014. The role of defensible space for residential structure protection during wildfires. International Journal of Wildland Fire 23:1165-1175.

The authors found:
- The most effective measures to reduce structure losses are to "reduce the percentage of woody cover up to 40% immediately adjacent to the structure and to ensure that vegetation does not overhang or touch the structure."
- There is no additional structure protection provided by clearing beyond 100 feet, even on steep slopes, and the most important treatment zone is from 16-58 feet.
- The amount of cover reduced is as important as the fuel modification distance; however complete removal of cover is not necessary. The term "clearance" should be replaced with "fuel modification" to emphasize this fact.

Fuel Breaks
Syphard, A.D., J.E. Keeley, T.J. Brennan. 2011. Comparing fuel breaks across southern California national forests. Forest Ecology and Management 261: 2038-2048.

The authors found:
- A substantial number of fuel breaks are never intersected by fires.
- Firefighter access — to fuel breaks for backfires and other control measures — was the most important determinant of their effectiveness.
- Among the forests studied, only 22% to 47% of fires stopped at fuel breaks, even when firefighters could access them.

9. Green House Gases
The Draft EIR fails to establish a reasonable/accurate way to measure greenhouse gas (GHG) emissions for treatment projects. The assumption that treated sites would create less GHG emissions than if burned in a wildfire, and thus sequestering carbon (meaning projects have no impact), is questionable.

Instead, the VTP needs to use a 100 year timeline for greenhouse gas (GHG) emissions. An example in how a 100 year timeline is used follows.

- On the project impact side, the total GHG emissions are calculated from projects over a 100 year time span. To determine the impact on a site that is repeatedly treated every 10 years, the sum of the total GHG emissions for 100 years of treatments is calculated.

- On the natural impact side, GHG emissions are calculated from fires, using the calculated "natural" fire return interval, and again summed over 100 years. If there is a 50 year fire return interval for a project site, emissions are calculated as if the site burned twice in the 100 year period. The sum of the GHG emissions from the two fires is calculated.

- The two sets of emissions are compared, and the difference between them is their cumulative GHG impact.

Why sum over 100 years? Groups like the Climate Action Reserve are using 100 year contracts for carbon sequestration, so looking at carbon emissions over 100 years allows

landowners to calculate the relative effects of carbon sequestration projects and vegetation treatments on the same time scale they use for sequestration contracts. This also allows the Board to help meet the state's carbon sequestration goals.

This method provides a fairly simple standard for quantitative calculations that fits in with what the Board is starting to do with reforestation for carbon sequestration. In this way, the Board can calculate the real impacts of the VTP.

Other Points Needing Clarification

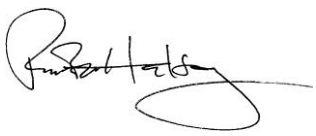
- Condition Class 3 (4-39) needs to clearly indicate it can meant either not enough fire or too much. Additionally, the fuel rank of 3 needs to be detailed out to include "too much fire."
- Climate change/carbon sequestration is only related project to emissions. It needs to reference carbon sequestration balances.
- There is no definition for old-growth chaparral. (4-16) Fifty-year-old stands and above qualify.
- There needs to be a CEQA/Federal SOPA type website that lists the proposed projects in each unit, date of any stakeholder meeting, including projects on state parks/CA Fish and Wildlife lands. (2-46)
- The WUI definition needs to be based on science, not agency opinions.
- The structure of the public meetings needs to be clarified.
- "Critical infrastructure" needs to be defined.
- Different forest types need to be recognized.
- The Draft EIR fire modeling shows fuel breaks on every ridgeline without incorporating the science that clearly shows this is not an effective strategy and causes unnecessary damage to plant communities.

What we wrote in our 2005 comment letter on the draft VTP then being considered still applies to the current draft.

> If a thorough analysis of the true costs of various fuel modification treatments is performed (one has never been done), we believe concentrating efforts directly where loss of life and property can occur will produce the greatest and most effective benefit.

We are hopeful such an analysis will also be imbedded in the current effort.

Sincerely,



Richard W. Halsey
Director

Appendix D

Understanding the Relationship between Fire and Chaparral

From Lombardo, K.J., T.W. Swetnam, C.H. Baisan, M.I. Borchert. 2009. Using bigcone Douglas-fir fire scars and tree rings to reconstruct interior chaparral fire history. Fire Ecology 5: 32-53.

Main Points

1. The southern California landscape was rich with fire from the early 1600s (and likely much earlier) to the mid 1800s. During this time we saw both localized fire events and landscape-sized events occurring. Large fires are a natural phenomenon of the southern California chaparral dominated landscape (1-3 per century).

2. By the early 1900s, many of the small fire events were absent from the record. Most of these small fires were likely the product of Native American activity. While small fires were frequent in the past, they did not effectively control or contain large events from occurring.

3. In limited cases, fire return intervals of less than 10-15 years were recorded by the same individual tree. Such short intervals, however, do not reflect what was happening on the broad landscape. The ecologic impact following those localized events is unknown. It is unlikely, however, that many of the chaparral species in those areas survived such frequent fire return intervals based on life history traits and modern day observations.

4. The presence of non-native species, such as grasses, has dramatically altered modern post-fire landscapes by quickly colonizing frequently burned areas.

Reconstructing Past Fire Regimes

Understanding the interactions between wildfire and native vegetation is critical to understanding how to manage the landscape for resource benefit. This is particularly true in our landscapes that are, or in some cases were, dominated by chaparral and coastal sage scrub species.

Fire plays a critical role in shaping these landscapes, however, while they are often referred to as “fire-dependent”, these suites of species are actually quite sensitive to fire at particular intervals. Using modern era records to understand what has occurred on our landscapes is certainly informative; however, prior to drawing any conclusions we must first acknowledge that the ecological events and processes in the modern era are heavily influenced by anthropogenic activities (e.g. grazing, logging, settlement, climate change, etc.). To eliminate some of these influences and elucidate past ecologies that may have functioned in a more natural state, we must look into the deep past.

Historical reconstruction of ecological processes and events is one of the best tools available to land managers who are interested in understanding how our systems operated

prior to advent modern day influences that have dramatically altered landscapes, species compositions and ecological processes. Present day managers can use the findings of these studies to establish natural baselines and guide restoration efforts whose aim is to re-create, as best as possible, fully functioning ecologies.

In the western United States, historic reconstructions that pre-date the 1800s, have been used extensively to establish the parameters for what is believed to be the natural operating state of the landscape. Native Americans have certainly had a degree of influence upon the American landscape for 1000s of years. We can't ignore the impact their land use and practices may have had on ecological processes and these impacts are embedded within the signals we detect in our modern day studies of the past. However, we do understand that their impacts were substantially lighter and spatially far less extensive than anything that has occurred in the past 200 years. So while we must always account for the potential impacts that these past anthropogenic practices may have played, we can examine historical records gleaned from natural data and begin to see how these landscapes may have operated with minimal human influence.

The Southern California National Forest Study

As a graduate student at the University of Arizona, I worked with Drs. Tom Swetnam and Don Falk on a reconstruction of fire histories in the southern California National Forests (Mark Borchert, a long standing USFS ecologist, was also a significant contributor to this study). The aim of our study was to document, examine and interpret the historical fire regime of the chaparral vegetation in these forest using Bigcone Douglas fir (BCDF) as a proxy species given that it is long-lived, able to withstand multiple fire events and relatively accessible in places. We only sampled stands that were completely surrounded by chaparral vegetation so that we could eliminate any influence on the BCDF fire record from fire that may have been more reflective of those originating and burning in mixed conifer stands.

In general, our results showed that fires, both big and small, were commonplace in the southern California forests from the 1600s to the mid 1800s. By the early 1900s, many of the smaller fire events were observed in the tree-ring record had ceased to exist. However, the large fire events that are familiar to many of us today, continued to occur. This was a common signal seen in Los Padres, Angeles and San Bernardino National Forests. While these results seem relatively cut and dry, detailed analysis and a clear understanding of the sampling techniques used to create tree-ring records, reveal a slightly more complicated story.

Below I have listed several distinct thoughts and interpretations that we believe are the main points to be taken from this work.

- The landscape was rich with fire from the early 1600s (and likely much earlier) to the mid 1800s. During this time we saw both localized fire events and landscape-sized events occurring. By the early 1900s, many of the small fire events were absent from the record. We believe that the absence of these types of events is due to the advent of fire suppression and the removal of Native Americans from the

landscape. Furthermore, this result signifies to us that large fires are a natural phenomenon of the southern California chaparral dominated landscape.

- While, small fires were frequent in the past, they did not effectively control or contain large events from occurring. Even in present day landscapes, wind-driven fire events (i.e. Santa Ana fires) can burn over, through and around recently burned landscapes that would be a deterrent to fires in normal weather conditions.

- We believe that the frequent fires of the past are a reflection of Native American burning practices meant as a means of landscape management and manipulation. Preliminary analysis suggests that fire frequencies reconstructed near known Native American settlements are higher than those reconstructed in areas not known to have been frequented by these peoples. However, further work needs to be done to provide a more robust understanding of the spatial and temporal patterns of Native American use of fire in this region.

- We generated mean fire return intervals (MFI) for both large and small sized fire events across all three forests. While these MFIs are often the most cited result from dendrochronology studies, they are often not used in the current context. For example, when a study cites a MFI of 10 years, in nearly all dendrochronology work, that refers to a fire of a certain size which has occurred somewhere within the sampled landscape once every ten years (on average). It does not mean that a fire occurs at the same point in a forest every ten years (on average). The ecological reality of those two situations is extremely different, especially in the case of chaparral.

- There were instances that we observed, in the tree-ring record, fires occurring at intervals of less than 10-15 years and were recorded by the same individual tree. In these limited cases, we do find that fires in southern California chaparral can occur at high frequencies. We don't know what the ecologic impact was following those events. Given what well-respected research has shown us, it is unlikely that many of the chaparral species in those areas survived the event based on life history traits and modern day observations. However, like the influence of Native Americans on fire regimes, we need to acknowledge the substantial impact the introduction of non-native species has had upon our landscapes. Prior to the mid 1800s, we lacked many of the now invasive non-native species that are abundant today. And those that were present were far more limited in their extent than in the present day. Unlike we see on the modern day landscape, when fire frequencies exceeded the ability of chaparral species to withstand closely repeated events, what followed was likely a barren landscape and not a field of aggressive, non-native species. These barren patches would slowly be colonized by native vegetation from surrounding areas or native species within the seedbank that survived the event. The ecological consequence was low, and would remain low to this day, if the suite of quick moving and ubiquitous non-native species were not present. That is certainly not the case

now and any benefits gained by short fire frequencies would quickly be negated by the advance of non-native species at the expense of native.

- Dr. Keith J. Lombardo

Global Warming and Future Fire Regimes

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Summary
Climate and weather have long been noted as playing key roles in promoting wildfires. Global warming is generally expected to exacerbate fire problems. After reviewing the scientific studies of fire-climate relationships, the following conclusions can be drawn. 1) Annual temperature is a crude predictor of ecosystem responses since many processes respond to specific seasonal temperature signals. For example, on landscapes where past climate signals are correlated with fire activity, winter and autumn temperatures are generally irrelevant, but spring and summer temperatures play an important role. 2) Annual fire activity in California has been strongly influenced by climate only in the mid- to higher-elevation forests. However, in lower elevations throughout the state, but most particularly in southern California, fires in shrublands and grasslands have not been strongly correlated with annual variations in temperature during any season. 3) Past fire activity has been strongly influenced by land use activities (e.g., suppression of natural fires or human ignitions) and the impacts have been radically different in the northern and southern parts of the state. These two very different landscapes need to be viewed separately when planning future fire management practices. Global warming is occurring along with a number of other global changes that may have greater influences on future fire regimes, including population growth, changes in land management policy, shifts in vegetation types, and patterns of fire ignitions. All of these factors interact in complicated ways, making future forecasts a challenge.

Current realities
Temperature has always been a key factor in wildfire danger indices, and global warming predictions are a major concern. Historical analyses have shown that the *sine qua non* of a severe fire season in California forests is dry spring weather. It is now widely recognized that this relationship between climate and fire activity has important implications for climate change impacts on fire regimes of the future. However, it is important to recognize that temperature effects are seasonally dependent. Based on historical analysis of the last 100 years of fire records, it is apparent that warmer winters or warmer autumns have had no discernible effect on fire activity, whereas spring and summer temperatures do play a pivotal role. It cannot be stressed enough that this fire-climate relationship is largely restricted to montane coniferous forest ecosystems. Lower elevations and most elevations in the lower part of the state are generally less responsive to yearly changes in temperature. These latter landscapes appear to be more strongly affected by direct anthropogenic impacts, including timing and location of ignitions.

California covers a greater latitudinal range than any other western state and, as such, comprises a huge range of climates and very diverse fire regimes. In terms of California fire issues, the recent United States Forest Service (USFS) analysis illustrates two distinct regions within the state (Figure 1). Due to the success of a century of fire-suppression policy, forests in the Sierra Nevada and the northern portion of the state have experienced far fewer fires than historically recorded. In contrast, the nonforested landscapes in the southern part of the state, although managed with the same fire suppression policy, have not experienced a deficit of burning. This is in part due the difficulty of suppressing fires in chaparral-dominated landscapes coupled with the greater numbers of human-caused ignitions in this southern region.

Scientific opportunities and challenges
Balancing fire hazard reduction and resource protection poses a major challenge in a state as diverse as California. This equation plays out very differently in northern versus southern ecosystems in the state. Most of California's forests have historically experienced frequent low-severity understory burning, and both understory herbaceous and shrubby species as well as overstory tree species are adapted to this fire regime. Managing these landscapes with frequent prescription burning has the potential for both reducing fire hazard and enhancing these resources

Research needs for forested landscapes include parsing out the effects of global warming in different seasons and developing models that equate temperature increases with expected fire activity. Because the effect of global warming may have multiple effects, including increases in the length of fire season as well as increasing fire frequency, this research can be complicated. A further complication is that as fire frequency increases, the current ecosystem may be set on a trajectory for a different vegetation type with different fire regime characteristics.

In the southern half of the state there is a need for a better understanding of other global change issues that will potentially have greater impacts than global warming. In particular, there is need for understanding how population growth and patterns of growth will impact future fire regimes, something that is particularly critical in light of the fact that human activity accounts for more than 95% of all fires. Issues in need of research are causes of ignitions and placement of prefire fuel treatments. On these southern California landscapes, humans dominate the ignitions and as ignitions have increased over the past century there has been a well-documented conversion from native shrublands to nonnative grasslands. These latter systems are much more flammable, increasing the length of the fire season and frequency of burning, which feeds back into even greater landscape conversion and resource degradation. Additional issues in need of research are ignition causes and placement of prefire fuel treatments.

Policy issues
The U.S. Geological Survey has been an active player in the development of wildland fire management policy. The Cohesive Strategy developed by federal agencies has focused on using sound scientific evidence when choosing among alternative management approaches.

On an annual basis, California wildfires are responsible for a small portion of the total acreage burned in the Western United States. However they consume the bulk of federal fire suppression dollars. This is largely due to the high population density of metropolitan areas juxtaposed with watersheds of dangerous chaparral fuels. Since the beginning of the 21st century California has averaged a loss of 1,000 homes a year from wildfires mostly in the southern half of the state.

- **Forested ecosystems.** These ecosystems have missed fires due to past fire-suppression policy (Figure 1) that has resulted in substantial increases in forest fuels threatening to change fire regimes to high-intensity crown fires. Forest restoration requires prescription burning or other fuel reduction tactics. One of the primary constraints on burning is air-quality, which applies to both allowing wildland fires to burn, as well as prescription burning. One solution to reducing surface fuels (e.g., leaves, small dead wood) and ladder fuels (e.g., young trees) could be mechanical treatments. Constraints on this approach are the greatly increased costs associated with mechanical treatments plus economic limitations to such tactics on National Park Service lands. Making these treatments pay for themselves through commercial contracts raises

serious issues about trees of value to be removed versus the impact on fire hazard. These are issues in need of serious discussion.

- **Nonforested ecosystems.** These landscapes comprise shrublands, which are the dominant plant community in southern California. Since the California State Legislature mandates a resource assessment of only timber and rangeland, these shrublands are perhaps not as well understood as is needed to assess their fire potential. On these landscapes the important global changes need to be viewed broadly to include more than climate change. Humans account for the vast majority of fires and human growth predictions are an order of magnitude greater than temperature warming in the coming decades.

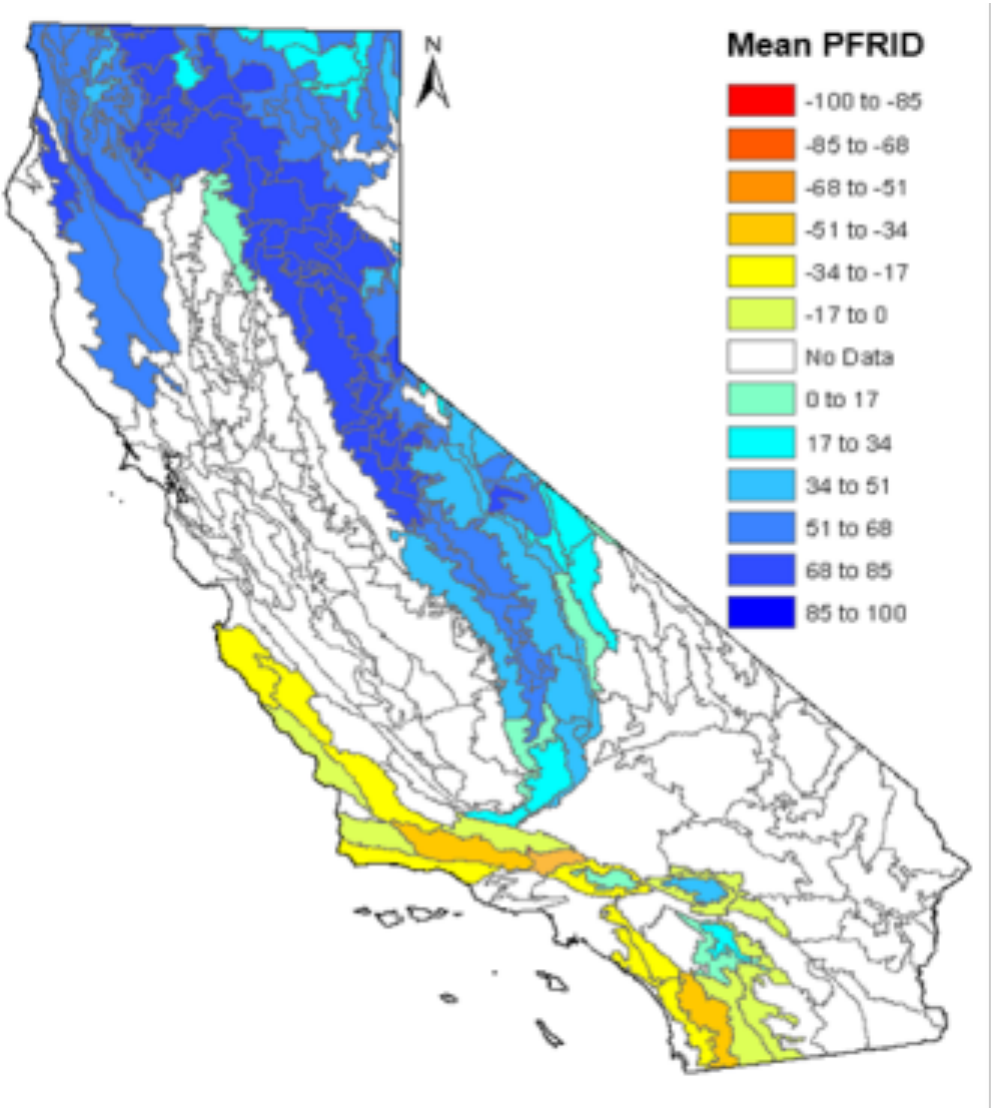
  Critical concerns do not only involve increased anthropogenic ignitions, but the spatial distribution of ignitions as well. In the south, the majority of fires that become catastrophic are ones that ignite in the interior and are driven by desert-to-ocean offshore winds known as Santa Ana winds. The more that development expands to the interior landscapes, the more likely such fires will increase in size. A closer relationship between fire management practices and land planning decisions could have positive effects.

  Throughout the western U.S. there has been an inordinate concern on landscape-level fuel treatments for handling wildfire issues. In southern California this issue is doubtful because catastrophic fires are driven more by factors such as weather than the state of the vegetation. We currently lack clear evidence that landscape-level fuel treatments change fire outcomes, particularly with respect to property losses. The model that seems to have the most support is that of fire management focused on "the house out," which describes a concern on focusing fire hazard reduction at the house and Wildland Urban Interface (WUI) zone, and decreasing emphasis as one moves out on the landscape. Particularly in these nonforested landscapes, additional research is needed to determine the appropriate strategic placement of vegetation treatments.

  Other issues that need further discussion include the state-mandated "clearance" requirements. Total clearance is not required for defensible space and thus a change in terminology may enhance communication. Recognition that embers are a major source of home ignition points to the need for more research on specific changes in maintenance required to produce fire safe conditions. The role of evergreen trees as ember catchers needs further research as well.

*** A position paper prepared for presentation at the conference on* Water and Fire: Impacts of Climate Change*, convened by the Institute on Science for Global Policy (ISGP), April 10–11, 2016, at California State University, Sacramento*

Figure 1



Fire departure map for USFS lands in California. Areas in blue indicate landscapes that, relative to historical fire regimes, have missed fires and are in need of prescription burning or other related vegetation treatments. Yellow and orange represent landscapes that, despite a century of fire suppression, have had more fire than historically was the case and 'restoring' fire is not needed (from Safford and van de waters 2014).

California Native Plant Society
ORANGE COUNTY CHAPTER

P.O. Box 54891
Irvine, CA 92619-4891
occnps.org

The California Native Plant Society is a statewide non-profit organization. Its membership is open to all.

CNPS' mission is to conserve California native plants and their natural habitats, and to increase understanding, appreciation, and horticultural use of native plants.

The Orange County Chapter of CNPS focuses that mission on the native plants and natural vegetation of Orange County and adjacent Southern California.

May 31, 2016

Board of Forestry and Fire Protection
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RE: Vegetation Treatment Program Draft PEIR Comments

Dear Ms. Hannigan and Members of the Board:

The Orange County Chapter of the California Native Plant Society has long been concerned that efforts to pre-emptively control wildfire, via "pre-fire" manipulation of the vegetation, do more harm than good to the native vegetation that we work to preserve and enhance. Study of the 2016 version of the proposed Vegetation Treatment Program indicates that it, too, may well do more harm than good to native vegetation in State Responsibility Areas, in Orange County and in the rest of California.

A few specific comments on the VTP:

Comment 1: On Invasive Plants: In Orange County, wildfires are an irregular occurrence in our wildlands, and evolutionarily necessary to its ecological integrity. Invasive non-native plants, however, are a constant threat to that integrity. OCCNPS has an active program to lessen that threat (occnps.org/invasives). We agree with the VTP's Chapter 4.2.2.3.1, especially the first and third bullets:

> A recent thorough study of the relationship between fire and invasive species in California is in a chapter from *The Landscape Ecology of Fire* (Keeley et al., 2011). **Essentially, [the relationship] is much more complicated than previously understood** [emphasis added]. Some of the conclusions are worth including here:

- Fires are natural ecosystem processes on many landscapes. Perturbations to the fire regime, such as increased fire frequency and fire suppression, are the real "disturbances" to these systems and can lead to alien plant invasions.
- In forests, both too little fire and too much fire can enhance invasions. Restoration of historical fire regimes may not be the best way to balance these two risks.
- Repeated fires in shrublands decrease fuel volumes, decrease fire intensity and increase alien plant invasion. Decreasing fire frequency may be the best means of reducing alien invasions.
- Prescription burning that targets noxious species in grasslands is often not sustainable unless coupled with restoration.

The VTP appears **not** to have taken this study to heart. Throughout all parts of Chapter 4.2 that discuss invasive plants, the assumption seems to be that invasion of non-natives after a VTP treatment will be reduced to "less than significant" [but recall the old saying: "Give a weed an inch and it'll take a yard"] by applying Standard Project Requirements BIO-8 and/or BIO-9.

1. BIO-8: "Only certified weed-free straw and mulch is to be used." This SPR is repeated mantra-like throughout Chapter 4.2.2, as if it were the cure-all for weed invasion.

   OCCNPS' long-term experiences and anecdotal observations have shown that:
   - "Certified weed-seed-free" straw usually isn't weed seed free.
   - Applying mulch thick enough to smother weed seeds will also likely smother the native seeds that are already in the soil awaiting overstory removal so they can germinate.
   - Weed seeds (blown-in, bird-dropped, e.g.) are often capable of germinating within mulch and sending roots through the mulch into the soil, thus getting an even bigger head start over native seeds.
2. BIO-9: "The project coordinator is to determine if there is a significant risk of introducing invasive plants and, if so, develop specific mitigation measures using principles outlined the California Invasive Plant Council's *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (2012)." This publication is an industry standard. Its BMPs should be integrated from the start into all phases of project planning and implementation—not just consulted at the end, as BIO-9 seems to imply.

OCCNPS suggests removing BIO-8 and replacing it with a rewritten BIO-9:

> New BIO-8: "At the outset of project planning, all who are involved in planning and coordination shall study the most recent edition of *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers"* (California Invasive Plant Council, cal-ipc.org/ip/prevention/landmanagers.php) and integrate the BMPs it details into all phases of implementation and mitigation."

The use of mulch, including but not limited to "weed-free" straw, can be a BMP. OCCNPS agrees that mulch has appropriate uses.

The best mulch is formed by the vegetation's own fallen leaves, left undisturbed to allow soil organisms to recycle the nutrients in the leaves back into the soil for the roots to absorb again.

Comment 2: On Vegetation Treatment in Southern California: OCCNPS is pleased to see that Chapter 4.2.3, *Mitigation and Standard Project Requirements*, includes recognition that southern California's shrubland vegetation is different from the rest of the state's vegetation types:

> BIO-5: Vegetation treatment projects that are not deemed necessary to protect critical infrastructure or forest health in San Diego, Imperial, Riverside, Orange, Los Angeles, Ventura, Santa Barbara, Kern, and San Bernardino counties shall:
>
> - Be designed to prevent vegetation type conversion.
> - Not take place in vegetation that has not reached the age of median fire return intervals.
> - Not re-enter treatment areas for maintenance in an interval shorter than the median fire return interval outside of the wildland urban interface and excluding fuel break maintenance.
> - Not take place in old-growth chaparral without consultation regarding the potential for significant impacts with the CDFW and the CNPS. **[Comment: More specificity is needed on the purposes and outcomes of this consultation.]**
> - Take into account the local aesthetics, wildlife, and recreation of the shrub-dominated subtype during the planning and implementation of the project.
> - During the project planning phase, provide a public workshop or public notice in a newspaper that is circulated locally describing the proposed project during the project planning phase for projects outside of the WUI. The notification will be used to inform stakeholders and to solicit information on the potential for significant impacts during the project planning phase. **[Comment: Using only a local newspaper to inform the public about projects is not adequate in this electronic age. You have an email notification list, at a minimum derived from the previous VTP iteration and increased by this iteration—use it! CA.gov must have IT staff knowledgable in the use of social media—use them!]**

Comment 3: On Fuel Breaks: The VTP cites Syphard, et al (2011a)[1] but not Syphard, et al (2011b)[2]. Each study shows that fuel breaks within wildlands don't, by themselves, deter or slow the spread of fires; their main value is as firefighter and equipment access to a fire's vicinity. With that in mind, OCCNPS is puzzled that the VTP would include fuel breaks as a valid method of wildfire control. Furthermore, several studies cited in the VTP show that fuel breaks are likely to be sites from which non-native plants invade wildlands—this corroborates our long-term

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1. 2011a: Syphard, A.D., J.E. Keeley, T.J. Brennan. *Factors Affecting Fuel Break Effectiveness in the Control of Large Fires on the Los Padres National Forest, California*. International Journal of Wildland Fire 20.6 (2011): 764-775
2. 2011b: Syphard, A.D., J.E. Keeley, T.J. Brennan. 2011. *Comparing the Role of Fuel Breaks Across Southern California National Forests*. Forest Ecology and Management 261(2011): 2038-2048. doi: 10.1016/j.foreco. 2011.02.030.

anecdotal observations. Why would anyone want to expend the time, effort, and funds to install and maintain fuel breaks, when fuel breaks don't do what they're intended to do, and are an entryway for invasives into wildlands?

Comment 4: On WUI in OC: The VTP's requirement of a 1.5-mile-wide buffer zone at the WUI is unrealistic in Orange County. The Fire Hazard map at right shows that all OC's SRA Zones are bounded if not surrounded by incorporated development. OC's WUI is our reserve lands: some are in SRA Zones and some are in incorporated areas. The SRA Zones are:

1. The OC portion of Chino Hills State Park, about 1/3 of the whole park.
2. The Santa Ana Mts. foothills, a patchwork of five OC nature parks, small-acreage private lands, and inholdings in the National Forest.
3. Rancho Mission Viejo—the yellow areas are now much extended as development proceeds—and Caspers (county)Wilderness Park and Starr Ranch Audubon Sanctuary.
4. Crystal Cove State Park and Laguna Coast and Aliso and Wood Canyons (county) Wilderness Parks.

Applying a 1.5-mile "buffer" of vegetation treatment in the Zones' state and county parks would remove most if not all of the parks' vegetation and the habitats it forms—i.e. removing the very reason the parks were set aside under NCCP or similar mitigation agreements.

OCCNPS does agree that it is necessary to do some vegetation treatment in the WUI, to help protect homes from wildfire. Such treatment must be part of an overall fire-safe program that starts from the house and works out, rather that working in from the wildland.

Thank you for the opportunity to comment on the VTP EIR.

Respectfully,

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May 31, 2016

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Re: Draft Programmatic Environmental Impact Report For The Vegetation Treatment Program of the California State Board of Forestry and Fire Protection

Dear Ms Hannigan and Members of the Board:

We appreciate the opportunity to comment on the Draft Programmatic Environmental Impact Report for The Vegetation Treatment Program Of the California State Board of Forestry and Fire Protection ("DEIR," "VTP," "BoF").

The California Native Plant Society (CNPS) works to protect California's native plant heritage and preserve it for future generations. CNPS promotes sound plant science and action against climate change as the backbone of effective natural areas protection. We work closely with decision-makers, scientists, and planners to advocate for well informed and environmentally friendly policies, regulations, and land management practices. CNPS support appropriate land management practices to sustain California native plant species, both on properties dedicated to that purpose (e.g. State, Federal, County, or local and private conservation parks or preserves) and other properties, private and public, where these species occur, especially where their continued survival helps provide a genetic buffer for their survival, should catastrophic events destroy them in protected areas.

We strongly agree that fire and invasive species are critical issues that must be actively managed. However, **westrongly recommends that this DEIR NOT be certified, due to lack of substantial evidence to support contentions and conclusions made throughout the document, due to substantial procedural lapses and irregularities, as well as the other issues we list below. We further contend that it cannot serve the purpose it was apparently designed for, and propose possibly more workable solutions for the Board's consideration.**

Based on the DEIR, we have many questions, including:

1. How the DEIR deals with its procedural lapses and irregularities
2. How the DEIR deals with native plants issues
3. How the DEIR deals with climate change
4. Why the DEIR contains so many misstatements based on scientific papers, reliance on anecdotal evidence, and avoidance of scientific advice?
5. Why the DEIR contains so many internal contradictions.

The following groups of questions are based on the concerns summarized above. We formally request that the BoF fully consider and respond to our questions in an effort to improve the Draft DEIR by clarifying, among other things, its purpose, rationale, and management structure.

We note that this letter contains similar material to the San Diego CNPS (CNPSSD) comment letter on a previous version of the DEIR, sent February 15, 2013. That letter also included a formal request to the Board of Forestry to respond to the questions that letter raised. The BoF never responded to that request, which is unfortunate, as many of those questions were specifically designed to help the BoF write a better DEIR. As a result, the current Report repeats many of its predecessors' mistakes, and the same criticisms still apply.

Background

California is inarguably the most complicated state in the US, whether the complexity is biodiversity (California is a global biodiversity hotspot[1]), socio-political, geographic, geologic, or in the massive infrastructure of aqueducts, power grids, farms, forests, and cities that allow over 38,000,000 people to live here. Worse, climate change is affecting everything, from water availability to fire behavior. Writing a programmatic EIR (PEIR) is about analyzing the predictable, cumulative impacts of a program. Writing a PEIR for a program that proposes a diverse set activities across almost one-fifth of California is a truly titanic undertaking that the writers of the DEIR did not really engage in.

The main body of the DEIR is only 759 pages long, and it contains multiple repetitions. To show why this is a problem, compare it to the natural resources management plan and Mitigated Negative Declaration for 1,092 acres of urban park in San Diego, which was 159 pages long[2]. The DEIR, supposedly an analysis of a long-term program that proposes to treat up to 22,000,000 acres over decades, is barely five times longer than a routine local management document that deals with a few miles of trail. There is no way the DEIR can provide adequate analysis in so short a length, and it does not. The scale of the DEIR far too small for the VTP. Unfortunately, the issues do with the DEIR do not stop at its short length.

1. With respect to CEQA, we noticed numerous procedural lapses and irregularities:

1.A. Why is the DEIR written with such lack of detail? It certainly is not because it is a PEIR. According to CEQA, all EIRs, whether programmatic or not, need to contain a detailed analysis, and PEIRs are supposed to analyze impacts " as specifically and comprehensively as possible."[3] Indeed, the role of a PEIR is two-fold: it includes “more exhaustive consideration" of

[1] Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B., and J. Kent. (2000). Biodiversity hotspots for conservation priorities. *Nature*, 403(6772), 853-858.
[2] City of San Diego (2015). Carmel Mountain/Del Mar Mesa Natural Resources Management Plan and Trail System..
[3] CEQA Guidelines, 15168(a), (c)(5)

impacts, mitigation, and alternatives than an individual project EIR could include, and it considers cumulative impacts[4]. Projects are supposed to "tier" off the PEIR, depending on and supplementing its analysis only, not doing the work that it was supposed to contain.

CEQA further notes that "[t]iering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration."[5] Also, "[d]esignating an EIR as a program EIR also does not by itself decrease the level of analysis otherwise required in the EIR."[6] Programmatic EIRs must contain "extensive, detailed evaluations" of a plan's impacts on the existing environment. The DEIR's reliance on future, project-level environmental review is contrary to CEQA's policy of favoring early identification of environmental impacts. CEQA does not allow agencies to defer analysis of a plan's impacts to some future EIR for specific projects contemplated by that plan. Finally, as we understand it (we are not lawyers) the courts have ruled that environmental review must take place before project approval, and specifically that, in an programmatic EIR, tiering" is not a device for deferring identification of significant environmental impacts that the adoption of a specific plan can be expected to cause."[7]

Given that the DEIR does exactly the opposite of what CEQA policy states and courts support, why was it written that way? Would it not have been better to follow CEQA and relevant case law?

1.B. What exactly is the Proposed VTP, and what are its boundaries in space and time?
Here is what we do know about the VTP, from the DEIR:

- (p. E-6) "The total land area where the vegetation formation assemblages are appropriate for a ...treatment is approximately 22 million acres, or 71 percent of the SRA [State Responsibility Area]."
- Maps in Figure ES-1 (pE-7) make it clear that many treatment acres are outside the SRA. Other maps (e.g. Figure A1-1, p. A-2) show that some of the "treatable acres in the VTP" are either in Local Responsibility Areas or Federal Responsibility Areas, although all maps in the DEIR are at too small a scale to see boundaries, a fact emphasized by the "blowup" sections on some to show the presence of undescribed and unanalyzed details (e.g. 2.2-9, p. 2-20).
- The VTP seeks to treat 60,000 acres per year, with 231 projects per year averaging 260 acres each (p. 2-35). This is huge (60,000 acres is 93.75 square miles, roughly the size of Oakland and Berkeley combined), but it is not clear if it is appropriate. For example, if every one of the 22,000,000 acres " appropriate for a treatment" were to be treated just once, it would take almost 367 years (22,000,000 acres/60,000 acres per year), which is clearly inadequate for any kind of sustained vegetation management. Clearly the VTP actually intends to treat a small subset of land " appropriate for a treatment, "but the actual parcels to be treated are not discussed, mapped, or analyzed, and may not be determined yet.
- The VTP breaks California down into nine ecoregions; it proposes three types of fuel management treatments, at the Wildand Urban Interface (WUI), on fire breaks, and as ecological restoration; it proposes a menu of treatment activities including controlled burns (supposedly half of the treatments), grazing with non-native herbivores, mechanical

[4] CEQA Guidelines, 15168(b)(1)-(2).
[5] CEQA Guidelines 15152(b)
[6] CEQA Guidelines 15160.
[7] Stanislaus Natural Heritage Project v. County of Stanislaus (1996)

clearance, clearance by hand, and herbicide application. Just a simple combinatorial analysis, 9 ecoregions times 3 management treatments times 5 treatment activities, leads to 135 different scenarios, even without adding further very necessary complexities. Analyzing the impacts of over one hundred scenarios is an enormous task, one that is impossible in a document that is only 759 pages long. Indeed, the DEIR does not grapple with this full complexity at all, so we have no idea exactly what will happen when, where, why, or how often.

There is a problem with this approach: as we understand it, the courts have ruled that "[a]n accurate, stable and finite project description" in an EIR is necessary to analyze its impacts, and a "truncated project concept" violates CEQA.[8] While exhaustive detail is unnecessary, CEQA mandates that EIR project descriptions should be sufficiently detailed, and sufficiently accurate, to permit informed decision making.[9]

Given that the DEIR does exactly the opposite of what CEQA policy states and courts support, why was the DEIR written that way? Would it not have been better to follow CEQA and relevant case law? What exactly is the VTP?

1.C. Where is the program map, and what parcels are subject to the VTP? According to CEQA[10]: "The precise location and boundaries of the proposed project shall be shown on a detailed map, preferably topographic. The location of the project shall also appear on a regional map." While numerous maps are supplied, they are labeled as responsibility areas or as modeled areas that might be treated. We could find no hard-line map.

- How can local impacts be analyzed if the time and place affected by any program is not specified? How can cumulative impacts be analyzed if there is insufficient local data on where and when the program occurs, and what is affected?
- How can landowners determine whether they or neighboring properties are susceptible to the VTP, in case they want to take action?
- Why does the DEIR show maps that are insufficiently detailed for any landowner to determine whether they are subject to the proposed program or not?

Environmental impacts must, by definition, have an environment in which to occur. Phrasing the acreage as " appropriate for treatment" is insufficient. If a parcel is considered eligible for the Program, then the Program has a boundary, and all parcels within that boundary must shown on maps, to circumscribe the environment impacted by the Program.

There is a second map issue, which can be seen clearly in Figure ES-1, but which is repeated throughout the DEIR: **Why do the maps of the State Responsibility Area, Treatable Vegetation Formations, and Treatable Acres in the VTP not agree? It appears that there are quite a few acres (fire breaks?) that occur in the deserts and other areas outside the State Responsibility Area. Is CALFIRE responsible for these?**

- **Why is vegetation that is outside the State Responsibility Area discussed but not mapped?**
- **Why are there fuel breaks that appear to be in the Federal Responsibility Area (compare Figure A-1.1, page A-2, and A-1.3, page A-5)? If these areas are under Federal Responsibility should the DEIR not also be an environmental impact statement, and EIR/S?**

[8] Sacramento Old City Association. v. City Council (1991), Rio Vista Farm Bureau v. County. of Solano (1992)
[9] CEQA Guidelines § 15124
[10] ibid.

1.D How does the DEIR deal with thresholds of significance? CEQA presumes that agencies will use thresholds of significance as a tool for determining the significance of a project's possible impacts. [11] What are the thresholds of significance for biological impacts in the DEIR? We could not find them, and this causes problems throughout the document. For example, the DEIR states that the VTP would have a significant impact if it contributes to the substantial, long-term decline in the viability of any native species (p. 4-115). Unfortunately, there is no threshold to determine what substantial, long-term, and viability mean in order to determine when a significant impact has occurred. Without thresholds, there is no mechanism for determining whether impacts have been mitigated to below the level of significance, and thus the analysis is incomplete.

1.E. Why does the DEIR defer analysis of so many impacts and creation of mitigations until after it is approved? CEQA requires EIRs to be detailed, complete, and contain a sufficient degree of analysis to let the public and decision-makers understand the proposed project's adverse environmental impacts, so that corrections can be made and an informed decision can ultimately be undertaken.[12] As we understand it, the courts repeatedly have ruled against deferring analysis until after the EIR is approved.[13] Similarly, EIRs are generally not allowed to defer evaluation of mitigations.[14] Why does the VTP DEIR resort to these tactics so often?

1.F. Why does the DEIR inadequately analyze so many impacts from the VTP? Under CEQA, "[a]n EIR shall identify and focus on the significant effects of the proposed project."[15] As we understand it, the courts have ruled against merely incorporating the conclusions of an analysis, and that an EIR must contain facts and analysis as well.[16] We deal with one glaring botanical example of this problem below in 2.A., but it is ubiquitous throughout the DEIR. Why does the DEIR resort to inadequate analysis so often?

1.G. Why does the DEIR contain so many mitigation measures that are vague, unenforceable, and inadequate? CEQA requires all EIRs to not only identify significant impacts but also to find ways to mitigate them below the level of significance as much as possible.[17] Furthermore, the mitigation measures must be enforceable.[18] As we understand it, the courts have ruled against mitigation measures that are vague and unenforceable. [19] Why does the VTP DEIR resort to these tactics so often? Where is the detailed, complete, and sufficient analysis in the DEIR to allow anyone to conclude that the VTP will not have significant individual and cumulative impacts?

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[11] CEQA Guidelines § 15064(a), 15064.7
[12] CEQA Guidelines § 15151.
[13] No Oil, Inc. v. City of Los Angeles (1974), Sundstrom v. County of Mendocino (1988), Gentry v. City of Murrieta (1995).
[14] CEQA Guidelines § 15126.4(a)(1)(B)
[15] CEQA Guidelines § 15126.2(a)
[16] Citizens of Goleta Valley v. Board of Supervisors (1990)
[17] Public Resources Code, §§ 21002, 21061.1; CEQA Guidelines §§ 15021(b), 15364
[18] Public Resources Code, § 21002; CEQA Guidelines §§ 15002(a)(3), 15126.4(a)(2)
[19] Anderson First Coalition v. City of Anderson (2005)

1. H. Why are the Objectives so badly defined?

- **Aren't Objectives 2, 3, and 4 subsets of Objective 1?** Objective 1, "Modify wildland fire behavior to help reduce losses to life, property, and natural resources,"(p. E-3) includes objectives 2-4 so one can argue that 2-4 are redundant. These objectives perhaps refer instead to the three treatment activities respectively deal with fire in the wildland urban interface ("WUI"), fire breaks, and "ecological restoration," although not only are they not named as such. In any case, they are, at best, sub-goals of #1. Why separate them out?
- **Can the VTP accomplish Objectives 2 and 3?** Objective 2 (p. E-2) states: "[i]ncrease the opportunities for altering or influencing the size, intensity, shape, and direction of wildfires within the wildland urban interface," and Objective 3 (p. E-3) states: "Reduce the potential size and total associated suppression costs of individual wildland fires by altering the continuity of wildland fuels." If the average VTP project is 260 acres, less the half a square mile, and embers can travel up to 12 miles (see section 4 below), then are VTP projects at the right scale to make any meaningful difference? The VTP needs to make clear what kinds of fires it envisions protecting against, because these two objectives seem to be scaled too small to control the wind-driven fires that cause a vast majority of destruction in California.
- **What is meant by Objective 4?** Objective 4 (p. E-3) is to "[r]educe the potential for high severity fires by restoring and maintaining a range of native, fire-adapted plant communities through periodic low intensity treatments within the appropriate vegetation types." While this might make sense in, for instance, ponderosa pine forests that have become overgrown with saplings due to fire suppression, it appears that the majority of controlled burns are aimed at shrub-dominated vegetation, e.g. chaparral (p. 4-427). As both the California Chaparral Institute and CNPSSD have argued repeatedly, there is too much fire in chaparral, especially in southern California. The simplest way to improve this fire return interval is to not burn in chaparral for the next century or so. Both Objective 4 and the VTP itself need to become consistent and transparent about what they intend to burn, where, and why. CNPSSD does not disagree that some plant communities, such as some ponderosa pine stands in the Sierra Nevada, could benefit from controlled burns. These need to be called out so that the impacts of treating them can be analyzed. Why were they not identified in this DEIR?

1.I. Why does the Alternatives Analysis depend so much on acres treated? One major issue here is that treating 60,000 acres per year is not one of the official objectives of the VTP, so it should not be used to judge alternatives. Clearly, however, it is the main *unofficial* objective. Nonetheless, the goal of 60,000 acres per year with unlimited potential for expansion to 22,000,000 acres is problematic, because it means that areas get treated once per century or once per 366 years, as noted above. Things like fire breaks only work if they are cleared regularly, ideally every year. However, limiting the VTP to acres that could be cleared every year would limit the program to something as small as 60,000 high-value acres (so that each acre could be cleared once every year). Any realistic VTP should be something in between 300,000 and 22,000,000 acres (probably less than a few million acres, as even projects in a 1,200,000 acre program would only be visited once every 20 years). That requires a much reduced project, so that some sites are visited frequently, some once. Regardless, any argument that downgrades alternatives because they limit the acreage treated is doomed by logistics and math. It is a criterion based on greed rather than analysis or logistics. Why use it?

