DEPARTMENT OF FORESTRY AND FIRE PROTECTION
NORTHERN REGION HEADQUARTERS
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OFFICIAL RESPONSE OF THE DIRECTOR OF THE CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION TO SIGNIFICANT ENVIRONMENTAL POINTS RAISED DURING THE TIMBER HARVESTING PLAN EVALUATION PROCESS

THP NUMBER: 2-22-00125-SHA

SUBMITTER: Sierra Pacific Industries

COUNTY: Shasta

END OF PUBLIC COMMENT PERIOD: November 14, 2022

DATE OF OFFICIAL RESPONSE/DATE OF APPROVAL: November 15, 2022

The California Department of Forestry and Fire Protection has prepared the following response to significant environmental points raised during the evaluation of the above-referenced plan. Comments made on like topics were grouped together and addressed in a single response. Where a comment raised a unique topic, a separate response is made. Remarks concerning the validity of the review process for timber operations, questions of law, or topics or concerns so remote or speculative that they could not be reasonably assessed or related to the outcome of a timber operation, have not been addressed.

Sincerely,

DocuSigned by:
AE5E25725914422...

Adam Deem, RPF #2759
Forester II
Review Team Chair

cc: Unit Chief
RPF
Plan Submitter
Dept. of Fish & Wildlife, Reg. 1
Water Quality, Reg. 5
Public Comment Writers

Table of Contents

Summary of Review Process

Common Forest Practice Abbreviations

AB 32	Assembly Bill 32
ARB	Air Resources Board
BOF	Board of Forestry
CAA	Confidential Archaeological Addendum
CAL FIRE	Department of Forestry & Fire Protection
CAPCOA	Calif. Air Pollution Control Officers Assoc.
CCR	Calif. Code of Regulations
CDFW/DFW	California Dept. of Fish & Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CGS	California Geological Survey
CIA	Cumulative Impacts Assessment
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide equivalent
CSO	California Spotted Owl
DBH/dbh	Diameter Breast Height
DPR	Department of Pesticide Regulation
EPA	Environmental Protection Agency
FPA	Forest Practice Act
FPR	Forest Practice Rules
GHG	Greenhouse Gas
ha^{-1}	per hectare
LBM	Live Tree Biomass
LTO	Licensed Timber Operator
LTSY	Long Term Sustained Yield
m^{-2}	per square meter
MAI	Mean Annual Increment
MMBF	Million Board Feet
$MMTCO_2E$	Million Metric Tons CO_2 equivalent
NEP	Net Ecosystem Production
NEPA	National Environ. Policy Act
NMFS	National Marine Fisheries Service
NPP	Net Primary Production
NSO	Northern Spotted Owl
NTMP	NonIndust. Timb. Manag. Plan
OPR	Govrn's Office of Plan. & Res.
PCA	Pest Control Advisor
Pg	Petagram = 10^{15} grams
PHI	Pre-Harvest Inspection
PNW	Pacific NorthWest
PRC	Public Resources Code
RPA	Resource Plan. and Assess.
RPF	Registered Professional Forester
[SIC]	Word used verbatim as originally printed in another document
SPI	Sierra Pacific Industries
SYP	Sustained Yield Plan
tC	tonnes of carbon
Tg	Teragram = 10^{12} grams
THP	Timber Harvest Plan
TPZ	Timber Production Zone
USFS	United States Forest Service
USFWS	U.S. Fish & Wildlife Service
WAA	Watershed Assessment Area
WLPZ	Watercourse. & Lake Prot. Zone
WQ	California Regional Water Quality Control Board
yr^{-1}	per year

Notification Process

In order to notify the public of the proposed timber harvesting, and to ascertain whether there are any concerns with the plan, the following actions are automatically taken on each THP submitted to CAL FIRE:

- Notice of the timber operation is sent to all adjacent landowners if the boundary is within 300 feet of the proposed harvesting, (As per 14 CCR § 1032.7(e))
- Notice of the Plan is submitted to the county clerk for posting with the other environmental notices. (14 CCR § 1032.8(a))
- Notice of the plan is posted at the Department's local office and in Cascade Area office in Redding. (14 CCR § 1032))
- Notice is posted with the Secretary for Resources in Sacramento. (14 CCR § 1032.8(c))
- Notice of the THP is sent to those organizations and individuals on the Department's current list for notification of the plans in the county. (14 CCR § 1032.9(b))
- A notice of the proposed timber operation is posted at a conspicuous location on the public road nearest the plan site. (14 CCR § 1032.7(g))

Plan Review Process

The laws and regulations that govern the timber harvesting plan (THP) review process are found in Statute law in the form of the Forest Practice Act which is contained in the Public Resources Code (PRC), and Administrative law in the rules of the Board of Forestry (rules) which are contained in the California Code of Regulations (CCR).