We strongly suggest that the BoF consider how much they truly need to work on, and make that the area of the VTP. We also strongly suggest that, if acreage treated is so important, that

the VTP make that the first official objective, and stop trying to hide this fundamental motivation for the VTP.

2. With respect to native plant issues, we noticed many problems. The treatment of native plants issues is riddled with issues, starting with the trivial (CNPS is repeatedly referenced in the DEIR, but the acronym is not spelled out nor included in the front glossary). In addition, the plural of plant is not vegetation, and vegetation has different issues than plants, despite the attempt of the DEIR to bundle them together), and going rapidly to the seriously non-functional.

We have the following questions about how native plant issues were treated in the DEIR:

2. A. Why were Standard Project Requirements (SPRs) BIO-1, BIO-2, and BIO-3 not carried out in preparation of the DEIR itself, rather than as a task to be carried out in subsequent analyses? ***The entire botanical analysis*** is the following statement: "[i]mpacts to botanical resources were analyzed by examining special status plants and communities listed in the California Natural Diversity Database (CNDDB) for each bioregion."**How does this meet CEQA Guideline 15125(c): "The EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects of the project to be considered in the full environmental context[?]"**

Note that CEQA requires this analysis in all EIRs. It is not option, nor, as noted above, is it allowable to forego this impacts analysis until after the VTP DEIR is approved.

- Where is the detailed evidence that this analysis was ever done?
- What were the detailed results of this analysis?
- What can we check to determine that this analysis was done properly, so that we can help fix any deficiencies?
- What were the impacts to populations of sensitive species? How many will be lost? How many will need to be transplanted or replanted? How many new populations were discovered?
- How are the impacts to each species to be mitigated below significance?
- What are the cumulative impacts?
- How are they to be mitigated below the level of significance?
- Are there unavoidable impacts? Where is the declaration of over-riding consideration for them?
- How did impacts to sensitive plants and the mitigation thereof influence the design of the VTP?

The current version of the DEIR has the dubious distinction of containing even less information about California's native plants than did its predecessors. Note that not all of California's plant species are affected by the VTP. Insular species like the extremely rare *Cercocarpus traskiae* will never be subject to vegetation treatment. Nor will a wide selection of beach dune plants (e.g. *Acmispon prostratus*, *Phacelia stellaris*, and *Nemacaulis denudata* var. *denudata*) that mostly occur on urban dunes. The fundamental point is that the Program does not affect all listed plants, it affects a subset of them. Why was this subset not identified?

2.B. Why is the biological description of the project area so incomplete? 4.2.1.2, the Biological Setting and Concerns, is a description of the "nine ecoregions" used in the analysis

(p.4-85-4-109) is not useful for environmental analysis. It does not describe what is important, it does not describe what is impacted, it does not use scientific names, but it does lump together plants with radically different fire ecologies and pretends they are equivalent. Indeed, it does not describe concerns or in any way highlight which bits of information are actually important. (For example, the Sierra Nevada is described as having "bold topography," rather than by the elevation range of any vegetation type or species mentioned).

According to CEQA,"[a]n EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published."[20] This includes the plants and animals within the project's boundary. Section 4.2.1.2. fails to do this. To pick one concern that is left undescribed, we learn on page 4-427, in the climate change section, that the majority of the 30,000 acres subject to controlled burns will occur in "shrub dominated vegetation." Despite the presence of BIO-5, it appears that the VTP specifically targets chaparral, but this is not mentioned in the Biological Setting and Concerns. Why is it not mentioned?

Worse, the DEIR contradicts itself on the utility of ecoregions. For example, it notes (p. 4-79) that "evaluating impacts at the bio-regional scale allows for a reasonable analysis of the foreseeable impacts without being neither so large an area as to dilute the impacts or too small an area to magnify the impacts," but later (p. 4-121) states that "[i]n order for an effect to be considered significant at the bioregional level, the species in question would have to be impacted enough to meet one of the Significance Criteria stated above. The amount of habitat that would have to be adversely modified to cause a substantial adverse effect has not been scientifically determined for most species and is likely unknowable until the threshold has been crossed and the species is in jeopardy." In other words, despite the importance of threshold analysis in CEQA as noted above, this document appears to regard threshold impacts as unknowable, at least at the bio-regional scale. Why was this scale used? It is also very unclear what the "Significance Criteria stated above" are, since this is the first use of the term "Significance Criteria" and other uses refer to over issues. What are they?

2.C. Why is SPR BIO-1 thought to be sufficient or workable? To us, SPR BIO-1 is unworkable, as it does not cover sensitive species on the CRPR list (note that the CNPS list has been the California Rare Plants Rank list for many years now), nor does it cover species protected by cities and counties. As written, this SPR fails to cover hundreds of sensitive plants. Moreover, the DEIR misses the fact that List 2 was split to List 2A and List 2B, to parallel Lists 1A and 1B. This SPR must be rewritten to conform to current practice and terminology, as it is obsolete as written. At the very least, the definition should follow CDFW current practice. We also note that counties like San Diego and Ventura have their own lists, which largely, but not entirely, match with those maintained by the state. The VTP should honor local lists and local practice that reflect local expertise and local needs.

2.D. Why does SPR BIO-2 designate the Project Coordinator to conduct a field review of any proposed project? What qualifications demonstrate that the Project Coordinator is competent to perform field identifications? Where is this competency requirement specified in the VTP? How will qualifications be assessed? The problem is that, unless the Project Coordinator is a qualified botanist, (s)he will lack the ability to determine how accurate the CNDDB or any other database is, will not know when or how to survey (the excellent

[20] CEQA guideline § 15125

guidance from CDFW and CNPS is inadequate without real training), will not know how to collect specimens, nor where to send them in problematic cases, nor how to deal with any truly complex issues.

Another problem here is that all databases are insufficient. For example, the CNDDB states, "[W]e cannot and do not portray the CNDDB as an exhaustive and comprehensive inventory of all rare species and natural communities statewide. Field verification for the presence or absence of sensitive species will always be an important obligation of our customers."[21] Trained botanists know this. Untrained bureaucrats do not.

It is routine to find new populations of sensitive species or even new species in areas (such as large, old ranches) that were never or rarely surveyed. The author of this letter (Dr. Landis) found what eventually turned out to be a new species of *Eriastrum* in 2007, on a wind farm project in the Tehachapis. The San Diego Plant Atlas, since 2003, has found over 300 new county records, 10 state records, and 2 new taxa.[22] Tejonflora.org documents the ongoing floristic survey of the Tejon Ranch, and the new species that are being described from there. A new species of cholla was described in Riverside and Imperial County in 2014[23], and an undescribed new manzanita species will be published in June. *Carex cyrtostachya*, described in 2013, is found in Butte, Yuba, and El Dorado Counties,[24] and it is a CRPR List 1B species that may not yet be in CNDDB. The same is true for the Sierran *Carex xerophila*, published in 2014,[25] and for *Calystegia vanzuukiae* from El Dorado County, published in 2013.[26] According to an informal, one-week email and Facebook survey of CNPS botanists undertaken in the last week of May 2016, undescribed new species in process of identification were reported to exist in Marin, Tehama, Butte, Shasta, and Santa Barbara counties, and more will certainly be found as large, old ranches and remote areas are surveyed for development, wind, and solar projects, and probably for the VTP. Experienced botanists know how to deal with this issue. Untrained bureaucrats do not.

The VTP provides no guidance as to the qualifications of Project Coordinators, nor does it specify when or how long they should spend in the field in each project, going against the advice of both CDFW and CNPS cited in the DEIR. In any case, CNPS always strongly suggests that surveys be left to qualified botanists with experience in the local area of any proposed project, that surveys should take place when the plants are most likely to be alive and identifiable, and that qualified surveyors be allowed adequate time for their work, and not forced to do a cursory, 15 minute visit where they do not get out of the vehicle. What is to stop Project Coordinators from doing cursory drive-by visits and not even setting foot on project sites? Why should drive-by surveys be considered acceptable under CEQA?

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[21] http://www.dfg.ca.gov/biogeodata/cnddb/cnddb_info.asp

[22] http://sdnhm.org/science/botany/projects/plant-atlas/, accessed 5/26/2016

[23] Baker, M. A., & Cloud-Hughes, M. A. (2014). *Cylindropuntia chuckwallensis* (Cactaceae), a New Species from Riverside and Imperial Counties, California. *Madroño, 61*(2), 231-243.

[24] Zika, P.F., L.P. Janeway, B. L. Wilson and L. Ahart (2013) *Carex cyrtostachya* (Cyperaceae), a new species of sedge endemic to the Sierra Nevada of California. *Journal of the Botanical Research Institute of Texas* 7:25–35.

[25] , Zika, P.F., L. P. Janeway and B. L. Wilson (2014) *Carex xerophila* (Cyperaceae), a New Sedge from the Chaparral of Northern California. *Madroño* 61(3):299-307.

[26] Brummitt, R. K. and Namoff, Sandra M. (2013) *Calystegia vanzuukiae* (Convolvulaceae), a Remarkable New Species From Central California. *Aliso* 31(1)

2.E. How is SPR BIO-5 actually supposed to protect anything? Critical terms like "type conversion," "median fire return interval," and " old growth" are left undefined, their determination at the mercy of the Project Coordinator whose qualifications are also left undefined. Moreover, these areas are to be protected for " aesthetics, wildlife, and recreation," not for sensitive plants, lichens, or even the reproduction of species that take decades to reproduce. Why should mountain bikers desiring new trails be privileged over the continued existence of last-of-their-kind stands? Additionally, local experts like the California Chaparral Institute, numerous local land management groups, and scientists from both academia and other agencies are left out of the decision loop. Why are they excluded? Finally, this SPR needs to be extended to all old growth vegetation throughout the state, because there is very little left of any of it. As the author (Dr. Landis) is finding, working in an urban stand of old growth chaparral, old growth is often home to other poorly known or even undescribed species. SPR BIO-5 is unworkable as written. It should incorporate the analysis of impacts to old growth stands directly into the DEIR, rather than forcing it onto a single Project Coordinator who only needs to make a single site visit. Why was this not done?

2.F. Why use the outdated WHR, when so much more useful vegetation information is available? California's flora is immensely complex, but the VTP analysis oversimplifies it by shoehorning all species into trees, shrubs, and herbs. No knowledgeable fire fighter would assume that ponderosa pine (*Pinus ponderosa*) and white fir (*Abies concolor*) have the same fire ecology, but they are all lumped together as "tree-dominated" vegetation (e.g. Table 4.2-14) for the purposes of describing the vegetation in the Sierra Nevada.

Considering that CDFW and CNPS have for decades been cooperating to map the vegetation of California and have created two editions of *The Manual of California Vegetation* ("MCV"), it really is sad to see the 1980s Wildlife Habitat Relationships system used by any state agency. The MCV contains a wealth of information on fire ecology. While it is admittedly incomplete, even incomplete it is a far more complete and more useful as a mapping system than is the WHR. We strongly recommend that the BoF use the MCV as its primary vegetation mapping tool and incorporate the fire ecology information therein into the analysis of programs like the VTP.

2.G. How does the VTP avoid becoming a major vector for pests and pathogens? CNPS has found that non-native, pathogenic water molds (genus *Phytophthora*) are spreading through the state and into wildlands through nursery-mediated infection of plants for restoration and landscaping. In 2015 we implemented a policy to try to stem the spread, at least through native plant nurseries.[27] The genus *Phytophthora* may be unfamiliar, but *Phytophthora ramorum* (the cause of Sudden Oak Death) is depressingly familiar, as is the Irish potato blight (*Phytophthora infestans*) that caused so many famines. Southern California is so far free of Sudden Oak Death, but it faces beetle invasions, from gold-spotted oak borer and polyphagous shot-hole borers. Native pine boring beetles have caused major tree die-offs elsewhere in the state. All of these pests and pathogens can be readily transported by carelessly handled wood, litter, untreated or insufficiently composted green waste, uncleaned equipment, carelessly grown nursery stock, and so on. Proper sanitation and quarantine are necessary to keep vegetation treatment activities from spreading pests and pathogens throughout the state.

[27] http://www.cnps.org/cnps/archive/phytophthora_policy_2015.pdf

Unfortunately, this was not addressed in the DEIR. As a result, the VTP can be expected to cause substantial individual and cumulative impacts as workers inadvertently spread pests and pathogens on uncleaned equipment and by removing dead, but still infected, plant material. Even leaving some infected material might be problematic, as the pest or pathogen could simply reinfest the area from whatever is left behind.

What is the VTP going to do about proper sanitation and quarantine? What are the impacts of doing these, or conversely, of not doing them? How are these impacts to be mitigated, individually and cumulatively?

3. There are serious climate change issues as well. As mentioned in the previous section, CNPS is a champion of California's native plants and of vegetation dominated by native plants. Because we were successful co-plaintiffs in the recent case *Center for Biological Diversity et al. vs. California Department of Fish and Wildlife and Newhall Land and Farming Company* ("Newhall Ranch ruling"), and because we are increasingly having to deal with climate change issues to protect native plants, we now also advocate on climate change issues. In our opinion the treatment of plants and the analysis of climate change impacts in the DEIR have substantial issues. We have a number of issues with the climate change impacts discussion (section 4.14, pp.4-408 to 4-434).

3.A. Why was the analysis of climate change impacts performed as it was? As we understand it, the relevant details of the climate change impacts analysis are as follows:

- The time frame of analysis is one year. Page 4-424: "Because the generally accepted time frame for evaluating project emissions is the year of project implementation with emissions generally reported as MT/year, this is also the time frame chosen for this analysis. This will conservatively estimate the VTPs impacts because the benefits of future vegetative growth as the site recovers and the reduction of wildfire risk to the treatment area and surrounding landscape is not taken into account."
- The DEIR assumes that, of the 60,000 acres proposed to be treated every year, 30,000 acres will be burned, 20% mechanical treatments (p.4-427), 10% manual treatments (p.4-428), and grazing non-native herbivores and spraying herbicides are only accounted for as trip miles, with herbivore methane emissions based on a sheep herd of 450 animals as the only model (p.4-428). Thus, only 50% of it burns.
- Conclusion: there are less than significant impacts to greenhouse gas emissions (p. 4-429): "The VTP would create approximately 298,745 MT/year of CO2e, less than the 510,030 MT/year CO2e emissions created by a similar size wildfire burning."

The conclusion does not follow from the analysis. It is only relevant if the 60,000 acres treated would have burned in the same year it was treated. This is intrinsically unlikely. 60,000 acres treated/22,000,000 acres in the VTP is 0. 272%. According to Figure 1.1-1, (" annual area burned in California 1950-2010", p. 1-3), during the worst wildfire year, 2007, only 1,400,000 acres burned. This is approximately 6.3% of the 22,000,000 acre VTP area. Even during the worst year in recent history, over 93% of the state went unburned.

What are the chances that the area treated by the VTP will burn in the same year, even during a historically bad fire year? If the treatment and the fire are independent events, the chance is much less than one percent. Still, one might argue that the BoF is very good at predicting where fires will occur and putting their treatments there, so the chance is much higher. Unfortunately

for this argument, the model used to predict fire hazards in the DEIR has been tested as a predictor for home loss during fires, and it contributed <5% to the model that predicted which homes would burn.[28] According to this test the model used in the DEIR is very bad at predicting where fires will occur in a particular year, as are most models. Fire occurrence has a large random component. Other research in southern California showed that, over 28 years (not one year), 23% of fuel treatments intersected fires in the study area, which means that 77% of fuel treatments went unburned over 28 years, in an area notorious for large wildfires.[29] Even in Southern California, a fire treatment area will most likely never be touched by a fire in a generation.

The upshot is that one cannot analyze the greenhouse gas impacts from a vegetation treatment as if the treatment displaces a similarly sized wildfire on the same spot in the same year. Absent truly improbable events, the treatment will not intersect any fire during the year of analysis. Therefore, greenhouse gas emissions from the treatment will not replace or reduce emissions from a fire that would have burned the same area. Instead, they will be emitted in addition to whatever wildfires occur that year.

Clearly, the analysis of climate change impacts is incorrect, and the VTP will cause substantial, unmitigated greenhouse gas emissions. This section needs to be redone, the individual and cumulative impact of greenhouse gas emissions from the VTP need to be analyzed, and real mitigation measures need to be proposed.

Moreover, the argument used in this section looks similar to the argument that the California Supreme Court ruled was invalid in the Newhall Ranch ruling. We therefore strongly suggest that BoF read that ruling, and incorporate it into designing a better analysis of greenhouse gas impacts and mitigations.

3.B. Why is the basic fire science wrong? In section 4.14.1.2.3.1 "Wildfire versus Prescribed Fire Emissions," the EIR makes the incorrect assumption that carbon dioxide emissions from a wildfire are equivalent to emissions of pollutants caused by inefficient burning. This is incorrect. The basic combustion reaction is that hydrocarbons + oxygen → carbon dioxide + water. The more efficiently this reaction runs, the more carbon dioxide is produces. Inefficient combustion produces soot, particulates, and other air pollutants. Decreasing combustion efficiency increases particulate and other pollution. Increasing combustion efficiency increases carbon dioxide production. There is no way to escape producing some pollutant by manipulating an fire.

As presented in the analysis, highly efficient controlled burns should produce more carbon dioxide emissions, not less. Carbon dioxide emissions thus cannot be controlled by the same processes that control air pollution from fires. They have to be managed separately, either through not burning or through carbon sequestration. Section 4.14 of the EIR needs to be rewritten to reflect this basic reality, as does SPR CC-1, CC-3, and CC-4.

3.C. Why are BIO-5 and BIO-6 mentioned in SPR CC-2 (p.4-434)? These two SPRs have nothing to do with carbon sequestration. The DEIR does need SPRs to deal with carbon sequestration, but it is not CC-2. This SPR needs to be totally rewritten to be useful.

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[28] Syphard, A. D., Keeley, J. E., Massada, A. B., Brennan, T. J., and V. C. Radeloff, V. C. (2012). Housing arrangement and location determine the likelihood of housing loss due to wildfire. PLoS One, 7(3), e33954.

[29] Syphard, A. D., Keeley, J. E., and T. J. Brennan, (2011). Comparing the role of fuel breaks across southern California national forests. Forest Ecology and Management, 261(11), 2038-2048.

3.D. What is the relationship between the VTP and CALFIRE's responsibility for sequestering carbon? Since CALFIRE has responsibility both for administering the VTP, which appears to be only about removing plants, and for carbon sequestration through planting plants, there needs to be an analysis of the impacts of these two programs on each other. After all, they are in fundamental conflict: fire protection seeks to remove plant matter from the landscape, while sequestration seeks to add it to the landscape. One might expect close coordination between these two programs and how they impact each other, yet there is no mention of it in the DEIR. Specifically, the DEIR needs to analyze:

- How will the VTP sequester the CO2e it produces (see 3.C. above)?
- How will mistakes and accidents increase CO2e emissions from the VTP?
- What is the rate or probability of CALFIRE controlled burns escaping control and becoming wildfires?
- How are escaped fires controlled, and how much do they burn relative to the proposed size of controlled burns?
- How are impacts from escaped burns assessed individually and collectively across the VTP?
- What happens if an escaped wildfire impacts a carbon sequestration site?
- Can CALFIRE's carbon sequestration programs be used as mitigation for the greenhouse gas impacts generated by the VTP?

3.E. Why did the DEIR ignore the method suggested in the California Chaparral Institute's response to the Notice of Preparation from October 24, 2015? That method would have avoided at least some of the issues raised in 3.A. and 3.D.

4. Why is the DEIR contain so many misstatements based on scientific papers, reliance on anecdotal evidence, and avoidance of scientific advice? We fully support the California Chaparral Institute's comments in their letter of May 24, 2016 ("CCI letter"). Some points we find problematic:

- **Why does the DEIR misquote the science?** The CCI letter contains ample documentation of this, including one scientist denying that his paper said what was implied in the DEIR. We strongly agree with the assessment, and ask the same.
- **Why does the DEIR rely on anecdotal evidence?** This is particularly apparent in the definition of the WUI, which is defined in the DEIR solely in reference to how far embers can fly. As noted in Appendix A of the CCI letter, there is no good science to support 1.5 miles as anything other than a polite political fiction, chosen from overheard conversations at a conference, based on what others might find acceptable. There is no reality behind this anecdote According to the CCI letter and the references therein, the 2009 Bunyip Ridge fire in Australia projected embers 20 km (about 12 miles), while the ongoing Ft. McMurray fire is reported to have projected embers 10 km (about 6 miles). 1.5 miles is insufficient to stop all embers during catastrophic wildfires.

  Worse, 1.5 miles is a silly number. If VTP projects are supposed to clear 260 acres on average, that is 11,325,600 square feet, and a 1.5 mile wide WUI clearance would be 7,920 feet wide. If one does the math, a 260 acre VTP clearance would create a 1.5 mile wide fire break that is 1,430 feet long, and such a firebreak only works if it is pointed directly at the oncoming fire, and somehow the fire doesn't burn down the uncleared sides of the fire break.

Conversely, there is increasing evidence for the utility of 300 feet of fire clearance around structures, and a 260 acre VTP project could be used to create 7.15 linear miles of fire break 300 feet wide. Choosing 1.5 miles at worst leads to silly projects. Why use it at all? Why not try approaches that appear more useful based on repeatable tests of evidence?

5. Why are there so many contradictions within the DEIR? It is riddled with them, and they are non-trivial.

- One example, from page E-3: "California's tremendous diversity in vegetation translates into a similar diversity in fuel types, with a resultant variation in fire behavior throughout the state. Considering statewide variations in fire behavior and the need to characterize it at a workable scale for a statewide environmental analysis, the vegetation of California is condensed into three main groups based on the distinct fire behavior each group exhibits. These groups can be classified as tree dominated, grass dominated, and shrub dominated vegetation formations." Really? Would any firefighter consider white fir and ponderosa pine to have the same fire ecology? How about other pairs of trees and shrubs that have highly divergent fire ecology: sequoia and redwood, lodgepole pine and whitebark pine, chamise and scrub oak? Clearly, the DEIR failed to usefully simplify the complexity, so we are left concluding that the original statement about diversity in fuel types was correct, and that the analysis failed to account for it at all.
- **The contradictions become more problematic when dealing with biological cumulative impacts.** The DEIR states (p 5-24) that "[o]verall, it is impossible to precisely specify at the scale of the state or region both the biophysical and economic ramifications of interaction between disturbance and biological resources."

  Later it says (p-5-24) that "[c]umulative effects occurring at the scale of the state or the region may not inform project level cumulative effects analysis...Cumulative effects, either negative or positive, can potentially impact individual species of concern, the distribution and sustainability of special habitat elements, wildlife, vegetation structures, and other biological resources. Cumulative effects attributable to these kinds of impact mechanisms are generally most reliably assessed at the scale of the individual project and lands immediately adjacent."

  At this point, the DEIR is going against CEQA's intent with PEIRs, as noted in section 1 above. Unfortunately, it goes on to say that (p. 5-25) "[t]he VTP Program EIR cumulative impact analysis, conducted at the scale of the watershed or bioregion, identifies and assesses impact mechanisms that may influence landscape scale biological resource issues such as wildlife movement or habitat capability across broad regions, likelihood of genetic interchange, change in plant community composition as a result of non-native species establishment, or change in species distribution." Really? Where is this analysis? What were its conclusions? This part of the DEIR should be thousands of pages long.

  Finally (p. 5-27) the DEIR states, "[b]ecause of the amount of acreage eligible but not receiving treatment under the VTP, **the proposed Program would likely result in a less than significant cumulative effect on biological resources at the bioregional scale** [emphasis added]. Wildfires would continue to occur in California, having both negative and positive effects on biological resources and wildlife habitat condition; the magnitude of effect being dependent on a wide suite of physical, biological, and climatic variables."

  This is an absurd, contradictory conclusion. It appears to say that, because only 60,000 acres is treated each year out of 22,000,000, there is no cumulative impact at all. Really? An

area half the size of Oakland is deliberately burned every year, but that is not significant, because it doesn't burn one-tenth of the state? And an equivalent area is herbicided, grazed, and masticated, but that's not significant, because the project doesn't herbicide, graze, and masticate one tenth of the state? Why does the BoF think this makes any sense at all?

As noted above, it is easy for a single, 260-acre vegetation treatment to wipe out the last stand of old growth chaparral, or to remove critical habitat that causes a sensitive species to spiral towards extinction, or to poison a watershed by accidental release of herbicides into a stream, or to transport a pest or pathogen where it never before existed, or to spark a wildfire that burns thousands of acres, because the crew was impatient and started the fire under inappropriate conditions (as in the 2013 San Felipe Fire). All of these are predictable and analyzable. If such predictable consequences are so hard for the BoF to analyze, why attempt theVTP at all?

If the DEIR is supposed to be a trustworthy document, to meet its Objective 5, to "[p]rovide a consistent, accountable, and transparent process for vegetation treatment monitoring that is responsive to the objectives, priorities, and concerns of landowners, local, state, federal governments and other stakeholders," then **all internal and external contradictions need to be resolved and removed.** How can the VTP be trusted otherwise?

Alternatives to the current VTP and DEIR

When reading the DEIR, one comes away with the overwhelming impression that this is a document written by people who want stuff done without thinking about the consequences. While we understand that impulse, we do not sympathize with it. The problem is that the VTP, if implemented as written, would be the single biggest igniter of wildland fires in California, igniting over 100 every year. While all of these are supposed to be controlled burns, the sheer number of ignitions means that some, eventually, will go out of control and cause damage through simple bad luck. Moreover, the VTP will be the single biggest vegetation-clearer. If the biological SPRs are implemented as written, VTP employees and contractors will become the single biggest danger to sensitive plants in the state. If scientists turn out to be right about fire behavior, most VTP activities will have little or no effect on saving lives or property from wildfires, while spending hundreds of millions of dollars.

This is why we care about consequences. The proposed VTP is far too hulking a program to run it impulsively and not analyze its predictable consequences.

We also care because the VTP simply doesn't add up as written. If 22,000,000 acres are " appropriate for treatment" and 60,000 acres are treated every year, it would take almost 367 years for each appropriate acre to get treated once. That's simply pointless. Old growth chaparral can re-establish itself in well under 367 years. The State of California is less than half that age. If the VTP's goal is truly treat WUI areas, that takes repeated visits every few years. In any case, the VTP can only include a small fraction of those 22,000,000 acres. There's no utility in making the program area unworkably large, and there's especially no point in using the scale of acres appropriate for treatment as a way to evaluate alternatives. Most of the land is untreatable anyway.

Then there is the time scale of preparation. The VTP in its current incarnation has been around since 2013, and its roots go back to the 1990s. That's a long time, and a lot of analysis and project design could have been accomplished in that interval. Unfortunately, the DEIR is

still focused on trying to avoid that analysis through a combination of pushing it forward (contrary to CEQA) to individual projects, hiding motivations, padded, repetitive, vague, contradictory and obfuscatory writing, ignoring reality, and simple sloppiness. As a result, the process has wasted years, and is no closer to satisfying CEQA or satisfying people, like us, who will have to deal with the VTP's consequences.

Fortunately, there are workable alternatives:

- **Base the VTP's objectives and strategies on science.** We understand that many firefighters distrust science, so we propose that the term "science" be accepted by the VTP preparers as the stuff that turns out to be true whether anyone believes in it or not. The science that underlies the VTP has to be the things that keep firefighters and others from being burned, properties as safe as possible, and keeps the VTP from being an engine for extinction, type conversion of native lands to weed-fields, and a major vector for pests and pathogens. This is the type of science CNPS tries hard to promote.
- **Create a program that implements those objectives and strategies, again using science.** This is common sense, although some may not see it that way. For example, the DEIR notes that "cost and time to meet environmental review requirements, surveying for and mitigating treatment effects to threatened and endangered species" are major impediments to treating 120,000 acres per year under the existing Vegetation Management Program ("VMP", p. 1-15). Oddly enough, agencies like the National Park Service somehow manage to get programs done within the constraint of environmental review requirements. Is the problem in the requirements, or within BoF's system for meeting them? This is an awkward, but critical question. If the problem isn't with the environmental review requirements, then the VTP is based on a fundamentally wrong assumption, and BoF needs to look at other options for accomplishing its objectives.
- **Front-load the analysis into the PEIR, rather than pushing it down to projects.** This is what CEQA requires. CNPS agrees with the BoF that we need to treat at least some vegetation within 300 feet of homes. We also agree that, in some parts of the state (like some pine forests in the Sierra Nevada), we need more controlled burns. Were the VTP limited to projects that have broad-based support, it would be in place right now. Unfortunately, none of this analysis or consensus seeking went into the VTP or its DEIR. If it had, many of the problems we identify would not exist.
- **Set hard boundaries early.** The math for the VTP simply does not work, and to be blunt, we suspect that a PEIR that realistically tried to analyze the impacts to 22,000,000 acres of any project would be unworkably huge. We are also quite sure that any real VTP will be a small fraction of that size. We are also quite sure that there are projects that everyone wants done. It should not be as hard as the project proponents think to figure out where projects need to be done and are likely to be done, and to focus the VTP down so that it only works on those areas. Indeed, once the VTP has done that, it might be easier to expand it from a small area using supplemental EIRs, rather than trying to deal with an unworkably huge initial project.
- **Follow CEQA exactly, and get the environmental analysts involved at the design stage, not at the end.** The point is to identify critical problems and avoid them through design changes, rather than solidifying the design and being left with a mess to mitigate. Environmental analysts earn their pay because they are, on an per-hour basis, substantially cheaper than lawyers, and sometimes even cheaper than firefighters. Their best role is helping people spot and avoid predictable problems, rather than in covering up issues. Many

southern California developers have learned this advice, and their projects get built without drama. We suggest that state agencies might find it useful as well.

- **Use a multi-year, overlapping planning process for each proposed project.** Since we can expect the climate to get more extreme in coming years (bigger storms, bigger droughts, and so forth), planning for things like burn days for controlled burns is going to be an exercise in patience. Rather than trying to go from plan to treatment in a single year, we suggest using a multi-year process, like the existing VMP, so that areas can be surveyed by professional biologists, local information and buy-in can be sought, and plans can be made ready for when the weather cooperates. Moreover, overlap projects, so that some are being researched while some are being implemented and others are being evaluated afterwards. Rushing will not just make waste, it may make wildfires, injure firefighters, and send species into extinction. Is convenience really worth this price?
- **Consider taking five years to create the next iteration of the VTP.** This is not for our convenience, but because so many things are changing right now:
    - Fire behavior may be changing with climate change, and new types of wildfires may be emerging.
    - California is still developing its climate change response by both limiting emissions and increasing sequestration, and it is fairly clear to us that few people in California government understand its ramifications yet.
    - Pests and pathogens are spreading rapidly, and new ones are showing up.

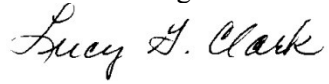
How much damage can the BoF do by rushing to implement a vague, opaque program at this time? Our strong sense in reading multiple versions of the DEIR is that the people who wrote it really did not understand most of the issues they wrote about, nor did they get help from some really good in-house researchers, such as the fire researchers in CALFIRE. We believe that the BoF needs to take a couple of years to understand and embrace what the 21st Century has in store for it, rather than rushing to implement a bigger version of the 1980s-era VMP. We only wish that this process had started a decade ago, rather than now.

Unfortunately, none of these suggestions change our basic opinion, which is that this DEIR needs to be thoroughly rewritten and recirculated, and that the VTP as written is unworkable. Please take the time to do it right.

Please keep us informed of all future developments with this and related projects. Thank you for consideration of our comments and questions.

Sincerely,

Frank Landis, PhD
Conservation Chair
CNPS San Diego



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Sent: Friday, June 10, 2016 7:42 AM
To: Vegetation Treatment Program@BOF
Subject: letter from CNPS San Diego Chapter

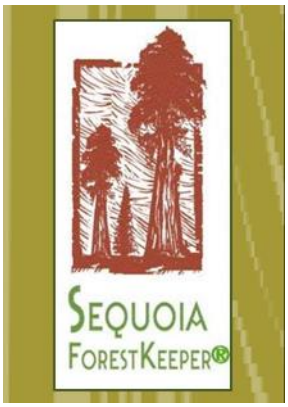
Hello,

As part of the VTP public comment you received a letter from the San Diego (CNPS-SD) and Kern County Chapters of the California Native Plant Society. That letter was written by Frank Landis, chair of the conservation committee of the CNPS-SD chapter. His letter was not reviewed and approved by the executive committee of the chapter, of which I was a member. So I feel that you should regard that letter as representing just his views on the VTP.

I do not know the views of the other CNPS-SD committee members, but my views of VTP are favorable to implementing the plan.

Regards,

Carl Bell
carl@socalinvasives.com



May 25, 2016

Board of Forestry and Fire Protection
ATTN: Edith Hannigan, Board Analyst
VTP Draft PEIR Comments
PO Box 944246
Sacramento, CA 94244-2460
VegetationTreatment@fire.ca.gov

Subject: Vegetation Treatment Program Environmental Impact Report (VTPEIR)

Thank you for the opportunity to comment.

We hereby incorporate herein the May 24, 2016 comments by the California Chaparral Institute in their entirety by reference. We hereby incorporate herein the April 8, 2016 comments by the Center for Biological Diversity in response to the "California Forest Carbon Action Plan Concept Paper in their entirety by reference. We hereby incorporate herein the February 4, 2016 in its entirety by reference.

Extensive scientific research clearly indicates that the best way to protect lives, property, and the natural environment from wildfire is through a comprehensive approach that focuses on community and regional planning, reducing ignitability of structures, and modifying vegetation within and directly around communities at risk. By focusing exclusively on clearing habitat, the Board is NOT addressing the main causes for loss of life and property from wildland fire.

The Board's proposal will target about 22 million acres (1/3 of the entire state) for "masticating," spraying with herbicides, burning, or grazing. This would increase its existing habitat clearance program five times over current levels. If certified, the programmatic EIR will exempt individual habitat clearance projects from public oversight required by the California Environmental Quality Act (CEQA). Everything from state parks to private lands could be stripped bare without local notice or a chance to appeal.

Every decade we increase funding for habitat clearance operations and fire suppression activities, followed by a decade of even worse fire impacts. The Board's proposal perpetuates and expands this same approach, one that has failed to reduce cumulative wildfire damage and firefighting expenditures over the past century. As a consequence, the proposal is a waste of tax payer money, will cause significant damage to the environment, and will fail to effectively protect Californians from wildland fire.

We hereby incorporate herein, in its entirety, by reference, the February 4, 2016 joint letter from scientists to Governor Brown about his State of Emergency proclamation that the 2015 "die-off is of such scale that it worsens wildfire risk across large regions of the State", is strongly at odds with the best available science.
http://www.sequoiaforestkeeper.org/pdfs/Science_papers/160204_Hansen_Scientist_letter_to_Gov_Brown_re_2015_snags.pdf

> "Based on the best available scientific evidence, the October 2015 emergency proclamation is not scientifically sound and, in fact, is directly contradicted by the overwhelming weight of current science. Further implementation of the proclamation would cause serious harm to numerous imperiled snag-dependent wildlife species, would exacerbate the ongoing deficit of snags in California's forests relative to the minimum needs of the most sensitive wildlife species, would substantially reduce carbon storage in our forests and cause large emissions of greenhouse gases due to increased burning of snags in bioenergy plants, and would not reduce fire intensity or spread."

Letter to Governor Brown from Chad Hanson, Ph.D., Research Ecologist John Muir Project of Earth Island Institute, Dominick DellaSala, Ph.D., Chief Scientist Geos Institute, Monica Bond, M.S., Principal Scientist Wild Nature Institute, George Wuerthner, Senior Scientist Foundation for Deep Ecology, Dennis Odion, Ph.D., Ecologist Earth Research Institute, University of California Santa Barbara, and Derek Lee, Ph.D., Principal Scientist Wild Nature Institute.

There is no scientific dispute that mechanical fuel treatments that remove trees, biomass, and a significant amount of tree canopy increase wind speeds.

Science demonstrates that;

- **Logging is not restoration.**
- **Logging increases fire risk and causes long term damage.**
- **Logging standing dead trees runs contrary to the best available science.**
- **Winds have been a major issue in the fire's spread & an impediment to containment.**
- **Biomass burning will increase atmospheric CO2 levels.**
- **Removing biomass from the forests for generating power will deplete the forest of future soil nutrients and will continue to exacerbate global climate change.**

<u>The EIS Analysis should consider an Alternative Approach to Providing Defensible Space.</u>

The DEIR is proposing to treat the WUI defense and threat zones, supposedly to create defensible space to protect the homes in the adjacent communities from a wild fire. Defensible

space is a place where firefighters can be safely stationed in the path of the advancing fire. And although the Forest Service has designated large WUI areas, cutting down trees beyond 200 to 300 feet from homes to create defensible space for firefighters to battle the wall of flames that might be approaching and to protect the homes from the fire will place firefighters in danger and will cause unnecessary resource damage. It will eventually result in areas that will become more flammable because of the subsequent growth of more flammable bushes and grasses than existed prior to leaving the forest canopy intact, including exotic grasses and herbaceous annuals that carry fire quickly to the base of the remaining trees.

Treating the Home Ignition Zone (HIZ), the 200 to 300 feet surrounding homes, and using that treated HIZ as the defensible space from which prescribed fire is anchored and allowed to burn into the surrounding forest would be far less costly and more effective than mechanical treatments beyond the HIZ.

We urge the agency to consider this alternative WUI size, defined by the Home Ignition Zone (HIZ) as a safezone from which firefighters would initiate prescribed fire to burn away from the HIZ and into the WUI.

Science support treatments limited to the Home Ignition Zone. The Forest Service's own Jack Cohen (Jack D. Cohen, Research Physical Scientist, Fire Sciences Laboratory, PO Box 8089, Missoula, MT 59807 406-329-4821 (fax) 406-329-4825 jcohen@fs.fed.us), has shown that the Home Ignition Zone – the 200 to 300 feet immediately surrounding homes, is where mechanical fuel treatments should be implemented to protect homes. The Home Ignition Zone treatments can be the mechanically-treated safezone that anchors prescribed fire treatments that would then be implemented beyond the HIZ and into the WUI to protect homes.

Treating areas for thousands of feet down slope of rural residences will only cause unnecessary changes in the wildlands and not protect the rural residences from the wildfire that could start in the wildland area, if treatments have not been applied to the area within 200 feet of structures (Cohen 1999).

The alternative of using the HIZ as the safezone anchor for prescribed fires into the WUI is reasonable because firefighters have successfully utilized narrower areas than the 200 to 300 foot wide HIZ when prescribed fires or backfires are initiated from roads and trails in forested areas.

Science Indicates the Importance of Fire as a Natural Ecosystem Process.

Wildfire is an essential part of natural ecosystem process. While it is true that fire suppression and logging practices have altered forest structures, it is important to note that this does not eliminate the essential role of fire, including high-severity fire, as a natural ecosystem process in many forest types. In fact, fire can have an essential role in restoring forest structure at larger geographical scales.

Fire is a natural and necessary component of forest ecosystems, with many critical functions for diversity and wildlife. It would be a misunderstanding of the science and nature of forest and fire

dynamics to approach these emissions in the same context as those from smokestacks, bioenergy and pile burning, which are discretionary activities that occur under direct human control.

Numerous studies and multiple lines of evidence indicate that the ponderosa pine and mixed-conifer forests of California are characterized by mixed-severity fire that includes ecologically significant amounts of high-severity fire (see review in Odion et al. 2014). Mixed-severity fire includes low-, moderate-, and high-severity effects that create complex successional diversity, high beta diversity, and diverse stand-structure across the landscape. High-intensity fire patches, including large patches, in large fires are natural in California mixed-conifer forests.

California's forested landscapes evolved with fire over thousands of years. This pre-European, forested landscape was shaped by mixed-severity fire, with low, moderate, and high-severity fire types. Plant and animal species in the forest evolved with fire, and many of these plant and animal species depend on wildfires, including high-severity fires, to reproduce and grow. For instance, fire can help return nutrients from plant matter back to soil, the heat from fire is necessary to the germination of certain types of seeds, and the snags (dead trees) and early succesional forests created by high-severity fire create habitat conditions that are beneficial to wildlife. Early successional forests created by high-severity fire support some of the highest levels of native biodiversity found in temperature conifer forests.

Several recent studies provide evidence for a mixed-severity fire regime in California forests, including an important role for high-severity fire, as well as declines in high-severity fire, as summarized here*:*

Beaty and Taylor 2001: On the western slope of the southern Cascades in California, historic fire intensity in mixed-conifer forests was predominantly moderate- and high-intensity, except in mesic canyon bottoms, where moderate- and high-intensity fire comprised 40.4% of fire effects [Table 7].)

Bekker and Taylor 2001: On the western slope of the southern Cascades in California, in mixed-conifer forests, fire was predominantly high-intensity historically [Fig. 2F].

Bekker and Taylor 2010: In mixed-conifer forests of the southern Cascades, reconstructed fire severity within the study area was dominated by high-severity fire effects, including high-severity fire patches over 2,000 acres in size [Tables I and II].

Collins and Stephens 2010: In a modern "reference" forest condition within mixed-conifer/fir forests in Yosemite National Park, 15% of the area experienced high-intensity fire over a 33-year period—a high-intensity fire rotation interval of approximately 223 years.

Nagel and Taylor 2005: The authors found that large high-severity fire patches were a natural part of 19th century fire regimes in mixed-conifer and eastside pine forests of the Lake Tahoe Basin, and montane chaparral created by high-severity fire has declined by 62% since the 19th century due to reduced high-severity fire occurrence. The authors expressed concern about harm to biodiversity due to loss of ecologically rich montane chaparral.

Odion et al. 2014: In the largest and most comprehensive analysis ever conducted regarding the historical occurrence of high-intensity fire, the authors found that ponderosa pine and mixed-conifer forests in every region of western North America had mixed-intensity fire regimes, which included substantial occurrence of high-intensity fire. The authors also found, using multiple lines of evidence, including over a hundred historical sources and fire history reconstructions, and an extensive forest age-class analysis, that we now have unnaturally low levels of high-intensity fire in these forest types in all regions, since the beginning of fire suppression policies in the early 20th century.

Numerous studies show that high-severity fire is beneficial to wildlife. High-severity fire creates very biodiverse, ecologically important, and unique habitat (often called "snag forest habitat"), which often has higher species richness and diversity than unburned old forest.

Bond et al. 2009: In a radio-telemetry study, California spotted owls preferentially selected high-intensity fire areas, which had not been salvage logged, for foraging, while selecting low- and moderate-intensity areas for nesting and roosting.

Buchalski et al. 2013: In mixed-conifer forests of the southern Sierra Nevada, rare myotis bats were found at greater levels in unmanaged high-severity fire areas of the McNally fire than in lower fire severity areas or unburned forest.

Burnett et al. 2010: Bird species richness was approximately the same between high-severity fire areas and unburned mature/old forest at 8 years post-fire in the Storrie fire, and total bird abundance was greatest in the high-severity fire areas of the Storrie fire [Figure 4]. Nest density of cavity-nesting species increased with higher proportions of high-severity fire, and was highest at 100% [Figure 8].

Cocking et al. 2014: High-intensity fire areas are vitally important to maintain and restore black oaks in mixed-conifer forests.

Donato et al. 2009: The high-severity re-burn [high-severity fire occurring 15 years after a previous high-severity fire] had the highest plant species richness and total plant cover, relative to high-severity fire alone [no re-burn] and unburned mature/old forest; and the high-severity fire re-burn area had over 1,000 seedlings/saplings per hectare of natural conifer regeneration.

Franklin et al. 2000: The authors found that stable or increasing populations of spotted owls resulted from a mix of dense old forest and complex early seral habitat, and less than approximately 25% complex early seral habitat in the home range was associated with declining populations [Fig. 10]; the authors emphasized that the complex early seral habitat was consistent with high-intensity fire effects, and inconsistent with clearcut logging.

Hanson and North 2008: Black-backed woodpeckers depend upon dense, mature/old forest that has recently experienced higher-intensity fire, and has not been salvage logged.

Hanson 2013: Pacific fishers are using pre-fire mature/old forest that experienced moderate/high-intensity fire more than expected based upon availability, just as fishers are selecting dense, mature/old forest in its unburned state. When fishers are near fire perimeters, they strongly select

the burned side of the fire edge. Both males and female fishers are using large mixed-intensity fire areas, such as the McNally fire, including several kilometers into the fire area.

Hutto, R.L. 1995: A study in the northern Rocky Mountain region found that 15 bird species are generally more abundant in early post-fire communities than in any other major cover type occurring in the northern Rockies. Standing, fire-killed trees provided nest sites for nearly two-thirds of 31 species that were found nesting in the burned sites.

Hutto, R.L. 2008: Severely burned forest conditions have occurred naturally across a broad range of forest types for millennia and provide an important ecological backdrop for fire specialists like the black-backed woodpecker.

Lee and Bond 2015: California spotted owls exhibited high site occupancy in post-fire landscapes during the breeding season following the 2013 Rim Fire, even where large areas burned at high severity; the complex early seral forests created by high-severity fire appear to provide important habitat for the small mammal prey of the owl.

Malison and Baxter 2010: In ponderosa pine and Douglas-fir forests of Idaho at 5-10 years post-fire, levels of aquatic insects emerging from streams were two and a half times greater in high-intensity fire areas than in unburned mature/old forest, and bats were nearly 5 times more abundant in riparian areas with high-intensity fire than in unburned mature/old forest.

Raphael et al. 1987: At 25 years after high-intensity fire, total bird abundance was slightly higher in snag forest than in unburned old forest in eastside mixed-conifer forest of the northern Sierra Nevada; and bird species richness was 40% higher in snag forest habitat. In earlier post- fire years, woodpeckers were more abundant in snag forest, but were similar to unburned by 25 years post-fire, while flycatchers and species associated with shrubs continued to increase to 25 years post-fire.
Sestrich et al. 2011: Native Bull and Cutthroat trout tended to increase with higher fire intensity, particularly where debris flows occurred. Nonnative brook trout did not increase.

Siegel et al. 2011: Many more species occur at high burn severity sites starting several years post-fire, and these include the majority of ground and shrub nesters as well as many cavity nesters. Secondary cavity nesters, such as swallows, bluebirds, and wrens, are particularly associated with severe burns, but only after nest cavities have been created, presumably by the pioneering cavity excavating species such as the Black-backed Woodpecker. As a result, fires that create preferred conditions for Black-backed Woodpeckers in the early post-fire years will likely result in increased nesting sites for secondary cavity nesters in successive years.

Swanson et al. 2010: A literature review concluding that some of the highest levels of native biodiversity found in temperate conifer forest types occur in complex early successional habitat created by stand-initiating [high severity] fire.

Erosion and Sediment Delivery from Harvest Units.

Erosion and sediment delivery into streams in the watershed from harvest units must be considered in the EIS. *An Analysis of Turbidity in Relation to Timber Harvesting in the Battle Creek Watershed, northern California*, September 2014, Prepared for the Battle Creek Alliance, www.thebattlecreekalliance.org Manton, CA by Jack Lewis, Statistical Hydrologist, Arcata, CA, jacklewis@suddenlink.net shows that substantial sediment flows from harvest units is an environmental impact that must be considered. This study found also at http://nebula.wsimg.com/f65f0fa520ec0c113b3e880b52fd565a?AccessKeyId=01B8D7A67C3CF9F65262&disposition=0&alloworigin=1 has documented that clearcutting and post-fire salvage logging is degrading water quality in California. Lewis analyzed data from the 1,700 measurements Battle Creek Alliance has collected for its Citizen's Water Monitoring Project since 2009.

Key findings of the analysis are:

- Increased turbidity (i.e. dirtiness of the water) is strongly associated with the amount of logging taking place in the watersheds that drain into the measurement sites.
- In watersheds that have been 30% cut, the average increase in turbidity is 200%. In watersheds that have been 90% cut, the average increase in turbidity is 3000%.
- These changes are far in excess of the Water Board's turbidity standard for the Central Valley region.

These findings led Lewis to conclude that "turbidity is greatest in tributaries that have experienced the heaviest logging."

Erosion and sediment delivery into streams in the watershed from harvest units must be considered and surveyed during periods of rainfall to assess whether there is and the greatest extent of erosion and delivery of sediments from harvest units. To survey during any other periods of time would fail to assess the full extent of the impact to watersheds from logging.

Rhodes, J.J., and C.A. Frissell. 2015, *The High Costs and Low Benefits of Attempting to Increase Water Yield by Forest Removal in the Sierra Nevada*. 108 pp. Report prepared for Environment Now, 12400 Wilshire Blvd, Suite 650, Los Angeles, CA 90025. http://www.environmentnow.org found environmental damage, including increased sediment flows from logging.

> Intensive forest management aimed at elevating water yield would incur major and enduring environmental costs, due to the frequency and magnitude of forest removal that would be needed to maintain increases in water yield. Together with associated forest removal activities, including roads, landings, and skid trails, frequent and extensive forest removal would permanently degrade soils, riparian areas, aquatic systems, and water quality. The latter would incur significant water supply costs, including increased costs of treatment for elevated sediment and nutrient levels, as well as the likelihood of increased flood damage. Thus, the at best modest benefits for water yield would come at the expense of high environmental and economic costs.

http://www.environmentnow.org/publications.html. The cumulative impacts of the prescription issued in the Board of Forestry and Fire Protection Comprehensive Fire Protection Program

DEIR that enables logging throughout California's forests must be reassessed in an EIR that contains no inaccuracies and misrepresentations of fact and science like those in the DEIR.

Trends in fire behavior.

While climate change will almost certainly alter many forest processes, including fire behavior, in many ecosystems over the coming decades, the current body of science offers a complex range of projections for California forests. Notably, the majority of studies that have analyzed recent trends in fire severity and frequency in California forests have found no significant trends in these metrics. Studies that project trends in fire activity have no clear consensus on how climate change will affect fire behavior in California forests.

Nine studies have analyzed recent trends in fire severity in California's forests in terms of proportion, area, and/or patch size. Seven of nine studies found no significant trend in fire severity, including: Collins et al. 2009 (central Sierra Nevada), Dillon et al. 2011 (Northwest California), Hanson et al. 2009 (Klamath, southern Cascades), Hanson and Odion 2014 (Sierra Nevada, southern Cascades), Miller et al. 2012a (four Northwest CA forests), Odion et al. 2014 (eastern and western Sierra Nevada, eastern Cascades), and Schwind 2008 (California forests). The two studies that report an increasing trend in fire severity – Miller et al. 2009 and Miller and Safford 2012 (Sierra Nevada, southern Cascades) – were refuted by Hanson and Odion (2014) using a larger dataset.

Hanson and Odion (2014) conducted the first comprehensive assessment of fire intensity since 1984 in the Sierra Nevada using 100% of available fire intensity data, and found no increasing trend in terms of high-intensity fire proportion, area, mean patch size, or maximum patch size. Hanson and Odion (2014) reviewed the approach of Miller et al. (2009) and Miller and Safford (2012) for bias, due to the use of vegetation layers that post-date the fires being analyzed in those studies. Hanson and Odion (2014) found that there is a statistically significant bias in both studies ($p = 0.025$ and $p = 0.021$, respectively), the effect of which is to exclude relatively more conifer forest experiencing high-intensity fire in the earlier years of the time series, thus creating the erroneous appearance of an increasing trend in fire severity. Hanson and Odion (2014) also found that the regional fire severity data set used by Miller et al. (2009) and Miller and Safford (2012) disproportionately excluded fires in the earlier years of the time series, relative to the standard national fire severity data set (www.mtbs.gov) used in other fire severity trend studies, resulting in an additional bias which created, once again, the inaccurate appearance of relatively less high-severity fire in the earlier years, and relatively more in more recent years.

Three studies have analyzed recent trends in the number of fires in California's forests and have reported conflicting results for trends in fire frequency. Two studies found no trend in the number of fires -- Schwind (2008) and Syphard et al. (2007) -- while Westerling et al. (2006) reported evidence of an increasing number of fires.

Projection studies have generally not modeled trends in future fire frequency and severity. Instead most studies have projected changes in area burned and the probability of burning. There is no consensus among these studies on future fire activity.

Of seven studies that have projected trends in area burned in California forests, four projected both increases and decreases in total area burned varying by region, including: Lenihan et al. 2003, Lenihan et al. 2008, Krawchuk et al. 2009, and Spracklen et al. 2009. One study projected an overall decrease in area burned (McKenzie et al. 2004), while two studies projected increases: Fried et al. 2004 in a small region in the Amador-El Dorado Sierra foothills and Westerling et al. 2011. The projected increases reported in Westerling et al. (2011) are relatively modest: median increases in area burned of 15% and 19% by 2020 relative to 1961-1990 under a lower (B1) and higher emissions scenario (A2) respectively, 21% and 23% by 2050, and 20% and 44% by 2085.

Three studies have projected changes in the probability of burning or the probability of a large fire occurring, and these studies have projected no change, increases, or decreases varying by region: Krawchuk and Moritz 2012, Moritz et al. 2012, and Westerling and Bryant 2008.

The studies empirically investigating the assumption that the most fire-suppressed forests are burning predominantly at high severity have consistently found that forest areas in California that have missed the largest number of fire return intervals are not burning at higher fire severity. Specifically, six empirical studies that have investigated this question found that the most long-unburned (most fire-suppressed) forests burned mostly at low/moderate-severity, and did not have higher proportions of high-severity fire than less fire-suppressed forests. Forests that were not fire suppressed (those that had not missed fire cycles, i.e., Condition Class 1, or "Fire Return Interval Departure" class 1) generally had levels of high-severity fire similar to, or higher than, those in the most fire-suppressed forests, as found by Odion et al. 2004, Odion and Hanson 2006, Odion and Hanson 2008, Odion et al. 2010, Miller et al. 2012a, van Wagtendonk et al. 2012.

Finally, studies have found that California is experiencing a fire deficit compared to pre-settlement conditions, meaning that there is much less fire on the landscape than there was historically, and this deficit is detrimental to forests (Stephens et al. 2007).

The Carbon Impacts of Forest Thinning.

The DEIS only considered climate change impacts on managing forests and fails to consider the effects from logging, biomass removal, and soil disturbance on climate change. The result is a highly one-sided defense of policy options to promote logging, followed by the burning of those woody materials for biomass energy production. However, studies that have specifically evaluated the carbon implications of this strategy have found that thinning results in increased carbon emissions to the atmosphere for many decades.

Three recently published studies of forests in the western United States suggest that emissions from removal and combustion of forest materials for bioenergy would exceed emissions from even high intensity fires, at least for some period of time. One study examined forest carbon responses to three different levels of fuel reduction treatments in 19 West Coast ecoregions containing 80 different forest types and different fire regimes (Hudiburg et al. 2011). In nearly all forest types, intensive harvest for bioenergy production resulted in net carbon emissions to the atmosphere, at least over the 20-year time frame of the study. Even lighter-touch fire prevention scenarios produced net carbon emissions in most ecoregions. The study shows that at present,

across a wide range of ecosystems, thinning for fuels reduction and using the thinnings for bioenergy increases carbon dioxide concentrations, at least in the short term.

A second study similarly found that thinning forests to avoid high-severity fire could actually increase overall carbon emissions (Campbell et al. 2011). Because the probability of a fire on any given acre of forest is relatively low, forest managers must treat many more acres than will actually burn in order to get much of a benefit—removing more carbon during "thinning" than would be released in a fire. The study also found that over a succession of disturbance cycles, models predicting forest growth, mortality, decomposition and combustion showed more carbon storage in a low-frequency, high-intensity fire regime than in a high-frequency, low-intensity fire regime. The study concluded: "we found little credible evidence that such efforts [fuel-reduction treatments] have the added benefit of increasing terrestrial C stocks" and "more often, treatment would result in a reduction in C stocks over space and time."

A review by Law and Harmon (2011) concluded that "Thinning forests to reduce potential carbon losses due to wildfire is in direct conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO2 to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment."

Furthermore, scientific studies have found that old forests store up to ~10 times more carbon in biomass per unit ground area than young forests, and old forests continue to have large carbon stores for hundreds of years (Luyssaert et al. 2008, Hudiburg et al. 2009, Law 2014, Schulze et al. 2012). Older trees not only store large amounts of carbon but actively sequester larger amounts of carbon compared to smaller trees (Stephenson et al. 2014). Contrary to the conventional forestry assumption that older trees are less productive, the mass growth rate for most temperate and tropical tree species increases continuously with age, meaning the biggest trees sequester the most carbon (Stephenson et al. 2014). In western USA old-growth forest plots, trees greater than 100 cm in diameter comprised 6% of trees, yet contributed 33% of the annual forest mass growth (Stephenson et al. 2014). Current research also shows that high-severity fire areas generally store the highest levels of carbon, due to the combination of the carbon in snags, downed logs, and post-fire regenerating vegetation, including shrubs and trees (Keith et al. 2009, Powers et al. 2013).

Logging significantly reduces forest carbon storage. Harvest of live trees from the forest not only reduces current standing carbon stocks, but also reduces the forest's future rate of carbon sequestration, and its future carbon storage capacity, by removing trees that otherwise would have continued to grow and remove CO2 from the atmosphere (Holtsmark 2012). Even if harvested biomass is substituted for fossil fuels, it can be decades or centuries before the harvested forest achieves the same CO2 reductions that could be achieved by leaving the forest unharvested (depending on harvest intensity, frequency, and forest characteristics) (Searchinger et al. 2009, Hudiberg et al. 2011, Campbell et al. 2012, Mitchell et al. 2012). It takes more than 100 years (~125-130 years) to make up for carbon loss after a forest is logged (Harmon 2014, Law 2014).

Accurate Accounting of the Carbon Impacts of Biomass Bioenergy.

Any policy to promote the use of forest-sourced biomass for bioenergy production must fully account for the emissions and climate change consequences associated with those activities. In order to develop a program that makes sense within the forest carbon and GHG emissions contexts, biomass uses must be compared not only to alternative "waste diversion" options but to the full spectrum of alternative fates, including the carbon sequestration and storage associated with living and growing trees and forests.

Woody biomass combustion is not carbon-neutral, as acknowledged by numerous scientific studies (see, e.g., Searchinger et al. 2009, Repo et al. 2010, Brandão et al. 2013), the IPCC,[1] and the EPA.[2] Measured at the smokestack, replacing fossil fuels with biomass actually *increases* CO2 emissions.[3] Notably, a recent study found that the climate impact per unit of CO2 emitted seems to be even higher for the combustion of slow-growing biomass than for the combustion of fossil carbon in a 100-year time frame (Holtsmark 2013). The warming effect from biomass CO2 can continue for decades or even centuries depending on the feedstock.

Multiple studies have shown that it can take a very long time for new biomass growth to recapture the carbon emitted by combustion, even where fossil fuel displacement is assumed, and even where "waste" materials like timber harvest residuals are used for fuel (Repo et al. 2010, Manomet Center for Conservation Sciences 2010, McKechnie et al. 2011, Mitchell et al. 2012, Schulze et al. 2012). One study, using realistic assumptions about repeat bioenergy harvests of woody biomass, concluded that the resulting atmospheric emissions increase may even be permanent (Holtsmark 2012). In addition to producing large amounts of CO2, biomass energy generation can result in significant emissions of other pollutants that worsen climate change and harm human health, such as black carbon. Many biomass emissions can exceed those of coal-fired power plants even after application of best available control technology.

Studies have found that global greenhouse gas emissions must peak by 2020 and drop sharply thereafter in order to preserve a likely chance of keeping global warming below 2°C — a level at

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[1] IPCC Task Force on National Greenhouse Gas Inventories, Frequently Asked Questions, at http://www.ipcc-nggip.iges.or.jp/faq/faq.html (last visited October 23, 2013) (Q1-4-5, Q2-10).

[2] U.S. EPA, Accounting Framework for Biogenic CO2 Emissions from Stationary Sources 11-12 (Sept. 2011) ("The IPCC . . . eschewed any statements indicating that its decision to account for biomass CO2 emissions in the Land-Use Sector rather than the Energy Sector was intended to signal that bioenergy truly has no impacton atmospheric CO2 concentrations."); see also Deferral for CO2 Emissions from Bioenergy and Other Biogenic Sources Under the Prevention of Significant Deterioration (PSD) and Title V Programs, 76 Fed. Reg. 43,490, 43,498 (July 20, 2011); Science Advisory Board Review of EPA's Accounting Framework for Biogenic CO2 Emissions from Stationary Sources 7 (Sept. 28, 2012) at 3.

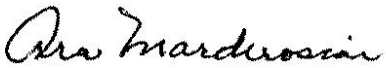
[3] Typical CO2 emission rates for facilities:
Gas combined cycle 883 lb CO2/MWh
Gas steam turbine 1,218 lb CO2/MWh
Coal steam turbine 2,086 lb/CO2/MWh
Biomass steam turbine 3,029 lb CO2/MWh
Sources: EIA, Electric Power Annual, 2009: Carbon Dioxide Uncontrolled Emission Factors. Efficiency values used to calculate emissions from fossil fuel facilities calculated using EIA heat rate data. (http://www.eia.gov/cneaf/electricity/epa/epat5p4.html); biopower efficiency value is 24%, a standard industry value.

which serious impacts will still occur (UNEP 2013). California's climate goals, as reflected in AB 32 and applicable executive orders (S-3-05 and B-30-15) also call for increasingly steep reductions in emissions over the next three decades. Yet the science shows this is precisely the time period during which biomass emissions released today will increase atmospheric CO2 levels. At a time when we need to reduce emissions dramatically in the short term and keep them down, California forest policy should not be promoting biomass burning that will exacerbate climate change.

> "One of the penalties of an ecological education is that one lives alone in a world of wounds. Much of the damage inflicted on land is quite invisible to laymen. An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise."

Aldo Leopold

Respectfully submitted,



Mr. Ara Marderosian,
Executive Director
Sequoia ForestKeeper®
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Kernville, CA 93238
(760) 376-4434
ara@sequoiaforestkeeper.org

Hannigan, Edith@BOF

From: Cynthia Maxwell <zinthia@charter.net>
Sent: Monday, May 30, 2016 8:09 PM
To: Vegetation Treatment Program@BOF
Subject: EIR Proposed Vegetation Treatment Program

May 30, 2016

California Board of Forestry and Fire Protection

Attn: Edith Hannigan, Board Analyst

Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and members of the California Board of Forestry and Fire Protection:

The Cold Creek Community Council is concerned that your current Programmatic EIR for California's proposed Vegetation Treatment Program does not meet the CEQA requirements. The lack of detail in the EIR and the passing on of responsibility for potential impact to project managers has us deeply worried.

Our community is surrounded entirely by chaparral and is entirely within the borders of the Santa Monica Mountains National Recreation Area. It is clear to us that this proposed program will cause significant and irreversible impacts to natural resources in the SMMNRA, while producing few, if any, fire-safety benefits.

The board of our homeowners association voted unanimously to recommend that Cal Fire withdraw its Vegetation Treatment Program Programmatic EIR and produce one that is based on best available science and that contains sufficient criteria to determine impacts to the state's biological resources, especially the chaparral habitat that is our home.

Sincerely,

Cynthia Maxwell

President, Cold Creek Community Council

Calabasas, California

Email: Zinthia@charter.net

The Nature Conservancy
Protecting nature. Preserving life.™

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nature.org

Board of Forestry and Fire Protection
ATTN: Edith Hannigan, Board Analyst
PO Box 944246
Sacramento, CA 94244-2460

May 31, 2016

RE: VTP Draft PEIR Comments

Dear Ms. Hannigan,

The Nature Conservancy is an international nonprofit organization dedicated to conserving the lands and waters on which all life depends. We have worked with a wide array of landowners, businesses, communities, governments, and other partners to successfully protect over 119 million acres worldwide. We seek to achieve our mission through science-based planning and implementation of conservation strategies that provide for the needs of people and nature.

The Nature Conservancy (the Conservancy) is pleased with the thoughtful inclusion of science used to prepare the Program Environmental Impact Report for the Vegetation Treatment Program (VTPEIR). The document includes a strong discussion of the differences in fire and disturbance ecology among different vegetation communities across the state. However, there still appear to be few well-defined limitations on fuel modification treatments designed to protect structures and human life while preventing habitat degradation in vegetation types with long fire-return-intervals and may be subject to type conversion or weed invasions following repeated fires, such as South Coast shrublands (e.g. Southern California chaparral and coastal sage scrub). Below we provide recommendations designed to address these concerns. Our recommendations fall into two broad categories: consideration for South Coast shrublands and recommendations about project review.

I. Considerations for South Coast Shrublands

As well described in chapter 4 of the VTPEIR, the fire ecology and natural fire return intervals in South Coast shrublands differ significantly from those of many other vegetation communities in the state. These differences are well described in the VTPEIR, but do not appear to result in significant differences in the overall conclusions drawn or recommendations made for how a project is evaluated or implemented. To address the differences among shrublands and other vegetation communities, we recommend a number of modifications to language throughout the VTPEIR.

First, the VTPEIR should eliminate broad generalizations about the influence of prescribed fire, crown fire, increase of fine fuels, and fire adapted ecosystems and rather present information for specific vegetation communities or groups of vegetation communities. These discussions could be strengthened by greater recognition of the importance of median fire return intervals in influencing how vegetation

communities are impacted or enhanced by fire and other management activities proposed in the VTPEIR. A few examples are discussed below.

The use of Condition Class to help guide selection of projects has limitations as presented in the VTPEIR with respect to South Coast shrublands. The Condition Class analysis is cited to be from 2003 using data from 2001. Large areas of the South Coast have burned since 2003, some multiple times, which would result in a misclassification of much of the region (e.g., burned versus unburned area) and overestimation of the time since last fire. This results in an overestimate of the need for prescribed fire and other management activities and increases the probability of negative impacts to these shrublands. Managing under this scenario may lead to type conversion to non-native annual grassland.

The Conservancy recommends that CalFire include a description of how Condition Classes are based on positive or negative deviations from the historic fire regime (as mentioned on page 4-44) and how these differences largely determine the enhancement or degradation potential of a particular vegetation treatment method. We recommend clarifying that under the current human-induced high fire frequency situation in the South Coast, there is no need to conduct ecological restoration in the region's shrublands. Language should be added that where Condition Classes 2 and 3 result from fires that occur too frequently only projects to remove non-native species can be implemented.

Two additional and related topics should be directly addressed during project evaluation within South Coast shrublands to ensure adequate protection of this ecosystem type under the VTP: effectiveness of altering landscape fuels; and the threat of type conversion. The effectiveness of altering landscape fuels to reduce fires that result in losses of life, property and natural resources for South Coast shrublands should be evaluated using the most up-to-date science. Peer-reviewed literature is available that assesses the influence of prescribed fire on wildfires in shrublands of the South Coast and similar biomes[1]. Based on this literature, the most efficient and effective strategies appear to be focusing fuel treatments within direct structure protection zones and along evacuation routes.

The use of prescribed fire and other management methods described in the VTPEIR in South Coast shrublands that have burned within the past few decades are likely to result in conversion these areas to non-native grasslands. Administration of prescribed fire in these areas would subject them to fire return intervals that are significantly shorter than they have experienced historically, and studies in the region have shown reducing the fire/disturbance frequencies in South Coast shrublands below the median interval, noted in the VTPEIR, commonly results in type conversion. Too much fire is recognized in the VTPEIR as a threat to these vegetation communities. CalFire should focus activities that disturb native shrublands on direct human asset protection and should not consider these treatments ecological restoration without further analyses. An updated, region-wide analysis should be conducted to determine the time since last fire of shrublands. Treatment for ecological restoration should only be considered if a significant proportion of the region supports stands older than the median fire return

[1] Enright N. J. and Fontaine J. B. (2014) Climate Change and the Management of Fire-Prone Vegetation in Southwest and Southeast Australia. Geographical Research 52: 34–44. doi: 10.1111/1745-5871.12026.

Price O. F., Bradstock R. A, Keeley J. E., and Syphard A. D. (2012) The impact of antecedent fire area on burned area in southern California coastal ecosystems. Journal of Environmental Management 113: 301-307.

Penman T. D., Collins L., Syphard A. D., Keeley J. E., and Bradstock R. A. (2014) Influence of Fuels, Weather and the Built Environment on the Exposure of Property to Wildfire. PLoS ONE 9(10): e111414. doi:10.1371/journal.pone.0111414.

interval for each vegetative community. Pending such an analysis, these vegetation communities should only be available for treatment where there is direct benefit to structure and evacuation route protection within the Wildfire Urban Interface (WUI).

II. Recommendations Related to Project Review

The Conservancy believes assessment and implementation of many of the standard project requirements (SPRs) and project specific requirements (PSRs) is too subjective to ensure cumulative impacts will be avoided as discussed on pages 5-29 through 5-31 with respect to invasive species mitigation in South Coast shrublands. Due to the subjectivity of some of the project assessment criteria, the project and/or California Environmental Quality Act (CEQA) coordinators appear to have too much flexibility in determining the need for further review or the implementation of certain mitigation measures.

Throughout the plan, it is stated that the project coordinator will be the lead on determining the project impacts and in completing the checklist. Under this system, if a project coordinator determines there is no need for additional review, there seem to be few checks to ensure further CEQA review if it is indeed warranted. Additionally, with approximately 230 projects anticipated to occur each year, additional staffing would appear necessary to allow adequate review. We are concerned that the large number of projects anticipated could outpace the ability of the California Department of Fish and Wildlife (CDFW) and/or the United States Fish and Wildlife Service (USFWS) to provide adequate review. There is also no discussion of the need for protocol level surveys, only "field review" even for listed species and it is unclear how this meets the requirements of California Endangered Species Act (CESA) and the Endangered Species Act (ESA).

Due to the intersection of biodiversity and threats in the South Coast, as recognized on page 4-91 of the VTPEIR, the Conservancy has concerns about the number of acres proposed for treatment in this region. Although 5,204 acres per year for regions with limited urbanization and few special status species may be insignificant, the potential cumulative loss or degradation of 52,000 acres of habitat in the South Coast over the ten-year period of the VTP is significant. The potential loss of habitat due to fire break construction and degradation from fuel treatment projects should be held to the same project review and mitigation standard as other projects that result in the loss of habitat as described in multiple Natural Community Conservation Planning/Habitat Conservation Plans in the region.

For BIO-5, which addresses treatments in much of the South Coast, the criteria definitions are unclear. To strengthen the Mitigation and Standard Project Requirement, both "old-growth chaparral" and "critical infrastructure" should be clearly defined. In addition, a maximum width for fuel breaks should be included to remove subjectivity around what can be defined as a fire break. Given the large size of the Wildland Urban Interface (WUI) for the South Coast, as defined in the VTPER, language should be added to focus projects on direct structure and evacuation route protection. Further, as a result of the many recent and large fires in the South Coast, projects outside of the WUI and fire breaks should be restricted to those that treat non-native species, but do not disturb native species.

We recommend that CalFire reconcile inconsistencies with respect to BIO-8 and clarify that this practice must be implemented for all projects. Under its definition on pages 4-148 and 7-24 there is no mention of this practice being at the discretion of the project coordinator, but on pages 4-124, 4-130, and 4-146 it states it must be implemented only "*if needed to prevent inadvertent introductions*" or "*mitigate project impacts*". As a result, it is unclear if this measure is at the discretion of the project coordinator

or must be implemented on all projects as implied by its definition. We recommend this practice be implemented for all projects.

BIO-9 allows the project coordinator to determine if there is a significant risk of introducing invasive plants, and if so to develop mitigation measures. This level of subjectivity does not appear appropriate based on the conclusion drawn on page 4-124 that "*The establishment of invasive plants within fuel treatments is a serious concern because many treated areas extend into remote, pristine wildland areas*." The BMPs should be implemented on all projects to limit the spread of non-native species.

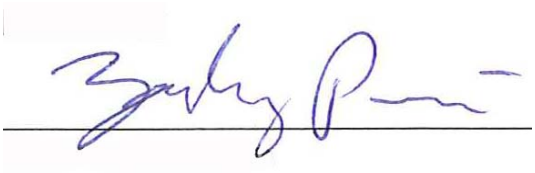
Questions 18, 19 and 20 on the checklist are very difficult to answer because of the large degree of uncertainty associated with burning in chaparral that reflects site specific disturbance histories, current composition, seedbank makeup, unpredictability of fire behavior, and climate conditions following the prescribed fire. As a result, we can offer no scientifically based metrics that can easily be applied to assess the potential impacts of prescribed fire on chaparral. Instead we recommend that treatments in chaparral be restricted to projects focused on direct structure and evacuation route protection and not be carried out to alter landscape fuel characteristics.

Question 28 appears to provide project reviewers too much discretion to conclude the VTP has no significant impacts to biological resources. Virtually any project within the WUI could be considered, even if it is to occur far from the closest structure and results in take of special status species. As a result, there is no way to adequately assess the level of impact under consideration, nor identify mitigation measures. To allow for such a question to be on the checklist, the Conservancy recommends including maximum distances of vegetation treatments to structures or evacuation routes, and based on these distances, evaluating a maximum area or threshold that could be impacted with "detrimental impact to a biological resource".

In conclusion, the Conservancy recommends that vegetation treatments in the South Coast should be reviewed under different criteria than those for other vegetation types. The VTPEIR discusses the unique characteristics and threats faced by these vegetation communities following fires and disturbance treatments, but does not address these differences adequately in the criteria for projects review. Modifications to the language of the criteria, project requirements and guidance presented in the VTPEIR could address these problems and provide the protections and mitigation measures necessary for South Coast shrublands.

We would be happy to further discuss our recommendations for conservation and management of South Coast shrublands and for a robust science-driven project review process. Thank you for your consideration.

Regards,



Zachary Principe
Stewardship Ecologist

DRAFT

Decision Tree for Prioritizing Vegetation Treatments To Reduce Fire Risks to Structures In California Shrublands

This draft decision tree (Figure 1) is narrowly intended to help Calfire prioritize where vegetation treatments are most likely to reduce wildfire risks to human structures in southern California chaparral, sage scrub, or other shrubland types. It is NOT intended to cover all possible cases of vegetation treatments (e.g., to achieve ecological restoration goals) or all vegetation types (e.g., coniferous forests). Similar, but different, decision trees could be created for these other situations.

Overview

The decision tree facilitates an objective, repeatable, and scientifically defensible decision-making process to categorize a proposed vegetation treatment project as High, Moderate, or Low Priority for implementation. It is based on extensive scientific information that shows where modifying vegetation is most likely to provide the "biggest bang for the buck" by reducing risks of structure damage from wildfires and improving firefighting tactical advantages during an incident, while minimizing adverse environmental impacts and economic costs. The goal is to maximize the benefit-cost ratio of vegetation treatment projects and to avoid wasting limited funds on projects that have a low probability of reducing risks or a high probability of adverse or unintended impacts (e.g., unnecessary environmental degradation, increases in flashy fuels, or high maintenance costs).

The decision tree starts with a coarse-filter (landscape level) evaluation of whether the proposed treatment is within a landscape zone mapped as having high risk of structure loss during a wildfire. Empirical analyses have shown structure loss is significantly more likely if a home is located in fire-prone areas (such as Santa Ana wind corridors) or in certain housing configurations (near the edge of a development or at low housing density) (Syphard et al. 2012,2013). Maps of high risk to structures can be developed as a function of where homes have historically been destroyed, but may also consider effects on fire risk of terrain, development patterns, vegetation characteristics, and wind patterns. A draft fire-risk map has been developed for San Diego County, and similar maps should be developed for other southern California counties.

If structures are in a high-risk area, the decision tree next evaluates the relative certainty that vegetation modification will reduce risks of structure loss by providing for defensible space or for additional firefighter safety and firefighting tactical advantages. Depending on distance of the proposed treatment from the structures at risk (roughly, <100 feet, 100-1,000 feet, or >1,000 feet away), it uses several field evaluation procedures to determine the likely benefits (i.e., risk reduction) and costs (e.g., environmental degradation) to assign treatments to High, Moderate, or Low Priority categories. (NOTE to reader: the field evaluation procedures are under preparation and are not yet included in this initial DRAFT. They should be developed in collaboration with firefighting experts and ecologists.)

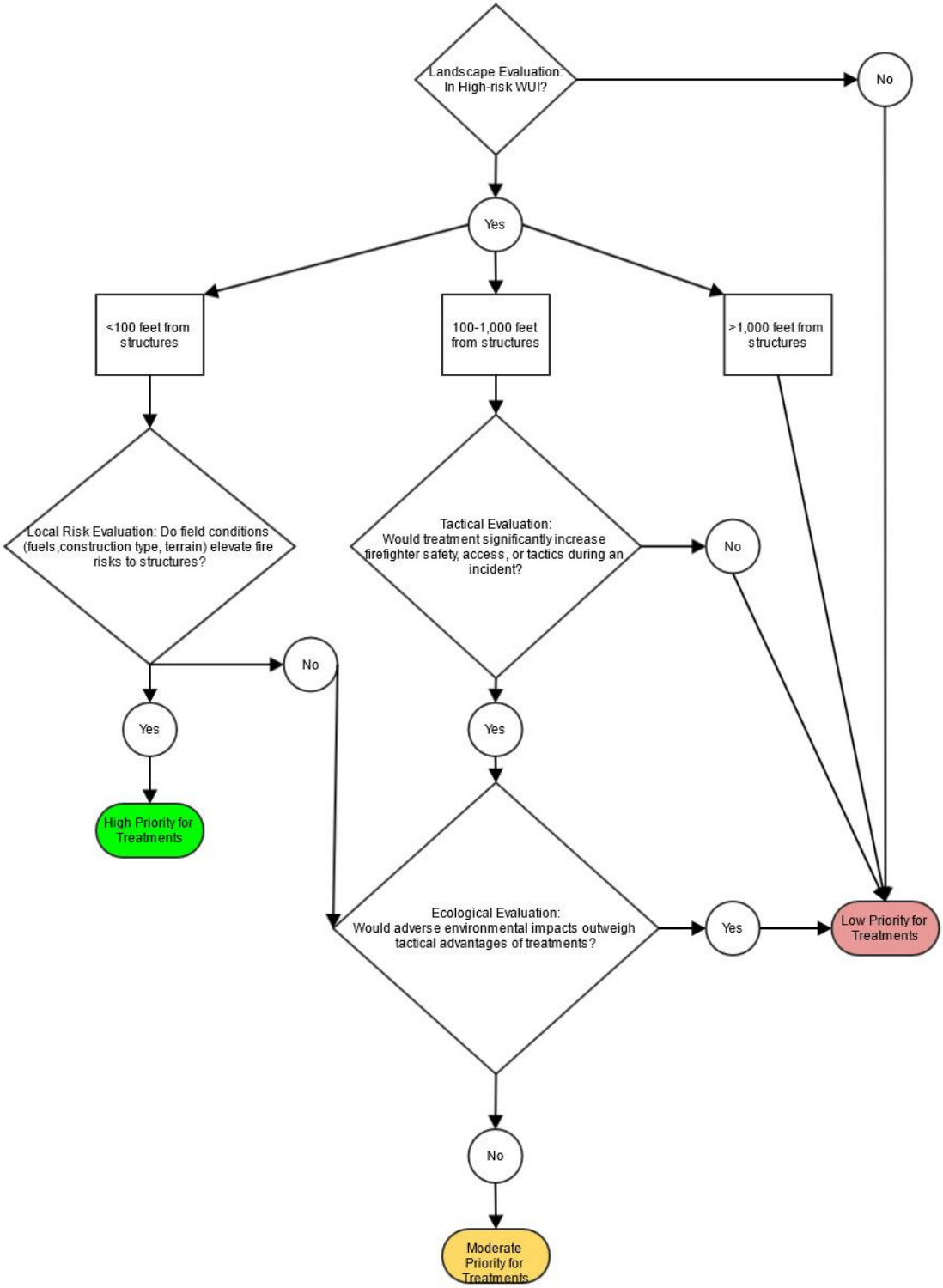


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Figure 1. Vegetation Treatment Decision Tree

Funds should always be allocated first to High Priority Treatment projects. Moderate Priority projects should only be implemented once all High Priority projects are implemented. Low Priority projects should rarely if ever be implemented, and only if the project is carefully designed and analyzed to demonstrate that it will have a positive benefit–cost ratio to risk reduction and will not increase other fire risk factors, such as by increasing flashy fuels.

Foundational Assumptions and Logic

- Most structure ignitions during wildfires occur from fire brands (blowing embers) rather than radiant or convective heating from flames.
- Most structure loss to wildfires occurs during wind-driven (e.g., "Santa Ana" and "Sundowner") fires. Fuel breaks alone do not stop fires under such severe weather conditions.
- Fuel breaks can provide access and anchor points for tactical firefighting operations and can be used to control fire perimeters under normal weather conditions or during the later stages of wind-driven fires, once the winds subside. The challenge is to identify strategic locations where fuel breaks are most likely to be effective.
- The certainty that vegetation treatments reduce structure losses decreases with distance from the structures:
    - Treatments immediately adjacent to (<100 feet from) homes or other structures minimize the potential for structure ignition from flame impingement or radiant heat and increase the amount of defensible space from which firefighters can safely protect those structures under either wind-driven or fuel-driven fires (e.g., by dousing ember ignitions in the built environment).
    - Empirical studies demonstrate that treatments more than 100 feet from structures do not directly influence the probability of structure losses. However, treatments that create or improve access routes, escape routes, safety zones, anchor points, or firelines for backfires, MAY help firefighters safely protect communities during incidents. To be useful to firefighters protecting communities, such fuel modifications should be near (generally, within about 1,000 feet of) the structures at risk and must be safely accessible from existing roads.
    - Due to great uncertainty that treatments more than about 1,000 feet from structures will help firefighters protect communities, they should rarely, if ever, be implemented, and only if in-depth analysis demonstrates that there are substantial tactical benefits to be gained due to special circumstances, along with minimal potential for adverse or unwanted impacts, such as degradation of ecological resources or increases in weedy (flashy) fuels.

Safety Considerations

Regardless of distance from structures at risk, only sites where firefighters can be safely deployed according to the National Wildfire Coordinating Group's (NWCG's) risk management process should be considered for vegetation treatments. Fuel breaks should be confined to areas where a firefighter's mandatory hazard control analysis based on firefighting rules of engagement (e.g., from Standard Fire Orders and the LCES checklist) determine that suppression operations could proceed safely and

effectively under expected fire conditions. Lack of anchor points, viable escape routes and safety zones, or presence of multiple "watch out" situations or tactical hazards should disqualify any potential treatment area. Fuel breaks should never be located in places too remote or dangerous for firefighters to reach given expected fire behavior or historic fire scenarios.

Next Steps

- Develop objective evaluation procedures (e.g., scoring matrices or other objective, repeatable methods) for how to perform the three field evaluation processes in the decision tree (the three large diamonds):
    - **Local Risk Evaluation**. This should entail a "house-out" field evaluation of structure risks based on characteristics of the built environment, vegetation, terrain, weather patterns, fire history, and other relevant factors. The evaluation process should be developed based on best available fire science and expertise and should include a cost-benefit analysis.
    - **Tactical Evaluation** of improvements to firefighter safety, access, and tactics. This field evaluation process should be developed collaboratively with fire-fighting experts having thorough knowledge of fire behavior and fire-fighting tactics and operations.
    - **Ecological Evaluation** of impacts to the environment. This field evaluation should be developed by experts in ecology and resource management in California shrubland ecosystems. It should consider the potential risks of vegetation type conversion, increases in weedy species and flashy fuels, runoff and soil erosion, and impacts to sensitive species and vegetation communities.
- Establish an expert oversight group and process to provide input and review for application of the decision tree and guidelines.
- Establish a process (such as another decision tree and associated guidelines) for planning and implementing ecological rehabilitation and restoration of unneeded fuel breaks (e.g., existing breaks that rate as Low Priority under these guidelines).
- Develop guidelines for maintaining higher-priority fuel breaks to ensure their continued effectiveness.
- Develop guidelines for what structures qualify for consideration under these guidelines (e.g., should treatments near isolated rural homes receive the same priority as treatments near suburban developments or clusters of homes?).

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May 27, 2016

Via FedEx

Edith Hannigan, Board Analyst
Board of Forestry and Fire Protection
1416 9th Street, Room 1506-14
Sacramento, CA 95814-5511

Re: Vegetation Treatment Program Environmental Impact Report

Dear Ms. Hannigan:

This firm represents the Endangered Habitats League ("EHL") in connection with the Vegetation Treatment Program ("VTP" or "Program") and its associated Draft Environmental Impact Report ("DEIR").[1] EHL is southern California's only regional conservation organization, and it and its members have a direct stake in maintaining the health of Southern California's unparalleled biodiversity and the native ecosystems that support it. Our client is deeply concerned about the far-ranging environmental impacts that would result from implementation of the VTP.

This letter is also submitted on behalf of Audubon California; California Chaparral Institute; California Native Plant Society, San Diego Chapter; Laguna Greenbelt, Inc.; Natural Resources Defense Council; San Diego Audubon Society; and Sea and Sage Audubon Society.

After carefully reviewing the VTP DEIR, we have concluded that it fails to comply with the requirements of the California Environmental Quality Act ("CEQA"), Public Resources Code section 21000 *et seq.* ("CEQA"). As described below, the DEIR violates CEQA because it: (1) fails to adequately describe the VTP; (2) fails to properly analyze the Program's environmental impacts, especially its impacts to biological resources; (3) relies on ineffective and unenforceable mitigation to conclude that the VTP's impacts would be reduced to levels that are less than significant; and (4) fails to

[1] The VTP and the DEIR have been prepared as one document. To avoid confusion, this letter distinguishes the Program from the DEIR.

undertake a legally sufficient study of alternatives to the Program. Such fundamental errors undermine the integrity of the DEIR. While this letter focuses predominantly on the VTP's impacts on biological resources, it is important to acknowledge that the Program would also have other extensive impacts including but not limited to increased greenhouse gas and criteria air pollutant emissions, degraded water quality, and ironically, an increased risk of wildland fires.

I. Introduction

The proposed VTP is a plan to burn, treat with herbicides, and otherwise modify the vegetative landscape of California on a massive and unprecedented scale. The Board of Forestry and Fire Protection's ("Board") Program requires the implementation of fuel management activities that would affect an area of about 22 million acres. DEIR at E-1 and E-6. That is an area greater than that of South Carolina and Delaware combined. The premise upon which the VTP rests—the Board's view that a substantial part of this vast amount of land must be "treated" to prevent wildfire—is not only grandiose but, for California's extensive shrub vegetation communities, entirely lacking in scientific basis. For this very large and vital component of the VTP, we can find no evidence in the DEIR that the VTP would even achieve the Board's mission of safeguarding the people and protecting the property and resources of California from the hazards associated with wildfire. Indeed, we are unaware of any other state that threatens the elimination of populations of sensitive wildlife and vegetation to prevent wildfires.

The current VTP is particularly concerning as EHL and its expert scientists in the fields of fire science and ecology, fire management, biogeography, native plant ecology, biodiversity, and wildlife conservation biology submitted extensive comments on the prior proposed VTP and its DEIR.[2] Wildlife regulatory agencies, including the United

[2] The following letters and reports are attached and are incorporated by reference into this letter: Letter from Dan Silver, Executive Director, Endangered Habitats League to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 1; Letter from CJ Fotheringham, Research Ecologist, USGS to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 2; Letter from Wayne D. Spencer, Chief Scientist, Conservation Biology Institute to Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 3; and Letter from Alexandra D. Syphard, Research Scientist, Conservation Biology Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 4.

States Fish and Wildlife Service and the California Department of Fish & Wildlife, and other environmental organizations also submitted comments on the prior VTP and the DEIR.[3] Each of these letters and reports explained that the prior Program's approach to reducing the severity and frequency of fires lacked a reasoned justification based on science and substantial evidence.

The prior VTP indefensibly treated the diverse ecological regions of the state with the same broad brush. For the scrub systems of Southern California, in particular, its

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[3] The following letters and reports are attached and are incorporated by reference into this letter: Letter from Karen A. Goebel, Assistant Field Supervisor, U.S. Department of the Interior, Fish and Wildlife Service to George Gentry, Executive Officer, California Department of Fire and Forest Protection, February 25, 2013, attached as Exhibit 5; Letter from Robert Taylor, Fire GIS Specialist, Department of the Interior, National Park Service, to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 6; Memorandum from Sandra Morey, Deputy Director, Ecosystem Conservation Division, California Department of Fish and Wildlife to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 7; Letter from Van K. Collinsworth, Natural Resource Geographer, to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 21, 2013, attached as Exhibit 8; Letter from Richard W. Halsey, Director, California Chaparral Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, January 25, 2013, attached as Exhibit 9; Letter from Richard W. Halsey, Director, California Chaparral Institute and Justin Augustine, Attorney, Center for Biological Diversity to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 10; Letter from Richard W. Halsey, Director, California Chaparral Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, April 8, 2013, attached as Exhibit 11; Letter from Anne S. Fege, Adjunct Professor, Department of Biology, San Diego State University to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 23, 2013, attached as Exhibit 12; Letter from Greg Suba, Conservation Program Director, California Native Plant Society to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013, attached as Exhibit 13; Letter from Frank Landis, Conservation Chair, California Native Plant Society to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 15, 2013, attached as Exhibit 14; and, Letter from Sweetgrass Environmental Consulting to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 24, 2013; attached as Exhibit 15.

management prescriptions—to the extent they could be gleaned from the DEIR—were bereft of scientific basis and lacked demonstrable efficacy. Furthermore, as EHL explained, the assumption that fire safety could be manufactured through vegetation removal is illusory as certain of the strategies contemplated by the VTP would likely result in an increase in fire frequency. Equally concerning, the VTP would encourage the continued expansion of the Wildland Urban Interface ("WUI"), and the resulting vicious cycle of additional home construction in high fire hazard areas.

The DEIR for the prior VTP was equally deficient. Wildlife regulatory agencies and environmental organizations including EHL explained that the environmental document defined the Program so vaguely as to preclude reasoned and meaningful assessment of its environmental impacts. The DEIR relied on speculation, not substantial evidence, in its analysis of environmental impacts. These agencies and organizations explained that although the VTP had the potential for irreversible environmental damage, there was simply no basis for determining the extent of the impact on the physical environment that would result from the burning or other modification of millions of acres of vegetation.

A peer review of the prior VTP and its EIR, conducted by the California Fire Science Consortium ("CFSC") was commissioned by CAL FIRE and the Board. *See* Panel Review Report of Vegetation Treatment Program Environmental Impact Report Draft, California Board of Forestry and Fire Protection in Association with CAL FIRE Agency, August 2014, at 5, attached as Exhibit 16. The CFSC peer review largely echoed the concerns raised by the other scientists, wildlife regulatory agencies and environmental organizations. It criticized the VTP's flawed approach of attempting to collapse the state's varied fire and fuel regimes into a standardized matrix where all treatments would be equally effective in all landscapes. CFSC Peer Review at 5-8. The CFSC explained that without deliberate oversight and revisions, the VTP would result in unassessed environmental impacts and irreparable damage to public agency relationships. The peer review culminated in a recommendation that the VTP undergo a major revision if the Plan was to be a contemporary, science based document. Specifically, the CFSC recommended that the VTP and its EIR explicitly describe how the treatments proposed for private lands fit into the state's overall fire plan, including protection of high value assets, state and local land use planning policies, and federal land use practices. The panel also called for a revised plan to utilize formal adaptive management: rigorous analysis of monitoring data collected in response to implementation of VTP projects. From these monitoring efforts, the CFSC explained, the EIR could be used to implement

projects and collect information on the relative efficacy and ecological effects of treatment and vegetation combinations. *Id.*

EHL has a long history of supporting reasonable strategies to protect people and property from the hazards associated with wildfire. Recognizing the critical importance of promoting sound wildfire prevention strategies, EHL offered the assistance of its world-renowned scientists to collaborate and assist on a revised VTP that would better protect natural resources and incorporate the most recent science.