The rules are lengthy in scope and detail and provide explicit instructions for permissible and prohibited actions that govern the conduct of timber operations in the field. The major categories covered by the rules include:

*THP contents and the THP review process

*Silvicultural methods

*Harvesting practices and erosion control

*Site preparation

*Watercourse and Lake Protection

*Hazard Reduction

*Fire Protection

*Forest insect and disease protection practices

*Logging roads and landing

When a THP is submitted to the California Department of Forestry and Fire Protection (CAL FIRE) a multidisciplinary review team conducts the first review team meeting to assess the THP. The review team normally consists of, but is not necessarily limited to, representatives of CAL FIRE, the Department of Fish and Game (DFW), and the Regional Water Quality Control Board (WQ). The California Geological Survey (CGS) also reviews THP's for indications of potential slope instability. The purpose of the first review team meeting is to assess the logging plan and determine on a preliminary basis whether it conforms to the rules of the Board of Forestry. Additionally, questions are formulated which are to be answered by a field inspection team.

Next, a preharvest inspection (PHI) is normally conducted to examine the THP area and the logging plan. All review team members may attend, as well as other experts and agency personnel whom CAL FIRE may request. As a result of the PHI, additional recommendations may be formulated to provide greater environmental protection.

After a PHI, a second review team meeting is conducted to examine the field inspection reports and to finalize any additional recommendations or changes in the THP. The review team transmits these recommendations to the RPF, who must respond to each one. The director's representative considers public comment, the adequacy of the registered professional forester's (RPF's) response, and the recommendations of the review team chair before reaching a decision to approve or deny a THP. If a THP is approved, logging may commence. The THP is valid for up to five years, and may be extended under special circumstances for a maximum of 2 years more for a total of 7 years.

Before commencing operations, the plan submitter must notify CAL FIRE. During operations, CAL FIRE periodically inspects the logging area for THP and rule compliance. The number of the inspections will depend upon the plan size, duration,

complexity, regeneration method, and the potential for impacts. The contents of the THP and the rules provide the criteria CAL FIRE inspectors use to determine compliance. While CAL FIRE cannot guarantee that a violation will not occur, it is CAL FIRE's policy to pursue vigorously the prompt and positive enforcement of the Forest Practice Act, the forest practice rules, related laws and regulations, and environmental protection measures applying to timber operations on the timberlands of the State. This enforcement policy is directed primarily at preventing and deterring forest practice violations, and secondarily at prompt and appropriate correction of violations when they occur.

The general means of enforcement of the Forest Practice Act, forest practice rules, and the other related regulations range from the use of violation notices which may require corrective actions, to criminal proceedings through the court system. Civil, administrative civil penalty, Timber operator licensing, and RPF licensing actions can also be taken.

THP review and assessment is based on the assumption that there will be no violations that will adversely affect water quality or watershed values significantly. Most forest practice violations are correctable and CAL FIRE's enforcement program seeks to assure correction. Where non-correctable violations occur, civil or criminal action may be taken against the offender. Depending on the outcome of the case and the court in which the case is heard, some sort of supplemental environmental corrective work may be required. This is intended to offset non-correctable adverse impacts. Once a THP is completed, a completion report must be submitted certifying that the area meets the requirements of the rules. CAL FIRE inspects the completed area to verify that all the rules have been followed including erosion control work.

Depending on the silvicultural system used, the stocking standards of the rules must be met immediately or in certain cases within five years. A stocking report must be filed to certify that the requirements have been met. If the stocking standards have not been met, the area must be planted annually until it is restored. If the landowner fails to restock the land, CAL FIRE may hire a contractor to complete the work and seek recovery of the cost from the landowner.

General Discussion and Background

The following summary is provided for some of the over-arching concerns expressed in public comment. Specific issues raised within comments will be addressed in the next section.

CEQA Analysis

A CEQA analysis is not required to be perfect, but it must be accurate and adequately describe the proposed project in a manner that allows for informed decision-making. It must include an assessment of impacts based upon information that was "reasonably available before submission of the plan." (Technical Rule Addendum #2)

CEQA clearly establishes that the Lead Agency has a duty to minimize harm to the environment while balancing Competing Public Objectives (14 CCR §15021)[1]. These

[1] Duty to Minimize Environmental Damage and Balance Competing Public Objectives

CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible.

(1) In regulating public or private activities, agencies are required to give major consideration to preventing environmental damage.
(2) A public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment.

(b) In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors.
(c) The duty to prevent or minimize environmental damage is implemented through the findings required by Section 15091.
(d) CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian. An agency shall prepare a statement of overriding considerations as described in Section 15093 to reflect the ultimate balancing of competing public objectives when the agency decides to approve a project that will cause one or more significant effects on the environment.

Note: Authority cited: Section 21083, Public Resources Code; Reference: Public Resources Code Sections 21000, 21001, 21002, 21002.1, and 21081; San Francisco Ecology Center v. City and County of San Francisco, (1975) 48 Cal. App. 3d 584; Laurel Hills Homeowners Association v. City Council, (1978) 83 Cal. App. 3d 515.