Upon learning that the prior VTP had been withdrawn, EHL was optimistic that the Board would take these suggestions and offers of assistance to heart and make substantive modifications to the VTP and revise the EIR in a manner that complied with CEQA. *See e.g.*, Letter from Dan Silver, Executive Director, Endangered Habitats League to Duane Shintaku, Deputy Director, California Department of Forestry and Fire Protection, October 2, 2014, attached as Exhibit 17. Yet, after carefully reviewing the current VTP and DEIR, it is clear that the Board's response to these comments and suggestions is, lamentably, denial. The vast majority of concerns raised by the CFSC, wildlife regulatory agencies and scientists about the Program and its EIR appear to have been rejected out of hand. Rather than substantively revise the VTP or accurately analyze the environmental harm that would accompany the Program, the VTP and its DEIR merely seek to defend the faulty science, erroneous assertions and conclusions of the prior documents.

Submitted under separate cover are reports prepared by Dr. Wayne D. Spencer, Ph.D, Conservation Biology Institute and CJ Fotheringham, Ph.D. that address the substantive flaws in the Board's approach to fire prevention and the inability of the VTP to achieve its own objectives. (*See* Letter from Wayne D. Spencer, Chief Scientist, Conservation Biology Institute to E. Hannigan, California Board of Forestry and Fire Protection, May 31, 2016 and letter from CJ Fotheringham, Research Ecologist, USGS to E. Hannigan, California Board of Forestry and Fire Protection, May 31, 2016). We respectfully request that the Final EIR respond separately to each of the points raised in the scientists' technical reports as well as to the points raised in this letter. In addition, this letter also incorporates by reference the letter from Richard Halsey, Director, California Chaparral Institute to E. Hannigan, California Board of Forestry and Fire Protection, May 24, 2016 and the letter from Frank Landis, Conservation Chair of the San Diego Chapter of the California Native Plant Society to E. Hannigan, California Board of Forestry and Fire Protection, May 31, 2016.

II. The DEIR Fails to Comply With CEQA.

A. The DEIR's Justifications For Failing to Provide a More Detailed Analysis of the VTP's Environmental Impacts Are Groundless.

Among the DEIR's most notable deficiencies is the lack of a detailed accounting of the VTP's environmental impacts. The DEIR attempts to defend its vague analysis by suggesting that the document serves as a first-tier document for later CEQA review of individual projects included in the Program and that further environmental review will likely be undertaken as each project is implemented. This justification is unavailing. Not only does the DEIR improperly defer analysis of ascertainable environmental impacts to a future process, but that future process lacks any workable means for analyzing and mitigating the impacts of individual projects, and effectively shuts out public participation.

Under CEQA, the "programmatic" nature of this DEIR is no excuse for its lack of detailed analysis. The DEIR grossly misconstrues both the meaning and requirements of a "program" EIR by suggesting that the broad scope of the VTP plays an important role in determining the appropriate level of detail to include in the DEIR. *See* DEIR at 4-116 ("Effects of fuel reduction on wildlife depend on the specific ecological requirements of individual species and thus are difficult to generalize, especially in a treatment area as large and complex as that considered here."). This approach is flawed, at the outset, because CEQA mandates that a program EIR provide an in-depth analysis of a large-scale project, looking at effects "as specifically and comprehensively as possible." Cal. Code Regs., tit. 14, § 15168(a), (c)(5); (hereafter "CEQA Guidelines"). Indeed, because it is designed to look at the "big picture," a program EIR must (1) provide "more exhaustive consideration" of effects and alternatives than can be accommodated by an EIR for an individual action, and (2) consider "cumulative impacts that might be slighted in a case-by-case analysis." CEQA Guidelines § 15168(b)(1)-(2).

Furthermore, whether a lead agency prepares a "program" EIR or a "project-specific" EIR under CEQA, the requirements for an adequate EIR remain the same. CEQA Guidelines § 15160. "Designating an EIR as a program EIR also does not by itself decrease the level of analysis otherwise required in the EIR." *Friends of Mammoth v. Town of Mammoth Lakes Redevelopment Agency* (2000) 82 Cal.App.4th 511, 533. Even a program-level EIR must contain "extensive, detailed evaluations" of a plan's effects on the existing environment. *Envt'l Planning and Info. Council v. Cnty. of El Dorado* (1982) 131 Cal.App.3d 350, 358. *See Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 723-24 (where the record before an agency contains

information relevant to environmental impacts, it is both reasonable and practical to include that information in an EIR). The "extensive, detailed evaluations" required by CEQA are absent from the DEIR.

The DEIR's reliance on future, project-level environmental review is also misplaced. Again, CEQA's policy favoring early identification of environmental impacts does not allow agencies to defer analysis of a plan's impacts to some future EIR for specific projects contemplated by that plan. *See Bozung v. Local Agency Formation Com.* (1975) 13 Cal.3d 263, 282-84; *Christward Ministry v. Superior Court* (1986) 184 Cal.App.3d 180, 194 (1986); *City of Redlands v. Cnty. of San Bernardino* (2002) 96 Cal.App.4th 398, 409 (2002). As CEQA Guidelines section 15152(b) explicitly warns, "[t]iering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration."

Moreover, as discussed below, there is no guarantee in this case that such future, detailed environmental review will happen or, if it does, that environmental impacts will be identified or mitigated. Under these circumstances, a detailed environmental impact analysis must be performed now, prior to the VTP's approval. As the Court of Appeal explained in *Stanislaus Natural Heritage Project v. Cnty. of Stanislaus* (1996) 48 Cal.App. 4th 182, 196 (1996), CEQA requires that this environmental review take place before project approval. In *Stanislaus*, the court rejected the argument that a programmatic EIR for a specific plan and general plan amendment could ignore site-specific environmental review because future phases of the development project would include environmental review, stating that tiering "is not a device for deferring the identification of significant environmental impacts that the adoption of a specific plan can be expected to cause." *Id.* at 199.

Because the Board intends to allow unspecified project-level approvals in reliance on this DEIR, and because there is no indication that any meaningful future environmental review will take place, the DEIR must include a detailed, project-level analysis of the impacts that could arise from the implementation of all aspects of the VTP, as well as a meaningful discussion of alternatives and mitigation measures, so the Board and the public can understand the consequences of the VTP before considering wither it should be approved.

B. The DEIR's Description of the VTP Is Vague and Not Finite.

An accurate description of a proposed project is "the heart of the EIR process" and necessary for an intelligent evaluation of the project's environmental effects. *Sacramento Old City Ass'n. v. City Council* (1991) 229 Cal.App.3d 1011, 1023; *see Rio Vista Farm Bureau v. Cnty. of Solano* (1992) 5 Cal.App. 4th 351, 369-370 (project description is the "sine qua non" of an informative and legally sufficient EIR) (citation omitted). Consequently, courts have found that, even if an EIR is adequate in all other respects, the use of a "truncated project concept" violates CEQA and mandates the conclusion that the lead agency did not proceed in a manner required by law. *San Joaquin Raptor/Wildlife Rescue Center v. Cnty. of Stanislaus* (1994) 27 Cal.App.4th 713, 730 (citation omitted). Thus, an inaccurate or incomplete project description renders the analysis of significant environmental impacts inherently unreliable. While extensive detail is not necessary, the law mandates that EIRs should describe proposed projects with sufficient detail and accuracy to permit informed decision-making. *See* CEQA Guidelines § 15124 (requirements of an EIR).

Here, one of the essential defects of this DEIR is its thoroughgoing failure to accurately describe the Program. The DEIR identifies categories of fuel management treatments (e.g., wildland urban interface; fire breaks and ecological restoration) and explains that within each of these treatment categories, a menu of treatment activities would be implemented to modify fuels within the landscape. These treatment activities include, for example, prescribed fire, "beneficial" grazing, and herbicide applications. *See* DEIR at 2-2; 2-3; 2-17; and 3-4. The fuel management treatments are projected to take place over a staggering 21.9 million acres throughout the state. *Id.* Within a ten year period, it is estimated that there would be approximately 2,300 projects implemented – approximately 231 projects per year at an average project size of 260 acres. *Id.* at 2-35. Yet, when one attempts to drill down to determine how the Program would actually be implemented, it becomes clear that the Board has no idea which program activities would take place or where they would be implemented. Consequently, the vagueness of the DEIR's description of the VTP creates all sorts of analytical problems.

For example, the DEIR states that the number and type of vegetation activities would be selected based on a number of parameters including: the potential for significant adverse impacts; opportunities to conserve desirable vegetation and wildlife habitat; and proximity of the treatment area to sensitive areas, such as wetlands, streams, or habitat for plant or animal species of concern, rare plants and…" DEIR at 2-34. The DEIR explains that these parameters would be considered before activity methods are selected, but the document provides no criteria as to how these parameters would be

applied. And, as discussed below, the DEIR lacks the necessary analysis of the VTP's environmental impacts. Thus a parameter suggesting that a specific vegetation treatment activity would be selected based on the "potential for significant adverse impacts" is entirely meaningless. Indeed, there is no way to know what the environmental impacts of the Program will be if there is not even a finite, stable project description. *San Joaquin Raptor, supra,* 27 Cal.App.4th 713, 730 (requiring "[a]n accurate, stable and finite project description" in an EIR) (citation omitted). In essence, the Project Description here is no more than an idea – an idea that may be changed in a never-ending variety of ways over the next decade or more.

As another example, the DEIR includes principles for implementing fuel break treatment projects but the principles are so broad and vague as to be meaningless. The DEIR suggests that fuel breaks would be constructed to significantly increase the chance of reducing the occurrence and impact of landscape-scale fires and be located at the most effective position on the landscape. DEIR at 2-23. Later, the DEIR states that the fuel breaks would be located and designed to protect "critical infrastructure" and to mitigate the "loss of high value assets." *Id.* But the DEIR never identifies the criteria for determining "the most effective position on the landscape," does not define the term "critical infrastructure," and provides no description of what would constitute a "high value asset." The DEIR also states that the fuel breaks would be constructed to minimize or avoid environmental impacts (*Id.*), but how would the Board decide whether the protection of infrastructure or a high value asset should come at the expense of important environmental resources such as special-status species? This built-in conflict is bound to arise over and over again during the Program's implementation, yet the DEIR does not provide even a hint as to how conflicts such as these would be resolved. Nor does the DEIR give readers any real indication as to where fuel breaks would be located or how the Board would ever determine the optimal locations for fuel breaks. Again, without specificity regarding this critical Program component, there can be no analysis of the VTP's environmental impacts.

Piling even more uncertainty on top of the already vague Project description, this DEIR, like its predecessor, lacks sufficient maps of potential treatment areas. The DEIR asserts that the California Fire Alliance undertook spatial modeling to determine the total footprint of the WUI, areas eligible for Ecological Restoration, and treatment areas for Fuel Breaks. DEIR at 4-32, 4-41, and 4-51. Yet, these maps are not serious tools of measurement to identify the locations of areas that would be treated or to evaluate the Program's environmental impacts. As an initial matter, the maps' scale of about 1:16 million render the maps useless to decision-makers and the public. There is no logical

reason why the maps could not have been printed at a larger scale on multiple pages and included as an technical appendix to the EIR. More importantly, as Wayne Spencer and Frank Landis explain, the maps are based on an outdated and problematic fire hazard analysis, which, in turn, was based on faulty science. (*See* May 31, 2016 Report from W. Spencer and May 31, 2016 letter from F. Landis).

Perhaps the most problematic component of the DEIR's Project Description though pertains to the Program's approach to the "Implementation" and "Subsequent Review" processes. We understand that the VTP is meant to provide an overview of the comprehensive wildfire risk reduction program, but the DEIR must still provide sufficient information to be able to determine how the VTP would be implemented and how it will affect environmental resources. The document suggests that "subsequent review" would occur at the project level, but this EIR and the approvals it informs are the only opportunity for the public to understand and weigh in on the big-picture questions that will determine the magnitude of ecological devastation that would accompany this broad Program.

The DEIR asserts that the VTP includes a built-in mechanism to evaluate the environmental impacts at the project-specific phase. Yet, there are so many loopholes in the VTP's suggested mechanism, that it is almost impossible to envision that a comprehensive evaluation of the VTP's environmental impacts would *ever* be undertaken.

First, the sheer number of projects that are envisioned to be implemented on a yearly basis and the geographic scope of each project alone would suggest that determining each project's environmental impacts would not be subject to a sufficient level of scrutiny. In other words, the multi-step project implementation process – of which the determination of environmental impacts is only one part—would be extraordinarily cumbersome, to put it mildly. The Board contemplates implementing 231 projects every year at an average project size of 260 acres. DEIR at 2-35. That is about one project for every work day of the year. For each such project, CAL FIRE would have to: (a) prepare a Project Scale Analysis ("PSA"); (b) hold a public workshop; (c) submit the PSA for three levels of review (county, regional and state); and (d) send the final determination to the Sacramento CEQA Coordinator. Does CAL FIRE even have sufficient staff to undertake this process for each of the 231 projects that are proposed for implementation every year? The DEIR does not say, but common sense tells us that meaningful review under these conditions is implausible.

Second, the specific process by which CAL FIRE would determine whether further environmental review would be necessary is also highly problematic. The DEIR explains that a CEQA Coordinator would make a final determination as to whether the project is consistent with the Program EIR. If it is determined that the project falls within the scope of the Program EIR, *then "no additional CEQA documentation would be required.*" DEIR at 2-47 (emphasis added). Thus, it would appear that a project need only be included in the scope of the Program EIR to escape further environmental review. Given the excessively broad scope of the VTP and the fact that the DEIR discusses the potential environmental impacts from all projects that could be implemented over a 22 million acre area, it is almost impossible to imagine the Coordinator making a determination that a project is outside the scope of the Program EIR. Given the absence of any specific environmental analysis in the Program EIR, the process is effectively designed so that such analysis will never occur.

Third, even assuming that the Coordinator intends to undertake an actual evaluation of a project's environmental impacts—and there is no assurance that this separate study would ever occur—there is still no indication that this evaluation would result in a project-level environmental review pursuant to CEQA. In fact, the DEIR includes numerous statements indicating that this DEIR satisfactorily evaluates the environmental impacts that would occur from the VTP's projects. For example, it states: (a) the VTP would result in beneficial environmental impacts ; (b) the specific projects would be "designed to avoid significant effects;" and (c) the Coordinator will ensure that the SPR measures reduce impacts to levels that are less than significant." DEIR at 4-117; 4-121; 4-124; 4-132; 4-156. Statements such as these give the distinct impression that the Board and CAL FIRE have pre-determined that any environmental impacts will be effectively addressed by the measures in the DEIR and that no further environmental review need be undertaken. Moreover, there is no indication that the Coordinator has the necessary expertise to evaluate all of the projects' potential environmental consequences – much less to do so at the rate of a project a day. The CEQA Coordinator may have sufficient experience to manage environmental review, but it is highly unlikely that this person has the expertise to evaluate the effect that a treatment project would have on, for example, a rare, threatened or endangered species, or any of the other myriad impacts that could occur from individual projects throughout the state. In light of these procedural uncertainties, the DEIR's assurance that future projects would undergo further environmental review is meaningless, misleading, and disingenuous.

It is also particularly disconcerting that the Coordinator's review and determination would happen behind closed doors. It is clear that the public would have

no opportunity to be notified of, or influence, the process. The public's right to participate in the environmental review process under CEQA is mandated in the statute itself and is vigilantly protected by the California courts that interpret and enforce CEQA. Pub. Resources Code, § 21091. Put simply, the public participation process is a critical tool to ensure that the public has an opportunity to hold agencies accountable for their actions.

The Subsequent Review process set out in the DEIR is grossly deficient. It must be revised to provide that each VTP project will receive full environmental review pursuant to CEQA, with full public participation, and must demonstrate how CALFIRE intends to provide such review for such a massive number of projects given its current staffing and budgetary limitations.

In sum, the total failure of the Project Description makes the rest of the DEIR inadequate as well. Because the specific details of the Program are unknown, its environmental impacts cannot be accurately analyzed, nor can effective mitigation be identified. The fog of uncertainty surrounding the Program and its impacts leads inevitably to deferred analysis and mitigation; over and over again the DEIR states essentially that impacts will be determined as they happen and mitigation will be worked out then. This strategy, while made necessary by the inadequate Project Description, is unlawful under CEQA.

C. The DEIR's Analysis of and Mitigation for the Impacts of the VTP Are Inadequate.

The discussion of a proposed project's environmental impacts is at the core of an EIR. *See* CEQA Guidelines § 15126.2(a) ("[a]n EIR shall identify and focus on the significant environmental effects of the proposed project"). As explained below, the DEIR's environmental impacts analysis is deficient under CEQA because it fails to provide the necessary facts and analysis to allow the Board and the public to make informed decisions about the Program. An EIR must effectuate the fundamental purpose of CEQA: to "inform the public and its responsible officials of the environmental consequences of their decisions *before* they are made." *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564. To do so, an EIR must contain facts and analysis, not just an agency's bare conclusions. *Id.* at 568. Thus, a conclusion regarding the significance of an environmental impact that is not based on an analysis of the relevant facts fails to fulfill CEQA's informational mandate.

Although it is clear that the proposed VTP has the potential to cause extraordinary environmental degradation, neither the public nor the Board have any way of knowing the magnitude of this harm. As we explain below, the DEIR fails entirely to provide the Board and the public with detailed, accurate information about the Program's significant environmental impacts and to analyze mitigation measures that would reduce or avoid such impacts.

1. The DEIR's Analysis of the VTP's Impacts on Biological Resources is Inadequate.

The DEIR's biological resources chapter is emblematic of the impossible task the Board has created for the DEIR authors by proceeding with CEQA review of a vague and standardless Plan. They must evaluate the environmental consequences of implementing a Plan that has not yet been defined but has the potential to severely affect millions of acres of lands that have biological resources of unparalleled importance. It is therefore not surprising that the DEIR's "analysis" of impacts is a pile of contradictions which renders it utterly useless, as the following paragraph demonstrates.

Regarding the scale of the analysis, the DEIR initially asserts that "evaluating impacts at the bio-regional scale allows for a reasonable analysis of the foreseeable impacts without being neither so large an area as to dilute the impacts or too small an area to magnify the impacts." DEIR at 4-79. The DEIR then completely reverses itself and explains it is not possible to evaluate the VTP's impacts at a bio-regional level. DEIR at 4-121 ("In order for an effect to be considered significant at the bioregional level, the species in question would have to be impacted enough to meet one of the Significance Criteria stated above. The amount of habitat that would have to be adversely modified to cause a substantial adverse effect has not been scientifically determined for most species and is likely unknowable until the threshold has been crossed and the species is in jeopardy."). The DEIR then states that an analysis at this macro level is appropriate since the VTP's impacts to biological resources *would be similar throughout the state* (at 4-120) while also acknowledging that vegetation and wildlife *differ across California*". DEIR at 4-120 and 4-85 (emphasis added).

The DEIR fares no better with regard to its conclusions as to the Plan's specific effect on biota, as the document explains that the Plan would both benefit and harm these resources. For example, in one instance, the DEIR states that the potential exists for *substantial adverse effects* to special status wildlife taxa. DEIR at 4-121 (emphasis added). In another instance, it asserts that the fire management treatments would be a

benefit to biological resources. (*See Id.* at 4-124 stating that "prescribed fire is believed to benefit the overall health of [...] ecosystems" (emphasis added).

Given this hodge-podge of contradictory statements, the DEIR's so-called analysis of biological impacts achieves a result exactly opposite from what CEQA requires. Under CEQA, decisionmakers and the public are to be given sufficient information about impacts and mitigation to come to their own judgments and decisions. *See* Pub. Resources Code, § 21061. This DEIR's strategy is to withhold information and to encourage the public to accept the decision that the agency wants. The DEIR never mentions, let alone analyzes, the actual and specific consequences to vegetation communities and wildlife that would result from this massive Program. The document makes no attempt, for example, to identify the locations of important habitat areas, to identify the specific species that would be impacted, to quantify the expected losses to species and habitat, to analyze the significance of the expected impacts in light of these facts, and finally to propose mitigation measures capable of reducing these impacts to a less than significant level.

A complete revision and recirculation is the only way that this document can come into compliance with CEQA. The VTP and its specific projects must be fully and accurately described, and the critical discussion of biological impacts must explain what will happen on the 10.7 million acres that are designated for Wildland Urban Interface treatments, the 7.4 million acres are designated for ecological restoration treatments, and the 4.0 million acres that are designated for fuel break treatment. DEIR at 4-38; 4-46; 4-54. *See Citizens of Goleta Valley, supra*, 52 Cal. 3d 553, 568 ("[T]he EIR must contain facts and analysis, not just the agency's bare conclusions . . . .") (quotation marks omitted). A sample of some of the most egregious flaws in the DEIR's analysis of impacts to biological resources follows.

(a) The DEIR Fails to Describe the VTP's Biological Setting.

The flaws in the biological resources analysis start at the very beginning, with the description of the Program's environmental setting. The DEIR lacks sufficient information regarding the resources within each bio-region and thus lacks a sufficient baseline for determining impacts. An EIR's description of a project's environmental setting crucially provides "the baseline physical conditions by which a lead agency determines whether an impact is significant." CEQA Guidelines § 15125(a). "Without a determination and description of the existing physical conditions on the property at the start of the environmental review process, the EIR cannot provide a meaningful assessment of the environmental impacts of the proposed project." *Save Our Peninsula*

Committee v. Monterey Cnty. Bd. of Supervisors (2001) 87 Cal.App.4th 99, 119. Here, the DEIR fails to identify each bio-region's resources and therefore undercuts the legitimacy of the environmental impact analysis from the outset.

The DEIR does acknowledge that the South Coast bio-region is "the most threatened biologically diverse area in the continental U.S. More than 250 species of vertebrate animals and 200 species of plants are either listed as protected or considered sensitive by wildlife agencies and conservation groups." DEIR at 4-92. Notwithstanding this remarkable biodiversity, the DEIR never even attempts to identify the species within the South Coast that could potentially be impacted by the VTP. Instead, it merely lists the number of each species that inhabit the region. *See e.g.*, page 4-92, "there are 476 vertebrate species… including 287 birds, 87 mammals, 52 reptiles, 16 amphibians and 34 fish." Without some meaningful identification of the resources that would be at risk, the DEIR preparers have no way of determining the Plan's potential impacts or identifying effective mitigation.

We can find no plausible explanation for this omission especially because it appears that CAL FIRE has access to specific data regarding biological resources when it states the following: "Over 600 special status wildlife taxa occur in California and over 300 occur in habitats likely to be treated under the VTP." DEIR at 4-118. Certainly the DEIR could disclose the identity of these wildlife taxa, including information as to their habitat requirements. The revised EIR should include this information.

(b) The DEIR Lacks Thresholds of Significance.

Determining whether a project may result in a significant adverse environmental effect is one of the key aspects of CEQA. CEQA Guidelines § 15064(a) (determination of significant effects "plays a critical role in the CEQA process"). CEQA specifically anticipates that agencies will use thresholds of significance as an analytical tool for judging the significance of a Project's impacts. *Id.* § 15064.7.

Thus, one of the first steps in any analysis of an environmental impact is to select a threshold of significance. Here, the DEIR contains no thresholds of significance for determining impacts on biological resources. This flaw leads to a cascade of other failures: without a threshold, the DEIR cannot do its job. For example, the DEIR states that the VTP would result in a significant effect if would contribute to a substantial, long-term reduction in the viability of any native species (at 4-115), but the document provides no standard by which to evaluate this impact's significance. This is critical; without a significance threshold, there is no means by which to conclude whether impacts would or

would not be significant, and findings under CEQA section 21081 cannot be properly made (i.e., whether significant impacts are reduced to a less-than-significant level and, if so, how). The revised EIR should identify appropriate thresholds for determining impacts to vegetation and wildlife.

(c) The DEIR Inappropriately Defers its Analysis of Impacts.

Contrary to CEQA's requirements, analysis of the Plan's impacts on biological resources is left until after project approval. Under CEQA, such deferred analysis and mitigation of these important impacts are unlawful. *See Gentry v. City of Murrieta* (1995) 36 Cal.App.4th 1359, 1396; *Sundstrom v. Cnty. of Mendocino* (1988) 202 Cal.App.3d 296, 306-30. As the California Supreme Court has explained, environmental review must happen before a project is approved if an EIR is to be anything more than a "post hoc rationalization of a decision already made." *No Oil, Inc. v. City of Los Angeles* (1974) 13 Cal.3d 68, 81 (internal quotation marks omitted).

CEQA also requires that an EIR be detailed, complete, and reflect a good faith effort at full disclosure. CEQA Guidelines § 15151. The document should provide a sufficient degree of analysis to inform the public about the proposed project's adverse environmental impacts and to allow decision-makers to make intelligent judgments. Id. Consistent with this requirement, the information regarding the project's impacts must be "painstakingly ferreted out." *Envt'l Planning and Info. Council, supra,* 131 Cal.App.3d 350, 357 (finding an EIR for a general plan amendment inadequate where the document did not make clear the effect on the physical environment). Here, the DEIR provides no analysis of impacts to vegetation communities and only the most superficial analysis of impacts to wildlife.

(i) Vegetation Impacts

In its discussion of vegetation impacts, the DEIR explains that impacts to botanical resources were analyzed by examining special status plants and communities listed in the California Natural Diversity Database ("CNDDB"). DEIR at 4-115. Setting aside for a moment the validity of using CNDDB to evaluate the Plan's impacts on vegetation (*see e.g.*, May 31, 2016 letter from F. Landis), the DEIR never actually uses the database—or any other method—to evaluate impacts. Indeed, it fails to provide *any* analysis at all. Instead, the DEIR calls for a project applicant to "check" for occurrences of special status plants in their project area and provide the information to the wildlife agencies. DEIR at 4-115, 116 (citing SPR BIO-2). Similarly, the DEIR explains that the wildlife agencies have developed guidelines for assessing the effects of projects on rare,

threatened or endangered plants and natural communities (at 4-116), but here too, the DEIR makes no attempt to use these guidelines to evaluate the VTP's impacts on vegetation.

In lieu of actually analyzing the Plan's impacts on vegetation communities, the DEIR simply asserts that BIO-2 (the measure calling for the applicant to check for special status plants) would reduce the Plan's impacts to a less than significant level. *Id.* The document, however, provides no evidentiary support for this conclusion. Quite simply, it appears the DEIR was set up to arrive at this preordained result. A conclusion that a measure will be effective in mitigating an impact must be supported by substantial evidence. *See Gray v. Cnty. of Madera* (2008) 167 Cal.App.4th 1099, 1115-18; *see also San Franciscans for Reasonable Growth v. City & Cnty. of San Francisco* (1984) 151 Cal.App.3d 61, 79 (measures must not be so vague that it is impossible to gauge their effectiveness). The DEIR fails to fulfill this paramount CEQA purpose because it neglects to present any factual support for its cursory conclusions.

The DEIR's failure to evaluate the VTP's impacts on chaparral/sage scrub is particularly troubling as EHL and it scientists along with wildlife regulatory agencies, including the California Department of Fish and Wildlife ("CDFW"), criticized the prior VTP EIR for failing to disclose the severity and extent of damage to this unique and increasingly rare community. *See* Letter from Sandra Morey, CDFW, February 25, 2013. As CDFW explained, fire management of California's shrublands has been heavily influenced by policies designed for coniferous forests; however, fire suppression has not effectively excluded fire from chaparral and coastal sage scrub landscapes and catastrophic wildfires are not the result of unnatural fuel accumulations. There is also considerable evidence that high fire frequency is a very real threat to native shrublands in southern California, sometimes leading to loss of species when fire return intervals are shorter than the time required to reach reproductive maturity. Both common and rare plant species and the habitats they provide are vulnerable to adverse impacts where fire regimes are altered. Since chaparral and coastal scrub are adapted to a regime of infrequent, relatively intense, dry season fires, imposition of low intensity cool season fires through prescribed burning can produce undesirable ecological effects and damage vegetation. Inasmuch as the current VTP proposes extensive treatment of chaparral/sage scrub lands, the DEIR's failure to analyze how these activities would affect these plant communities is a fatal flaw.

(ii) Wildlife Impacts

The DEIR's pattern of unlawfully deferred and delegated analysis and mitigation is repeated over and again as the DEIR acknowledges that the VTP would cause impacts to wildlife, but fails to perform the required impact analysis. The DEIR begins its discussion of impacts to wildlife by explaining that it is difficult to determine the effects of fuel reduction on wildlife because of the size of the treatment area and the complexity of the program. It goes on to state that responses of wildlife to fuel reduction have not been studied extensively and information on is lacking. DEIR at 4-116. California courts explain that an agency cannot evade its obligate to analyze a project's environmental impacts on the grounds that the project is just too such large and complex. Following this convoluted reasoning, the greater the environmental harm contemplated by an agency, the lesser the obligation of conducting environmental review. As explained by the Court in *Laurel Heights Improvement Ass'n of San Francisco v. Regents of the University of California* (1988) 47 Cal.3d 376, 399 (1988), "[w]e find no authority that exempts an agency from complying with the law, environmental or otherwise, merely because the agency's task may be difficult."

Rather than provide an extensive analysis of impacts on wildlife as CEQA requires, the DEIR provides only cursory, unsupported statements. For example, it mentions that impacts to wildlife should be mostly beneficial however, the temporal and spatial effects as well as the short-and long-term effectives that fire will have on animals needs to be considered. DEIR at 4-117. The DEIR never mentions any of the specific species that could be impacted nor what type of impacts might occur. Nor does it provide any factual analysis to support its conclusion that impacts "should be mostly beneficial."

The DEIR generally takes a "trust us" approach when it asserts that direct wildlife mortality due to fire is low since most animals are able to escape or take shelter. *Id.* Yet, the DEIR's biological resources appendix repeatedly contradicts the DEIR's text. In its *two-sentence* evaluation of the effect that prescribed fire has on mammals, the appendix states that direct mortality of small mammals as a result of fire are primarily from heat effects and asphyxiation. Biological Resources Appendix at page 2. Direct mortality would not appear to be a beneficial effect. The appendix's *three-sentence* evaluation of the effect that prescribed fire has on ground dwelling invertebrates is vague and therefore entirely meaningless. Here, the appendix states that the direct effects of prescribed fire depend largely on the invertebrates' locations at the time of the fire and fire intensity, which depends, in large part on duff consumption. *Id.* Common sense would dictate that the VTP's effects on wildlife would depend on location and fire intensity, but here too, the DEIR does not tell us which species of invertebrates would be most at risk nor what

the direct effects to these invertebrates would be. Nor does the DEIR explain "duff consumption" or how it relates fire intensity.

The DEIR's analysis of impacts on biological resources is so fundamentally deficient that it does not come close to meeting CEQA's clear requirements. Revisions of the required magnitude will require recirculation of the DEIR. If this DEIR truly reflects the current state of the VTP, then this is not a Program ready for approval. The first step in revising the DEIR must be serious commitment by the Board to define the VTP in a manner that would allow the Program's impacts to be effectively evaluated.

2. The DEIR Contains Inadequate Mitigation Measures that Are Unenforceable, Uncertain, and Vague and Thus Do Not Ensure Impacts Will Be Reduced to Insignificant Levels.

CEQA requires an EIR not only to identify a project's significant effects, but also to identify ways to avoid or minimize them. Pub. Resources Code, § 21002.1. An EIR generally may not defer evaluation of mitigation to a later date. CEQA Guidelines § 15126.4(a)(1)(B). Furthermore, for every mitigation measure evaluated, the agency must demonstrate that the mitigation measure either: (1) will be effective in reducing a significant environmental impact; or (2) is ineffective or infeasible due to specific legal or "economic, environmental, social and technological factors." *Friends of Oroville v. City of Oroville* (2013) 219 Cal.App.4th 832, 841-44; Pub. Resources Code, §§ 21002, 21061.1; CEQA Guidelines §§ 15021(b), 15364.

In addition, the lead agency must adopt all feasible mitigation measures that can substantially lessen the project's significant impacts, and it must ensure that these measures are enforceable. Pub. Resources Code, § 21002; CEQA Guidelines §§ 15002(a)(3), 15126.4(a)(2); *City of Marina v. Bd. of Trustees of the Cal. State Univ.* (2006) 39 Cal.4th 341, 359, 368-69. The requirement for enforceability ensures "that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded." *Federation of Hillside and Canyon Associations v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1261 (italics omitted); CEQA Guidelines § 15126.4(a)(2). Uncertain, vague, and speculative mitigation measures have been held inadequate because they lack a commitment to enforcement. *See, e.g., Anderson First Coalition v. City of Anderson* (2005) 130 Cal.App.4th 1173, 1188-1189 (holding traffic mitigation fee measure inadequate under CEQA due to vagueness in program for implementing required improvements). Here, the DEIR is woefully inadequate because it relies on measures that are unenforceable,

uncertain and vague to conclude that the VTP's impacts would be less than significant.[4] Indeed, these measures simply do not and cannot reduce to insignificance the severe impacts caused by the Program.

For example, SPR BIO-3 calls for the Coordinator to prepare a summary of all special status species which would be affected by the project and then to conduct a field review to determine the presence or absence of any special status species. DEIR at 4-157. The fact that this measure requires a study of special status species does not save the DEIR's analysis; it is too little too late. "A study conducted after approval of a project will inevitably have a diminished influence on decisionmaking. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." *Sundstrom, supra,* 202 Cal.App.3d 296, 307. Moreover, this measure relies largely on the California Natural Diversity Database ("CNDDB") to identify species that would be affected by VTP projects. Yet, as Wayne Spencer and Frank Landis explain in their letters, this database is incomplete, at best. While it may identify some of the species that would be impacted by a VTP project, it is highly unlikely to identify all potentially impacted species. The CNDDB records rely on field biologists to voluntarily submit information on the results of surveys and monitoring. As a result, the database is biased geographically towards areas where surveys have been conducted or where survey efforts are greater. Many areas, including private lands where the VTP projects would likely be implemented, have not been surveyed at all. Moreover, even if the Coordinator were able to identify all species that could be affected, SPR BIO-3 does nothing to ensure that species would actually be protected during the project's implementation.

The DEIR fares no better with SPR BIO-13. This measure states that if any special status species are identified within the project area, the project manager would evaluate the habitat requirements of the species, identify the SPRs or mitigation measures, and take "necessary actions." *See* BIO-13 at 2-58. While this measure calls for the agency to take necessary actions, it does not specify the nature of such actions. It

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[4] The DEIR identifies a series of "Standard Project Requirements ("SPRs") that are considered minimum standards for each of the individual projects that would be implemented by the VTP. DEIR at 4-156. The DEIR appears to use the terms SPRs and mitigation measures interchangeably. *See e.g.*, Table 4.1-1 (DEIR p. 4-6): Impact Summary Analysis and Reference Locations which includes a column "Mitigation/SPR" and indicates that impacts to biological resources were to determined to be less than significant after mitigation is applied.

could include suggesting that the project applicant attempt to protect sensitive habitats, if feasible. But, attempting to protect habitats is a vague, voluntary concept and therefore provides no assurance that the habitat would in fact be protected. There is no indication in the document as to what would constitute a "necessary action", much less whether those actions would be effective in avoiding significant impacts to special status species.

BIO-4 calls for the Coordinator to submit the evaluation of impacts to wildlife agencies with a request for information relating to avoidance measures to be implemented. (*See* BIO-4 at 4-157). Yet, simply submitting an evaluation to wildlife agencies does not ensure that impacts would be mitigated. The SPR does not call for any action by the wildlife agencies. Nor could it since the Board has no authority to force another agency to adopt or implement mitigation.

At first glance, BIO-5 appears promising as it suggests that limitations should be placed on vegetation treatment projects in southern California. *See* DEIR at 4-157. Unfortunately, a detailed review of this measure reveals it is nothing more than an empty shell as it contains numerous loopholes. For example, the measure calls for designing a project to prevent vegetation type conversion. Yet, the DEIR never defines "vegetation type conversion; " nor does it provide any indication as to how a project would be designed to prevent such conversion. The measure also lacks definitions for important terms such as "critical infrastructure" and "forest health." It does not provide any criteria for making a determination as to which projects would be necessary to protect forest health. The measure also fails to include any criteria for determining whether vegetation has or has not reached the age of "median fire return intervals." Finally, the measure does not require the Board, or anyone else for that matter, to take any action at all. The closest it comes, in this regard, is a suggestion that the agency take into account wildlife when planning and implementing a project.

Yet another fatal flaw common to all of the DEIR's measures is their failure to include *any* basis to judge their effectiveness. Rather, it appears that these measures are a mere expression of hope that the Board will eventually be able to devise a way to address the VTP's impacts on plant and wildlife. CEQA requires more than that to mitigate significant impacts. *Lincoln Place Tenants Association v. City of Los Angeles* (2005) 130 Cal.App.4th 1491, 1508.

Since the DEIR relies on vague, malleable and non-enforceable mitigation measures, it lacks the evidentiary basis to conclude that the VTP's impacts would be reduced to less than significant levels.

D. The DEIR's Analysis of Alternatives Inadequate.

A core substantive requirement of CEQA is that "public agencies should not approve projects as proposed if there are feasible alternatives . . . which would substantially lessen the significant environmental effects of such projects." Pub. Resources Code, § 21002; *see also* CEQA Guidelines §§ 15002(a)(3), 15021(a)(2), 15126(d); *Citizens for Quality Growth v. City of Mount Shasta* (1988) 198 Cal.App.3d 433, 443-45. Accordingly, a major function of the EIR "'is to ensure that all reasonable alternatives to proposed projects are thoroughly assessed by the responsible official.'" *Laurel Heights, supra*, 47 Cal.3d 376, 400 (quoting *Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 197). To fulfill this function, an EIR must consider a "reasonable range" of alternatives "that will foster informed decisionmaking and public participation." CEQA Guidelines § 15126.6(a). "An EIR which does not produce adequate information regarding alternatives cannot achieve the dual purpose served by the EIR . . . ." *Kings County Farm Bureau, supra*, 221 Cal.App.3d 692, 733.

In addition, under CEQA, readers must be able to "evaluate [alternatives'] comparative merits." *Kings County Farm Bureau, supra*, 221 Cal.App.3d 692,733 (absence of comparative data in EIR precluded meaningful consideration of alternatives). A thorough comparison of the Program's alternatives' impacts is therefore crucial to a successful environmental document. This evaluation "shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project." CEQA Guidelines § 15126.6(d).

The DEIR for the VTP fails to heed these basic mandates. First, while the document purports to identify four alternatives, these alternatives are so similar that they become identical for purposes of environmental review. Second, the DEIR's perfunctory comparative analysis of the VTP alternatives fails to adequately distinguish the environmental impacts of each option, to the extent there are differences. Finally, the DEIR fails to identify a feasible, less environmentally damaging alternative for managing wildfire risk in California.

1. The DEIR Fails to Consider A Reasonable Range of Alternatives.

Other than the No Project Alternative, the DEIR presents four alternatives that are extraordinarily similar. Indeed, each alternative includes identical vegetation management treatments: prescribed fire, mechanical, manual, herbivory and herbicide applications. The only difference between each alternative and the proposed VTP is the

locations of the areas that would be treated and the times of these treatments. [5] DEIR at 3-15; 3-21; 3-25.

Alternative A would treat vegetation within the WUI only; Alternative B would treat vegetation within the WUI and Fuel Breaks; Alternative C would treat vegetation within Very High Hazard Severity Zones; and Alternative D would treat vegetation on all of the lands within the VTP but would limit the timing of prescribed burns to reduce the Program's air quality impacts. In comparison to the proposed VTP which would treat about 22 million acres, the remaining three geographic alternatives would have substantially reduced footprints. DEIR at 3-36. "Alternative A: WUI Only" would treat about 10.6 million acres; "Alternative B: WUI and Fuel Breaks" would treat about 14.6 million acres; and "Alternative C: Very High Hazard Severity Zone" would treat about 11.8 million acres. *Id.*

However, because the *annual* area treated under the alternatives is virtually identical, the DEIR asserts that each of the alternatives would pose nearly identical environmental risks to the VTP. This approach is untenable. Since the primary purpose of an alternatives analysis under CEQA is to explore different options to proposed actions that will adversely affect the environment, analyzing only slight variations of the same proposal – all of which have essentially identical environmental effects – does not constitute an adequate alternatives analysis. *Laurel Heights, supra,* 47 Cal.3d 376, 403 (purpose of an EIR's alternatives analysis is to identify ways to reduce or avoid significant environmental effects); CEQA Guidelines § 15126.6(c) (agency should analyze alternatives that "could avoid or substantially lessen one or more of the significant effects."); Pub. Resources Code, § 21002 (same).

To the extent that the Board believes it has no obligation to consider alternatives other than vegetation treatment because the Program allegedly results in no significant environmental impacts, the agency is mistaken. As this letter clarifies, the only reason that the DEIR determines the Program would not result in significant environmental impacts is that the document fails to conduct the necessary examination. Had the DEIR conducted a thorough investigation of the VTP's environmental impacts, the Board would be compelled to conclude that the Program will cause extensive adverse effects.

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[5] Alternative D: Reduction of Prescribed Fire Treatments to Reduce Air Quality Impacts calls for allowing prescribed burns in non-attainment areas only on "burn days."

2. The DEIR Fails to Conduct the Necessary Comparative Analysis of the Alternatives' Environmental Impacts.

CEQA requires an EIR to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed Project. CEQA Guidelines § 15126.6(d). Yet, the DEIR's perfunctory and uninformative "analysis" here makes it impossible to determine which, if any, of the alternatives would effectively reduce the Program's significant environmental impacts.

Indeed, the DEIR provides no actual analysis of each alternative's impact on the environment. Instead, it merely asserts the overall impacts of Alternatives A, B and C would be similar to, or even *more impactful*, than the proposed VTP.[6] *Id.* The DEIR reaches this contrived conclusion because the agency has crafted the alternatives so that each one would treat the exact same amount of acreage (60,000 acres) every year with identical vegetation treatment activities expected to occur. DEIR at 4-154;155.

The DEIR's cursory approach is no substitute for the in-depth discussion comparing each alternative's impacts that the law and common sense require. In order to be adequate, the DEIR must contain enough information to define the issue and provide a clear basis for choice between the alternatives. The alternatives that calls for focusing treatments in the very high fire hazard severity zone or only within the WUI would appear to be logical, less environmentally damaging alternatives since they would concentrate treatments in smaller geographic areas. DEIR at 4-155. Yet, because the DEIR provides no way to distinguish between the impacts caused by the alternatives and those caused by the VTP, the alternatives' analysis thus becomes a meaningless exercise.

3. There are Valid Alternatives to the VTP That Are Far Less Environmentally Damaging.

Given that each of the DEIR's alternatives include identical vegetation treatment strategies, it is clear that the Board believes that the VTP is the only valid approach to

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[6] In addition to being incorrect, the DEIR's conclusion that each alternative would have identical impacts to the VTP, is wholly unsupported by facts or *any* analysis. Instead of supplying a thorough comparison of the environmental impacts of each alternative, the document merely asserts, as regards biological resources for example, that all impacts would be expected to be similar in nature to those from the proposed VTP. DEIR at 4-155.

prevent wildfires. However, there are far more effective methods to minimizing wildfire, that would be less environmentally harmful, yet these are completely ignored in the DEIR. The most effective way to protect lives, property, and the natural environmental from wildfire is through a comprehensive approach that focuses on fuel modifications within and directly around communities at risk, ignitability of structures and effective land use planning.

To this end, EHL has developed an alternative that would achieve these goals without the severe environmental impacts that would accompany the VTP. This alternative is described in Wayne Spencer's May 31, 2016 report.

Given the truly enormous impacts that the VTP would have on the environment, and to remedy the DEIR's faulty alternatives analysis, the Board must consider alternatives that actually lessen the VTP's significant environmental impacts. Without this opportunity, the public is merely asked to take on "blind trust" that the proposed VTP is the best alternative. Asking for this sort of faith is not only unfair to the people of California, it is unlawful "in light of CEQA's fundamental goal that the public be fully informed as to the consequences of action by their public officials." *Laurel Heights, supra,* 47 Cal.3d 376, 494. Because the EHL Alternative is reasonable and viable, and because it would lessen the Program's impacts, the Board must examine it in the revised DEIR.

E. The DEIR Must Be Revised and Recirculated.

Under California law, the present EIR cannot properly form the basis of a final EIR. CEQA and the CEQA Guidelines describe the circumstances which require recirculation of a draft EIR. Such circumstances include: (1) the addition of significant new information to the EIR after public notice is given of the availability of the DEIR but before certification[7], or (2) the draft EIR is so "fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded." CEQA Guidelines § 15088.5(a)(4).

Here, both circumstances apply. The Board and the public cannot possibly assess the VTP's impacts, or even its feasibility, through the present DEIR, which is riddled with errors. Among other fundamental deficiencies, the DEIR repeatedly understates the

[7] Significant new information includes the identification of new significant impacts, a substantial increase in the severity of identified significant impacts, and the mitigation measures that could reduce impacts below a level of significance. *Id.*

VTP's significant environmental impacts and assumes that unformulated or clearly useless mitigation measures will effectively reduce these impacts. In order to resolve these issues, the Board must prepare a revised EIR that would necessarily include substantial new information. Failure to recirculate the revised DEIR would thus violate CEQA.

III. Conclusion

For the reasons set forth above, we respectfully request that the Board revise its VTP in a manner that provides a far more specific process and set of governing criteria for determining how, where and whether a specific project should be implemented, based on up-to-date scientific research. We also request that no further consideration be given to the VTP until the Board has prepared an EIR for the revised Program that provides meaningful environmental analysis in full compliance with CEQA.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

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Senior Attorney
Natural Resources Defense Council

Mike Lynes
Director of Public Policy
Audubon California

Frank Landis
Conservation Chair
California Native Plant Society
San Diego Chapter

List of Exhibits:

Exhibit 1	Letter from Dan Silver, Executive Director, Endangered Habitats League to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 2	Letter from CJ Fotheringham, Research Ecologist, USGS to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 3	Letter from Wayne D. Spencer, Chief Scientist, Conservation Biology Institute to Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 4	Letter from Alexandra D. Syphard, Research Scientist, Conservation Biology Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 5	Letter from Karen A. Goebel, Assistant Field Supervisor, U.S. Department of the Interior, Fish and Wildlife Service to George Gentry, Executive Officer, California Department of Fire and Forest Protection, February 25, 2013.
Exhibit 6	Letter from Robert Taylor, Fire GIS Specialist, Department of the Interior, National Park Service, to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.

Exhibit 7	Memorandum from Sandra Morey, Deputy Director, Ecosystem Conservation Division, California Department of Fish and Wildlife to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 8	Letter from Van K. Collinsworth, Natural Resource Geographer, to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 21, 2013.
Exhibit 9	Letter from Richard W. Halsey, Director, California Chaparral Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, January 25, 2013.
Exhibit 10	Letter from Richard W. Halsey, Director, California Chaparral Institute and Justin Augustine, Attorney, Center for Biological Diversity to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 11	Letter from Richard W. Halsey, Director, California Chaparral Institute to George Gentry, Executive Officer, Board of Forestry and Fire Protection, April 8, 2013.
Exhibit 12	Letter from Anne S. Fege, Adjunct Professor, Department of Biology, San Diego State University to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 23, 2013.
Exhibit 13	Letter from Greg Suba, Conservation Program Director, California Native Plant Society to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 25, 2013.
Exhibit 14	Letter from Frank Landis, Conservation Chair, California Native Plant Society to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 15, 2013.
Exhibit 15	Letter from Sweetgrass Environmental Consulting to George Gentry, Executive Officer, Board of Forestry and Fire Protection, February 24, 2013.

Exhibit 16	Panel Review Report of Vegetation Treatment Program Environmental Impact Report Draft, California Board of Forestry and Fire Protection in Association with CAL FIRE Agency, August 2014.
Exhibit 17	Letter from Dan Silver, Executive Director, Endangered Habitats League to Duane Shintaku, Deputy Director, California Department of Forestry and Fire Protection, October 2, 2014.

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May 31, 2016

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Via Email: VegetationTreatment@bof.ca.gov

Dear Ms. Hannigan and Members of the Board:

The recently revised Draft Program Environmental Impact Report for the proposed Vegetation Treatment Program again fails to meet the requirements of good science, rational project analysis, and the California Environmental Quality Act (CEQA). It also fails to address the most effective ways to protect lives and property from wildfire. In this light, our comments from February 15, 2013 remain relevant as to the many issues of concern with the revised DPEIR.

The latest draft again contains:
- Environmental impacts of clearance operations that are dismissed without support;
- Clearance of northern chaparral being justified by unsupported concepts;
- Research from several scientists that continues to be misrepresented (despite corrections that have been submitted); and
- A continuing lack of transparency concerning public involvement and notification process regarding clearance projects.

The document also reveals a significant number of inconsistencies as it initially references current science, only to qualify or ignore it later in order to support the Program's objectives. By using contradictory statements, undefined terms, and legally inadequate mitigation processes, the document abounds in ambiguity. It appears to be a program in search of confirming data rather than one developed from analysis examining the actual problem.

The most concerning issue, however, relates to the failure of the document to provide a key component of a programmatic EIR - providing a more exhaustive consideration of effects and cumulative impacts than could be accomplished at the project level (14 CCR § 15168).

Instead, volumes of repetitive text are punctuated with the unsupported claim that determining impacts is impossible, deferring to project managers to determine with a checklist and standard project requirements that depend on subjective judgments.

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This effort to clear native vegetation appears to ignore the Greenhouse Gas Reduction Fund expenditures that specify preserving habitat, specifically forest habitat. It is another sign of two agencies working under the same banner that are, in fact, working against one another. In addition, there is a glaring lack of analysis on the GHG emmissions from the use of heavy equipment in the proposed vegetation removal and the loss of carbon sequestration from the removed vegetation that further counters the State's intent to reduce GHG impacts in California.

How does the DPEIR justify ignoring a thorough examination of impacts as required by CEQA? The DPEIR vacillates between claiming the Program is too large and complex to analyze, or the actual treatment areas are too small to have an impact.

As a consequence, the current DPEIR fails to provide adequate support for concluding that the proposed program will not have a significant effect on the environment.

Friends of Harbors, Beaches and Parks strongly opposes the conclusions of this faulty document, as we did in our letter of February 15, 2013 for the prior Draft. We believe that it is imperative that the Board and staff re-evaluate the baseline approach to formulate a new and comprehensive program to address vegetation treatment only within the immediate vicinity (100 meters) of occupied residential structures in California.

Sincerely,

Jean H. Watt
President

cc: Russ Henley, Natural Resources Agency

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February 15, 2013

Board of Forestry and Fire Protection
Attn: George Gentry
Executive Officer
VegetationTreatment@fire.ca.gov
Sacramento, CA 94244-2460

Re: Draft Program EIR for the Vegetation Treatment Program

Dear Mr. Gentry and Board Members:

Friends of Harbors, Beaches and Parks (FHBP) is a countywide non-profit organization in Orange County, California. Our mission is to protect the natural lands, waterways and beaches. In addition to our Coalition of more than 80 conservation and community groups, FHBP has more than 5,000 individuals that support our regional work. We are writing you today to provide comments on the Draft Program Environmental Impact Report (PEIR).

While we support the program's intended goal to "lower the risk of catastrophic wildfires" we do not support the approach. We are surprised to read that the State Board of Forestry and Fire Protection (BOF) plans to eliminate vegetation through the removal, rearrangement or conversion of vegetation. This is not only unacceptable but also demonstrates the BOF is moving in a backwards direction from appropriate scientific methodologies The removal of vegetation ~~have~~ has significant and unavoidable impacts to our ecosystems and our communities including:

- Loss of endangered and threatened species
- Loss of native habitat for our wildlife
- Increased erosion
- Decreased water quality,

In normal instances of habitat removal, say for a housing development, the state and federal resource and permitting agencies would require quantified restoration and/or protection of adjacent areas through acquisition and dedication.

If the BOF would like to reduce the number, frequency, and size of catastrophic wildfires we respectfully recommend you start by implementing good land use planning that no longer puts people in harm's way. State regulations should require that local jurisdictions no longer allow residential development at the Wildland-Urban Interface (WUI). By increasing the WUI and adding or expanding roadways into natural areas, there is an increase in not only the danger to those new home owners, but an increase in the fire ignition points.

It also seems the BOF believes the native vegetation is at fault. We disagree and so does the science. Instead the entire environment needs to be evaluated from the location of the homes to the types of homes and building materials, emergency and evacuation plans as well as the types of fire suppression available (such as hardening the edges of roadways, properly maintained utility lines, etc.) It is disturbing to think that in 2013 the State of California actually believes removing habitat is the best approach to protecting that habitat and homes.

Another land use recommendation would be to understand where and why fires are starting. We recommend you review the study completed by Hills For Everyone which documents 100 years of fire history near Chino Hills State Park. You'll discover that in the approximate 97 year history, of the 103 fires they were able to obtain data for two of the fires were natural. The remainder (101 fires) were human caused and the most common causes were arson, car fires and powerlines. In other words it seems fire prevention needs to be aimed at the humans igniting the fires and having increased access to the wildlands because of poorly planned developments and road access. This study is available online at: http://www.hillsforeveryone.org/projects/fire-study.html

Additionally, if removing the vegetation actually solved the problem of catastrophic wildfires we would agree with you. But the reality is, when you remove the native vegetation, the non-native vegetation moves in in its place. Non-native vegetation dries earlier, ignites easier and spreads wildfire faster than native vegetation. By removing native vegetation you simply increase the amount of fuel, its ability to ignite and its ability to spread fire. You get the exact opposite of what you had hoped for – more and more intense fires.

We are also distrubed by the PEIR approach. Can the entire state of California be treated as one big habitat when local conditions exist that should be considered when planning for wildfire suppression? We believe individuals and organizations should be allowed to review each individual project under the requirements of the California Environmental Quality Act. Instead, the BOF proposes a "trust us" approach that includes a yet-to-be created checklist and the specific management actions on the lands.

We also disagree that the plants and animals are at risk from catastrophic wildfire. The reality is, the bigger risk for them, based on your plans, is loss of habitat. Instead of losing a few hundred acres from a wildfire in a season they will lose more than 38 million acres of habitat in one fell swoop. To that end, FHBP requests that the BOF retract the Vegetation Treatment Program PEIR and create a program that will properly consider the entire fire environment, reflect regional differences, allow for independent oversight, and incorporate the most up to date science.

Thank you for your time and consideration of our comments.

Sincerely,

Jean H. Watt

Jean H. Watt
President

California Native Plant Society
East Bay Chapter
Conservation Committee

May 31, 2016

California Board of Forestry and Fire Protection
Attn: Edith Hannigan, Board Analyst
Email: VegetationTreatment@bof.ca.gov

(As duplicated in part, with permission from California Chaparral Institute comment letter, submitted 5/24/16, please also reference their thorough list of resources cited.)

Re: Comments on Draft Programmatic Environmental Impact Report For The Vegetation Treatment Program of the California State Board of Forestry and Fire Protection

Dear Ms. Hannigan and Members of the Board,

It is with a deep sense of disappointment to find that the current Draft Programmatic Environmental Impact Report (DPEIR) for the state's proposed Vegetation Treatment Program contains many of the same errors (some with the exact wording), contradictions, and failures to identify environmental impacts that were pointed out in previous versions.

Many of the productive suggestions provided to the Board of Forestry on how they could improve the draft DPEIR were ignored, including those from the California Legislature's required review by the California Fire Science Consortium, the Department of Fish and Wildlife, fire scientists, and environmental groups.

Potential impacts are dismissed by the DPEIR without support, mitigations of impacts are unenforceable and unmeasurable, the treatment of northern chaparral is justified by non sequitur reasoning, and the research of several scientists continues to be misrepresented (despite corrections being submitted). The lack of transparency remains a significant issue – using a local newspaper to inform the public about projects is no longer adequate. One of the most egregious examples of the DPEIR's failure is the continued use of outdated and inadequate spatial data that provides the foundation for the entire Program. Although updated data is available from Cal Fire itself, **the DPEIR ignores this rich resource** and depends instead on questionable information from decades ago.

As a consequence, the current DPEIR fails to meet the requirements of the California Environmental Quality Act (CEQA).

The DPEIR also reveals **a significant number of inconsistencies** as the document initially references current science to only qualify or ignore it later in order to support the

Program's objectives. By using contradictory statements, undefined terms, and legally inadequate mitigation processes, the document is a testament in ambiguity. It appears to be a program in search of confirming data rather than one developed from examining the actual problem.

The most concerning issue, however, relates to the failure of the document to provide a key component of a programmatic EIR - providing a more exhaustive consideration of effects and cumulative impacts than could be accomplished at the project level (14 CCR § 15168).

Instead, volumes of repetitive text are punctuated with the unsupported claim that determining impacts is impossible, pushing it off to project managers to determine with a checklist and standard project requirements that depend on subjective judgments. How does the DPEIR justify ignoring a thorough examination of impacts as required by CEQA? The document vacillates between claiming the Program is too large and complex to analyze, or the treatment areas are too small to have an impact.

As a consequence, the current DPEIR
- fails to provide adequate support for concluding that the proposed program will not have a significant effect on the environment
- fails to provide adequate guidance to prevent significant environmental harm
- fails to adequately support Cal Fire's mission to protect life, property, and natural resources

Briefly, the reasons for these failures include:

1. Circumventing CEQA
- impacts determined to be less than significant by the "Fallacy of Authority" (our conclusions are true because we say so – no evidence provided)
- lack of detail as required within a programmatic EIR
- passing on responsibility to project managers to determine potential impacts
- inadequate mitigation measures
- Significance Criteria to determine impact to biological resources dismissed without support

2. Substandard Research
- misrepresenting cited scientific literature
- dependence on anecdotal evidence
- contradictory statements
- ignoring information in the record
- cited references missing, non sequiturs

3. Inadequate Data
- outdated fire hazard analysis model/data unsuitable for project level planning
- utilizing coarse-scale maps that cannot provide sufficient detail for competent

analysis
- WUI assessments based on 26-year-old information
- dependence on maps that no longer reflect current conditions

The DPEIR also fails to properly address the impacts the Program may have on **carbon emissions and the loss of carbon sequestration** by the clearance of native habitats.
A list of **Suggested Improvements** will follow the evaluation below.

Our Hope

Having worked on the Vegetation Treatment Program since 2005, our experience with this process allows us to offer a uniquely informed evaluation of the DPEIR.
Despite addressing the same problems over and over again, after all the well-informed feedback, all the legal battles, and all the delays caused by failures to meet requirements of environmental compliance, we remain hopeful that a quality Vegetation Treatment Program will emerge in a collaborative manner.
For a quality Program to develop, however, the process must focus on **"How do we protect lives and property from wildfire?"** rather than the current priority, "How do we manage fuel?" These are different questions with very different solutions.

1. Circumventing CEQA

Failure to Determine Impacts

The lack of detail in the DPEIR is a clear violation of the California Environmental Quality Act's requirements for a programmatic EIR.
Throughout the document, the DPEIR completely ignores the necessary detail needed to determine if the Program will have significant impacts. Instead, it defers to managers at the individual project level because the Program is either too "large and complex" to consider the true environmental impacts within the DPEIR (4-116 among others), or too small because the projects average 260 acres (5-44 among others). By using the "Fallacy of Authority," the DPEIR claims without providing supporting evidence,
Because of the amount of acreage eligible but not receiving treatment under the VTP, the proposed Program would likely result in a less than significant cumulative effect on biological resources at the bioregional scale. (5-27)
The DPEIR frequently follows up these claims, again without supporting evidence, with the suggestion that the Program may actually provide a net environmental gain because it may "decrease the frequency, extent, or severity of wildfire." (5-32)

Such rationales have no merit. There is a rich source of literature describing the potential impacts, both local and cumulative, of "fuel treatments" as well as the ecological benefits of high-severity fires in crown fire ecosystems. The DPEIR should adhere to the requirements of CEQA and determine the overall environmental impact of the Program,

not pass the responsibility on to individual project managers via a checklist based on subjective opinions.
This failure to account for environmental impacts is troubling because it gives the impression that the DPEIR was not produced to comply with CEQA, but rather to accomplish its stated goal of streamlining the regulatory process (1-7). In fact, this is in line with the Board of Forestry's 2010 Strategic Fire Plan which endorses efforts to "remove regulatory barriers that limit hazardous fuel reduction activities" (Fire Plan Goal #5, objective "b").
While it may be within the rights of the Board of Forestry to lobby the legislature to change laws, CEQA is quite clear about what programmatic EIRs need to address. An EIR's purpose is to examine environmental impacts. The Board should produce a document that does so.

Sincerely,
Karen Whitestone
(submitted electronically)
Karen Whitestone
Conservation Analyst

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Hannigan, Edith@BOF

From: Shaye Wolf <swolf@biologicaldiversity.org>
Sent: Tuesday, May 31, 2016 5:44 PM
To: Vegetation Treatment Program@BOF; 'Shaye Wolf'
Subject: RE: CBD comments on the VTP DEIR, part 1 of 5

As a follow-up to my prior email, the email address for DEIR comments (VegetationTreatments@bof.ca.gov) was unable to receive the zipped folders with pdfs of the cited references that I emailed. Therefore, I have sent a memory stick with pdfs of the comment letter and all cited references by certified mail.

Please let me know if you have any questions.

Best,
Shaye

Shaye Wolf, Ph.D.
Climate Science Director
Center for Biological Diversity
Office: (510) 844-7101
Cell: (415) 385-5746

From: Shaye Wolf [mailto:swolf@biologicaldiversity.org]
Sent: Tuesday, May 31, 2016 4:32 PM
To: 'VegetationTreatment@bof.ca.gov'
Subject: CBD comments on the VTP DEIR, part 1 of 5

Please find attached a comment letter on the VTP DEIR submitted on behalf of the Center for Biological Diversity. I am also submitting pdfs of the cited references as zip files in four subsequent emails, labeled parts 2 to 5 of 5. Please contact me if you have any questions about these comments.

Best,
Shaye

Shaye Wolf, Ph.D.
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CENTER for BIOLOGICAL DIVERSITY Because life is good.

May 31, 2016

Via Internet Upload (VegetationTreatment@bof.ca.gov)

Board of Forestry and Fire Protection
ATTN: Edith Hannigan, Board Analyst
VTP Draft PEIR Comments
PO Box 944246
Sacramento, CA 94244-2460

Re: Vegetation Treatment Program (VTP) Draft Environmental Impact Report

To Whom It May Concern:

The Center for Biological Diversity (the "Center") submits the following comments on the Draft Program Environmental Impact Report ("DEIR") for the State's proposed Vegetation Treatment Program ("VTP" or "Program") prepared by the California Department of Forestry and Fire Protection ("Cal Fire"). The Center also joins, and incorporates by reference here, comments submitted on 27 May 2016 by Richard Halsey of the California Chaparral Institute and nine additional organizations, comments submitted on 24 May 2016 by The California Chaparral Institute, and comments submitted on 27 May 2016 by Shute, Mihaly, and Weinberger.

The Center is a non-profit organization with more than one million members and online activists and offices throughout the United States, including in Oakland, Los Angeles, and Joshua Tree, California. The Center's mission is to ensure the preservation, protection and restoration of biodiversity, native species, ecosystems, public lands and waters and public health. In furtherance of these goals, the Center's Climate Law Institute seeks to reduce U.S. greenhouse gas emissions and other air pollution to protect biological diversity, the environment, and human health and welfare. Specific objectives include securing protections for species threatened by global warming, ensuring compliance with applicable law in order to reduce greenhouse gas emissions and other air pollution, and educating and mobilizing the public on global warming and air quality issues.

Based on our review, we find that the DEIR fails to comply with the California Environmental Quality Act ("CEQA"), Public Resources Code § 21000 et seq., and the CEQA Guidelines, title 14, California Administrative Code, § 15000 et seq. The DEIR violates CEQA on numerous counts, including the following key deficiencies discussed further below: (1) the DEIR provides an inadequate analysis of the Program's environmental impacts; (2) Standard Project Requirements are actually mitigation measures and must be treated as such; (3) the DEIR fails to provide an accurate, stable, and finite project description; (4) the DEIR does not consider a reasonable range of alternatives; (5) the DEIR's justification for the VTP is not based on

substantial evidence; (6) key objectives of the VTP are not based on substantial evidence; (7) the DEIR fails to adequately disclose, analyze, assess the significance of, and propose mitigation for impacts to biological resources caused by the Program; (8) the DEIR fails to meet CEQA's requirements with regard to the analysis of greenhouse gas ("GHG") emissions.

While these comments focus on the deficiencies in the DEIR's analysis of impacts on biological resources and greenhouse gas emissions, significant and unlawful deficiencies pervade the remaining environmental impacts analyses as well. In short, the proposed VTP will result in a wide range of harmful environmental impacts that are not adequately disclosed, analyzed, or mitigated in the DEIR. The California State Board of Forestry and Fire Protection cannot lawfully approve the VTP based on this EIR.

I. The DEIR Provides an Inadequate Analysis of the Program's Environmental Impacts

The DEIR provides an impermissibly vague and cursory analysis of the VTP's environmental impacts, which is a fatal flaw that permeates the entire document. The DEIR attempts to justify the lack of detailed analysis by labeling itself a programmatic EIR and suggesting that there will be a future opportunity for environmental review when each project is implemented. DEIR at E-5. CEQA, however, does not allow an agency to defer analysis simply by labeling its EIR a "program EIR." CEQA recognizes that a program EIR "can provide an occasion for a *more exhaustive* consideration of effects and alternatives" than a project-specific EIR. Guidelines § 15168(b)(1) (emphasis added). In addition, program EIRs must "deal[] with the effects of the program as specifically and comprehensively as possible" and consider "cumulative impacts that might be slighted in a case-by-case analysis." *Id*. § 15168(b)(2), (c)(5). As the Court summarized in *Friends of Mammoth v. Town of Mammoth Lakes Redevelopment Agency*, 82 Cal.App.4th 511, 533 (2000)("[d]esignating an EIR as a program EIR also does not by itself decrease the level of analysis otherwise required in the EIR." The California Supreme Court also recently cautioned, "'[t]iering does not excuse the lead agency from adequately analyzing reasonably foreseeable significant environmental effects of the project and does not justify deferring such analysis to a later tier EIR or negative declaration."); *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova,* 40 Cal.4th 412, 431 (2007)(quoting Guidelines § 15152(b)).

Here, the DEIR fails as an informational document because it does not provide decision-makers and the public with adequate information about the impacts of the overall program. Moreover, the vague, cursory, deferred analysis in the program DEIR is not sufficient to support any later project-level decision-making. There is no process in the program DEIR that guarantees that a future, detailed environmental review will occur, or that environmental impacts will be disclosed, analyzed, and mitigated.

II. Standard Project Requirements are Actually Mitigation Measures and Must Be Treated as Such

Throughout the DEIR, Cal Fire presents Standard Project Requirements (SPRs) that "are program design elements for reducing or avoiding adverse environmental effects of the treatment activities that are set by the VTP and applied to individual projects." DEIR at 2-51-52. The DEIR broadly presumes these SPRs will mitigate any potentially significant impacts from the project. *See, e.g.,* DEIR at 3-8, 4-118, 4-429, 430. But this approach runs afoul of CEQA's requirement that impacts first be fully disclosed and analyzed separately from the mitigation analysis. As the court noted in *Lotus v. Dep't of Transportation*, separation of significance and mitigation/alternatives analysis ensures that appropriate mitigation measures have been considered and that decision makers and the public can "intelligently analyze the logic of the [agency's] decision." *Lotus v. Dept. of Transportation*, 223 Cal. App. 4th 645, 655-656 (2014). In *Lotus*, the EIR for a highway through an old-growth redwood stand assumed that because certain mitigation measures to minimize damage were proposed as part of the project, the impact was non-significant. The court, however, held that the EIR was deficient because it failed to first identify the significant impacts and then appropriate alternatives and mitigation measures, consequently "subvert[ing] the purposes of CEQA by omitting material necessary to informed decisionmaking and informed public participation." *Id*. at 658. Similarly, the VTP DEIR impermissibly conflates the impacts analysis and mitigation analysis to the extent that it assumes SPRs will reduce impacts to the level of non-significance.[1]

The fallacy of relying on SPRs rather than quantified mitigation measures is particularly apparent with regard to greenhouse gases. Some of the SPRs that the DEIR claims will reduce GHG emissions do not appear to do so. For instance, SPR CC-1 states that the project coordinator will run GHG emission models to "confirm" that GHG emissions are minimized. DEIR at 4-432. Yet, there is zero indication what it means to "confirm" minimal emissions, and what changes would be implemented to reduce greenhouse gases. This SPR is not only ineffective on its face but also constitutes impermissible deferred mitigation. *See* CEQA Guidelines § 15126.4(a)(1)(B). The DEIR also indicates that implementation of mitigation measure AIR-3 would reduce greenhouse gas emissions (DEIR at 4-432) but, as noted below, the air quality mitigation measures are aimed at reducing criteria pollutants such as particulate matter that vary inversely with CO_2 emissions. Had the effectiveness of these and other SPRs been subjected to the detailed analysis required for mitigation measures under CEQA, the shortcomings in assumed GHG reductions would have become evident. Furthermore, without sufficient information on the effectiveness of each mitigation measure, the DEIR fails as an

[1] The fact that some of the SPRs may also be regulatory requirements does not excuse the DEIR's lack of analysis. Compliance with a regulatory requirement does not automatically reduce environmental impacts to a less-than-significant level. *See, e.g.*, *Californians for Alternatives to Toxics v. Department of Food & Agriculture*, 136 Cal. App. 4th 1, 16-17 (2005).

informational document under CEQA. *See, e.g., Sierra Club v. County of San Diego*, 231 Cal. App. 4th 1152 (2014).

Moreover, CEQA's requirements for mitigation measures are intended to ensure those measures are enforceable and are actually implemented. CEQA prohibits public agencies from approving projects with significant environmental impacts unless all feasible mitigation measures to minimize those impacts are adopted. *See* Pub. Res. Code §§ 21002, 21002.2(b), 21081. In doing so, the lead agency must "ensure that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded." *Federation of Hillside and Canyon Assns. v. City of Los Angeles*, 83 Cal.App.4th 1252, 1261 (2000) (italics omitted). Mitigation measures must be "fully enforceable," either through conditions of approval or through incorporation into a project itself. CEQA Guidelines § 15126.4(b). Where feasible mitigation measures exist, a public agency cannot approve a project without specifically finding that legally adequate measures have been incorporated into the project. *See* Pub. Res. Code § 21081(a)(1). An agency also must adopt a mitigation monitoring and reporting plan to ensure that measures are actually implemented following project approval. Pub. Res. Code § 21081.6(a)(1); CEQA Guidelines § 15097. If mitigation is infeasible, the agency must make a specific finding to this effect, and must adopt a statement of overriding considerations before it can approve the project. Pub. Res. Code § 21081(a)(3), (b); CEQA Guidelines §§ 15091(a)(3), 15093. Here, the DEIR improperly substitutes unenforceable, vague, and uncertain SPRs in place of the enforceable mitigation measures required under CEQA. The DEIR improperly relies on these vague SPRs to determine that each and every one of the Program's adverse impacts would be reduced to a less-than-significant level.

III. The DEIR Fails to Provide an Accurate, Stable, and Finite Project Description

In order for an environmental document to adequately evaluate the environmental ramifications of a project, it must first provide a comprehensive description of the project itself. An EIR must describe a proposed project with sufficient detail and accuracy to permit informed decision-making. *See* CEQA Guidelines § 15124. Indeed, "[a]n accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR." *San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus*, 27 Cal. App. 4th 713, 730 (1994), quoting *County of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193 (1977). As a result, courts have found that, even if an EIR is adequate in all other respects, the use of a "truncated project concept" violates CEQA and mandates the conclusion that the lead agency did not proceed in a manner required by law. *San Joaquin Raptor*, 27 Cal. App. 4th at 730. Furthermore, "[a]n accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity." *Id.* (citation omitted). Thus, an inaccurate or incomplete project description renders the analysis of significant environmental impacts inherently unreliable. *See Communities for a Better Env't v. City of Richmond*, 184 Cal. App. 4th 70, 82-83 (2010) (approval of EIR based on inadequate project description constitutes legal error).

Here, the DEIR's basic description of the Program is impermissibly vague and unstable. The DEIR states that the VTP will implement a wide range of fuel treatment projects across a vast area encompassing 21.9 million acres of habitat in California. DEIR at 3-10. Projects conducted under the VTP fall into three general types (wildland-urban interface, fuel breaks, and ecological restoration projects) that are subject to a potential "menu" of six broad vegetation treatment types (prescribed fire with pile burn, prescribed fire with broadcast burn, mechanical treatment, manual treatment, prescribed herbivory, and herbicides). DEIR at 2-16-17. These treatments "may be applied singularly or in any combination needed for a particular vegetation type to meet specific resource management objectives." DEIR at 2-33. Adding to the Program's uncertainty, the DEIR provides only gross approximations of the proportions of treatment types to be applied in each bioregion, and sets no limits on treatment amounts. DEIR at 2-38. Instead, the vegetation treatment type that will be applied is determined only at the project-level ("during the planning phase of a VTP project, the appropriate activity would be selected," DEIR at 2-33); similarly, the regimen of follow-up maintenance activities is set at the project-level. DEIR at 2-35 ("In general, all vegetation types require follow up maintenance to meet long-term vegetation management goals. The type of follow-up treatment and interval between treatments would depend on site conditions and project objectives."). Overall, within a ten-year period the DEIR estimates that there would be approximately 2,301 projects implemented with an average of 231 projects per year and 60,000 acres treated annually. Once again, the maximum number of acres treated every year is uncertain and unbounded ("the actual acres treated annually in any region will vary year-to-year based on several factors," DEIR at 2-35) and the locations where treatment activities could occur are provided only at an extremely coarse scale (see maps at Figures ES-1, 2.2-5, 2.2-8, 2.2-10, and 2.2-12). In essence, Cal Fire fails to provide any stable or finite definition of the types and amounts of treatments that will be applied to the landscape, nor where treatments will be applied.

The lack of a stable and finite project description renders analysis of the Project's environmental impacts impossible. The DEIR acknowledges that each type of treatment activity will have different environmental impacts. DEIR at 2-38 ("each of these activity types can have a characteristic impact on the environment"). However, without knowing which treatment types and amounts will be used in each bioregion, there is no way of assessing the environmental impacts that the Program's treatments will incur. Accordingly, the DEIR fails to provide an adequate description of the Project.

IV. The DEIR Does Not Consider a Reasonable Range of Alternatives

The DEIR does not complete an adequate analysis of project alternatives. The mitigation and alternatives sections are the "core" of the EIR, and an agency should not approve a project as proposed if there are feasible alternatives or mitigation measures that would substantially lessen the impact of the project. Pub. Resources Code § 21002; *Habitat and Watershed Caretakers v. City of Santa Cruz*, 213 Cal. App. 4th 1277, 1302 (2013). Under CEQA, an EIR must consider a range of reasonable alternatives that would feasibly attain most of the objectives of the Program

while avoiding or substantially lessening its significant impacts, and must compare the relative merits of these alternatives. CEQA Guidelines § 15126.6. Furthermore, the range of alternatives should be designed to "foster informed decision making." *Id*. The alternatives presented in the DEIR, however, fail to present a "range" because each alternative is simply some portion or combination of the same components as the preferred alternative. Yet, there are feasible alternatives that were not presented and would meet the objectives of the project and lessen environmental impacts. For instance, wildfire damage could be significantly reduced using a program that focuses "from the house out"[2] to reduce home flammability without extensive biomass removal.

The DEIR also dismisses a number of alternatives from consideration without sufficient analysis. Under CEQA, an agency must identify alternatives that were considered but rejected as infeasible. CEQA Guidelines §15126.6(c). In doing so, the agency must provide a reasoned analysis of its reasons because the public should not be expected to accept its determination on blind trust. *Laurel Heights Improvement Assn of San Francisco v. Regents of the University of California*, 47 Cal. 3d 376, 404 (1988); *Habitat and Watershed Caretakers v. City of Santa Cruz*, 213 Cal. App. 4th 1277, 1305 (2013). Furthermore, "an EIR should not exclude an alternative from detailed consideration merely because it would impede to some degree the attainment of the project objectives." *In re Bay-Delta*, 43 Cal. 4th 1143, 1165 (2008). Here, the DEIR rejects in rapid succession seven alternatives from further consideration. The DEIR quickly rejects these alternatives as failing to achieve project objectives and as "not consistent with 2010 Strategic Fire Plan for California or the 2012 Strategic Plan." DEIR at 3-37 to 3-40. Yet no explanation is given for what parts of these Strategic Plans are inconsistent or what aspects of the Project conflict with the stated objectives. Moreover, a generic and conclusory assertion of conflict with an agency's vision for management is not a valid basis for finding an alternative infeasible. The DEIR fails to provide adequate "facts or analysis" to enable the public to "understand and consider meaningfully the issues raised by the proposed project." *Laurel Heights*, 47 Cal. 3d at 405-405.

One alternative that the DEIR must analyze is a VTP limited to treating the defensible space around homes and other structures. As detailed below (Section V.H), on-the-ground research indicates that vegetation management within the defensible space in the 40-meter radius surrounding individual homes effectively protects homes from wildland fire, even intense fire, whereas management beyond the defensible space does not effectively protect homes. An alternative that analyzes vegetation treatments only in defensible space would greatly minimize the significant impacts of the Project while maximizing the protection of people, property, and natural resources of California, the stated mission of the Board and CalFire. DEIR at E-2.

[2] See http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_faqs#gen01.

V. The DEIR's Justification for the VTP Is Not Based on Substantial Evidence

The DEIR's justification for the VTP is predicated on assertions that are either unsupported by the best-available science or highly uncertain. The DEIR states that the purpose of the VTP is "lowering the risk of damaging wildfire in the SRA by managing wildland fuels through the use of environmentally appropriate vegetation treatments." DEIR at E-2. The DEIR asserts that "[i]n some forested portions of California fire suppression has created an uninterrupted accumulation of wildland fuels with resultant increases in fire hazard" (DEIR at E-1)[3] and that "climate change suggests a continuing and even accelerated risk from wildfire," including large-scale mortality from insects. DEIR at E-2.

However, the DEIR fails to provide supporting scientific evidence to show that wildfire in California's forests is burning at unnatural or unusual levels or severities and therefore should be reduced. The DEIR similarly presents no evidence showing that fire suppression and bark beetle outbreaks have led to increased fire activity in California. The DEIR further ignores the extensive body of scientific studies examining current effects of climate change on wildfire activity which indicates that fire severity and amount have not increased in California's forests. In addition, studies projecting the influence of climate change on future fire activity indicate that fire severity in California forests is likely to stay the same or decrease, and that climate change effects on future fire activity are highly uncertain. The DEIR makes no effort to address this evidence.

In contrast to the DEIR's unsupported assertions, the best-available science detailed below indicates that (1) wildfire is a natural and necessary component of California forests, California's mixed-conifer and ponderosa pine forests have been historically characterized by mixed-severity fire including significant amounts of high-severity fire, and high-severity fire creates biodiverse, ecologically important, and unique habitat; (2) California forests are experiencing a deficit of fire compared with historical conditions; (3) California's forests are not burning at higher severity or amount, nor are the most long-unburned forests burning at higher severity; (4) the projected effects of climate change on fire activity in California are highly uncertain; (5) bark beetle outbreaks have not increased annual area burned or fire severity; (6) trees killed by drought and beetles do not increase fire intensity or extent; and (7) vegetation management within the defensible space immediately surrounding homes effectively protects homes from wildland fire.

As a result, the DEIR is out of touch with the best-available science on wildfire activity in California and fails to provide a defensible justification for the VTP. Of added concern, the body of science detailed below demonstrates that treatment activities to reduce wildfire pursuant to the DEIR are likely to cause significant environmental harm to California's ecosystems.

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[3] Similarly, the DEIR states: "catastrophic high severity wildfire; which in most cases in California is the inevitable eventual consequence of lack of fuel reduction coupled with fire suppression." DEIR at 4-117.

While these comments focus on the DEIR's deficiencies related to forests, the DEIR is also scientifically unsupported in its discussion and analysis of shrublands, particularly chaparral, and grasslands, as detailed by other commentators. See comments submitted 24 May 2016 and 27 May 2106 by the California Chaparral Institute (incorporated by reference).

A. Wildfire, including high-severity fire, is a natural and necessary component of California's forested landscapes.

1. California mixed-conifer and ponderosa pine forests are characterized by mixed-severity fire.

Numerous studies and multiple lines of evidence demonstrate that California's mixed-conifer and ponderosa pine forests are characterized by mixed-severity fire that includes ecologically significant amounts of high-severity fire. Mixed-severity fire creates complex successional diversity, high biological diversity, and diverse stand structure across California's forested landscapes.

Baker 2014: A reconstruction of historical forest structure and fire across 330,000 ha of Sierra Nevada mixed-conifer forests using data from 1865-1885 demonstrates that these historical forests experienced mixed-severity fire over 43-48% of the land area, with high-severity fire over 31-39% and low-severity fire over just 13-26%. Historical forests were generally dense with abundant large trees, but numerically dominated by smaller pines and oaks. Smaller trees, understory seedlings, saplings and shrubs created abundant ladder fuels. The high-severity fire rotation was 281 years in the northern and 354 years in the southern Sierra, which contributed to high levels of heterogeneity, including abundant areas and large patches (up to 9,400 ha) of early successional forest and montane chaparral, as well as old-growth forest over large land areas. The author concludes that "[p]roposals to reduce fuels and fire severity would actually reduce, not restore, historical forest heterogeneity important to wildlife and resiliency."[4]

Beaty and Taylor 2001: On the western slope of the southern Cascades in California, historical fire intensity in mixed-conifer forests was predominantly moderate- and high-intensity, except in mesic canyon bottoms, where moderate- and high-intensity fire comprised 40.4% of fire effects [Table 7].)[5]

[4] Baker, W.L. 2014. Historical forest structure and fire in Sierran mixed-conifer forests reconstructed from General Land Office survey data. Ecosphere 5(7): Article 79.
[5] Beaty, R.M. and A.H. Taylor. 2001. Spatial and temporal variation of fire regimes in a mixed conifer forest landscape, Southern Cascades, USA. Journal of Biogeography 28: 955–966.

Bekker and Taylor 2001: On the western slope of the southern Cascades in California, in mixed-conifer forests, fire was predominantly high-intensity historically [Fig. 2F].[6]

Bekker and Taylor 2010: In mixed-conifer forests of the southern Cascades, reconstructed fire severity within the study area was dominated by high-severity fire effects, including high-severity fire patches over 2,000 acres in size [Tables I and II].[7]

Collins and Stephens 2010: In a modern "reference" forest condition within mixed-conifer/fir forests in Yosemite National Park, 15% of the area experienced high-intensity fire over a 33-year period—a high-intensity fire rotation interval of approximately 223 years.[8]

Halofsky et al. 2011: In the Klamath-Siskiyou Mountains of northwestern California and southwestern Oregon, a mixed-severity fire regime produces structurally diverse vegetation types with intimately mixed patches of varied age. The close mingling of early- and late-seral communities results in unique vegetation and wildlife responses, including high resilience of plant and wildlife species to mixed-severity fire.[9]

Hanson and Odion 2016: An assessment of US Forest Service forest survey data from 1910 and 1911 for central and southern Sierra Nevada ponderosa pine and mixed-conifer forests indicates that these historical forests had a mixed-severity fire regime, with an average of 26% high-severity fire effects. This study's findings are contrary to those of several other reports that use a very small subset of the available data from the 1910 and 1911 surveys, demonstrating the importance of analyzing data from sufficiently large spatial scales when drawing inferences about historical conditions.[10]

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[6] Bekker, M.F. and A.H. Taylor. 2001. Gradient analysis of fire regimes in montane forests of the southern Cascade Range, Thousand Lakes Wilderness, California, USA. Plant Ecology 155: 15-28.

[7] Bekker, M.F. and A.H. Taylor. 2010. Fire disturbance, forest structure, and stand dynamics in montane forest of the southern Cascades, Thousand Lakes Wilderness, California, USA. Ecoscience 17: 59-72.

[8] Collins, B.M. and S.L. Stephens. 2010. Stand-replacing patches within a mixed severity fire regime: quantitative characterization using recent fires in a long-established natural fire area. Landscape Ecology 25: 927939.

[9] Halofsky, J. E., D.C. Donato, D.E. Hibbs, J.L. Campbell, M. Donaghy Cannon, J.B. Fontaine, J.R. Thompson, R.G. Anthony, B.T. Bormann, L.J. Kayes, B.E. Law, D.L. Peterson, and T.A. Spies. 2011. Mixed-severity fire regimes: lessons and hypotheses from the Klamath-Siskiyou Ecoregion. Ecosphere 2(4): art40.

[10] Hanson, C.T. and D.C. Odion. 2016. Historical fire conditions within the range of the Pacific fishers and spotted owl in the central and southern Sierra Nevada, California, USA. Natural Areas Journal 36: 8-19.

Nagel and Taylor 2005: The authors found that large high-severity fire patches were a natural part of 19th century fire regimes in mixed-conifer and eastside pine forests of the Lake Tahoe Basin, and montane chaparral created by high-severity fire has declined by 62% since the 19th century due to reduced high-severity fire occurrence. The authors expressed concern about harm to biodiversity due to loss of ecologically rich montane chaparral.[11]

Odion et al. 2014: In the largest and most comprehensive analysis conducted to date regarding the historical occurrence of high-intensity fire, the authors found that ponderosa pine and mixed-conifer forests in every region of western North America had mixed-intensity fire regimes, which included substantial occurrence of high-intensity fire. The authors also found, using multiple lines of evidence, including over a hundred historical sources and fire history reconstructions, and an extensive forest age-class analysis, that we now have unnaturally low levels of high-intensity fire in these forest types in all regions, since the beginning of fire suppression policies in the early 20th century.[12]

2. High-severity fire creates important habitat critical to numerous species.

High-severity fire creates complex, biodiverse, ecologically important, and unique habitat (often called "snag forest habitat"), which often has higher species richness and diversity than unburned old forest. Plant and animal species in the forest evolved with fire, and many of these species (such as the black-backed woodpecker[13]) depend on wildfires, and particularly high-severity fires, to reproduce and grow. Fire helps to return nutrients from plant matter back to soil, the heat from fire is necessary to the germination of certain types of seeds, and the snags (dead trees) and early successional forests created by high-severity fire create habitat conditions that

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[11] Nagel, T.A. and A. H. Taylor. 2005. Fire and persistence of montane chaparral in mixed conifer forest landscapes in the northern Sierra Nevada, Lake Tahoe Basin, California,USA. J. Torrey Bot. Soc.132: 442-457.

[12] Odion, D.C., C.T. Hanson, A. Arsenault, W.L. Baker, D.A. DellaSala, R.L. Hutto, W. Klenner, M.A. Moritz, R.L. Sherriff, T.T. Veblen, and M.A. Williams. 2014. Examining historical and current mixed-severity fire regimes in Ponderosa pine and mixed-conifer forests of western North America. Plos One 9(2): e87852. *See also* response and rebuttal: Odion D.C., C.T. Hanson, W.L. Baker, D.A. DellaSala, and M.A. Williams. 2016. Areas of agreement and disagreement regarding ponderosa pine and mixed conifer forest fire regimes: a dialogue with Stevens et al. PLoS ONE 11(5): e0154579; Stevens J.T. et al. 2016. Average stand age from forest inventory plots does not describe historical fire regimes in ponderosa pine and mixed-conifer forests of western North America. PLoS ONE 11(5): e0147688.

[13] Seavy, N.E., R.D. Burnett, and P.J. Taille. 2012. Black-backed woodpecker nest tree preference in the burned forests of the Sierra Nevada, California. Wildlife Society Bulletin 36: 722-728; Tingely, M.W., R.L. Wilkerson, M.L. Bond, C.A. Howell, and R.B. Siegel. 2014. Variation in home-range size of black-backed woodpeckers. The Condor 116: 325-340.

are beneficial to wildlife. Early successional forests created by high-severity fire support some of the highest levels of native biodiversity found in temperate conifer forests.

Bond et al. 2009: In a radio-telemetry study, California spotted owls preferentially selected high-intensity fire areas, which had not been salvage logged, for foraging, while selecting low- and moderate-intensity areas for nesting and roosting.[14]

Buchalski et al. 2013: In mixed-conifer forests of the southern Sierra Nevada, rare myotis bats were found at greater levels in unmanaged high-severity fire areas of the McNally fire than in lower fire severity areas or unburned forest.[15]

Burnett et al. 2010: Bird species richness was approximately the same between high-severity fire areas and unburned mature/old forest at 8 years post-fire in the Storrie fire, and total bird abundance was greatest in the high-severity fire areas of the Storrie fire [Figure 4]. Nest density of cavity-nesting species increased with higher proportions of high-severity fire, and was highest at 100% [Figure 8].[16]

Cocking et al. 2014: High-intensity fire areas are vitally important to maintain and restore black oaks in mixed-conifer forests.[17]

DellaSala et al. 2014: Complex early seral forests in the Sierra Nevada of California, which are produced by mixed-severity fire including large high severity patches, support diverse plant and wildlife communities that are essential to the region's ecological integrity. Fire suppression and biomass removal after fire reduce structural complexity, diversity, and resilience in the face of climate change.[18]

Donato et al. 2009: The high-severity re-burn [high-severity fire occurring 15 years after a previous high-severity fire] had the highest plant species richness and total plant cover, relative to high-severity fire alone [no re-burn] and unburned mature/old forest; and the high-

[14] Bond, M.L., D.E. Lee, R.B. Siegel, and J.P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73: 1116-1124.
[15] Buchalski, M.R., J.B. Fontaine, P.A. Heady III, J.P. Hayes, and W.F. Frick. 2013. Bat response to differing fire severity in mixed-conifer forest, California, USA. PLoS ONE 8: e57884.
[16] Burnett, R.D., P. Taillie, and N. Seavy. 2010. Plumas Lassen Study 2009 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA.
[17] Cocking M.I., J.M. Varner JM, and E.E. Knapp. 2014. Long-term effects of fire severity on oak-conifer dynamics in the southern Cascades. Ecological Applications 24: 94-107.
[18] DellaSala, D., M.L. Bond, C.T. Hanson, R.L. Hutto, and D.C. Odion. 2014. Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity? Natural Areas Journal 34: 310-324.

severity fire re-burn area had over 1,000 seedlings/saplings per hectare of natural conifer regeneration.[19]

Franklin et al. 2000: The authors found that stable or increasing populations of spotted owls resulted from a mix of dense old forest and complex early seral habitat, and less than approximately 25% complex early seral habitat in the home range was associated with declining populations [Fig. 10]; the authors emphasized that the complex early seral habitat was consistent with high-intensity fire effects, and inconsistent with clearcut logging.[20]

Hanson and North 2008: Black-backed woodpeckers depend upon dense, mature/old forest that has recently experienced higher-intensity fire, and has not been salvage logged.[21]

Hanson 2013: Pacific fishers use pre-fire mature/old forest that experienced moderate/high-intensity fire more than expected based upon availability, just as fishers are selecting dense, mature/old forest in its unburned state. When fishers are near fire perimeters, they strongly select the burned side of the fire edge. Both males and female fishers are using large mixed-intensity fire areas, such as the McNally fire, including several kilometers into the fire area.[22]

Hanson 2015: Pacific fisher females in the Sierra Nevada use unlogged higher severity fire areas, including very large high-severity patches. In the McNally fire area at 10 to 11 years postfire, female fishers used the large, intense fire area significantly more than unburned forest, and females were detected at multiple locations >250m into the interior of a very large (>5,000 ha), unlogged higher severity fire patch. The author concludes that these results "suggest a need to revisit current management direction, which emphasizes extensive commercial thinning and postfire logging to reduce fuels and control fire."[23]

Hutto 1995: *A study in the northern Rocky Mountain region found that 15 bird species are generally more abundant in early post-fire communities than in any other major cover type*

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[19] Donato, D.C., J.B. Fontaine, W.D. Robinson, J.B. Kauffman, and B.E. Law. 2009. Vegetation response to a short interval between high-severity wildfires in a mixed-evergreen forest. Journal of Ecology 97:142-154.