Discussion: Section 15021 brings together the many separate elements that apply to the duty to minimize environmental damage. These duties appear in the policy sections of CEQA, in the findings requirement in Section 21081, and in a number of court decisions that have built up a body of case law that is not immediately reflected in the statutory language. This section is also necessary to provide one place to explain how the ultimate balancing of the merits of the project relates to the search for feasible alternatives or mitigation measures to avoid or reduce the environmental damage.

duties are further refined in the Z'berg-Nejedly Forest Practice Act (PRC §4512(c)[2]) and PRC §4513(b)[3] for how the mandate to provide "maximum sustained production of high quality timber products" is to be balanced with other environmental considerations. The term "while giving consideration to" is further defined in 14 CCR §895.1 as follows:

> ***While Giving Consideration*** *means the selection of those feasible silvicultural systems, operating methods and procedures which substantially lessen significant adverse Impact on the environment and which best achieve long-term, maximum sustained production of forest products, while protecting soil, air, fish and wildlife, and water resources from unreasonable degradation, and which evaluate and make allowance for values relating to range and forage resources, recreation and aesthetics, and regional economic vitality and employment.*

What is missing from the Act, Rules or CEQA Guidelines is the weight that is to be applied to the evaluation of the other resources specified. Clearly, there are certain legal restrictions on the degradation of specific values (e.g. water quality standards) but many of the elements that must be considered have a qualitative, not quantitative mandate for evaluation. This allows the Plan Submitter and the Lead Agency to exercise "professional judgement[4]" when preparing and evaluating plans.

The placement of this section early in the article on general responsibilities helps highlight this duty to prevent environmental damage. This section is an effort to provide a careful statement of the duty with its limitations and its relationship to other essential public goals.

[2] (c) The Legislature thus declares that it is the policy of this state to encourage prudent and responsible forest resource management calculated to serve the public's need for timber and other forest products, while giving consideration to the public's need for watershed protection, fisheries and wildlife, sequestration of carbon dioxide, and recreational opportunities alike in this and future generations.

[3] (b) The goal of maximum sustained production of high-quality timber products is achieved while giving consideration to values relating to sequestration of carbon dioxide, recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment, and aesthetic enjoyment.

[4] *14CCR §897(d) Due to the variety of individual circumstances of timber harvesting in California and the subsequent inability to adopt site-specific standards and regulations, these Rules use judgmental terms in describing the standards that will apply in certain situations. By necessity, the RPF shall exercise professional judgment in applying these judgmental terms and in determining which of a range of feasible (see definition 14 CCR 895.1) silvicultural systems, operating methods and procedures contained in the Rules shall be proposed in the plan to substantially lessen significant adverse Impacts in the environment from timber harvesting. The Director also shall exercise professional judgment in applying these judgmental terms in determining whether a particular plan complies with the Rules adopted by the Board and, accordingly, whether he or she should approve or disapprove a plan. The Director shall use these Rules to identify the nature he limits to the professional judgment to be exercised by him or her in administering these Rules.*

What is also evident from an examination of the entire record (i.e. information provided by the Plan Submitter, submitted as public comment and information supplemented to the record by CAL FIRE) is that there is disagreement amongst experts about what the appropriate course of action is or what the feasible alternatives to the project may be. Again, CEQA provides guidance on this topic, with respect to both the adequacy of the record, and on differences of opinion, even between recognized experts:

> *15151. Standards for Adequacy of an EIR*
>
> *An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.*
>
> *Note: Authority cited: Section 21083, Public Resources Code; Reference: Sections 21061 and 21100, Public Resources Code; San Francisco Ecology Center v. City and County of San Francisco, (1975) 48 Cal. App. 3d 584.*
>
> *Discussion: This section is a codification of case law dealing with the standards for adequacy of an EIR. In Concerned Citizens of Costa Mesa, Inc. v. 32nd District Agricultural Assoc. (1986) 42 Cal. 3d 929, the court held that "the EIR must contain facts and analysis, not just the agency's bare conclusions or opinions." In Browning-Ferris Industries of*

> *California, Inc. v. San Jose (1986) 181 Cal. App. 3d 852, the court reasserted that an EIR is a disclosure document and as such an agency may choose among differing expert opinions when those arguments are correctly identified in a responsive manner. Further, the state Supreme Court in its 1988 Laurel Heights decision held that the purpose of CEQA is to compel government at all levels to make decisions with environmental consequences in mind. CEQA does not, indeed cannot, guarantee that these decisions will always be those which favor environmental considerations, nor does it require absolute perfection in an EIR.*

CAL FIRE has an obligation to explain the rationale for approving a plan. This is often done in the presence of contradicting information and results in different parties being displeased with the results. A competent CEQA analysis is not required to make the "best" choice, but the choice made must be supported by information contained within the record. This is where Lead Agency discretion comes into play. CAL FIRE ultimately bears the responsibility for making a decision and, when presented with public comments, is expected to provide an answer to significant questions raised.

Another expressed concern is over the extent to which the plan, and by extension CAL FIRE, discusses effects that are not deemed to be significant. CEQA provides guidance on how to address impacts within 14 CCR §15130:

> *15130. DISCUSSION OF CUMULATIVE IMPACTS*
>
> *(a) An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the*

incremental effect is not cumulatively considerable.

(1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the

cumulative impact. The following elements are necessary to an adequate discussion of significant cumulative impacts:

(1) Either:

(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.

(2) When utilizing a list, as suggested in paragraph (1) of subdivision (b), factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type. Location may be important, for example, when water quality impacts are at issue since projects outside the watershed would probably not contribute to a cumulative effect. Project type may be important, for example, when the impact is specialized, such as a particular air pollutant or mode of traffic.

(3) Lead agencies should define the geographic scope of the area affected by the cumulative

effect and provide a reasonable explanation for the geographic limitation used.

(4) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

(5) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

(c) With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by- project basis.

(d) Previously approved land use documents, including, but not limited to, general plans, specific plans, regional transportation plans, plans for the reduction of greenhouse gas emissions, and local coastal plans may be used in cumulative impact analysis. A pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master or comparable programmatic plan where the lead agency determines that the regional or areawide cumulative impacts of the proposed project have already been adequately addressed, as defined in section 15152(f), in a certified EIR for that plan.

(e) If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section 15183(j).

Note: Authority cited: Sections 21083, 21083.05, Public Resources Code. Reference: Sections 21003(d), 21083(b), 21093, 21094 and 21100, Public Resources Code; Whitman v. Board of Supervisors, (1979) 88 Cal. App. 3d 397; San Franciscans for Reasonable Growth v. City and County of San Francisco (1984) 151 Cal.App.3d 61; Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692; Laurel Heights Homeowners Association v. Regents of the University of California (1988) 47 Cal.3d 376; Sierra Club v. Gilroy (1990) 220 Cal.App.3d 30; Citizens to Preserve the Ojai v. County of Ventura (1985) 176 Cal.App.3d 421; Concerned Citizens of South Cent. Los Angeles v. Los Angeles Unified Sch. Dist. (1994) 24 Cal.App.4th 826; Las Virgenes Homeowners Fed'n v. County of Los Angeles (1986) 177 Cal.App.3d 300; San Joaquin Raptor/Wildlife Rescue Ctr v. County of Stanislaus (1994) 27 Cal.App.4th 713; Fort Mojave Indian Tribe v. Cal. Dept. Of Health Services (1995) 38 Cal.App.4th 1574; Santa Monica Chamber of Commerce v. City of Santa Monica (2002) 101 Cal.App.4th 786; Communities for a Better Environment v. California Resources Agency (2002) 103 Cal.App.4th 98; and Ass'n of Irritated Residents v. County of Madera (2003) 107 Cal.App.4th 1383.

When an analysis has determined that the impacts are less than significant, a detailed discussion is not required and an abbreviated explanation is acceptable.

About Agency “Activism” (Agency Prohibited from creating “underground regulations”)

Another theme is that CAL FIRE should take an activist role in steering plan submitters towards, or in this case away from, certain actions that the comment writer deems deleterious to the natural environment. To do so would be contrary to our purpose and entirely outside of our jurisdictional authority. The plan submitter is responsible for proposing plans consistent with their objectives and CAL FIRE is responsible for determining whether or not the operations as proposed would cause a significant adverse effect on the environment. How an individual THP may or may not align with state goals or other non-regulatory targets is not a factor we can consider when making such a determination.

In fact, if CAL FIRE was to impose a standard not required by regulation, we would likely be found to have created an “underground regulation[5]” and would be open to legal challenge.

Requirement to augment the record

In addition to information provided by the Plan Submitter and Public Commenters, CAL FIRE is also responsible for considering additional information and adding it to the plan record. This requirement is specified in 14 CCR §898 ”*The Director shall supplement the information provided by the RPF and the plan submitter when necessary to ensure that all relevant information is considered.*“ Sometimes this information is discovered while reviewing submitted literature and other information is added when the reviewer believes it is relevant to the discussion.

All Concerns Are Treated Equal

From CAL FIRE’s perspective, one concern expressed is as good as a thousand. Every concern, no matter who it comes from, is given careful consideration. It is our responsibility to the public and to those we regulate to provide a fair and unbiased review. This Official Response is written with that in mind.

[5] https://oal.ca.gov/underground_regulations/

Watersheds as the Focal Point for Cumulative Impacts Evaluation

Because they have defined boundaries and a single outlet, watersheds are an appropriate way to measure impacts to many resources (e.g. watershed, soil productivity) because these resources are bound primarily by the effects of gravity. For example: water flows downhill, landslides move down and not up slope such that upslope or resources in an adjacent watershed would not expect impacts. Most of the early environmental concerns rest upon the choice of assessment area and its appropriateness.

For other resources (e.g. recreation, noise, traffic, visual, fire hazard, greenhouse gas), the watershed boundary is not necessarily a limiting factor. For instance, deer and wolves move between watersheds easily and birds traverse large areas during their normal life cycle. Thus, it makes sense that some other delineation of assessment area for these specific resources would be used. While early THPs typically used the watershed boundary as the basis for evaluating all cumulative effects, contemporary analysis acknowledges the need for more refined boundaries, based upon the resource being evaluated. Even so, in some instances, areas such as the watershed (or multiple watersheds) are used to define the assessment area for resources such as fire hazard or greenhouse gas, because there is a requirement to have some defined boundary (e.g. carbon exchange occurs on a global scale but projects must evaluate site-specific impacts so a smaller area of evaluation is required in order to have a relevant analysis).

The Forest Practice Rules and Technical Rule Addendum #2 provide guidance in the determination of the size and shape of the assessment areas. 14 CCR §898 provides the general direction and reference to the evaluation of significant impacts and states:

> “Cumulative impacts shall be assessed based upon the methodology described in Board Technical Rule Addendum Number 2, Forest Practice Cumulative Impacts Assessment Process and shall be guided by standards of practicality and reasonableness. The RPF's and plan submitter's duties under this section shall be limited to closely related past,

> present and reasonably foreseeable probable future projects within the same ownership and to matters of public record."