[20] Franklin, A.B., D.R. Anderson, R.J. Gutierrez, and K.P. Burnham. 2000. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California.Ecological Monographs 70: 539-590.

[21] Hanson, C. T. and M. P. North. 2008. Postfire woodpecker foraging in salvage-logged and unlogged forests of the Sierra Nevada. Condor 110: 777–782.

[22] Hanson, C.T. 2013. Pacific fisher habitat use of a heterogeneous post-fire and unburned landscape in the southern Sierra Nevada, California, USA. The Open Forest Science Journal 6: 24-30.

[23] Hanson, C.T. 2015. Uses of higher severity fire areas by female Pacific fishers on the Kern Plateau, Sierra Nevada, California, USA. Wildlife Society Bulletin 39: 497-502.

occurring in the northern Rockies. Standing, fire-killed trees provided nest sites for nearly two-thirds of 31 species that were found nesting in the burned sites.[24]

Hutto 2008: Severely burned forest conditions have occurred naturally across a broad range of forest types for millennia and provide an important ecological backdrop for fire specialists like the black-backed woodpecker.[25]

Hutto et al. 2016: This review highlights that high severity fire was historically common in western conifer forests and is ecologically essential. Many animal and plant species depend on severely burned forests for persistence. The researchers recommend a "more ecologically informed view" of severe forest fire, including changes in management and education to maintain ecologically necessary levels of severe fire and the complex early-seral forest conditions it creates.[26]

Lee and Bond 2015: California spotted owls exhibited high site occupancy in post-fire landscapes during the breeding season following the 2013 Rim Fire, even where large areas burned at high severity; the complex early seral forests created by high-severity fire appear to provide important habitat for the small mammal prey of the owl.[27]

Malison and Baxter 2010: In ponderosa pine and Douglas-fir forests of Idaho at 5-10 years post-fire, levels of aquatic insects emerging from streams were two and a half times greater in high-intensity fire areas than in unburned mature/old forest, and bats were nearly 5 times more abundant in riparian areas with high-intensity fire than in unburned mature/old forest.[28]

Ponisio et al. 2016: A study of plant–pollinator communities in mixed-conifer forest in Yosemite National Park found that pyrodiversity (the diversity of fires within a region) increases the richness of the pollinators, flowering plants, and plant-pollinator interactions, and buffers pollinator communities against the effects of drought-induced floral resource scarcity. The

[24] Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: 1041–1058.
[25] Hutto, R. L. 2008. The ecological importance of severe wildfires: Some like it hot. Ecological Applications 18: 1827–1834.
[26] Hutto, R.L., R.E. Keane, R.L. Sherriff, C.T. Rota, L.A. Eby, and V.A. Saab. 2016. Toward a more ecologically informed view of severe forest fires. Ecosphere 7(2):e01255.
[27] Lee, D.E. and M.L. Bond. 2015. Occupancy of California spotted owl sites following a large fire in the Sierra Nevada, California. The Condor 117: 228-236.
[28] Malison, R.L. and C.V. Baxter. 2010. The fire pulse: wildfire stimulates flux of aquatic prey to terrestrial habitats driving increases in riparian consumers. Canadian Journal of Fisheries and Aquatic Sciences 67: 570-579.

authors conclude that lower fire diversity is likely to negatively affect the richness of plant–pollinator communities across large spatial scales. [29]

Raphael et al. 1987: At 25 years after high-intensity fire, total bird abundance was slightly higher in snag forest than in unburned old forest in eastside mixed-conifer forest of the northern Sierra Nevada; and bird species richness was 40% higher in snag forest habitat. In earlier post- fire years, woodpeckers were more abundant in snag forest, but were similar to unburned by 25 years post-fire, while flycatchers and species associated with shrubs continued to increase to 25 years post-fire.[30]

Sestrich et al. 2011: Native bull and cutthroat trout tended to increase with higher fire intensity, particularly where debris flows occurred. Nonnative brook trout did not increase.[31]

Siegel et al. 2012: Many more species occur at high burn severity sites starting several years post-fire, and these include the majority of ground and shrub nesters as well as many cavity nesters. Secondary cavity nesters, such as swallows, bluebirds, and wrens, are particularly associated with severe burns, but only after nest cavities have been created, presumably by the pioneering cavity excavating species such as the black-backed woodpecker. As a result, fires that create preferred conditions for black-backed woodpeckers in the early post-fire years will likely result in increased nesting sites for secondary cavity nesters in successive years.[32]

Swanson et al. 2010: A literature review concluding that some of the highest levels of native biodiversity found in temperate conifer forest types occur in complex early successional habitat created by stand-initiating [high severity] fire.[33]

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[29] Ponisio, L.C., K. Wilken, L.M. Gonigle, K. Kulhanek, L. Cook, R. Thorp, T. Griswold, and C. Kremen. 2016. Pyrodiversity begets plant-pollinator community diversity. Global Change Biology 22: 1794-1808.
[30] Raphael, M.G., M.L. Morrison, and M.P. Yoder-Williams. 1987. Breeding bird populations during twenty-five years of postfire succession in the Sierra Nevada. The Condor 89: 614-626.
[31] Sestrich, C.M., T.E. McMahon, and M.K. Young. 2011. Influence of fire on native and nonnative salmonid populations and habitat in a western Montana basin. Transactions of the American Fisheries Society 140: 136-146.
[32] Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2012. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2011 Annual Report. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification #4; U.S. Forest Service Pacific Southwest Region, Vallejo, CA.
[33] Swanson, M.E., J.F. Franklin, R.L. Beschta, C.M. Crisafulli, D.A. DellaSala, R.L. Hutto, D. Lindenmayer, and F.J. Swanson. 2010. The forgotten stage of forest succession: early-successional ecosystems on forest sites. Frontiers Ecology & Environment 9: 117-125.

B. California's forests have a deficit of fire, including a deficit of high-severity fire, compared with historical conditions.

Studies indicate that California's forests are experiencing a significant fire deficit compared with pre-settlement conditions, meaning that there is much less fire on the landscape than there was historically (Mouillet and Field 2005, Stephens et al. 2007, Marlon et al. 2012, Odion et al. 2014, Parks et al. 2015).[34] A recent analysis by Parks et al (2015) reported that California forests, including Sierra Nevada and southern Cascades forests, experienced a significant fire deficit during the recent 1984-2012 study period, attributed to fire suppression activities.[35] According to Stephens et al. (2007), prior to 1800, an estimated 18 to 47 times more area burned each year in California, including 20 to 53 times more forest area, than has burned annually during recent decades: "skies were likely smoky much of the summer and fall." This study estimated that 1.8 million to 4.8 million hectares burned each year in California prior to 1800, of which 0.5 million to 1.2 million hectares were forest, compared to just 102,000 hectares burned each year between 1950-1999, of which 23,000 hectares were forest. Based on this extreme fire deficit, Stephens et al. (2007) recommend "increasing the spatial extent of fire in California [as] an important management objective." Odion et al. (2014) similarly found evidence that there is currently much less high-severity fire in California's mixed-conifer and ponderosa pine forests than compared with historical levels.

C. Scientific studies are finding no significant trends in wildfire activity: California forests are not experiencing an increase in fire severity or burned area.

Scientific evidence does not indicate that wildfire activity is at unnatural levels in California's forests and therefore must be reduced. Notably, the majority of studies that have analyzed recent trends in fire severity, area burned, and fire frequency in California forests have found no significant trends in these metrics.

Eleven studies have analyzed recent trends in fire severity in California's forests in terms of proportion, area, and/or patch size. Nine of eleven studies found no significant trend in fire

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[34] Mouillot, F. and C. Field. 2005. Fire history and the global carbon budget: a 1º x 1º fire history reconstruction for the 20th century. Global Change Biology 11: 398-420; Stephens, S.L., R.E. Martin, and N.E. Clinton. 2007. Prehistoric fire area and emissions from California's forests, woodlands, shrublands and grasslands. Forest Ecology and Management 251: 205-216; Marlon, J.R., Bartlein, P.J., Gavin, D.G., Long, C.J., Anderson, R.S., Briles, C.E., Brown, K.J., Colombaroli, D., Hallett, D.J., Power, M.J., Scharf, E.A., and M.K. Walsh. 2012. Long-term perspective on wildfires in the western USA. PNAS 109: E535–E543; Odion, D.C. et al. 2014; Parks, S.A., C. Miller, M-A Parisien, L.M. Holsinger, S.Z. Dobrowski, and J. Abatzoglou. 2015. Wildland fire deficit and surplus in the western United States, 1984-2012. Ecosphere 6: Article 275.

[35] Parks, S.A. et al. 2015.

severity, including: Baker 2015 (California dry pine and mixed conifer forests), Collins et al. 2009 (central Sierra Nevada), Dillon et al. 2011 (Northwest California), Hanson et al. 2009 (Klamath, southern Cascades), Hanson and Odion 2014 (Sierra Nevada, southern Cascades), Miller et al. 2012 (four Northwest CA forests), Odion et al. 2014 (eastern and western Sierra Nevada, eastern Cascades), Picotte et al. 2016 (California forest and woodland), and Schwind 2008 (California forests).[36] The two studies that report an increasing trend in fire severity—Miller et al. 2009 and Miller and Safford 2012 (Sierra Nevada, southern Cascades)[37]—were refuted by Hanson and Odion (2014) using a larger dataset.

Hanson and Odion (2014) conducted the first comprehensive assessment of fire intensity since 1984 in the Sierra Nevada using 100% of available fire intensity data, and found no increasing trend in terms of high-intensity fire proportion, area, mean patch size, or maximum patch size. Hanson and Odion (2014) reviewed the approach of Miller et al. (2009) and Miller and Safford (2012) for bias, due to the use of vegetation layers that post-date the fires being analyzed in those studies. Hanson and Odion (2014) found that there is a statistically significant bias in both studies ($p = 0.025$ and $p = 0.021$, respectively), the effect of which is to exclude relatively more conifer forest experiencing high-intensity fire in the earlier years of the time series, thus creating the erroneous appearance of an increasing trend in fire severity. Hanson and Odion (2014) also found that the regional fire severity data set used by Miller et al. (2009) and Miller and Safford (2012) disproportionately excluded fires in the earlier years of the time series,

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[36] Baker, W.L. 2015. Are high-severity fires burning at much higher rates recently than historically in dry-forest landscapes of the Western USA? PLoS ONE 10(9): e0136147; Collins, B.M., J.D. Miller, A.E. Thode, M. Kelly, J.W. van Wagtendonk, and S.L. Stephens. 2009. Interactions among wildland fires in a long-established Sierra Nevada natural fire area. Ecosystems 12:114–128; Dillon, G.K., et al. 2011. Both topography and climate affected forest and woodland burn severity in two regions of the western US, 1984 to 2006. Ecosphere 2: Article 130; Hanson, C.T., D.C. Odion, D.A. DellaSala, and W.L. Baker. 2009. Overestimation of fire risk in the Northern Spotted Owl Recovery Plan. Conservation Biology 23:1314–1319; Hanson, C.T., and D.C. Odion. 2014. Is fire severity increasing in the Sierra Nevada mountains, California, USA? International Journal of Wildland Fire 23: 1-8; Miller, J.D., C.N. Skinner, H.D. Safford, E.E. Knapp, and C.M. Ramirez. 2012. Trends and causes of severity, size, and number of fires in northwestern California, USA. Ecological Applications 22: 184-203; Odion, D.C. et al. 2014; Picotte, J.J., B. Peterson, G. Meier, and S.M. Howard. 2016. 1984-2010 trends in fire burn severity and area for the coterminous US. International Journal of Wildland Fire 25: 413-420; Schwind, B. 2008. Monitoring trends in burn severity: report on the Pacific Northwest and Pacific Southwest fires (1984 to 2005). USGS.

[37] Miller, J.D., H.D. Safford, M.A. Crimmins, and A.E. Thode. 2009. Quantitative evidence for increasing forest fire severity in the Sierra Nevada and southern Cascade Mountains, California and Nevada, USA. Ecosystems 12:16–32; Miller, J.D. and H. Safford. 2012. Trends in wildfire severity: 1984-2010 in the Sierra Nevada, Modoc Plateau, and southern Cascades, California, USA. Fire Ecology 8(2): 41-57.

relative to the standard national fire severity data set (www.mtbs.gov) used in other fire severity trend studies, resulting in an additional bias which created, once again, the inaccurate appearance of relatively less high-severity fire in the earlier years, and relatively more in more recent years.

Of note, Baker (2015) found that the rate of recent (1984–2012) high-severity fire in dry pine and mixed conifer forests in California is within the range of historical rates, or is too low. There were no significant upward trends from 1984–2012 for area burned and fraction burned at high severity. The author concluded that "[p]rograms to generally reduce fire severity in dry forests are not supported and have significant adverse ecological impacts, including reducing habitat for native species dependent on early-successional burned patches and decreasing landscape heterogeneity that confers resilience to climatic change."

In studies of area burned, Dennison et al. (2014) found no significant increase in annual fire area in the Sierra Nevada/Klamath/Cascades forest ecoregion in California during the 1984-2011 study period, nor a significant trend toward an earlier fire season in this or any other western ecoregion.[38] Similarly, Dillon et al. (2011) detected no trends in annual area burned in the two ecoregions that occur in part in northern California (i.e., Pacific, Inland Northwest) during the 1984-2006 study period.[39]

Studies that have analyzed recent trends in the number of fires in California's forests have reported conflicting results. Two studies found no trend in the number of fires: Schwind (2008) and Syphard et al. (2007).[40] Westerling et al. (2006) averaged data across forested regions in the western United States between 1970 and 2003 and reported that a marked shift occurred during the mid-1980s toward a higher frequency of large fires in the western US, although trends since the mid-1980s were less clear.[41]

D. The most long-unburned forests are not burning at higher fire severity.

Studies empirically investigating the assumption that the most long-unburned forests are burning predominantly at high severity have consistently found that forest areas in California that have missed the largest number of fire return intervals are not burning at higher fire severity. Specifically, six empirical studies that have investigated this question found that the most long-

[38] Dennison, P.E., Brewer, S.C., Arnold, J.D., and M.A. Moritz. 2014. Large wildfire trends in the western United States, 1984-2011. Geophysical Research Letters 41: 2928–2933.
[39] Dillon, G.K., et al. 2011.
[40] Schwind, B. 2008; Syphard, A.D., V.C. Radeloff, J.E. Keeley, T.J. Hawbaker, M.K. Clayton, S.I. Stewart, and R.B. Hammer. 2007. Human influence on California fire regimes. Ecological Applications 17(5): 1388-1402.
[41] Westerling A.L., H.G. Hidalgo, D.R. Cayan, T.W. Swetnam. 2006. Warming and earlier spring increase western US forest wildfire activity. Science 313: 940–43.

unburned (most fire-suppressed) forests burned mostly at low/moderate-severity, and did not have higher proportions of high-severity fire than less fire-suppressed forests. Forests that were not fire suppressed (those that had not missed fire cycles, i.e., Condition Class 1, or "Fire Return Interval Departure" class 1) generally had levels of high-severity fire similar to, or higher than, those in the most fire-suppressed forests, as found by Odion et al. 2004, Odion and Hanson 2006, Odion and Hanson 2008, Odion et al. 2010, Miller et al. 2012, and van Wagtendonk et al. 2012.[42]

E. The projected impacts of climate change on wildfire activity in California are uncertain.

While climate change will almost certainly alter fire activity in many California ecosystems, scientific research does not indicate that climate change will increase fire severity nor necessarily increase fire amount in California forests. As described above, the majority of studies that have analyzed recent wildfire trends in California forests have found no significant trends in fire activity. Studies that project trends in fire activity under climate change scenarios indicate that fire severity in California forests is likely to stay the same or decrease, and projection studies show no consensus on how climate change is likely to affect future fire probability or area burned in California forests, as detailed below.

Notably, a recent study by Parks et al. (2016) projected that most areas of the western US, including California's forested areas, will experience decreases or no change in fire severity by mid-century (2040-2069) under the highest-emission RCP 8.5 scenario used in global climate models.[43] Three studies that have projected changes in the probability of burning or the probability of a large fire occurring show no consensus, with projections for no change,

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[42] Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala, and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the Klamath Mountains, northwestern California. Conservation Biology 18: 927-936; Odion, D.C., and C.T. Hanson. 2006. Fire severity in conifer forests of the Sierra Nevada, California. Ecosystems 9: 1177-1189; Odion, D.C., and C.T. Hanson. 2008. Fire severity in the Sierra Nevada revisited: conclusions robust to further analysis. Ecosystems 11: 12-15; Odion, D. C., M. A. Moritz, and D. A. DellaSala. 2010. Alternative community states maintained by fire in the Klamath Mountains, USA. Journal of Ecology; Miller, J.D., C.N. Skinner, H.D. Safford, E.E. Knapp, and C.M. Ramirez. 2012. Trends and causes of severity, size, and number of fires in northwestern California, USA. Ecological Applications 22:184-203; van Wagtendonk, J.W., K.A. van Wagtendonk, and A.E. Thode. 2012. Factors associated with the severity of intersecting fires in Yosemite National Park, California, USA. Fire Ecology 8: 11-32.

[43] Parks, S.A., C. Miller, J.T. Abatzoglou, L.M. Holsinger, M-A. Parisien, and S. Dobrowski. 2016. How will climate change affect wildland fire severity in the western US? Environmental Research Letters 11: 035002.

increases, or decreases in fire varying by region: Krawchuk and Moritz 2012, Moritz et al. 2012, and Westerling and Bryant 2008.[44]

Studies that have projected trends in area burned in California forests under climate change show no consensus. Four studies project both increases and decreases in total area burned depending on the region: Lenihan et al. 2003, Lenihan et al. 2008, Krawchuk et al. 2009, and Spracklen et al. 2009.[45] One study projected an overall decrease in area burned (McKenzie et al. 2004), while two studies projected increases (Fried et al. 2004 in a small region in the Amador-El Dorado Sierra foothills; Westerling et al. 2011).[46] The projected increases in Westerling et al. (2011) are relatively modest, with median increases in area burned of 21% and 23% by 2050, and 20% and 44% by 2085, relative to 1961-1990 under lower (B1) and higher (A2) emissions scenarios respectively. Given that the average annual burned area in California in the past several decades was many times lower than the burned area historically, these projected increases in fire activity in California would likely remain well within the historical range of the past several centuries.

As reviewed in Whitlock et al. (2015), wildfire projection studies involve numerous uncertainties, including high uncertainty around future changes in precipitation timing and amount in the western US, which create significant differences among study results. According to Whitlock et al. (2015), observed and projected changes in wildfire activity must be understood

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[44] Krawchuk, M. A., and M. A. Moritz. 2012. Fire and Climate Change in California. California Energy Commission. Publication number: CEC-500-2012-026; Moritz, M., Parisien, M., Batllori, E., Krawchuk. M., Van Dorn, J., Ganz, D., & Hayhoe, K. 2012. Climate change and disruptions to global fire activity. Ecosphere 3 (6): 1-22; Westerling, A. and B. Bryant. 2008. Climate change and wildfire in California. Climate Change 87: S231– S249.

[45] Lenihan, J.M., Drapek, R.J., Bachelet, D., and Neilson, R.P. 2003. Climate change effects on vegetation distribution, carbon, and fire in California. Ecological Applications 13: 1667-1681; Lenihan, J.M., D. Bachelet, R.P. Neilson, and R. Drapek. 2008. Response of vegetation distribution, ecosystem productivity, and fire to climate change scenarios for California. Climate Change 87(Suppl. 1): S215-S230; Krawchuk, M.A., M.A. Moritz, M. Parisien, J. Van Dorn, K. Hayhoe. 2009. Global pyrogeography: the current and future distribution of wildfire. PloS ONE 4: e5102; Spracklen, D.V., L.J. Mickley, J.A. Logan, R.C. Hudman, R. Yevich, M.D. Flannigan, A.L. Westerling. 2009. Impacts of climate change from 2000 to 2050 on wildfire activity and carbonaceous aerosol concentrations in the western United States. Journal of Geophysical Research 114: D20301.

[46] McKenzie, D., Z. Gedalof, D.L. Peterson, and P. Mote. 2004. Climatic change, wildfire, and conservation. Conservation Biology 18: 890-902; Fried, J. S., M. S. Torn, and E. Mills. 2004. The impact of climate change on wildfire severity: A regional forecast for northern California. Climatic Change 64 (1–2):169–191; Westerling, A.L., B. P. Bryant, H.K. Preisler, T.P. Holmes, H.G. Hidalgo, T. Das. And S.R. Shrestha. 2011. Climate change and growth scenarios for California wildfire. Climatic Change 109 (Suppl 1): S445-S463.

in terms of (1) fire's ecological benefits, (2) the current fire deficit in most forested regions of North America, and (3) a sufficiently long baseline to capture the historical range of fire variability within the particular ecosystem. Detecting and interpreting the significance of climate-driven fire patterns requires information on the magnitude and direction of change in comparison to the long-term fire occurrence within the ecosystem as well as the relative influences of climatic and non-climatic drivers that affect fire activity (i.e., invasion of nonnative plants, introduction of nonnative grazers, land-use change, and changes in forest management practices).[47]

F. Bark beetle outbreaks have not increased annual area burned or fire severity.

Substantial field-based evidence demonstrates that bark beetle outbreaks have not increased annual area burned in the western United States, beetle outbreaks do not contribute to severe fires, and outbreak areas do not burn more severely when fire does occur (Bond et al. 2009, Black et al. 2013, Harvey et al. 2013, Hart et al. 2015a, Hart et al. 2015b, DellaSala 2016).[48] Furthermore, scientific studies indicate that thinning and logging have no effect during beetle outbreaks of landscape scales, and that post-fire logging can reduce forest resilience to natural disturbances such as fire (DellaSala 2016).[49]

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[47] Whitlock, C., D.A. DellaSala, S. Wolf, and C.T. Hanson. 2015. Climate Change: Uncertainties, Shifting Baselines, and Fire Management. Pp. 265-289 in The Ecological Importance of Mixed Severity Fires: Nature's Phoenix. D.A. DellaSala and C.T. Hanson, eds. Elsevier, Amsterdam, Netherlands.

[48] Bond, M.L., D.E. Lee, C.M. Bradley, and C.T. Hanson. 2009. Influence of pre-fire tree mortality on fire severity in conifer forests of the San Bernardino Mountains, California. The Open Forest Science Journal 2: 41-47; Black, S.H., D. Kulakowski, B.R. Noon, and D.A. DellaSala. 2013. Do bark beetle outbreaks increase wildfire risks in the Central U.S. Rocky Mountains: Implications from Recent Research. Nat. Areas J. 33: 59-65; Harvey, B.J, D.C. Donato, W.H. Romme, and M.G. Turner. 2013. Influence of recent bark beetle outbreak on fire severity and postfire tree regeneration in montane Douglas-fir forests. Ecology 94: 2475–2486; Hart, S.J., T. Schoennagel, T.T. Veblen, and T.B. Chapman. 2015a. Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks. PNAS 112: 4375-4380; Hart, S.J., T.T. Veblen, N. Mietkiewicz, and D. Kulakowski. 2015b. Negative feedbacks on bark beetle outbreaks: widespread and severe spruce beetle infestation restricts subsequent infestation. PLoS ONE 10(5): e0127975; DellaSala, D.A. 2016. Do mountain pine beetle outbreaks increase the risk of high-severity fires in western forests? A summary of recent field studies. Geos Institute.

[49] DellaSala, D.A. 2016.

G. Trees killed by drought and beetles do not increase fire intensity or extent.

The DEIR refers to the Governor's Proclamation of a State of Emergency on Tree Mortality, which addresses drought and beetle-related tree mortality in the state, as evidence that California's forests are in a "perilous condition" and "require accelerated management." DEIR at 1-11. While the governor's declaration identifies the potential health and safety issues related to dead and dying trees directly adjacent to (i.e. within falling distance of) houses, roads, and infrastructure, this does not indicate any ecological or public safety need for forest management (i.e., logging) of forests in general. Specifically, dead trees do not pose an increased fire risk to wildland-urban interface ("WUI") communities, as is made clear in the scientific literature and recent summaries of the state of the science on this issue (Hart et al. 2015a, DellaSala 2016, Hanson et al. 2016).[50] Furthermore, ecologically healthy forests and native wildlife populations depend upon abundant snags, and California's forests still have a deficit of snags (Hanson et al. 2016).

H. Vegetation management within the defensible space immediately surrounding homes effectively protects homes from wildland fire.

Vegetation management within the defensible space in the 40 meters [about 131 feet] surrounding individual homes effectively protects homes from wildland fire, even intense fire. However, forest management beyond the defensible space is not effectively protecting homes, and is unnecessarily putting firefighters at risk by focusing on remote wildlands.

Cohen 2000: The home and its surrounding 40 meters determine home ignitability.[51]

Cohen and Stratton 2008: The vast majority of homes burned in wildland fires are burned by slow-moving, low-intensity fire, and defensible space within 100-200 feet of individual homes [reducing brush and small trees, and limbing up larger trees, while also reducing the combustibility of the home itself] effectively protects homes from fires, even when they are more intense.[52]

Gibbons et al. 2012: Defensible space work within 40 meters [about 131 feet] of individual homes effectively protects homes from wildland fire, even intense fire. The authors concluded that the current management practice of thinning broad zones in wildland areas

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[50] Hanson, C.T., D.A. DellaSala, M. Bond, G. Wuerthner, D. Odion, and D. Lee. 2016. Scientists Letter to Governor Brown on the Governor's Proclamation of a State of Emergency on Tree Mortality. 4 February 2016.

[51] Cohen, J.D. 2000. Preventing disaster: home ignitability in the Wildland-Urban Interface. Journal of Forestry 98: 15-21.

[52] Cohen, J.D., and R.D. Stratton. 2008. Home destruction examination: Grass Valley Fire. U.S. Forest Service Technical Paper R5-TP-026b.

hundreds, or thousands, of meters away from homes is ineffective and diverts resources away from actual home protection, which must be focused immediately adjacent to individual structures in order to protect them.[53]

Scott et al. 2016: This study investigated the degree to which fuel management practices on USFS land can reduce wildfire exposure to human communities on a landscape encompassing the Sierra National Forest in California. The study found that treating defensible space near homes was by far the most efficient at reducing WUI exposure, including exposure transmitted from USFS lands. Treating USFS land did little to reduce overall WUI exposure across the landscape.[54]

VI. Key Objectives of the VTP Are Not Based On Substantial Evidence

The DEIR fails to present substantial evidence to support key objectives of the VTP. The VTP's first objective to "[m]odify wildland fire behavior to help reduce losses to life, property, and natural resources" is the "governing goal of the Program." DEIR at E-3. This objective is based on the "primary assumption… that vegetation treatments can affect wildland fire behavior through the manipulation of wildland fuels." DEIR at 2-7. However, the DEIR itself acknowledges that this assumption is highly uncertain, thus undermining the basis for the entire program. For example, the DEIR states that "existing modeling literature suggests that relatively large proportions of the landscape needs to be treated to achieve wildfire risk reduction at the landscape scale" but then admits that the VTP will not be treating large portions of the landscape (e.g., "the proposed annual acres of treatment may not affect all the potential landscape fuels," DEIR at 2-7). The DEIR also states that "there is not a direct correlation between implementation of a vegetation treatment project and a proportionate reduction in numbers of fires or acres burned" (DEIR at 4-430) and that the "VTP is not proposed as the solution to California's vegetation management and fire problem" (DEIR at 2-36). Furthermore, the DEIR briefly acknowledges the need for frequent follow-up "maintenance" of areas receiving fuel treatments in order for treatments to remain effective (DEIR at 4-75), but fails to analyze how maintenance will be incorporated into the Program nor the environmental impacts of repeat treatments.

Even more fundamentally, the DEIR fails to provide substantial evidence to support its governing assumption that fuel treatment activities will be effective in reducing wildfire activity. The body of studies on fuel reduction treatments indicates that the potential for fuel

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[53] Gibbons, P. et al. 2012. Land management practices associated with house loss in wildfires. PLoS ONE 7: e29212.

[54] Scott, J.H., M.P. Thompson, and J.W. Gilbertson-Day. 2016. Examining alternative fuel management strategies and the relative contribution of National Forest System land to wildfire risk to adjacent homes – A pilot assessment on the Sierra National Forest, California, USA. Forest Ecology and Management 362: 29-37.

treatments to reduce wildfire occurrence is highly uncertain.[55] Research indicates that larger fires are driven by hot, dry, windy weather conditions, with forest fuel conditions playing a relatively unimportant role in determining fire behavior and intensity.[56] Furthermore, research in western US forests indicates that there is a low probability that an area that has received a vegetation treatment will overlap with a moderate or high-severity fire, further limiting the presumed efficacy of the VTP.[57]

The DEIR similarly provides no support for the assumption underlying objective 3 that "decreasing fire size will have a resulting decrease on overall fire suppression costs." DEIR at 2-8. In fact, the DEIR cites a study (Gude et al. 2013) indicating that fire proximity to homes is a significant driver of suppression costs. The DEIR also acknowledges that there is no evidence showing that fuel treatments reduce fire damage in the WUI, defined in the DEIR as the area starting beyond the defensible space to 1.5 miles from a structure. DEIR at 2-8 ("there is a lack of quantifying data to directly relate treatment methods to a reduction in damage and costs relative to the WUI"). As detailed above (Section V.H., *supra*), the best-available science indicates that vegetation management within the defensible space in the 40 meters surrounding individual homes effectively protects homes from wildland fire, while forest management in the WUI beyond the defensible space does not effectively protect homes.

VII. The DEIR Fails to Adequately Disclose, Analyze, Assess the Significance of, and Propose Mitigation for Impacts to Biological Resources Caused by the Program

The DEIR's disclosure, analysis, and mitigation of impacts to biological resources from the implementation of the VTP are cursory, incomplete, and inadequate. Specifically, the DEIR completely fails to disclose, analyze, and assess the significance of several key impacts that would result from the Program; acknowledges but fails to analyze wide-ranging impacts to special-status species, sensitive habitat areas, and migratory corridors; is inconsistent with the best-available science; fails to identify any clear and consistent baseline against which the Program's impacts to biological resources can be evaluated; and improperly defers mitigation to the project level analysis. Due to all of these failures and omissions, the DEIR's discussion of impacts to biological resources fails to satisfy CEQA's fundamental requirements.

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[55] E.D. Reinhardt, et al., *Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States*, 256 FOREST ECOLOGY & MGMT. 1997 (2008).
[56] Id.; see also J.M. Lydersen, M.P. North, and B.M. Collins, *Severity of an uncharacteristically large wildfire, the Rim Fire, in forests with relatively restored fire regimes*, 328 FOREST ECOLOGY & MGMT. 326 (2014); T. Schoennagel, et al., *The interaction of fire, fuels, and climate across Rocky Mountain Forests*, 54 BIOSCIENCE 661 (2004); E.A. Johnson, *Towards a sounder fire ecology*, 1 FRONTIERS IN ECOLOGY & THE ENVT. 271 (2003).
[57] J.J. Rhodes and W.L. Baker, *Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests*, 1 OPEN FOREST SCIENCE JOURNAL 1 (2008).

First, the DEIR completely fails to disclose, analyze, or assess the significance of impacts resulting from the Program's efforts to reduce wildfire activity in California ecosystems, including high-severity fire activity. As discussed in detail above (Part V.A, *supra*), overwhelming scientific evidence demonstrates that California forests are adapted to mixed-severity fire regimes, including significant amounts of high-severity fire that create critical habitat diversity and are necessary for the persistence of numerous animal and plant species. The Program's fundamental goal to reduce wildfire activity threatens California forest ecosystems which are already experiencing a significant fire deficit in comparison to historical conditions (Part V.B, *supra*). Nor does the DEIR adequately acknowledge the detrimental effects on wildlife species and habitat of removing dead trees (whether killed by fire, drought, or beetles) from the forest. The DEIR must acknowledge and analyze the findings of numerous studies, detailed above, that demonstrate that reduction in wildfire activity and fuel reduction activities threaten the health, resilience, and diversity of California ecosystems and species. Instead, the DEIR simply substitutes this required analysis with a conclusory and unsupported statement that high-severity wildfire (a natural component of most California ecosystems) is detrimental to wildlife: "each of the various treatment types proposed in this program come with potential negative direct and/or indirect effects on wildlife, one must weigh these effects against the known effects on wildlife from catastrophic high severity wildfire." DEIR at 4-117. Such unsupported, conclusory statements are not permitted under CEQA. Such statements also represent an impermissible attempt to balance adverse environmental effects against purported project benefits without making the specific findings required by law. "CEQA does not authorize an agency to proceed with a project that will have significant, unmitigated effects on the environment, based simply on a weighing of those effects against the project's benefits, unless the measures necessary to mitigate those effects are truly infeasible." *City of Marina v. Bd. of Trs. of Cal. State Univ.*, 39 Cal. 4th 341, 368-69 (2006); *see also* Pub. Res. Code § 21081(a)(3), (b).

Second, the DEIR fails to adequately analyze the adverse impacts of the VTP's treatment activities on biological resources. The DEIR states that over 300 special status wildlife taxa occur in habitats likely to be treated under the VTP. DEIR at 4-118. The DEIR repeatedly acknowledges that VTP's fuel reduction treatments are likely to have adverse effects on a wide variety of species: "direct effects to special status wildlife taxa due to fuel reduction treatments are inherently adverse and will not vary much between bioregions" and "some potential exists for substantial adverse effects [from fuel reduction treatments]" (DEIR at 4-121); "the potential for substantial adverse effects from prescribed fire are most likely to occur in the conifer woodland, hardwood woodland, herbaceous, and shrub habitat types due to problems with invasive species, impacts to regeneration, burn intensity, canopy removal and burn frequency" (DEIR at 4-128); "in summary, mechanical activities have the potential for significant effects in all lifeforms since there is no comparable natural disturbance to which individual plants or communities have adapted over time, and because of the high level of disturbance to canopy cover and the soil layer" (DEIR at 4-139).

However the DEIR completely fails to discuss and analyze the adverse impacts of the VTP on specific special-status species and sensitive habitats. To serve as an adequate informational document, the DEIR must analyze how the Program will impact special-status species, including California's forest-dependent special-status species such as the state and/or federally listed northern spotted owl, Sierra Nevada red fox, marbled murrelet, American wolverine, Pacific fisher, and the fire-dependent black-backed woodpecker[58] (under consideration for federal listing), and riparian and aquatic special status species such as the Sierra Nevada yellow-legged frog, mountain yellow-legged frog, Yosemite toad, Siskiyou Mountains salamander, and numerous listed salmon and steelhead species. Forest thinning has been found to degrade and eliminate habitat for numerous rare and imperiled wildlife species, and this must be disclosed and analyzed in the DEIR. For example, adverse effects have been found with regard to spotted owls (Gallagher 2010),[59] Pacific fishers (Garner 2013),[60] black-backed woodpeckers (Hutto 2008),[61] and olive-sided flycatchers (Robertson and Hutto 2007).[62] The need for species-specific analysis is affirmed by the DEIR itself which states that effects of the VTP will be species-specific and are thus difficult to generalize. DEIR at 4-116 ("Effects of fuel reduction on wildlife depend on the specific ecological requirements of individual species and thus are difficult to generalize, especially in a treatment area as large and complex as that considered here"). The DEIR must also analyze impacts to sensitive habitat areas, wildlife movement corridors, and consistency with conservation plans.

Third, the DEIR's thresholds of significance for biological resources are impermissibly lenient and sometimes contradictory. Under CEQA Guidelines § 15065(a)(1), a lead agency *must* find that a project will have a significant effect on the environment if the project has the potential to do any of the following:

- Reduce substantially the habitat of a fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community; or

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[58] For example, thinning and post-fire clear-cutting are shown to have detrimental effects on the fire-dependent black-backed woodpecker by reducing post-fire habitat. *See* Odion, D.C. and C.T. Hanson, *Projecting Impacts of Fire Management on a Biodiversity Indicator in the Sierra Nevada and Cascades, USA: The Black-Backed Woodpecker*, 6 THE OPEN FOREST SCIENCE JOURNAL 14 (2013).

[59] Gallagher, C.V. 2010. Spotted owl home range and foraging patterns following fuels-reduction treatments in the northern Sierra Nevada, California. M.S. thesis, Univ. of Calif., Davis.

[60] Garner, J.D. 2013. Selection of disturbed habitat by fishers (*Martes pennanti*) in the Sierra National Forest. M.S. thesis, Humboldt State University.

[61] Hutto, R. L. 2008. The ecological importance of severe wildfires: Some like it hot. Ecological Applications 18: 1827–1834.

[62] Robertson, B.A. and R.L. Hutto. 2007. Is selectively harvested forests and ecological trap for olive-sided flycatchers? The Condor 109: 109-121.

• Reduce substantially the number or restrict the range of an endangered, rare, or threatened species.

The DEIR improperly avoids these standards by imposing thresholds that are impermissibly lenient under CEQA and likely to miss significant impacts. In *Endangered Habitats League, Inc. v County of Orange*, 131 Cal. App. 4th 777, 793 (2005), the court held that the EIR's standard of significance for impacts on biological resources was "impermissibly lenient" because it was narrower than the standards in 14 Cal. Code Regs. §15065(a)(1). The DEIR here makes the same error. For example, the DEIR requires that the "contribution to a substantial long-term reduction in the viability of any native species or subspecies" must occur "at the state level" to be significant. DEIR at 4-115 (emphasis added). Analyzing thresholds at the state level is likely to obscure significant impacts that might happen at smaller geographical scales. The DEIR itself asserts that detecting significant impacts at the bioregional level is virtually impossible: "in order for an effect to be considered significant at the bioregional level, the species in question would have to be impacted enough to meet one of the Significance Criteria stated above. The amount of habitat that would have to be adversely modified to cause a substantial adverse effect has not been scientifically determined for most species and is likely unknowable until the threshold has been crossed and the species is in jeopardy." DEIR at 4-121. The natural conclusion is that detecting impacts at the larger state level is even more infeasible.

The significance standards for biological resources are also contradictory at times. For example, CEQA Guidelines require that adverse effects must be considered and mitigated for "any species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations, or by CDFW or USFWS." DEIR at 4-114. However, the DEIR limits the scope of analysis to consider adverse effects as "significant" only if they would affect taxa that are listed as either threatened or endangered at the federal or state level. DEIR at 4-118.

Fourth, the DEIR fails to identify any clear and consistent baseline against which the Program's impacts to biological resources can be evaluated. The DEIR contains a brief, general discussion of the environmental and regulatory setting for the Program, but it does not contain any of the information about existing physical conditions necessary to evaluate the Program's biological impacts. *See, e.g.*, *Save Our Peninsula Comm. v. Monterey Cty. Bd. of Supervisors*, 87 Cal. App. 4th 99, 119 (2001) ("Without a determination and description of the existing physical conditions on the property at the start of the environmental review process, the EIR cannot provide a meaningful assessment of the environmental impacts of the proposed project.").

VIII. The DEIR Fails to Meet CEQA's Requirements with Regard to the Analysis of Greenhouse Gas ("GHG") Emissions

The DEIR fails to meet CEQA's requirements with regard to the analysis of greenhouse gas ("GHG") emissions. First, it fails to include reasonably foreseeable indirect impacts of

vegetation treatment. Second, the DEIR adopts an invalid threshold for significance. Third, the analysis of impacts under GHG "Impact 2" is fatally flawed.

A. The DEIR fails to analyze indirect greenhouse gas impacts from Cal Fire's Vegetation Treatment Program.

The DEIR stops short of the full analysis of impacts required under CEQA because it considers only short-term direct emissions of greenhouse gases ("GHGs"). CEQA requires disclosure and analysis of "direct physical changes in the environment and reasonably foreseeable indirect physical changes which may be caused by the project." CEQA Guidelines § 15064(d). Furthermore, an EIR must take into account both long-term and short term impacts, "giving due consideration to both short-term and long-term effects." CEQA Guidelines § 15126.2; see also Pub. Resources Code §21083; CEQA Guidelines § 15065(a)(2). This DEIR fails to consider either indirect effects or long-term impacts, resulting in a deficient impacts analysis.

Greenhouse gas emissions from bioenergy projects should have been considered as an indirect impact of the project. The DEIR notes that up to 10 percent of biomass from mechanical treatments might be removed to fuel biomass plants.[63] DEIR at 4-65. Yet, the DEIR contains no evaluation of the impact of emissions from that biomass when it is combusted for energy. This is important because combustion of wood for energy instantaneously releases virtually all of the carbon in the wood to the atmosphere as CO_2. Burning wood for energy is typically less efficient, and thus far more carbon-intensive per unit of energy produced, than burning fossil fuels. Measured at the stack, biomass combustion produces significantly more CO_2 per megawatt-hour than fossil fuel combustion; a large biomass-fueled boiler may have an emissions rate far in excess of 3,000 lbs CO_2 per MWh.[64] Smaller-scale facilities using gasification technology are

[63] The EIR provides no analysis, justification, or evidence to support the assumption that 10 percent of biomass from mechanical treatments could be removed to biomass plants. Absent a reasoned explanation and evidentiary support for this figure, Cal Fire's conclusions lack a legally adequate basis.

[64] The Central Power and Lime facility in Florida, for example, is a former coal-fired facility recently permitted to convert to a 70-80 MW biomass-fueled power plant. According to permit application materials, the converted facility would consume the equivalent of 11,381,200 MMBtu of wood fuel per year. *See* Golder Assoc., Air Construction Permit Application: Florida Crushed Stone Company Brooksville South Cement Plant's Steam Electric Generating Plant, Hernando County Table 4-1 (Sept. 2011). Using the default emissions factor of 93.8 kg/MMBtu CO_2 found in 40 C.F.R. Part 98, and conservatively assuming both 8,760 hours per year of operation and electrical output at the maximum 80 MW nameplate capacity, the facility would produce about 3,350 lbs/MWh CO_2. If the plant were to produce only 70 MW of electricity, the CO_2 emissions rate would exceed 3,800 lbs/MWh. If such a facility were dispatched to replace

similarly carbon-intensive; the Cabin Creek bioenergy project recently approved by Placer County would have an emissions rate of more than 3,300 lbs CO_2/MWh.[65] By way of comparison, California's 2012 baseline emissions rate from fossil-fuel electric power generation was 954 lbs CO_2 per MWh.[66] As one recent scientific article noted, "[t]he fact that combustion of biomass generally generates more CO_2 emissions to produce a unit of energy than the combustion of fossil fuels increases the difficulty of achieving the goal of reducing GHG emissions by using woody biomass in the short term."[67] Put more directly, replacing California grid electricity with biomass electricity likely more than *triples* smokestack CO_2 emissions.

Even if net carbon cycle effects are taken into account, emissions from biomass power plants can increase atmospheric CO_2 concentrations for decades to centuries depending on feedstocks, biomass harvest practices, and other factors. Multiple studies have shown that it can take a very long time to discharge the "carbon debt" associated with bioenergy production, even where fossil fuel displacement is assumed, and even where "waste" materials like timber harvest residuals are used for fuel.[68] One study, using realistic assumptions about initially increased and

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one MWh of fossil-fuel fired generation with one MWh of biomass generation, the facility's elevated emissions rate would also result in proportionately higher emissions on a mass basis.

[65] Ascent Environmental, Cabin Creek Biomass Facility Project Draft Environmental Impact Report, App. D (July 27, 2012) (describing 2 MW gasification plant with estimated combustion emissions of 26,526 tonnes CO_2e/yr and generating 17,520 MWh/yr of electricity, resulting in an emissions rate of 3,338 lbs CO2e/MWh).

[66] See Energy and Environment Daily, Clean Power Plan Hub, at http://www.eenews.net/interactive/clean_power_plan/states/california (visited May 18, 2016).

[67] David Neil Bird, et al., *Zero, one, or in between: evaluation of alternative national and entity-level accounting for bioenergy*, 4 GLOBAL CHANGE BIOLOGY BIOENERGY 576, 584 (2012), doi:10.1111/j.1757-1707.2011.01137.x.