Further, 14 CCR §897(b)(2) [Implementation of Act Intent] provides additional context for evaluating timber harvesting plans:

> Individual THPs shall be considered in the context of the larger forest and planning watershed in which they are located, so that biological diversity and watershed integrity are maintained within larger planning units and adverse cumulative impacts, including impacts on the quality and beneficial uses of water are reduced.

Although the Rules acknowledge that different assessment areas may be chosen based upon the resource under consideration, the designation of the planning watershed as an appropriate spatial scale is consistent with 14 CCR §15130(b)(1)(B)(3), which states that:

> "Lead agencies should define the geographical scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used."

There are, however, two different systems for classifying watersheds in California.

The CalWater System

The Natural Resource Conservation service established the nationwide classification of watersheds from 1992-1996 (Wikipedia, 2020). The California Resources Agency began a digitization project in 1993 based upon the Hydrologic Basin Planning Maps developed by the State Water Resources Control Board in 1986 (CAL FIRE, 2004). The state and federal systems in California were moved closer together over time, through multi-agency MOUs and integrated into the CalWater system, managed by the California Department of Water Resources (DWR). In 2017, DWR notified the original members of the MOU that going forward the National Hydrography Dataset (NHD) would be the new authoritative dataset (DWR, 2021). The CalWater 2.2.1 system is widely used in California, although the boundaries

vary in some cases from the federal designations. Most notably, some watersheds in the Calwater system are broken up using administrative or political boundaries.

The California Forest Practice Rules first included a definition of “Watershed” in the 1992 Rules:

> ***planning watershed*** *means the contiguous land base and associated watershed system that forms a fourth order or other watershed typically 10,000 acres or less in size. Where a watershed exceeds 10,000 acres, the Director may approve subdividing into smaller planning watersheds which shall be a composite of contiguous lower order watersheds and areas draining into the main channel but not supporting a first order tributary. Smaller planning watersheds shall not be less than 3,000 acres nor exceed 10,000 acres in size as proposed by a plan submitter and approved by the Director. Plan submitters with approval of the director may allow a larger size planning watershed when 10,000 acres or less is not a logical planning unit, such as on the Eastside Sierra Pine type, as long as the size in excess of 10,000 acres is the smallest that is practical. Third order basins flowing directly into the ocean shall also be considered an appropriate planning watershed. This section will stay in effect until such time as the Director prepares and distributes maps identifying planning watersheds using the above criteria.*

The 1997 Rules were revised as follows:

> ***Planning Watershed*** *means the contiguous land base and associated watershed system that forms a fourth order or other watershed typically 10,000 acres or less in size. Planning watersheds are used in planning forest management and assessing impacts. The Director has prepared and distributed maps identifying planning watersheds plan submitters must use. Where a watershed exceeds 10,000 acres, the Director may approve subdividing it. Plan*

> *submitters may propose and use different planning watersheds, with the director's approval. Examples include but are not limited to the following: when 10,000 acres or less is not a logical planning unit, such as on the Eastside Sierra Pine type, as long as the size in excess of 10,000 acres is the smallest that is practical. Third order basins flowing directly into the ocean shall also be considered an appropriate planning watershed.*

Initially, plan preparers were directed to come up with their own watersheds, based upon the 10,000 acre target. The California Resources Agency (CRA) Department of Forestry and Fire Protection (CDF) contracted with Tierra Data Systems for the original digital production in 1993, based on Hydrologic Basin Planning Maps published in hardcopy (CAL FIRE, 2004). Once this was finished, it was distributed to RPFs for use in plans. The system was then maintained by an interagency group called the "California Interagency Watershed Mapping Committee". Changes were made to boundaries and information over time, with the newest changes made in 2004 (version 2.2.1).

The CalWater system is broken down into 6 categories:

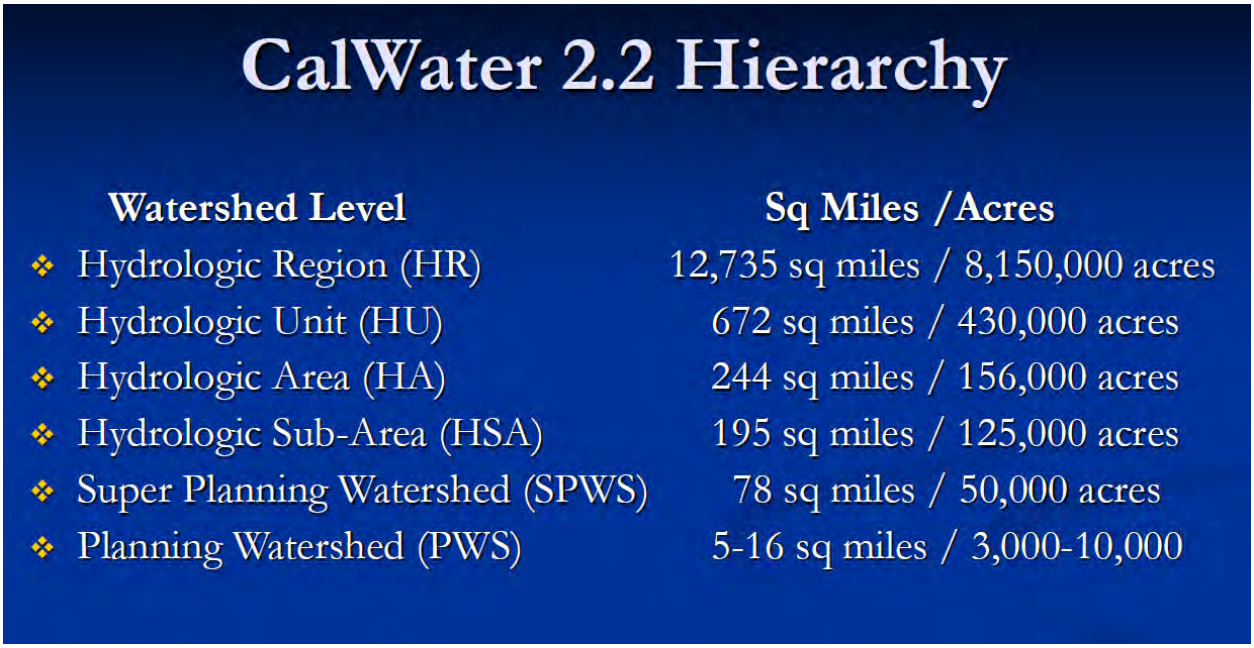


Figure 1 CalWater 2.2.1 Hierarchy (Meyers, 2004)

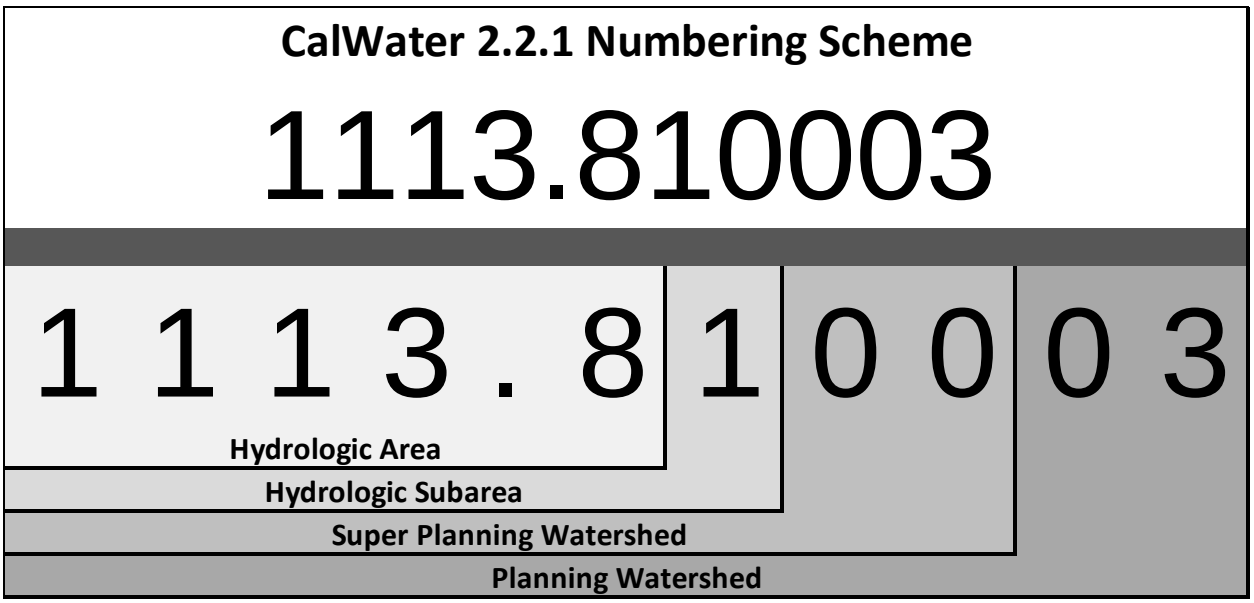
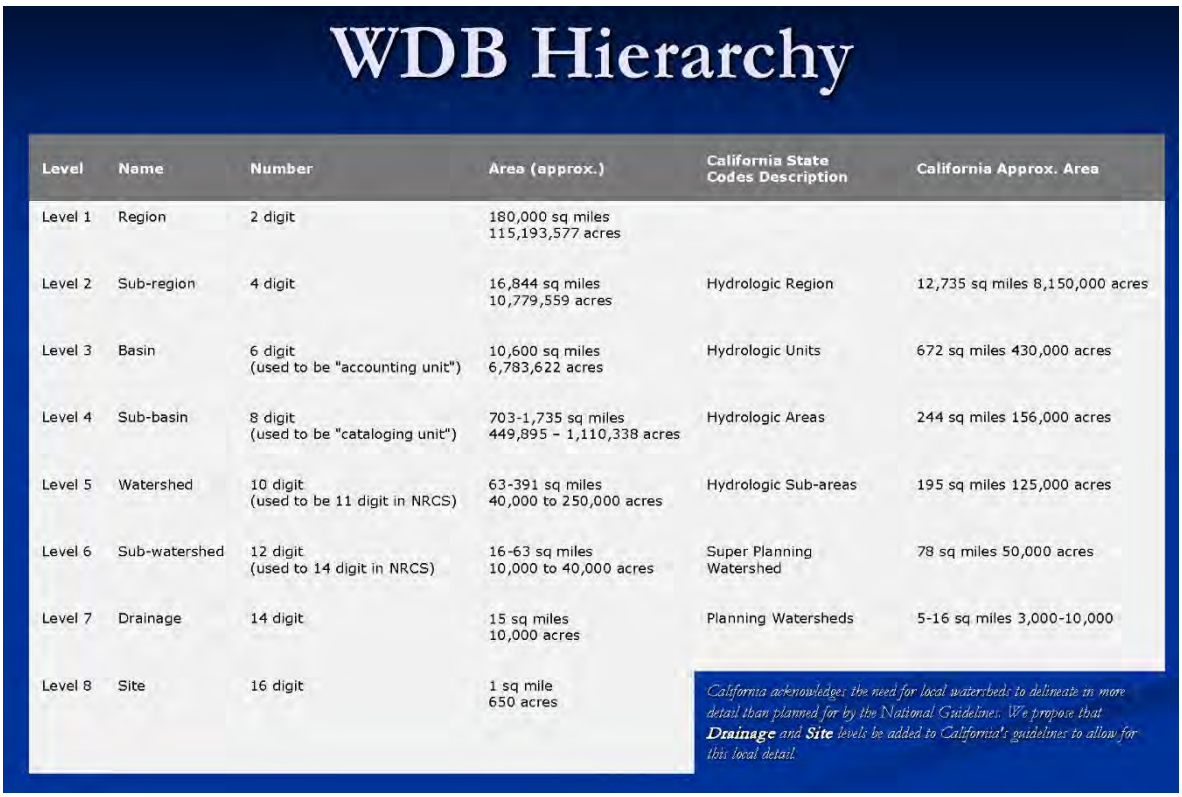


Figure 2 A breakdown of the CalWater 2.2.1 numbering scheme

The Federal Hydrologic Unit Maps (HUC)

Initially begun in 1978 by the USGS, this is an ongoing project to designate all hydrologic units in the US (USGS, 2020). In 1999, a multi-agency MOU was formed between state and federal agencies to bring the CalWater system into compliance with the federal model. There are still differences between the watershed boundaries established by both systems, but both represent logical approaches to watershed delineation that are widely used for assessment purposes.



WDB Hierarchy

Level	Name	Number	Area (approx.)	California State Codes Description	California Approx. Area
Level 1	Region	2 digit	180,000 sq miles 115,193,577 acres		
Level 2	Sub-region	4 digit	16,844 sq miles 10,779,559 acres	Hydrologic Region	12,735 sq miles 8,150,000 acres
Level 3	Basin	6 digit (used to be "accounting unit")	10,600 sq miles 6,783,622 acres	Hydrologic Units	672 sq miles 430,000 acres
Level 4	Sub-basin	8 digit (used to be "cataloging unit")	703-1,735 sq miles 449,895 – 1,110,338 acres	Hydrologic Areas	244 sq miles 156,000 acres
Level 5	Watershed	10 digit (used to be 11 digit in NRCS)	63-391 sq miles 40,000 to 250,000 acres	Hydrologic Sub-areas	195 sq miles 125,000 acres
Level 6	Sub-watershed	12 digit (used to 14 digit in NRCS)	16-63 sq miles 10,000 to 40,000 acres	Super Planning Watershed	78 sq miles 50,000 acres
Level 7	Drainage	14 digit	15 sq miles 10,000 acres	Planning Watersheds	5-16 sq miles 3,000-10,000
Level 8	Site	16 digit	1 sq mile 650 acres		

California acknowledges the need for local watersheds to delineate in more detail than planned for by the National Guidelines. We propose that ***Drainage*** *and* ***Site*** *levels be added to California's guidelines to allow for this local detail.*

Figure 3 Federal Watershed Boundary Hierarchy (Meyers, 2004)

The use of CalWater Planning Watersheds (14 CCR §895.1) is an accepted method for determining the impacts of proposed timber operations on Watershed Resources. The rationale is that all impacts from the proposed operation will only be seen within the area that is drained by that watershed, and areas downstream of that watershed. Areas that do not receive drainage from the watershed (i.e. adjacent or upstream watersheds), would not be impacted.

Planning watersheds are defined in 14 CCR §895.1 as:

> "the contiguous land base and associated watershed system that forms a fourth order or other watershed typically 10,000 acres or less in size. Planning watersheds are used in planning forest management and assessing impacts. The Director has prepared and distributed maps identifying planning watersheds plan submitters must use. Where a watershed exceeds 10,000 acres, the Director may approve

> subdividing it. Plan submitters may propose and use different planning watersheds, with the Director's approval."

The methodology used in the Board's rules to determine the size of the Watershed Assessment Area (WAA) was clarified by a letter to all RPFs and LTOs from the Director on January 7, 1992. This letter states on page 4 that:

> The watershed assessment area for assessing cumulative watershed effects (CWEs) should be selected to include an area of manageable size relative to the THP (usually an order 3 or 4 watershed) that maximizes the opportunity to detect an impact. Where there is a choice of combining watersheds with different disturbance levels, the assessment area should be based on the smallest watershed area that includes the most disturbances. The intent is to focus on an area of manageable size, where the presence of cumulative effects related to the proposed project and the benefits or failings of the proposed practices can be reasonably considered. (CAL FIRE, 1992)

The size of the assessment area quoted in the letter above is supported in the Board rules described in 14 CCR § 897(b)(2) and in the definition for "Planning Watershed" found in 14 CCR §895.1. The size of the watershed assessment area found in these regulations is a recommended third or fourth order watershed size, and therefore, the letter from the Director is consistent with the regulations of the Board.