[68] *See, e.g.*, Stephen R. Mitchell, et al., *Carbon Debt and Carbon Sequestration Parity in Forest Bioenergy Production*, GLOBAL CHANGE BIOLOGY BIOENERGY (2012) ("Mitchell 2012"), doi: 10.1111/j.1757-1707.2012.01173.x (attached); Ernst-Detlef Schulze, et al., *Large-scale Bioenergy from Additional Harvest of Forest Biomass is Neither Sustainable nor Greenhouse Gas Neutral*, GLOBAL CHANGE BIOLOGY BIOENERGY (2012), doi: 10.1111/j.1757-1707.2012.01169.x at 1-2 (attached); Jon McKechnie, et al., *Forest Bioenergy or Forest Carbon? Assessing Trade-Offs in Greenhouse Gas Mitigation with Wood-Based Fuels*, 45 ENVIRON. SCI. TECHNOL. 789 (2011) (attached); Anna Repo, et al., *Indirect Carbon Dioxide Emissions from Producing Bioenergy from Forest Harvest Residues*, GLOBAL CHANGE BIOLOGY BIOENERGY (2010) ("Repo 2010"), doi: 10.1111/j.1757-1707.2010.01065.x (attached); John Gunn, et al., Manomet Center for Conservation Sciences, Massachusetts Biomass Sustainability and Carbon Policy Study (2010), *available at* https://www.manomet.org/sites/manomet.org/files/Manomet_Biomass_Report_Full_LoRez.pdf (visited May 24, 2016).

subsequently repeated bioenergy harvests of woody biomass, concluded that the resulting atmospheric emissions increase may even be permanent.[69]

Another indirect source of emissions from the project is the loss of forest carbon. The DEIR avoids analysis of forest carbon loss through an impermissible constriction of the timescale of analysis. The DEIR acknowledges that impacts could be considered on multiple timescales from annual to decadal. DEIR at 4-424. It elects, however, to consider only annual emissions from equipment and combustion. This violates CEQA's requirement that long-term impacts be considered as well. In both the short- and long-term, vegetation treatment will remove biomass. The loss of this biomass significantly reduces stored carbon and thus equates to carbon emissions. One recent study concluded, for this and other reasons, that thinning operations tend to remove about three times as much carbon from the forest as would be avoided in wildfire emissions.[70] Another report from Oregon found that thinning operations resulted in a net loss of forest carbon stocks for up to 50 years.[71] Another published study found that even light-touch thinning operations in several Oregon and California forest ecosystems incurred carbon debts lasting longer than 20 years.[72] Other recent studies have shown that intensive harvest of logging residues that otherwise would be left to decompose on site can deplete soil nutrients and retard forest regrowth as well as reduce soil carbon sequestration.[73]

The DEIR also appears to misinterpret the benefits of prescribed burns relative to wildfires when it indicates that prescribed fires reduce greenhouse gas emissions. The EIR states that because the flaming phase is most efficient, it creates minimal emissions, while the smoldering phase causes greater emissions. DEIR at 4-421, 4-379. The DEIR then concludes that because prescribed burns are more efficient, they emit less greenhouse gases. DEIR at 4-421. While this may be true for criteria air pollutants, the exact opposite is true for CO_2 emissions. Combustion efficiency is a measure of how much carbon is released as CO_2 as opposed to other carbon forms; the greatest efficiency is associated with the largest fraction of CO_2. Therefore, the

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[69] Bjart Holtsmark, *The Outcome Is in the Assumptions: Analyzing the Effects on Atmospheric CO_2 Levels of Increased Use of Bioenergy From Forest Biomass*, GLOBAL CHANGE BIOLOGY BIOENERGY (2012), doi: 10.1111/gcbb.12015.

[70] John L. Campbell, et al., *Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions?* FRONT. ECOL. ENV'T (2011), doi:10.1890/110057.

[71] Joshua Clark, et al., *Impacts of Thinning on Carbon Stores in the PNW: A Plot Level Analysis*, Final Report (Ore. State Univ. College of Forestry May 25, 2011).

[72] Tara Hudiburg, et al., *Regional carbon dioxide implications of forest bioenergy production*, 1 NATURE CLIMATE CHANGE 419 (2011), doi:10.1038/NCLIMATE1264.

[73] David L. Achat, et al., *Forest soil carbon is threatened by intensive biomass harvesting*, SCIENTIFIC REPORTS 5:15991 (2015), doi:10.1038/srep15991; D.L. Achat, et al., *Quantifying consequences of removing harvesting residues on forest soils and tree growth – A meta-analysis*, 348 FOREST ECOLOGY & MGMT. 124 (2015).

DEIR is factually incorrect in its assertion that increased combustion efficiency associated with prescribed burning translates to reduced greenhouse gas emissions.

B. The selected threshold for significance of "Impact 1" is irrational and violates CEQA.

In its analysis of GHG "Impact 1" the DEIR compares the annual direct greenhouse gas emissions from vegetation treatment to the CO_2 emissions that might occur if an area the same size as the project burned in a wildfire. This choice of significance threshold is invalid because (1) it weighs environmental effects against the objective of the project; (2) it incorrectly assumes that vegetation treatment of an area equates to prevention of wildfire in that location; and (3) it impermissibly and without justification compares the project's emissions to a hypothetical "wildfire" scenario rather than to a baseline derived from existing environmental conditions.

First, the comparison violates CEQA by using the benefit sought to be achieved as the threshold. "CEQA does not authorize an agency to proceed with a project that will have significant, unmitigated effects on the environment, based simply on a weighing of those effects against the project's benefits, unless the measures necessary to mitigate those effects are truly infeasible." *City of Marina v. Bd. of Trs. of Cal. State Univ.*, 39 Cal. 4th 341, 368-69 (2006). The DEIR acknowledges that prescribed burn, construction-related, and livestock greenhouse gas emissions[74] will occur due to increased forest management activities under the VTP. DEIR at 4-422. But these emissions are compared against the potential emissions from prevented wildfire, the precise objective of the project. DEIR at 2-6. The DEIR's attempt to dismiss the proposed VTP's adverse effects by weighing them against its purported benefits is legally improper absent full and formal compliance with the findings requirements of Public Resources Code section 21081.

Second, the DEIR fails to provide substantial evidence that vegetation treatment actually prevents fire, which is a fundamental assumption inherent in the selected threshold. The DEIR consistently indicates that potential reductions in wildfire size or severity are uncertain and

[74] We note that methane from enteric fermentation is the primary greenhouse gas emitted by the livestock in question. In order to compare these to other project emissions, the EIR uses an extremely inaccurate value for methane global warming potential ("GWP"). The value used by the EIR is 21 (EIR at 4-420), but this is outdated. The most recent IPCC Fifth Assessment Report assigns a value of 34 to biogenic methane over 100 years and a value of 86 over 20 years. At a minimum an updated 100-year GWP must be adopted. See G. Myhre et al., *Anthropogenic and Natural Radiative Forcing*, in CLIMATE CHANGE 2013: THE PHYSICAL SCIENCE BASIS. CONTRIBUTION OF WORKING GROUP I TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE IPCC Table 8.7 at 714 (Cambridge Univ. Press 2013). Furthermore, we urge Cal Fire to adopt a 20-year GWP as the California Air Resources Board has for its recent greenhouse gas analyses.

unpredictable: "while there is not a direct correlation between implementation of a vegetation treatment plan and proportionate reduction in numbers of fires or acres burned, … it would likely result in some reduction." DEIR at 4-430; *see also* DEIR at 4-423 (cannot predict, but "reasonable to assume"). This is largely because it is impossible to know in advance where fires will occur, and thus impossible to target only the areas likely to burn for treatment.[75] Viewed most optimistically, the data in the DEIR suggest that treatment at best may produce a reduction in burn severity. DEIR at 4-423, 424. Furthermore, the DEIR ignores the body of literature that finds no relation. For instance, a recent study by Syphard et al. (2012) found that Cal Fire's hazard analysis fails as a predictor of wildfire.[76] Price et al. (2015) found no relationship between area burned and previous fire for the Sequoia-Kings Canyon area.[77] Other studies have found that vegetation treatment in remote areas is ineffective.[78] Even if vegetation treatment were positively associated with lower fire severity, there remains extreme uncertainty that vegetation treatment of an area can even influence wildfire behavior in that particular location.

Third, by comparing project emissions to emissions that would occur if a similar area burned in a wildfire, the DEIR relies on an impermissible baseline. CEQA requires that environmental impacts be assessed against existing physical conditions rather than hypothetical or merely legally conceivable scenarios. *See, e.g.*, CEQA Guidelines § 15125(a); *Communities for a Better Env't v. S. Coast Air Quality Mgmt. Dist.*, 48 Cal. 4th 310, 319, 322 (2010); *Save Our Peninsula Comm. v. Monterey Cty. Bd. of Supervisors*, 87 Cal. App. 4th 99 (2001). As discussed above, there is no possible way Cal Fire can carry out vegetation treatments in only the areas that will burn in a wildfire. As one recent study put it, "[a]ny approach to [carbon] accounting that assumes a wildfire burn probability of 100% during the effective life span of a fuel-reduction treatment is almost certain to overestimate the ability of such treatments to reduce pyrogenic emissions on the future landscape."[79] As a result, the DEIR's assessment of GHG

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[75] See generally Campbell 2011, *supra* note 70 at 4 (noting that "[a]mong fire-prone forests of the western US, the combination of wildfire starts and suppression efforts result in current burn probabilities of less that 1%," and reviewing literature finding that only 3% of the area treated is likely to be exposed to fire during an effective treatment lifespan of 20 years).

[76] Syphard, A.D., J.E. Keeley, A.B. Massada, T.J. Brennan, and V.C. Radeloff. 2012. Housing arrangement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7: e33954 at 4 (doi: 10.1371/journal.pone.0033954).

[77] Price, O.F., J.G. Pausas, N. Govender, M.D. Flannigan, P.M. Fernandes, M.L. Brooks, and R.B. Bird G. 2015. Global patterns in fire leverage: the response of annual area burnt to previous fire. International Journal of Wildland Fire 24(3): 297-306.

[78] Keeley, J.E, H. Safford, C.J. Fotheringham, J. Franklin, and M. Moritz 2009. The 2007 Southern California wildfires: lessons in complexity. Journal of Forestry September: 287-296; Syphard, A.D., J.E. Keeley, and T.J. Brennan. 2011. Comparing fuel breaks across southern California national forests. Forest Ecology and Management 261: 2038-2048.

[79] Campbell 2011, *supra* note 70 at 4.

emissions rests on an inherently misleading and legally impermissible baseline and is also unsupported by substantial evidence.

Finally, it should be noted that the annual predicted volume of emissions from the proposed VTP would be significant based on objective measures. The DEIR estimates that the project would result in 298,745 metric tons of CO_2e each year. DEIR at 4-427. This is equivalent to 62,894 passenger cars or the electricity use in 41,098 homes[80] – not an insignificant source of emissions. For comparison, the South Coast Air Quality Management District has established a GHG threshold of 10,000 MT CO_2e per year.[81] The Bay Area Air Quality Management District established thresholds of 10,000 MT CO_2e per year for stationary sources and 1,100 MT CO_2e per year for non-stationary sources,[82] although these thresholds are currently not in place due to pending review at the California Supreme Court.[83] The DEIR also makes the mistake of minimizing GHG impacts by comparing the project's emissions to national and state inventories. This is not a valid basis of comparison. As the California Supreme Court recently noted, the global nature of climate change means that any one project is unlikely to appear significant, but rather the question is one of incremental effects that are cumulatively significant. *Center for Biological Diversity v. Dept. Fish and Wildlife*, 62 Cal. 4th 204, 219 (2015).

C. Analysis under GHG "Impact 2" is confusing and unsupported by substantial evidence.

The DEIR's GHG "Impact 2" titled "Impacts of climate change on VTP projects: increase in vulnerability of lands in Cal Fire's responsibility area" is confusing and appears to be attempting several different analyses at once. To the best we can discern, the DEIR is claiming that climate change will increase the incidence of wildfire, and vegetation treatment will mitigate the purported climate-related fire hazard. But then the same impact analysis also seems to consider whether the VTP complies with state climate goals. Both portions of the analysis are invalid and inadequate under CEQA. Furthermore, this confusing juxtaposition of analyses violates CEQA's requirement that information be clearly presented in order to adequately inform the reader. Kostka & Zischke, Practice Under the California Environmental Quality Act § 11.20 (CEB 2016 supp.).

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[80] Converted using EPA's Greenhouse Gas Equivalencies Calculator, available at https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator.
[81] See http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.
[82] See http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx.
[83] See http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_May%202011_5_3_11.ashx.

1. The DEIR fails to provide substantial evidence for increased wildfire with climate change.

The DEIR purports to analyze whether the VTP will increase vulnerability to climate-induced wildfire. In so doing, it focuses on the assumption that climate change will increase wildfire without providing substantial evidence for that assertion. First, as detailed above (Part V.E., *supra*), the evidence is weak to non-existent that climate change increases fire hazard. Second, a number of the studies cited in the DEIR related to climate impacts on wildfire are inapposite. For instance, the DEIR cites to Randerson et al. (2006) for the proposition that frequency and intensity of wildland fires may result from altered weather, precipitation and temperatures. DEIR at 4-431. But Randerson et al. did not assess climate impacts on wildfire; instead, the study examined the impact of boreal fire on climate change at high northern latitudes. The DEIR implies that climate impacts somehow relate to increased exposure of people and homes to wildfire at the urban interface areas. *Id.* But the study by Syphard et al. (2007) that is cited for this proposition actually states that "while climate change may have played some role in our observed change in area burned, we cannot extend those results to our analysis because we included fires of all sizes under multiple land ownership classes, and historical fire patterns in the lower elevations do not correspond to patterns [in other studies]."[84] The analysis by Syphard et al. in fact provided an insightful examination of how human activity at the urban interface can increase fire risk and does not address climate change. In short, the DEIR has ignored a large body of data regarding climate change impacts on wildfire and has failed to provide substantial evidence for a number of its assertions related to climate change impacts.

2. The DEIR fails to adequately consider potential conflict with State GHG goals.

As noted in the DEIR, one of the significance criteria for greenhouse gases under Appendix G of the CEQA Guidelines is whether the project would "conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases." Yet, the DEIR ignores the potential conflict between losses of forest carbon from vegetation treatment and state climate goals, asserting without analysis that the VTP is necessary and sufficient to protect forest carbon goals.

Increased removals of carbon from forests and increased operational CO_2 emissions over the next 10 years will likely conflict with science-driven greenhouse gas reduction goals established in the 2008 Scoping Plan, the 2014 Scoping Plan update, Executive Order B-30-15,

[84] Syphard, A.D.et al. 2007. Human Influence on California Fire Regimes. Ecological Applications 17: 1388-1402 at 1399.

and Executive Order S-3-05.[85] As discussed in detail above, the removal of excess biomass will result in a net loss of forest carbon and the use of forest materials for bioenergy generation can increase atmospheric CO_2 concentrations for a period of decades to centuries depending on the feedstocks involved. The DEIR fails to address whether foreseeable increases in CO_2 emissions as a result of VTP over the next several decades conflict with science and state policy requiring CO_2 emissions to decrease sharply over that same period. *See Center for Biological Diversity v. California Dept. of Fish & Wildlife*, 62 Cal. 4th 204, 223 & n.6.

The DEIR must compare how this project's impacts both in the form of direct GHG emissions and in the form of lost carbon storage relate to the deep carbon reductions that climate science as reflected in state policy indicates are necessary. In particular, the 2014 Scoping Plan Update states that "California forests must be managed to ensure that they provide net carbon storage even in the face of increased threats from wildfire, pests, disease, and conversion pressures." Scoping Plan Update at 72. Furthermore, Executive Order S-3-05 set a statewide greenhouse gas emissions reduction target of 1990 levels by 2020, and Executive Order B-30-15 set the greenhouse gas target of 40% below 1990 levels by 2030. And while none of these referenced plans set a specific numerical target for forest carbon, removals of carbon from forests and resulting CO_2 emissions need to be evaluated in light of these targets and cannot be ignored.

The DEIR asserts that vegetation treatment has been implemented in part under grants made possible in part by ARB's cap-and-trade program to mitigate impacts of climate change and reduce risks of catastrophic wildfire. But as noted above, the DEIR has ignored evidence that such treatment is ineffective for protecting forest carbon stores. Thus, the DEIR has not adequately analyzed potential conflict with state goals to reduce greenhouse gas emissions.

IX. Conclusion

In sum, the DEIR fails to comply with CEQA and the CEQA Guidelines. Cal Fire cannot approve the VTP on the basis of this DEIR. Rather, Cal Fire must revise both the DEIR and the VTP to comply with the requirements of law and to reflect the physical and ecological realities of California's forests.

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[85] *See* CAL. AIR RES. BD., FIRST UPDATE TO THE CLIMATE CHANGE SCOPING PLAN: BUILDING ON THE FRAMEWORK 33-34 (2014), *available at* http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm (visited May 20, 2016); CAL. AIR RES. BD., CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE 117-21 (December 2008), *available at* http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm (visited May 20, 2016).

Sincerely,

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Attachments: References Cited (uploaded in PDF format)

References Cited (all references uploaded in pdf format)

Achat, D.L., M. Fortin, G. Landmann, B. Ringeval, and L. Augusto. 2015. Forest soil carbon is threatened by intensive biomass harvesting. Scientific Reports 5: Art. 15991.

Achat, D.L., C. Deleuze, G. Landmann, N. Pousse, J. Ranger, and L. Augusto. 2015. Quantifying consequences of removing harvesting residues on forest soils and tree growth – A meta-analysis. Forest Ecology and Management 348: 124-141.

Ascent Environmental, Cabin Creek Biomass Facility Project Draft Environmental Impact Report, App. D (July 27, 2012).

Baker, W.L. 2014. Historical forest structure and fire in Sierran mixed-conifer forests reconstructed from General Land Office survey data. Ecosphere 5(7): Article 79.

Baker, W.L. 2015. Are high-severity fires burning at much higher rates recently than historically in dry-forest landscapes of the Western USA? PLoS ONE 10(9): e0136147.

Beaty, R.M. and A.H. Taylor. 2001. Spatial and temporal variation of fire regimes in a mixed conifer forest landscape, Southern Cascades, USA. Journal of Biogeography 28: 955–966.

Bekker, M. F. and A.H. Taylor. 2001. Gradient analysis of fire regimes in montane forests of the southern Cascade Range, Thousand Lakes Wilderness, California, USA. Plant Ecology 155: 15-28.

Bekker, M. F. and A.H. Taylor. 2010. Fire disturbance, forest structure, and stand dynamics in montane forest of the southern Cascades, Thousand Lakes Wilderness, California, USA. Ecoscience 17: 59-72.

Bird, D.N., N. Pena, and G. Zanichi. 2011. Zero, one, or in between: evaluation of alternative national and entity-level accounting for bioenergy. Global Change Biology Bioenergy 4: 576-587.

Black, S.H., D. Kulakowski, B.R. Noon, and D.A. DellaSala. 2013. Do bark beetle outbreaks increase wildfire risks in the Central U.S. Rocky Mountains: Implications from recent research. Natural Areas Journal 33: 59-65.

Bond, M.L., D.E. Lee, C.M. Bradley, and C.T. Hanson. 2009. Influence of pre-fire tree mortality on fire severity in conifer forests of the San Bernardino Mountains, California. The Open Forest Science Journal 2: 41-47.

Bond, M.L., D.E. Lee, R.B. Siegel, and J.P. Ward, Jr. 2009. Habitat use and selection by California Spotted Owls in a postfire landscape. Journal of Wildlife Management 73: 1116-1124.

Bond, T.C., et al. 2013. Bounding the role of black carbon in the climate system: A scientific assessment. Journal of Geophysical Research 118: 53805552.

Buchalski, M.R., J.B. Fontaine, P.A. Heady III, J.P. Hayes, and W.F. Frick. 2013. Bat response to differing fire severity in mixed-conifer forest, California, USA. PLOS ONE 8: e57884.

Burnett, R.D., P. Taillie, and N. Seavy. 2010. Plumas Lassen Study 2009 Annual Report. U.S. Forest Service, Pacific Southwest Region, Vallejo, CA.

California Air Resources Board. 2008. Climate Change Scoping Plan: A Framework for Change.

California Air Resources Board. 2014. First Update to the Climate Change Scoping Plan: Building on the Framework.

Campbell, J.L., M.E. Harmon, and S.R. Mitchell. 2011. Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and Environment 10: 83-90.

Chen, L.-W.A. et al. 2007. Emissions from laboratory combustion of wildland fuels: emission factors and source profiles. Environmental Science and Technology 41: 4317-4325.

Chen, L.-W.A., P. Verburg, A. Shackelford, D. Zhu, R. Susfalk, J.C. Chow, and J.G. Watson. 2010. Moisture effects on carbon and nitrogen emission from burning of wildland biomass**.** Atmospheric Chemistry and Physics 10: 6617-6625.

Chung, C.E., V. Ramanathan, and D. Decremer. 2012. Observationally constrained estimates of carbonaceous aerosol radiative forcing. PNAS 109: 11624-11629.

Clark, J. et al. 2011. Impacts of Thinning on Carbon Stores in the PNW: A Plot Level Analysis, Final Report (Ore. State Univ. College of Forestry May 25, 2011).

Cocking MI, Varner JM, and E.E. Knapp. 2014. Long-term effects of fire severity on oak-conifer dynamics in the southern Cascades. Ecological Applications 24: 94-107.

Cohen, J.D. 2000. Preventing disaster: home ignitability in the Wildland-Urban Interface. Journal of Forestry 98: 15-21.

Cohen, J.D., and R.D. Stratton. 2008. Home destruction examination: Grass Valley Fire. U.S. Forest Service Technical Paper R5-TP-026b.

Collins, B.M. and S.L. Stephens. 2010. Stand-replacing patches within a mixed severity fire regime: quantitative characterization using recent fires in a long-established natural fire area. Landscape Ecology 25: 927939.

Collins, B.M., J.D. Miller, A.E. Thode, M. Kelly, J.W. van Wagtendonk, and S.L. Stephens. 2009. Interactions among wildland fires in a long-established Sierra Nevada natural fire area. Ecosystems 12: 114–128.

DellaSala, D.A. 2016. Do mountain pine beetle outbreaks increase the risk of high-severity fires in western forests? A summary of recent field studies. GEOS Institute

DellaSala, D., M.L. Bond, C.T. Hanson, R.L. Hutto, and D.C. Odion. 2014. Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity? Natural Areas Journal 34: 310-324.

Dennison, P.E., Brewer, S.C., Arnold, J.D., and M.A. Moritz. 2014. Large wildfire trends in the western United States, 1984-2011. Geophysical Research Letters 41: 2928–2933.

Dillon, G.K. et al. 2011. Both topography and climate affected forest and woodland burn severity in two regions of the western US, 1984 to 2006. Ecosphere 2: Article 130.

Doerr, S.H. and C. Santin. 2016 Global trends in wildfire and its impacts: perceptions versus realities in a changing world. Phil. Trans. R. Soc. B 371: 20150345.

Donato, D.C., J.B. Fontaine, W.D. Robinson, J.B. Kauffman, and B.E. Law. 2009. Vegetation response to a short interval between high-severity wildfires in a mixed-evergreen forest. Journal of Ecology 97: 142-154.

Franklin, A.B., D.R. Anderson, R.J. Gutierrez, and K.P. Burnham. 2000. Climate, habitat quality, and fitness in northern spotted owl populations in northwestern California. Ecological Monographs 70: 539-590.

Fried, J. S., M. S. Torn, and E. Mills. 2004. The impact of climate change on wildfire severity: A regional forecast for northern California. Climatic Change 64 (1–2): 169–191.

Gallagher, C.V. 2010. Spotted owl home range and foraging patterns following fuels-reduction treatments in the northern Sierra Nevada, California. M.S. thesis, Univ. of Calif., Davis.

Garner, J.D. 2013. Selection of disturbed habitat by fishers (*Martes pennanti*) in the Sierra National Forest. M.S. thesis, Humboldt State University.

Gibbons, P. et al. 2012. Land management practices associated with house loss in wildfires. PLoS ONE 7: e29212.

Golder Assoc. 2011. Air Construction Permit Application: Florida Crushed Stone Company Brooksville South Cement Plant's Steam Electric Generating Plant, Hernando County Table 4-1 (Sept. 2011).

Gunn, J., et al., Manomet Center for Conservation Sciences. 2010. Massachusetts Biomass Sustainability and Carbon Policy Study: Report to the Commonwealth of Massachusetts Department of Energy Resources.

Halofsky, J. E., D.C. Donato, D.E. Hibbs, J.L. Campbell, M. Donaghy Cannon, J.B. Fontaine, J.R. Thompson, R.G. Anthony, B.T. Bormann, L.J. Kayes, B.E. Law, D.L. Peterson, and T.A. Spies. 2011. Mixed-severity fire regimes: lessons and hypotheses from the Klamath-Siskiyou Ecoregion. Ecosphere 2(4): art40.

Hanson, C.T. 2013. Pacific fisher habitat use of a heterogeneous post-fire and unburned landscape in the southern Sierra Nevada, California, USA. The Open Forest Science Journal 6: 24-30.

Hanson, C.T. 2015. Uses of higher severity fire areas by female Pacific fishers on the Kern Plateau, Sierra Nevada, California, USA. Wildlife Society Bulletin 39: 497-502.

Hanson, C. T. and M. P. North. 2008. Postfire woodpecker foraging in salvage-logged and unlogged forests of the Sierra Nevada. Condor 110: 777–782.

Hanson, C.T., and D.C. Odion. 2013. Is fire severity increasing in the Sierra Nevada mountains, California, USA? International Journal of Wildland Fire 23: 1-8.

Hanson, C.T. and D.C. Odion. 2016. Historical fire conditions within the range of the Pacific fishers and spotted owl in the central and southern Sierra Nevada, California, USA. Natural Areas Journal 36: 8-19.

Hanson, C.T., D.C. Odion, D.A. DellaSala, and W.L. Baker. 2009. Overestimation of fire risk in the Northern Spotted Owl Recovery Plan. Conservation Biology 23:1314–1319.

Hanson, C.T., D.A. DellaSala, M. Bond, G. Wuerthner, D. Odion, and D. Lee. 2016. Scientist Letter to Governor Brown on the Governor's Proclamation of a State of Emergency on Tree Mortality. 4 February 2016.

Hardy, C.C. 1996. Guidelines for Estimating Volume, Biomass, and Smoke Production for Piled Slash. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, Gen. Tech. Rep. PNW-GTR-364 (1996).

Harmon, M.E. et al. 1996. Modeling carbon stores in Oregon and Washington forest products: 1900-1992. Climatic Change 33: 521-550, at 546.

Hart, S.J., T. Schoennagel, T.T. Veblen, and T.B. Chapman. 2015a. Area burned in the western United States is unaffected by recent mountain pine beetle outbreaks. PNAS 112: 4375-4380.

Hart, S.J., T.T. Veblen, N. Mietkiewicz, and D. Kulakowski. 2015b. Negative feedbacks on bark beetle outbreaks: widespread and severe spruce beetle infestation restricts subsequent infestation. PLoS ONE 10(5): e0127975.

Harvey, B.J, D.C. Donato, W.H. Romme, and M.G. Turner. 2013. Influence of recent bark beetle outbreak on fire severity and postfire tree regeneration in montane Douglas-fir forests. Ecology 94: 2475–2486.

Holtsmark, B. 2013. The outcome is in the assumptions: analyzing the effects on atmospheric CO_2 levels of increased use of bioenergy from forest biomass. Global Change Biology Bioenergy 5: 467-473.

Hudiburg, T.W., B.E. Law, C. Wirth, and S. Luyssaert. 2011. Regional carbon dioxide implications of forest bioenergy production. Nature Climate Change 1: 419-423.

Hutto, R. L. 1995. Composition of bird communities following stand-replacement fires in Northern Rocky Mountain (U.S.A.) conifer forests. Conservation Biology 9: 1041–1058.

Hutto, R. L. 2008. The ecological importance of severe wildfires: Some like it hot. Ecological Applications 18:1827–1834.

Hutto, R.L., R.E. Keane, R.L. Sherriff, C.T. Rota, L.A. Eby, and V.A. Saab. 2016. Toward a more ecologically informed view of severe forest fires. Ecosphere 7(2): e01255.

Jacobson, M.Z. 2014. Effects of biomass burning on climate, accounting for heat and moisture fluxes, black and brown carbon, and cloud absorption effects. Journal of Geophysical Research 119: 8980-9002.

Johnson, E.A. 2003. Towards a sounder fire ecology. Frontiers in Ecology and the Environment 1: 271-276.

Keeley, J.E., H. Safford, C.J. Fotheringham, J. Franklin, and M. Moritz. 2009. The 2007 southern California wildfires: Lessons in complexity. Journal of Forestry 107: 287–296.

Klein, R.D., J. Lewis, and M.S. Buffleben. 2012. Logging and turbidity in the coastal watersheds of northern California. Geomorphology 139-140: 136-144.

Knapp, E.E. et al. 2005. Fuel reduction and coarse woody debris dynamics with early season and late season prescribed fire in a Sierra Nevada mixed conifer forest. Forest Ecology and Management 208: 383-397.

Kodros, J.K., C.E. Scott, S.C. Farina, Y.H. Lee, C. L'Orange, J. Volckens, and J.R. Pierce. 2015. Uncertainties in global aerosols and climate effects due to biofuel emissions. Atmospheric Chemistry and Physics 15: 8577-8596.

Krawchuk, M. A., and M. A. Moritz. 2012. Fire and Climate Change in California. California Energy Commission. Publication number: CEC-500-2012-026.

Krawchuk, M.A., M.A. Moritz, M. Parisien, J. Van Dorn, K. Hayhoe. 2009. Global pyrogeography: the current and future distribution of wildfire. PloS ONE 4: e5102.

Lee, D.E. and M.L. Bond. 2015. Occupancy of California spotted owl sites following a large fire in the Sierra Nevada, California. The Condor 117: 228-236.

Lenihan, J.M., R.J. Drapek, D. Bachelet, and R.P. Neilson. 2003. Climate change effects on vegetation distribution, carbon, and fire in California. Ecological Applications 13: 1667-1681.

Lenihan, J.M., D. Bachelet, R.P. Neilson, and R. Drapek. 2008. Response of vegetation distribution, ecosystem productivity, and fire to climate change scenarios for California. Climate Change 87 (Suppl. 1): S215-S230.

Lydersen, J.M., M.P. North, and B.M. Collins. 2014. Severity of an uncharacteristically large wildfire, the Rim Fire, in forests with relatively restored fire regimes. Forest Ecology and Management 328: 326-334.

Malison, R.L. and C.V. Baxter. 2010. The fire pulse: wildfire stimulates flux of aquatic prey to terrestrial habitats driving increases in riparian consumers. Canadian Journal of Fisheries and Aquatic Sciences 67: 570-579.

Marlon, J.R., Bartlein, P.J., Gavin, D.G., Long, C.J., Anderson, R.S., Briles, C.E., Brown, K.J., Colombaroli, D., Hallett, D.J., Power, M.J., Scharf, E.A., and M.K. Walsh. 2012. Long-term perspective on wildfires in the western USA. PNAS 109: E535–E543.

Mazzoleni, L.R., B. Zielinska, and H. Moosmüller. 2007. Emissions of levoglucosan, methoxy phenols, and organic acids from prescribed burns, laboratory combustion of wildland fuels, and residential wood combustion. Environmental Science and Technology 41: 2115-2122.

McKechnie, J. et al. 2011. Forest bioenergy or forest carbon? Assessing trade-offs in greenhouse gas mitigation with wood-based fuels. Environ. Sci. Technol. 45: 789-795.

McKenzie, D., Z. Gedalof, D.L. Peterson, and P. Mote. 2004. Climatic change, wildfire, and conservation. Conservation Biology 18: 890-902.

McMeeking, G.R. et al. 2009. Emissions of trace gases and aerosols during the open combustion of biomass in the laboratory. Journal of Geophysical Research 114: D19210.

Miller, J.D. and H.D. Safford. 2008. Sierra Nevada Fire Severity Monitoring 1984-2004. U.S. Forest Service Technical Paper R5-TP-027. Pacific Southest Region, Vallejo, CA.

Miller, J.D. and H. Safford. 2012. Trends in wildfire severity: 1984-2010 in the Sierra Nevada, Modoc Plateau, and southern Cascades, California, USA. Fire Ecology 8(2): 41-57.

Miller, J.D., H.D. Safford, M.A. Crimmins, A.E. Thode. 2009. Quantitative evidence for increasing forest fire severity in the Sierra Nevada and southern Cascade Mountains, California and Nevada, USA. Ecosystems 12: 16–32.

Miller, J.D., C.N. Skinner, H.D. Safford, E.E. Knapp, and C.M. Ramirez. 2012. Trends and causes of severity, size, and number of fires in northwestern California, USA. Ecological Applications 22: 184-203.

Mitchell, S.R. et al. 2012. Carbon debt and carbon sequestration parity in forest bioenergy production. Global Change Biology Bioenergy 4: 818-827.

Moritz, M., Parisien, M., Batllori, E., Krawchuk. M., Van Dorn, J., Ganz, D., & Hayhoe, K. 2012. Climate change and disruptions to global fire activity. Ecosphere 3(6): 1-22.

Mouillot, F. and C. Field. 2005. Fire history and the global carbon budget: a 1º x 1º fire history reconstruction for the 20th century. Global Change Biology 11: 398-420.

Myhre, G., D. Shindell et al. 2013. Anthropogenic and Natural Radiative Forcing. Pp 659-740 in Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change IPCC. Stocker, T.F. et al., eds. Cambridge University Press, Cambridge UK and New York USA.

Nagel, T.A. and A. H. Taylor. 2005. Fire and persistence of montane chaparral in mixed conifer forest landscapes in the northern Sierra Nevada, Lake Tahoe Basin, California, USA. J. Torrey Bot. Soc.132: 442-457.

Odion, D.C. and C.T. Hanson. 2006. Fire severity in conifer forests of the Sierra Nevada, California. Ecosystems 9: 1177-1189.

Odion, D.C. and C.T. Hanson. 2008. Fire severity in the Sierra Nevada revisited: conclusions robust to further analysis. Ecosystems 11: 12-15.

Odion, D.C. and C.T. Hanson. 2013. Projecting impacts of fire management on a biodiversity indicator in the Sierra Nevada and Cascades, USA: the black-backed woodpecker. The Open Forest Science Journal 6: 14-23.

Odion, D. C., M. A. Moritz, and D. A. DellaSala. 2010. Alternative community states maintained by fire in the Klamath Mountains, USA. Journal of Ecology.

Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala, and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the Klamath Mountains, northwestern California. Conservation Biology 18: 927-936.

Odion, D.C., C.T. Hanson, A. Arsenault, W.L. Baker, D.A. DellaSala, R.L. Hutto, W. Klenner, M.A. Moritz, R.L. Sherriff, T.T. Veblen, and M.A. Williams. 2014. Examining historical and current mixed-severity fire regimes in Ponderosa pine and mixed-conifer forests of western North America. PLoS ONE 9(2): e87852.

Odion D.C., C.T. Hanson, W.L. Baker, D.A. DellaSala, and M.A. Williams. 2016. Areas of agreement and disagreement regarding ponderosa pine and mixed conifer forest fire regimes: a dialogue with Stevens et al. PLoS ONE 11(5): e0154579.

Parks, S.A., C. Miller, M-A Parisien, L.M. Holsinger, S.Z. Dobrowski, and J. Abatzoglou. 2015. Wildland fire deficit and surplus in the western United States, 1984-2012. Ecosphere 6: Article 275.

Parks, S.A., C. Miller, J.T. Abatzoglou, L.M. Holsinger, M-A. Parisien, and S. Dobrowski. 2016. How will climate change affect wildland fire severity in the western US? Environmental Research Letters 11: 035002.

Picotte, J.J., B. Peterson, G. Meier, and S.M. Howard. 2016. 1984-2010 trends in fire burn severity and area for the coterminous US. International Journal of Wildland Fire 25: 413-420.

Pinder, R.W., E.A. Davidson, C.L. Goodale, T.L. Greaver, J.D. Herrick, and L. Liu. 2012. Climate change impacts of US reactive nitrogen. PNAS 109: 7671-7675.

Ponisio, L.C., K. Wilken, L.M. Gonigle, K. Kulhanek, L. Cook, R. Thorp, T. Griswold, and C. Kremen. 2016. Pyrodiversity begets plant-pollinator community diversity. Global Change Biology 22: 1794-1808.

Price, O.F., J.G. Pausas, N. Govender, M. Flannigan, P.M. Fernandes, M.L. Brooks, and R.B. Bird. 2015. Global patterns in fire leverage: the response of annual area burnt to previous fire. International Journal of Wildland Fire 24: 297-306.

Raphael, M.G., M.L. Morrison, and M.P. Yoder-Williams. 1987. Breeding bird populations during twenty-five years of postfire succession in the Sierra Nevada. The Condor 89: 614-626.

Reinhardt, E.D., R.E. Keane, D.E. Calkin, and J.D. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. Forest Ecology and Management 256: 1997-2006.

Repo, A. et al. 2010. Indirect carbon dioxide emissions from producing bioenergy from forest harvest residues. Global Change Biology Bioenergy 3: 107-115.

Rhodes, J.J. and W.L. Baker. 2008. Fire probability, fuel treatment effectiveness and ecological tradeoffs in western U.S. public forests. Open Forest Science Journal 1: 1-7.

Ricke, K.L. and K. Caldeira. 2014. Maximum warming occurs about one decade after a carbon dioxide emission. Environmental Research Letters 9: 124002.

Robertson, B.A. and R.L. Hutto. 2007. Is selectively harvested forests and ecological trap for olive-sided flycatchers? The Condor 109: 109-121.

Schoennagel, T., T.T. Veblen, and W.H. Romme. 2004. The interaction of fire, fuels, and climate across Rocky Mountain Forests. BioScience 54: 661-676.

Schulze, E.-D. et al. 2012. Large-scale bioenergy from additional harvest of forest biomass is neither sustainable nor greenhouse gas neutral. Global Change Biology Bioenergy 4: 611-616.

Schwind, B. 2008. Monitoring trends in burn severity: report on the Pacific Northwest and Pacific Southwest fires (1984 to 2005). U.S. Geological Survey. Online at: http://www.mtbs.gov/reports/projectreports.html.

Scott, J.H., M.P. Thompson, and J.W. Gilbertson-Day. 2016. Examining alternative fuel management strategies and the relative contribution of National Forest System land to wildfire risk to adjacent homes – A pilot assessment on the Sierra National Forest, California, USA. Forest Ecology and Management 362: 29-37.

Searchinger, T.D. et al. 2009. Fixing a critical climate accounting error. Science 326: 527-528.

Seavy, N.E., R.D. Burnett, and P.J. Taille. 2012. Black-backed woodpecker nest tree preference in the burned forests of the Sierra Nevada, California. Wildlife Society Bulletin 36: 722-728.

Sestrich, C.M., T.E. McMahon, and M.K. Young. 2011. Influence of fire on native and nonnative salmonid populations and habitat in a western Montana basin. Transactions of the American Fisheries Society 140: 136-146.

Siegel, R.B., M.W. Tingley, and R.L. Wilkerson. 2012. Black-backed Woodpecker MIS surveys on Sierra Nevada national forests: 2011 Annual Report. A report in fulfillment of U.S. Forest Service Agreement No. 08-CS-11052005-201, Modification #4; U.S. Forest Service Pacific Southwest Region, Vallejo, CA.

Spracklen, D.V., L.J. Mickley, J.A. Logan, R.C. Hudman, R. Yevich, M.D. Flannigan, A.L. Westerling. 2009. Impacts of climate change from 2000 to 2050 on wildfire activity and carbonaceous aerosol concentrations in the western United States. Journal of Geophysical Research 114: D20301.

Stephens, S.L., R.E. Martin, and N.E. Clinton. 2007. Prehistoric fire area and emissions from California's forests, woodlands, shrublands and grasslands. Forest Ecology and Management 251: 205-216.

Stevens J.T. et al. 2016. Average stand age from forest inventory plots does not describe historical fire regimes in ponderosa pine and mixed-conifer forests of western North America. PLoS ONE 11(5): e0147688.

Swanson, M.E., J.F. Franklin, R.L. Beschta, C.M. Crisafulli, D.A. DellaSala, R.L. Hutto, D. Lindenmayer, and F.J. Swanson. 2010. The forgotten stage of forest succession: early-successional ecosystems on forest sites. Frontiers in Ecology and Environment 9: 117-125.

Syphard, A.D., J.E. Keeley, and T.J. Brennan. 2011. Comparing the role of fuel breaks across southern California national forests. Forest Ecology and Management 261: 2038-2048.

Syphard, A.D., V.C. Radeloff, J.E. Keeley, T.J. Hawbaker, M.K. Clayton, S.I. Stewart, and R.B. Hammer. 2007. Human influence on California fire regimes. Ecological Applications 17(5): 1388-1402.

Syphard A.D., J.E. Keeley, A.B. Massada, T.J. Brennan, and V.C. Radeloff. 2012. Housing arrangement and location determine the likelihood of housing loss due to wildfire. PLoS ONE 7(3): e33954.

Ter-Mikaelian, M.T., S. Colombo, and J. Chen. 2015. The burning question: does forest bioenergy reduce carbon emissions? A review of common misconceptions about forest carbon accounting. Journal of Forestry 113: 57-68.

Tingely, M.W., R.L. Wilkerson, M.L. Bond, C.A. Howell, and R.B. Siegel. 2014. Variation in home-range size of black-backed woodpeckers. The Condor 116: 325-340.

Turn, S.Q., B.M. Jenkins, J.C. Chow, L.C. Pritchett, D. Campbell, T. Cahill, and S.A. Whalen. 1997. Elemental characterization of particulate matter emitted from biomass burning: Wind tunnel derived source profiles for herbaceous and wood fuels. Journal of Geophysical Research 102: 3683-3699.

U.S. EPA Science Advisory Board. 2012. Science Advisory Board Review of EPA's Accounting Framework for Biogenic CO_2 Emissions from Stationary Sources 7 (Sept. 28, 2012).

U.S. EPA, SPECIATE Data Browser, Profile 91102 (Wildfires – Composite), *at* https://cfpub.epa.gov/si/speciate/ehpa_speciate_browse_details.cfm?ptype=PC&pnumber=91102

van Wagtendonk, J.W., K.A. van Wagtendonk, and A.E. Thode. 2012. Factors associated with the severity of intersecting fires in Yosemite National Park, California, USA. Fire Ecology 8: 11-32.

Westerling, A. and B. Bryant. 2008. Climate change and wildfire in California. Climate Change 87: S231– S249.

Westerling A.L., H.G. Hidalgo, D.R. Cayan, T.W. Swetnam. 2006. Warming and earlier spring increase western US forest wildfire activity. Science 313: 940–43.

Westerling, A.L., B. P. Bryant, H.K. Preisler, T.P. Holmes, H.G. Hidalgo, T. Das. And S.R. Shrestha. 2011. Climate change and growth scenarios for California wildfire. Climatic Change 109 (Suppl 1): S445-S463.

Whitlock, C., D.A. DellaSala, S. Wolf, and C.T. Hanson. 2015. Climate Change: Uncertainties, Shifting Baselines, and Fire Management. Pp. 265-289 in The Ecological Importance of Mixed Severity Fires: Nature's Phoenix. D.A. DellaSala and C.T. Hanson, eds. Elsevier, Amsterdam, Netherlands.

Hannigan, Edith@BOF

From: Marily Woodhouse <marily-lobo@hotmail.com>
Sent: Tuesday, May 31, 2016 4:39 PM
To: Vegetation Treatment Program@BOF
Subject: Comment on Vegetation Treatment Plan

Battle Creek Alliance is a non-profit grassroots group which works on forest, watershed, and wildlife issues.

We are writing in support of the comments submitted by the California Chaparral Institute which detail problems with the plan to clear tens of millions of acres of wildlife habitat.

Sequoia Forestkeeper also submitted such thorough comments that we have nothing to add. We agree with their concerns that this is an ill-advised plan which ignores science.

Marily Woodhouse, Director, Battle Creek Alliance
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May 31, 2016

To: California Board of Forestry and Fire Protection (BOF):

Subject: Comments on Draft Vegetation Treatment Program (VTP) Programmatic Environmental Impact Report (PEIR)

I am Chief Scientist at the Conservation Biology Institute (CBI), a nonprofit research and planning institution that performs applied research in biological conservation and resource management. We also provide scientific guidance and support for large-scale conservation and land management plans.

By training, I am an ecologist and wildlife biologist with over 35 years of research and conservation planning experience in California and the west. Because I combine science and real-world planning experience, I am often asked to lead science advisory processes and collaborations amongst agencies, land managers, academic scientists, NGOs, and other stakeholders to resolve complex and contentious land and resource management issues.

Since the 2003 Cedar Fire disaster in San Diego County (during which I housed evacuated friends, and after which I monitored biological impacts) a passionate goal of my work has been to develop better approaches for reducing wildfire risks to human and natural resources while sustaining natural ecological conditions and biological diversity. Currently, I lead teams of experts from state and federal agencies, academia, and NGOs that are tasked with refining management strategies for Sierra Nevada forests to reduce wildfire risks, restore more naturally resilient forest conditions, and improve habitat for species associated with "fuel rich" forests—especially the Pacific fisher (*Pekania pennanti*; a California Threatened Species) and the California spotted owl (*Strix occidentalis occidentalis*; a Candidate for listing).

Based on this professional experience, and at the request of the Endangered Habitats League (EHL), I offer the following comments on the 2016 VTP PEIR.

The current Draft VTP PEIR remains fundamentally flawed and inadequate under CEQA. Numerous substantial comments[1] pointing out errors, fallacies, inadequacies, and other problems with the 2013 Draft VTP PEIR—as well as recommendations from the Fire Science Consortium peer reviewers—appear to have had little influence on the 2016 draft, which still fails to adequately describe the VTP, analyze impacts, develop clear, enforceable and effective mitigation measures, develop an appropriate range of alternatives, or even to justify the purpose and need for the PEIR with any meaningful scientific support.

I understand that the flood of negative comments from scientists, conservationists, and other informed parties in 2013 were largely responsible for the BOF withdrawing and redrafting the PEIR, and obtaining independent scientific peer review by the California Fire Science Consortium. Since 2013, I participated in one meeting with the peer reviewers and several other meetings, workshops, and phone conferences with PEIR participants, scientists, and other experts. Our intent was to provide useful recommendations to CalFire and BOF for improving the VTP and the PEIR. Considering all this expert input during the PEIR revision process, I had hoped that this new draft would be a substantial improvement over the previous. I am disappointed.

Although the PEIR authors did correct some errors and improved much of the content (at least in introductory chapters)—including somewhat improved descriptions of California's vegetation communities and fire regimes—they failed to adequately apply this scientific information in meaningful ways to actually improve the program or the PEIR's defensibility under CEQA. In fact, actions proposed in the VTP are often in conflict with the cited science. This results in the PEIR contradicting itself in later chapters, such as the impact and mitigation chapters.

The following issues are fundamental flaws that render the PEIR out of compliance with CEQA.

Misplaced Goals. Despite the PEIR's *stated* goals (reducing risks to human life, property, and natural resources) its *actual* goal seems to be reducing regulatory hurdles so that CalFire can treat more acres/year—*whether or not the treatments are actually needed and effective*. Note that these different goals lead to very different approaches. If the goal is to treat more acres, there is little incentive to consider more effective, less costly, or more environmentally friendly alternatives. There is no scientific support for acreage quotas.

Insufficient Project Description. The project description is still so vague that the environmental impacts cannot be meaningfully analyzed. The PEIR provides broad categories of vegetation treatments and WUI-based land zones where they may apply, but fails to explain how these would actually be used in the project planning process. For

[1] My comment letter from 2013 (Attachment A) is incorporated herein by reference, because many of the problems it addressed remain in the 2016 PEIR.

example, the PEIR states that the number and type of vegetation treatments would be selected based on "a number of parameters"—starting with, "the potential for significant adverse impacts"—but it never specifies how the various parameters, criteria, and principles would actually be applied to project planning. It also fails to define key terms, such as "high value asset," "old growth," and "forest health," which are used as loopholes in the already vague principles. Impact findings based on such a loosely described project can be nothing more than simplistic speculations. Consequently, the PEIR defers the analysis of impacts and mitigation to be determined project-by-project in the future.

Basically, the program seems to boil down to: We'll determine the impacts of projects as they happen and then figure out mitigation if need be. But it is the purpose of a PEIR to fully analyze and disclose the individual and cumulative impacts of projects it would cover and to prescribe adequate mitigation actions for impacts of those projects. This draft does not do that.

Poor Scientific Justifications. The PEIR often cites references that don't support its statements, misrepresents some scientific references, uses inappropriate references to justify assumptions and conclusions, and omits a number of cited publications from the References (Chapter 9). Rather than create a lengthy list of these (I trust other scientists will weigh in on this topic as well), here are just a few examples:

Chapter 2 still cites Bonnicksen (2003) to support statements about changes in forest composition, habitat value, and stream sedimentation due to fire suppression (although note that the reference is missing from Chapter 9, References). As pointed out in comment letters on the 2013 draft, Bonnicksen (2003) is not a credible or scientific reference, but rather testimony before Congress by a highly controversial timber products lobbyist whose misrepresentations of science and of his own qualifications have been publicly repudiated, including by the University of California System for Bonnicksen claiming a non-existent university affiliation (Rundel et al. 2006). An EIR must objectively consider the best available information, not cherry pick non-scientific opinions.

The 1.5-mile WUI definition is not supported by any scientific evidence or rationale, but rather by citing the 2004 US Forest Service Sierra Nevada Forest Plan Amendment, which is a federal planning document that used 1.5-miles as an arbitrary distance to roughly assess the number of homes and communities that might be affected by the plan. (Note also that the Amendment has been highly controversial, with implementation impeded up by various law suits.) Something as key to establishing the area within which treatments are planned to meet the VTP's stated goals (protecting human and natural resources) should be based on sound, objective analysis, not arbitrary analytical thresholds established by another agency for another purpose.

As commented on extensively by various scientists already, and supported by peer-reviewed science, creating and maintaining fuel breaks not immediately adjacent to homes is not an efficient expenditure of funds, provides little if any protection to homes

or other "high value assets" (especially under severe fire weather when most losses occur) and should be assessed as a resource sacrifice rather than a resource benefit (Cohen 2000; Keeley et al. 2009; Syphard et al. 2011, 2012, 2014; Calkin et al. 2013; Penman et al. 2014; Price et al. 2015).

Some conclusions the PEIR draws from the scientific literature are illogical. For example, it cites Safford and Van de Water (2014) to claim that northern California chaparral is not threatened by increased fire frequencies and that therefore fuel treatments in northern chaparral can be used for ecological purposes. First, this ignores that Safford and Van de Water went on to state that "… recent trends in fire activity, burned area, and fire severity suggest that the situation is rapidly changing as climate warms…." Second, it is a non-sequitur to conclude that fuel treatments in northern chaparral may be *ecologically beneficial* just because they aren't *as threatened* (yet) by type conversion as southern chaparral. *What scientific evidence supports that burning, grinding, or grazing northern chaparral is ecologically beneficial*?

Failure to Adequately Reflect Peer Comments. The PEIR seems to use the CFSC peer review to provide a veneer of scientific respectability, but fails to actually implement the peer comments in meaningful ways. For example, the peer review recommended that the PEIR should "provide an inventory and evaluation of the fuel breaks within the state that includes the development costs associated with continuing to develop and maintain a system… Across all of the Alternatives within the VTPEIR, different levels of investment (capital and maintenance) in fuels breaks should be clearly detailed (Agee et al. 2000)." I have been unable to find such an evaluation in the PEIR.

The review also strongly recommended using a formal adaptive management approach to improve understanding of VTP effects and effectiveness, and use of an outside party to monitor projects to "remove the ability of managers to rely on self-rating checklists that may not always show sound evaluation." The current draft PEIR defers formal adaptive management to some future date (when more funding hopefully becomes available) and (unless I missed something) it still empowers managers (or the "Project Coordinator") to use self-rating checklists without third party input, monitoring, or review.

This is a serious concern that permeates the PEIR: CalFire and BOF seem to take a "trust us, we're professionals" attitude about project planning and implementation, while continuing to ignore implications of peer-reviewed science and being less than transparent about methods, guidelines, etc. This approach does not increase trust.

Poor and Inappropriate Maps, Data and Analyses. It is surprising that the PEIR relies on outdated and inadequate spatial data, presents almost unreadable, very coarse-resolution maps, and that the "GIS-based" analyses are not described with sufficient detail to judge their merits. This is especially concerning given that GIS experts that are familiar with CalFire's GIS staff tell me they are highly competent and have updated data layers that could have been used. Why were these resources not meaningfully deployed to update

and refine the analysis and presentation of where fuels treatments would be used or beneficial?

The PEIR does not even seem aware of CalFire's own expertise, data products, and directives. It uses a fire hazard analysis from 2001-2003 and a WUI model based on 1990 census data, despite that updated datasets are available (some produced by CalFire!). The results of the fire hazard analyses were not subject to formal peer review. Nevertheless, Syphard et al. (2012) found that the model outputs had no power to predict housing losses from wildfire. Relying on admittedly outdated, inaccurate, imprecise, and poorly described analyses to prioritize vegetation treatments is not acceptable.

No Evidence the Proposed Treatments Will Be Effective. The PEIR still provides no evidence, references, or research studies demonstrating the effectiveness of the proposed treatments in protecting homes or other resources. Anecdotal case studies do not represent substantial, objective analyses. Cherry-picking case studies, such as cases when a fuel break may have helped stop a wildfire, can be highly misleading, particularly in the face of peer-reviewed studies showing low probabilities of this occurring over a large sample of fires (Syphard et al. 2011, 2012).

Inadequate Range of Alternatives. An EIR must analyze a range of reasonable alternatives that could feasibly attain the project objectives. However, all alternatives in the PEIR are just variations on the theme of treating vegetation on wildlands to reduce fire risks to human or natural resources, despite all the science calling this approach into question. None of the alternatives is likely to achieve the stated objectives; and there are more environmentally friendly and effective alternatives. Reasonable alternatives that would meet the stated objectives would need to take a comprehensive approach to fire management that includes community and regional planning, reducing ignitability of structures, and using strategic fuel modifications and ignition prevention planning within and directly around (e.g., within 100 feet of) the commodities at risk.

During PEIR revision, the Endangered Habitats League (EHL) in collaboration with several scientists, including me, provided CalFire with an alternative to consider that would better achieve the PEIR's stated goals and reduce the VTP's environmental impacts. This proposed approach prioritized treatments (using properly defined WUI) within 100 feet of at-risk structures (highest priority); within 100-1,000 feet of structures where a tactical fire-fighting evaluation and an ecological evaluation agree there would be a positive benefit/cost ratio (moderate priority); and >1,000 feet from structures, or having adverse ecological effects if closer than this (lowest priority). This recommended alternative approach also reflected the prevailing scientific consensus that fuels treatments in chaparral and other shrub-dominated communities should be generally excluded as too costly and ineffective in reducing fire risks or increasing ecological benefits. I don't see due consideration of such logical, science-based prioritization alternatives in the PEIR.

Vague Criteria and Guidelines. The VTP puts a lot of weight on use of various criteria, principles, and guidelines to avoid and mitigate impacts, but does not spell these out with sufficient detail for one to evaluate their effectiveness. For example, the principles for locating and implementing fuel break treatments are so shallow and vague as to be meaningless, and no process is defined for how conflicts between project objectives would be resolved. For example, who decides what to do, and how, when a project might impact a sensitive species?

Moreover, some criteria, guidelines, and principles are nothing but empty promises, such as, treatments shall be designed "to prevent type conversion." Who determines this, when, how, based on what? And what recourse is there if the finding is incorrect?

Continued Failure to Adequately Analyze Impacts. There is no defensible analysis of VTP impacts for any alternative, nor any meaningful comparison among alternatives. The impact findings are unsubstantiated opinions lacking factual support. In part this stems from the overly vague Project Description and unclear Significance Criteria, which provide no measurable thresholds of significance. For example, concerning biological impacts, the PEIR states that the VTP would have a significant impact if it "contributes to the substantial, long-term decline in the viability of any native species." How are the terms substantial, long-term, decline, and viability defined and measured? Who makes this determination, when, over what portion of the species population distribution, using what data and logic?

The impact analysis for each biological resource basically says there is no significant impact because the projects are relatively small (estimated average = 260 ac), and Standard Project Requirements (SPRs) will minimize and mitigate any impacts (despite how vague, unmeasurable, and unenforceable they appear to be; see below). In fact, the PEIR concludes, the SPRs are likely to *benefit* resources by reducing wildfire size and severity (despite scant scientific support for these assumptions). This is pure speculation without scientific support.

Then, for cumulative impacts, the analysis concludes the program is so "large and complex" that the impacts can't really be assessed, but we assume they are not significant at the regional scale. Which is it, too little area or too much area? This does not represent an adequate analysis of either project or program impacts.

Continued Reliance on Vague and Ineffective Mitigation Concepts. The PEIR relies on vague, unmeasurable, unenforceable, and probably ineffective mitigation concepts to reduce project and cumulative impacts to less than significant. In some cases, the "mitigation" is simply to "identify issues" and "take necessary actions." How is "identifying issues" mitigation? What "necessary actions"? Again, the mitigation statements seem to be based on a "trust us, we're professionals" attitude.

As an example, the PEIR proposes that the "Project Coordinator" will perform a CNDDB search for sensitive species in and near a proposed project area. Really? CNDDB is a

positive-only database that includes data only from areas where surveys have been performed (not to mention it is notoriously out of date, sometimes inaccurate, and does not adequately account for recent taxonomic or status changes, etc.). What are the qualifications of the Project Coordinator? Are they a biologist familiar with the nuances, inadequacies, and interpretations of CNDDB or other biological data sources? I have seen way too many cases of state agencies (and others) misusing CNDDB to draw grossly inappropriate conclusions about project impacts to accept this approach. As pointed out in previous comment letters, there are better, newer, more efficient and informative ways to assess potential resources at risk; and trusting an unnamed "Project Coordinator" to make this determination based on a CNDDB search is not even close to adequate.

The PEIR also seems to imply that simply identifying a problem makes it go away. Identifying issues is not mitigation. What is the resolution when a potentially significant impact is identified by the Project Coordinator and the outcomes of discussions with resource agencies? The PEIR does not describe how resource conflicts will be resolved, projects declined or altered, or mitigation prescribed.

No Consideration of Other Land and Resource Management Plans

As an ecologist with a long history of involvement in California's landscape-scale conservation planning efforts, I am especially concerned that the PEIR seems blind to the progress we have made in establishing ecosystem reserves and how to manage them. I cannot even begin to document this in this letter due to time constraints, but it is unbelievable that a state-wide VTP PEIR would fail to address how its actions relate to existing preserve management guidelines that apply to large areas of conserved land that fall within the State Responsibility Area. This is a major problem that CalFire needs to coordinate much more closely with the California Department of Fish and Wildlife, the Natural Communities Conservation Program, and numerous Habitat Conservation Plans, Conservation Strategies, and other progressive land and water conservation and management plans in this state.

CalFire needs to engage with other agencies—state, federal, tribal, and local—to collaboratively determine how best to manage vegetation and fire issues on our landscape. On its own, CalFire has shown it is not sufficiently informed and competent to meet its stated objectives. Collaboration, science, and logic are needed. I suggest that that it would be fruitful for CalFire and BOF to coordinate with organizations like the California Landscape Conservation Cooperative (CA LCC: http://californialcc.org/) to improve coordination of the VTP with US and California collaborative efforts to conserve biological diversity in the face of climate change using best available science and decision-support tools. CA LCC has representation from all pertinent state and federal agencies and NGOs, except for CalFire. CalFire should catch up with the rest of state government to get on board with efficient, collaborative, science-based programs. The current VTP is not it.

Conclusions

The VTP PEIR remains fundamentally flawed, should not be certified, and needs to be completely redone once a much more scientifically valid approach to wildfire management replaces the current VTP. I again recommend that the program be rethought from the ground up in collaboration with scientists, stakeholders, and other appropriate experts to develop a strategy that might actually achieve the goals of reducing risks to human and natural resources. All this PEIR does is try to justify increasing the acreage of vegetation treated by various means, without sufficient guidance or oversight, in the misguided assumption this will solve the problem. Contacting the California LCC for assistance might be a fruitful first step.

Sincerely,

Dr. Wayne D. Spencer
Chief Scientist, Conservation Biology Institute

Literature Cited

Calkin, D.E., J.D. Cohen, M.A. Finney, and M.P. Thompson. 2013. How risk management can prevent future wildfire disasters in the wildland-urban interface. Proceedings of the National Academies of Science. www.pnas.org/cgi/doi/10.1073/pnas.1315088111

Cohen, J.D. 1999. Reducing the wildland fire threat to homes: where and how much? USDA Forest Service Gen. Tech. Report PSW-GTR-173, pp 189-195.

Cohen, J.D. 2000. Preventing disaster: home ignitability in the wildland-urban interface. Journal of Forestry 98: 15-21Cohen, J. and J. Saveland. 1997. Structure ignition assessment can help reduce fire damages in the W-UI. Fire Mgt. Notes 57:19-23.

Keeley, J.E., H. Safford, C.J. Fotheringham, J. Franklin, and M. Moritz. 2009. The 2007 southern California wildfires: lessons in complexity. Journal of Forestry, September 2009:287-296.

Penman, T.D., L. Collins, A.D. Syphard, J.E. Keeley, and R.A. Bradstock. 2014. Relative influence of fuels, weather and the built environment on the exposure of property to wildfire in San Diego, California. PLoS ONE 10):e11148914.

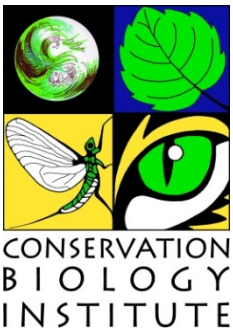
Price, O.F., R.A. Bradstock, J.E. Keeley, and A.D. Syphard. 2012. The impact of antecedent fire area on burned area in southern California coastal ecosystems. J. Environmental Management 113:301-307.

Rundel, P.W., M.F. Allen, N.L. Christensen Jr., and J.E. Keeley. 2006. Open Letter to the Media (Re: Thomas Bonnicksen). October 17, 2006.

Syphard, A.D., Keeley, J.E., and Brennan, T.J. 2011. Factors affecting fuel break effectiveness in the control of large fires in the Los Padres National Forest, California. International Journal of Wildland Fire 20: 764-775.

Syphard, A.D., Keeley, J.E., Bar Massada, A., Brennan, T.J., and Radeloff, V.C. 2012. Housing location and pattern increase fire risk. PLoS ONE 7: e33954. doi:10.1371/journal.pone.0033954.

Syphard, A.D., T.J. Brennan, and J.E. Keeley. 2014. The role of defensible space for residential structure protection during wildfires. International Journal of Wildland Fire 23:1165-1175.



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Dr. Spencer is a wildlife conservation biologist with over 30 years of professional experience in biological research and conservation planning. He specializes in the practical application of ecological and conservation science to resources management, design of nature reserves, and recovery of endangered species. He has conducted numerous studies on rare and sensitive mammals, with particular focus on forest carnivores (e.g., martens and fishers) and endangered rodents (e.g., Pacific pocket mouse and Stephens' kangaroo rat). Dr. Spencer also collaborates with other researchers and planners to develop and apply methods for identifying and conserving wildlife movement corridors and maintaining ecological connectivity in the face of habitat loss, fragmentation, and climate change. He has provided scientific guidance for several large-scale habitat connectivity plans, including the South Coast Missing Linkages Project and the California Essential Habitat Connectivity Project. In the past, Dr. Spencer has prepared habitat conservation plans (HCPs), habitat management plans (HMPs), and natural community conservation plans (NCCPs) for numerous sensitive species in California, including the first NCCP plan ever permitted (Poway Subarea NCCP/HCP). Because he has both research and real-world conservation planning experience, Dr. Spencer is often asked to lead science advisory processes to provide guidance for regional conservation and recovery plans, such as the California Desert Renewable Energy Conservation Plan and the Sacramento-San Joaquin Bay Delta Conservation Plan.

EDUCATION

Ph.D., Ecology and Evolutionary Biology, University of Arizona. 1992. Highest Honors.

M.S., Forestry and Resource Management/Wildlife Ecology. University of California, Berkeley. 1981. Honors.

B.S., Biology and Wildlife Management (double major). University of Wisconsin, Stevens Point. 1978. Highest Honors.

RECENT AWARDS

2011 Special Recognition Award, Desert Tortoise Council
2011 Special Contributions Award, Desert Tortoise Preserve Committee
2008 Conservationist of the Year Award, Western Section of The Wildlife Society

SELECT PROJECT EXPERIENCE

Southern Sierra Nevada Fisher Conservation Strategy — Sierra Nevada Conservancy, US Forest Service, and US Fish and Wildlife Service. Dr. Spencer serves as Chair of a Fisher Technical Team (FTT), a multi-agency group of experts that is preparing a conservation assessment (Spencer et al. 2015b), conservation strategy, and decision-support system to guide conservation of an isolated population of the fisher (*Pekania pennanit*) in the southern Sierra Nevada. The fisher is a carnivore associated with dense mature forests that is proposed for listing under both federal and California Endangered Species Acts. Dr. Spencer is guiding development of spatially explicit habitat and population models to project how this small and isolated population is likely to be affected by various management actions, wildfires, and other factors, and using the results to guide how forest management can restore more resilient forest conditions and recover the fisher population.

Science Facilitator and Lead Advisor for Regional Conservation Plans — Numerous Agencies. Served (or serving) as science facilitator and lead science advisor for a wide variety of large-scale HCPs and NCCPs throughout California, including the Desert Renewable Energy Conservation Plan, the Sacramento-San Joaquin Bay Delta Conservation Plan, the Altamont Pass Wind Resource Area Conservation Plan, and NCCP/HCP plans for the counties of Butte, Santa Clara, San Diego, Merced, Yuba, Sutter, and Yolo, and the city of Santa Cruz. These plans cover hundreds of listed and sensitive species in diverse habitats and ecological communities, usually under severe pressures from human development or other threats to biological integrity. The process includes selecting and leading groups of independent science advisors to reach consensus on scientific principles and solutions, reviewing extensive technical information, organizing questions and issues for advisors to address, compiling and editing inputs from the advisors, and usually serving as first author and editor of a science advisory report. The advisory reports serve as foundations for planning ecological reserve systems and developing adaptive management and monitoring plans to sustain biological diversity, native habitats, and the species inhabiting them.

Principle Investigator for California Mammal Species of Special Concern – California Department of Fish and Wildlife. Led a Technical Advisory Committee and other contributors in a comprehensive update of the Mammal Species of Special Concern (MSSC) in California. The team developed and applied a systematic scoring procedure to rank mammal species, subspecies, or distinct population segments for their relative degree of conservation concern within California. They compiled mammal locality data and other pertinent information concerning the status and distribution of nominee taxa, and prepared species accounts for most species on the final list of MSSC. The results are to be used to update the California Department of Fish and Wildlife list of sensitive taxa.

Principle Investigator for California Essential Habitat Connectivity Project California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration. This project was a highly collaborative

effort to identify and characterize areas important to maintaining a functional network of connected wildlands throughout the state of California (Spencer et al. 2010). The project produced three primary products: (1) a statewide Essential Habitat Connectivity Map, (2) a database characterizing areas delineated on the map, and (3) guidance for mitigating the fragmenting effects of roads and for developing and implementing local and regional connectivity plans. The essential connectivity network consists of 850 relatively intact and well-conserved natural landscape blocks larger than 2,000 acres and 192 essential connectivity areas for maintaining wildlife movement and other ecological flows among them. The final report provides detailed guidance for considering ecological connectivity in transportation and land management planning, preparing finer-resolution regional and local connectivity plans and linkage designs, and siting and creating road-crossing improvements for wildlife to improve ecological connectivity and reduce vehicle-wildlife collisions. All products were produced using cutting-edge GIS modeling methods in a highly collaborative, transparent, and repeatable process that could be emulated by other states. The project received the 2011 Exemplary Ecosystem Initiative Award from the Federal Highways Administration.

Lead Scientist for Pacific Fisher Baseline Assessment and Cumulative Effects Analysis in the Sierra Nevada, California – US Forest Service, Region 5. Led a comprehensive compilation and analysis of data on the Pacific fisher (*Martes [Pekania} pennanti*)—which was found to be "warranted but precluded" for endangered species listing in 2004—to assess the species' historic, current, and future habitat and population status in the Sierra Nevada, and especially to assess the cumulative effects of wildfires, fuels management, timber harvest, and other threats to this isolated population. The project included extensive coordination with state, federal, and local agencies and stakeholder groups (e.g., conservation organizations and timber industry representatives), and facilitation of an independent science advisory body to ensure application of best available science. Cutting-edge spatial-analytical tools were used to forecast changes in fisher habitat and population size under various forest management and fire scenarios, and to forecast resulting effects on population viability. This involved coupling landscape-level models of fire and vegetation dynamics with fisher habitat suitability models and spatially explicit population dynamic models (Spencer et al. 2008, 2011; Syphard et al. 2011, Scheller et al. 2011).

Project Manager/Lead Biologist for Habitat Conservation Plans and Natural Community Conservation Plans – Numerous Agencies. Managed the design, analysis documentation, public involvement, and permitting processes for a variety of regional HCP/NCCPs in California pursuant to the Endangered Species Act and the California NCCP Act, including the following:

- *Poway Subarea HCP/NCCP – City of Poway, California.* The first plan successfully permitted under the NCCP Act of 1991, this wildlife conservation plan was designed to sustain populations of 42 sensitive species in an interconnected habitat network within a 25,000 acre planning area.
- *Multiple Habitat Conservation Program (MHCP) – San Diego Association of Governments (SANDAG).* Managed design and documentation of this HCP/NCCP

covering 7 incorporated cities and over 186 square miles in north San Diego County. Oversaw development and use of a comprehensive GIS database to design a biologically defensible plan that balances conservation and economic concerns. Included a public policy development and coordination component to ensure consensus between all pertinent organizations and agencies, as well as economic and financing analyses for plan implementation.

- *City of Carlsbad Habitat Management Plan (HMP)*. Helped the City of Carlsbad complete a citywide HMP that also serves as a multiple species HCP/NCCP. Met with affected property owners and agencies to negotiate preserve areas within the 25,000-acre planning area; managed biological surveys, GIS analyses, and document preparation. The plan covered nearly 100 sensitive plant and animal species, while preserving reasonable economic growth and private property rights throughout the city.
- *City of Oceanside HCP/NCCP.* Managed preparation of the City's subarea HCP/NCCP, which covered 27,000-acres. Tasks included managing field surveys, GIS database development and analyses, public outreach, and plan documentation.

Framework Monitoring Plan for the Channel Island Fox – US Navy and The Nature Conservancy. Served as project manager, science facilitator, and lead author on a project to review existing monitoring data and methods across all populations of the endangered Channel Island fox (*Urocyon littoralis*) and develop statistically robust monitoring methods to address population status, trends, and threats. Working closely with a panel of experts on fox biology, wildlife monitoring, and statistics, the team developed a statistically robust approach to monitoring population status and threats to the San Clemente Island fox (*U. l. clemente*) that met diverse operational and biological goals of the US Navy, which owns and operates San Clemente Island as a live-fire and special-operations training area. Based on this model, we developed a framework monitoring plan that could also be used on the other 5 islands supporting island fox populations (each island supports a unique subspecies and has different ownerships, management issues, and environmental conditions).

Research on Effects of Fire Severity and Distance from Unburned Edge on Mammalian Community Post-fire Recovery — U.S. Forest Service, Joint Fire Science Program, Riverside Fire Lab. Served as Principle Investigator for a 4-year study of how mammal species and communities recovered following the largest wildfire in California in over 100 years (the October 2003 Cedar Fire in San Diego County). Oversaw a crew of field biologists from the San Diego Natural History Museum that sampled mammal communities and vegetation at numerous plots inside and outside the fire perimeter, at varying distances from the edge and in areas of differing fire intensity (Diffendorfer et al. 2012, Schuette et al. 2014).

Pacific Pocket Mouse Studies Program – Transportation Corridor Agencies, U.S. Fish and Wildlife Service, and California Department of Fish and Game. Served as Principal Investigator for studies designed to further recovery of the critically endangered Pacific pocket mouse (*Perognathus longimembris pacificus*). Tasks included studying

dispersal characteristics and other pertinent biological information on the species; performing detailed field studies of a surrogate subspecies to perfect field methods and design monitoring programs; determining the feasibility of a translocation or reintroduction program for the species, determining baseline measures of genetic diversity within and between extant (using live-captured specimens) and historic (using museum specimens) populations and developing genetic goals for the recovery program; and coordinating ongoing monitoring studies at extant population sites to maximize the value of the monitoring data for both scientific and preserve management goals (Spencer 2005).

Stephens' Kangaroo Rat Studies at the Ramona Airport, San Diego County, California – KEA Environmental. Verified a new population of the endangered Stephens' kangaroo rat in the Santa Maria Valley, Ramona California, by trapping and reconnaissance surveys. Mapped the density and extent of this new, southern-most population, and performed GIS habitat modeling to predict other potential habitat throughout the Santa Maria Valley. Prepared a biological technical report and sections of the Biological Assessment for the Ramona Airport expansion project. Participated in a Section 7 consultation and prepared a Habitat Management Plan for the Stephens' kangaroo rat on the airport property. Prepared and oversaw implementation of a translocation program to salvage kangaroo rats prior to construction, house them in captivity, release them to release sites in improved habitat areas, and monitor success of the translocated population and the overall population in the area for several years.

Basewide Survey for Pacific Pocket Mouse – U.S. Marine Corps Base Camp Pendleton. Managed an intensive field survey to determine the distribution of the endangered Pacific pocket mouse on base. Developed detailed survey protocols in consultation with other mammalogists and the USFWS. Coordinated a team of 15 biologists performing reconnaissance and trapping surveys over all previously unsurveyed habitat for the species on base (over 6,000 acres). Managed development of a GIS database that summarizes all data for the species on base, including results of previous surveys. Analyzed habitat relationships of PPM using GIS and statistical models.

Studies on the Community Ecology of the Chihuahuan Desert – National Science Foundation. Studied the community ecology of desert rodents with Dr. James H. Brown, University of Arizona. Captured, identified, measured, and marked individuals of 15 species of rodents, including three species of kangaroo rats and three species of pocket mice, in over 20,000 trapnights in the Chihuahuan and Sonoran deserts. Trapped, marked, measured, and radio-tracked various species of kangaroo rats with Dr. Peter Waser, Purdue University, for a study of kangaroo rat behavior and ecology. Studied effects of foraging by javelina on native plant species. Performed microhabitat analyses and censuses and intensive foraging studies on wintering sparrow flocks while studying ecological interactions between desert rodents, birds, and ants in the Chihuahuan Desert (Thompson et al. 1991).

Pine Marten Ecology Studies in the Pacific States – U.S. Forest Service. Studied the ecology and behavior of pine martens in the Sierra Nevada and Cascade mountain ranges using trapping, radio-tracking, snow-tracking, smoked track-plate plots, and intensive habitat analyses (Spencer 1981; Spencer 1982; Spencer et al. 1983; Spencer and Zielinski 1983; Zielinski et al. 1983; Spencer 1987).

Studies of Space-use Patterns, Behavior, and Brain Evolution in Heteromyid Rodents – National Science Foundation and National Institute of Health. Researched space use patterns, memory, navigation, and spatial cognition in various species of kangaroo rats, pocket mice, and grasshopper mice (Spencer 1992). Collaborated with Dr. Lucia Jacobs on the evolution of spatial cognition and the hippocampus of the brain in kangaroo rats and pocket mice (Jacobs and Spencer 1991, 1994).

Mount Baker Geothermal Energy Development Biological Resources Assessment – Seattle City Light and Power Company. Led a team that studied the impacts of geothermal energy development on sensitive wildlife in old-growth forests on Mount Baker, Washington. Radio-tracked pine martens and performed trapping and other surveys for various rare carnivore species, including lynx, fisher, and wolverine. Coordinated with biologists studying northern spotted owls and mountain goats.

Assessment of Impacts of Free-roaming House Cats on Native Wildlife Populations at Saguaro National Monument and Tucson Mountain Parks – National Park Service, Western Region. Performed a study involving the impacts of free-roaming house cats on wildlife populations for the design of buffers around nature preserves in Arizona. Radio-tracked 14 free-roaming house cats and analyzed their movements, food habits, home ranges, and behaviors.

Miscellaneous Endangered Species Surveys — numerous clients throughout California, Arizona, and New Mexico. Coordinated and performed field surveys for the California gnatcatcher, coastal cactus wren, least Bell's vireo, southwestern willow flycatcher, desert tortoise, San Joaquin kit fox, and other rare and endangered species throughout the southwestern U.S. Coordinated and performed trapping surveys for the endangered Stephens' kangaroo rat, Pacific pocket mouse, Mojave River vole, and other rare small mammals in southern California.

Kern River Pipeline Desert Tortoise Surveys and Construction Monitoring – Kern River Company. Managed large crews of biologists doing field surveys and construction monitoring for the federally threatened desert tortoise throughout California, Nevada, Utah, and Arizona. Trained field biologists in techniques for surveying and monitoring tortoise populations. Educated construction personnel about mitigation requirements for protecting tortoises during construction of a natural gas pipeline across Utah, Nevada, and California. Relocated tortoises from the impact area under a memorandum of understanding with the USFWS.

PROFESSIONAL REGISTRATIONS AND PERMITS

Society for Conservation Biology
Association for Fire Ecology
American Institute of Biological Sciences
The Wildlife Society
American Society of Mammalogists
Society of American Naturalists
Sigma Xi Honor Society

PUBLICATIONS

Spencer, W.D, H. Rustigian-Romsos, K. Ferschweiler, and D. Bachelet. 2015a. Simulating effects of climate and vegetation change on distributions of martens and fishers in the Sierra Nevada, California, using Maxent and MC1. Pp. 135-149 In: D. Bachelet and D. Turner, eds. Global vegetation dynamics: concepts and applications in the MCI model. Geographical Monograph 214, First Edition. John Wiley & Sons.

Spencer, W.D., S.C. Sawyer, H.L. Romsos, W.J. Zielinski, R.A. Sweitzer, C.M. Thompson, K.L. Purcell, D.L. Clifford, L. Cline, H.D. Safford, S.A. Britting, and J.M. Tucker. 2015b. Southern Sierra Nevada fisher conservation assessment. Unpublished report produced by Conservation Biology Institute.

Zielinski, W.J., K.M. Moriarty, J. Baldwin, T.A. Kirk, K.M. Slauson, H.L. Rustigian-Romsos, and W.D. Spencer. 2015. Effects of season on occupancy and implications for habitat modeling: the Pacific marten *Martes caurina*. Wildlife Biology 21:56-67.

Schuette, P.A., J.E. Diffendorfer, D.H. Deutschman, S. Tremor, and W. Spencer. 2014. Carnivore distributions across chaparral habitats exposed to wildfire and rural housing in southern California. International Journal of Wildland Fire 23:591-600.

Spencer, W.D. 2012. Home ranges and the value of spatial information. Journal of Mammalogy 93:929-947.

Scheller, R.M., W.D. Spencer, H. Rustigian-Romsos, A.D. Syphard, B.C. Ward, and J.R. Strittholt. 2011. Using stochastic simulation to evaluate competing risks of wildfires and fuels management on an isolated forest carnivore. Landscape Ecology 26:1491-1504.

Beier, P., W. Spencer, R. Baldwin, and B. McRae. 2011. Toward best practices for developing regional connectivity maps. Conservation Biology 25:879-892.

Diffendorfer, J., G.M. Fleming, S. Tremor, W. Spencer, and J.L. Beyers. 2012. The role of fire severity, distance from fire perimeter and vegetation on post-fire recovery of small-mammal communities in chaparral. International Journal of Wildland Fire. http://dx.doi.org/10.1071/WF10060.

Carroll, C., W. Spencer, and J. Lewis. 2012. Use of habitat and viability models in *Martes* conservation and restoration. Pages 429-450 In: K. Aubry, W. Zielinski, M. Raphael, G. Proulx, and S. Buskirk, eds. Biology and Conservation of Martens, Sables, and Fishers: A New Synthesis. Cornell University Press.

Syphard, A.D., R.M. Scheller, B.C. Ward, W.D. Spencer, and J.R. Strittholt. 2011. Simulating landscape-scale effects of fuels treatments in the Sierra Nevada, California, USA. International Journal of Wildland Fire 20:364-383.

Spencer, W., H. Rustigian-Romsos, J. Strittholt, R. Scheller, W. Zielinski, and R. Truex. 2011. Using occupancy and population models to assess habitat conservation opportunities for an isolated carnivore population. Biological Conservation 144:788-803. DOI 10.1016/j.biocon.2010.10.027.

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration. February 2010.

Spencer, W.D., H.L. Rustigian, R.M. Scheller, A. Syphard, J. Strittholt, and B. Ward. 2008. Baseline evaluation of fisher habitat and population status, and effects of fires and fuels management on fishers in the southern Sierra Nevada. Unpublished report prepared for USDA Forest Service, Pacific Southwest Region. June 2008. 133 pp + appendices.

Beier, P., D.R. Majka, and W.D. Spencer. 2008. Forks in the road: Choices in GIS procedures for designing wildland linkages. Conservation Biology 22:836-851.

Beier, P., K. Penrod, C. Luke, W. Spencer, and C. Cabanero. 2006. South Coast Missing Linkages: restoring connectivity to wildlands in the largest metropolitan area in the United States. Pages 555-586 in: K. Crooks and M. Sanjayan, eds. Connectivity Conservation. Cambridge University Press.

Penrod, K., C.R. Cabanero, P. Beier, C. Luke, W. Spencer, E. Rubin, and C. Paulman. 2008. A linkage design for the Joshua Tree-Twentynone Palms connection. South Coast Wildlands, Fair Oaks, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, E. Rubin, R. Sauvajot, S. Riley, and D. Kamradt. 2006. South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2006. South Coast Missing Linkages Project: A Linkage Design for the San Bernardino-San Jacinto Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2006. South Coast Missing Linkages Project: A Linkage Design for the Palomar-San

Jacinto/Santa Rosa Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2006. South Coast Missing Linkages Project: A Linkage Design for the Peninsular-Borrego Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Spencer, W.D. 2005. Recovery research for the endangered Pacific pocket mouse: An overview of collaborative studies. In B.E. Kus and J.L. Beyers, technical coordinators. Planning for Biodiversity: Bringing Research and Management Together: Proceedings of a Symposium for the South Coast Ecoregion. Gen. Tech. Rep. PSW-GTR-195. Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Albany, CA: 274pp.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2005. South Coast Missing Linkages Project: A Linkage Design for the San Bernardino-Granite Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2005. South Coast Missing Linkages Project: A Linkage Design for the San Bernardino-Little San Bernardino Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2005. South Coast Missing Linkages Project: A Linkage Design for the Sierra Madre-Castaic Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, E. Rubin, S. Loe, and K. Meyer. 2004. South Coast Missing Linkages Project: A Linkage Design for the San Gabriel-San Bernardino Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, and E. Rubin. 2004. South Coast Missing Linkages Project: A Linkage Design for the San Gabriel-Castaic Connection. South Coast Wildlands, Idyllwild, CA. www.scwildlands.org.

Luke, C., K. Penrod, C.R. Cabanero, P. Beier, and W. Spencer. 2004. A Linkage Design for the Santa Ana – Palomar Mountain Connection: one of the South Coast's 15 Missing Linkages. Unpublished report. San Diego State University Field Station Programs, San Diego, California. www.fs.sdsu.edu

Penrod, K., C. Cabanero, C. Luke, P. Beier, W. Spencer, and E. Rubin. 2003. South Coast Missing Linkages Project: A Linkage Design for the Tehachapi Connection. South Coast Wildlands Project, Idyllwild, CA. www.scwildlands.org.

Swei, A., P.V. Brylski, W.D. Spencer, S.C. Dodd, and J.L. Patton. 2003. Hierarchical genetic structure in fragmented populations of the little pocket mouse (*Perognathus longimembris*). Conservation Genetics 4:501-514.

Spencer, W.D., M.D. White, and J.A. Stallcup. 2001. On the global and regional ecological significance of southern Orange County: conservation priorities for a biodiversity hotspot. Unpublished peer-reviewed report. Prepared for Endangered Habitats League. 44pp.

Jacobs, L.F., and W.D. Spencer. 1994. Space-use patterns and the evolution of hippocampal size in rodents. *Brain, Behavior, and Evolution* 44:125-132.

Spencer, W.D. 1992. Space in the lives of vertebrates: On the ecology and psychology of space use. Ph.D. dissertation. University of Arizona. 131pp.

Thompson, D.D., J.H. Brown, and W.D. Spencer. 1991. Indirect facilitation of granivorous birds by desert rodents: Experimental evidence from foraging patterns. *Ecology* 72:852-863.

Jacobs, L.F., and W.D. Spencer. 1991. Patterns of natural spatial behavior predict hippocampal size in kangaroo rats. *Soc. Neurosci. Abstr.*

Spencer, W.D. 1987. Seasonal rest-site preferences of pine martens in the northern Sierra Nevada. *J. Wildl. Manage.* 51:616-621.

Spencer, W.D., and R.H. Barrett. 1985. An evaluation of the harmonic mean measure for defining carnivore activity areas. *Acta Zool. Fennica* 171:255-259.

Spencer, W.D., R.H. Barrett, and W.J. Zielinski. 1983. Marten habitat preferences in the northern Sierra Nevada. *J. Wildl. Manage.* 47:1181-1186.

Spencer, W.D., and W.J. Zielinski. 1983. Predatory behavior of pine martens. *J. Mammal.* 64:715-717.

Zielinski, W.J., W.D. Spencer, and R.H. Barrett. 1983. Relationship between food habits and activity patterns of pine martens. *J. Mammal.* 64:387-396.

Spencer, W.D. 1982. A test of a pine marten habitat suitability index model for the northern Sierra Nevada. *U.S. Dep. Agric. For. Serv. Supp. Rep.* RO-33. 43pp.

Spencer, W.D. 1981. Pine marten habitat preferences at Sagehen Creek, California. M.S. Thesis, Univ. California, Berkeley. 121pp.

Spencer, W.D. 1978. Habitat changes on easement properties in the Lower Wisconsin River Wildlife Area. *Interdep. Rep., Wisconsin Dep. Nat. Resource.* 76pp.

SELECT PRESENTATIONS

California's Desert Renewable Energy Conservation Plan: A case study in use of independent science advice. Invited Keynote Address at annual conference of Northern California Conservation Planning Partners: Habitat Conservation Planning from Tahoe to the Bay. November 2012.

Planning for ecological connectivity from statewide to local scales. Invited Presentation, Caltrans Biologist Connectivity Training Workshop, Los Angeles, California. October 2011.

Potential effects of large-scale algal biofuels production on wildlife. Invited Presentation to National Academy of Sciences Committee on Sustainable Biofuels Production. August 2011.

Independent science advice for the California Desert Renewable Energy Conservation Plan: Background, Recommendations, and Future Directions. Invited Keynote Address at annual conference of the Desert Tortoise Council, Las Vegas, Nevada. February 2011.

Trends in independent science advice for NCCP/HCPs. Invited presentation at annual conference of the Western Section of The Wildlife Society, Riverside, California. February 2011.

Why mammals use home ranges: The value of spatial information. Invited Special Symposium Presentation, American Society of Mammalogists, Fairbanks, Alaska. June 2009.

Roles for science-based NGOs in wildlife management and conservation. Invited Plenary Talk at annual conference of the Western Section of The Wildlife Society, Redding, California. February 2008.

Managing landscape linkages to conserve desert wildlife during climate change. Invited presentation and panel discussion. The Climate & Deserts Workshop: Adaptive Management of Desert Ecosystems in a Changing Climate. Laughlin, NV, April 2008.

Improving science delivery for regional conservation plans: Lessons from science advisory processes in California. Invited presentation. Society for Conservation Biology, San Jose California, June 2006.

The science advisory process for regional NCCPs and HCPs. Invited presentation, Continuing Legal Education (CLE) workshop on regional conservation planning. San Francisco, California. December 2005.

Bioethical meanderings of a fur trapper to game biologist to ivory tower ecologist to bioslut to NGO conservation scientist convert. Invited talk at Special Session on Ethics in Wildlife Biology, Western Section of The Wildlife Society, February 2003.

Salvage translocation of endangered Stephens' kangaroo rats in a small, satellite population. Society for Conservation Biology, Duluth, Minnesota. 2003.

The role of consultants in conservation science delivery. Invited presentation at Regional Conservation Planning (NCCP/HCP) Workshop. Western Section of the Wildlife Society. Sacramento, California. 2001.

The science component of regional conservation plans. Invited presentation at Regional Conservation Planning (NCCP/HCP) Workshop. Western Section of the Wildlife Society. Sacramento, California. 2001.

Designing a translocation program to recover the critically endangered Pacific pocket mouse (*Perognathus longimembris pacificus*). American Society of Mammalogists. Missoula, Montana. 2001.

Status of mammals in near coastal habitats, with emphasis on the endangered Pacific pocket mouse. Invited Symposium Presentation. Planning for Biodiversity: Bringing Research and Management Together. Pamona, California. 2000.

U.S.-Mexican cooperation in the conservation of rare mammals: Workshop Introduction. International Theriological Congress IV. Acapulco, Mexico. 1997.

Does the extremely endangered pacific little pocket mouse exist in Baja, California, Mexico? International Theriological Congress IV. Acapulco, Mexico. 1997.

Linkage planning under severe constraints: gnatcatchers and the Oceanside stepping-stone hypothesis. Interface Between Ecology and Land Development in California. J.E. Keeley, ed. Southern Calif. Acad. Sci., Los Angeles. 1997.

Threatened and endangered species of California: a regional overview. CLE International Conference on the Endangered Species Act. San Diego, California. 1995.

Impacts of free-ranging house cats on wildlife at a suburban-desert interface. Society for Conservation Biology. Guadalajara, Mexico. 1994.

Resource dispersion, information, and space-use patterns of vertebrates. Animal Behavior Society. Binghamton, New York. 1990.

Statistical moments for analyses of two-dimensional distributions in ecology. Southwest Association of Biologists. Portal, Arizona. 1988.

Spatial learning and models of foraging movements. Southwestern Association of Biologists. Flagstaff, Arizona. 1987.

Multiple central-place foraging in small carnivores. American Society of Mammalogists. Albuquerque, New Mexico. 1987.

On cognitive maps and the optimal use of home range. Animal Behavior Society. Tucson, Arizona. 1986.

An evaluation of the harmonic mean measure for defining carnivore activity areas. Invited Paper: International Theriological Congress. Helsinki, Finland. 1982.

Selection of resting and foraging sites by *Martes americana*. International Theriological Congress. Helsinki, Finland. 1982.

Rest-site selection by pine martens at Sagehen Creek, California. Western Section of The Wildlife Society. Reno, Nevada. 1981.