Watersheds may also be used as the basis for other assessment areas. The California Forest Carbon Plan (Forest Climate Action Team, 2018) discusses using watersheds as the basis for Greenhouse Gas emission and sequestration assessments:

> *The watershed level has proven to be an appropriate organizing unit for analysis and for the coordination and integrated management of the numerous physical, chemical, and biological processes that make up a watershed ecosystem. Similarly, a watershed can serve as an appropriate reference*

> *unit for the policies, actions, and processes that affect the biophysical system, and providing a basis for greater integration and collaboration. Forests and related climate mitigation and adaptation issues operate across these same biophysical, institutional, and social gradients.*
>
> *Because of these factors, the Forest Carbon Plan proposes working regionally at the landscape or watershed scale. The appropriate scale of a landscape or watershed to work at will vary greatly depending upon the specific biophysical conditions, land ownership or management patterns, and other social or institutional conditions.*

However, it should be noted that the detailed analysis for the Watershed Assessment Area selected by the RPF does not limit CAL FIRE with respect to consideration of other activities outside the assessment area. The watershed assessment area is more like a window which CAL FIRE can see through to view the combined effects of other related projects, rather than a wall or barrier. CAL FIRE recognizes that environmental elements cannot be truly and completely separated one from another. It is the limitations of analytical processes that require infinitely complex systems to be subdivided into reasonably manageable components.

Further, the RPF is expected to explain and justify the rationale for the chosen assessment area. CAL FIRE must then review this rationale and either accept or reject the defined assessment areas. This occurs with every THP reviewed.

The Board's rules do not require a specific method of cumulative impacts assessment, because the Board determined that no single, available procedure adequately addresses the wide range of site conditions and THP activities found in California. Technical Rule Addendum No. 2, provides the framework of what should be considered and what to look for with respect to conditions that may be at or near some level of concern. As stated in the Addendum, *"The watershed impacts of past upstream and on-site projects are often reflected in the condition of stream channels on the project area."* This is a critical element as it guides the RPF to focus on areas where cumulative watershed effects are known to accumulate. The Addendum then describes factors that can be used to evaluate the potential project impacts. Such factors include gravel embeddedness, pool filling, stream aggrading, bank cutting, bank mass wasting, downcutting, scouring, organic debris, stream-side vegetation, and recent floods. Taken together, they help

inform the RPF about the status of the Environmental Setting (14 CCR §15125[6]) with respect to the impacts of past projects, and will form the basis of a determination on the impacts of the proposed project.

[6] **15125. ENVIRONMENTAL SETTING**
(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts.

(1) Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record.

(2) A lead agency may use projected future conditions (beyond the date of project operations) baseline as the sole baseline for analysis o.nly if it demonstrates with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public. Use of projected future conditions as the only baseline must be supported by reliable projections based on substantial evidence in the record.

(3) An existing conditions baseline shall not include hypothetical conditions, such as those that might be allowed, but have never actually occurred, under existing permits or plans, as the baseline.

(b) When preparing an EIR for a plan for the reuse of a military base, lead agencies should refer to the special application of the principle of baseline conditions for determining significant impacts contained in Section 15229.

(c) Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project. 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.

(d) The EIR shall discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans. Such regional plans include, but are not limited to, the applicable air quality attainment or maintenance plan or State Implementation Plan, area-wide waste treatment and water quality control plans, regional transportation plans, regional housing allocation plans, regional blueprint plans, plans for the reduction of greenhouse gas emissions, habitat conservation plans, natural community conservation plans and regional land use plans for the protection of the Coastal Zone, Lake Tahoe Basin, San Francisco Bay, and Santa Monica Mountains.

(e) Where a proposed project is compared with an adopted plan, the analysis shall examine the existing physical conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced as well as the potential future conditions discussed in the plan.

CEQA Thresholds of Concern (TOC) and Quantitative Versus Qualitative Assessments

The Board's rules do not require a specific method of cumulative impacts assessment, because the Board determined that no single, available procedure adequately addresses the wide range of site conditions and THP activities found in California. Technical Rule Addendum No. 2 provides the framework of what should be considered and what to look for with respect to conditions that may be at or near some level of concern. As stated in the Addendum, "The watershed impacts of past upstream and on-site projects are often reflected in the condition of stream channels on the project area." This is a critical element as it guides the RPF to focus on areas where cumulative watershed effects are known to accumulate. The Addendum then describes factors that can be used to evaluate the potential project impacts. Such factors include gravel embeddedness, pool filling, stream aggrading, bank cutting, bank mass wasting, downcutting, scouring, organic debris, stream-side vegetation, and recent floods. Taken together, they help inform the RPF about the status of the Environmental Setting (14 CCR §15125[7]) with respect to the impacts of past projects, and will form the basis of a determination on the impacts of the proposed project.

[7] **15125. ENVIRONMENTAL SETTING**
(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts.

(1) Generally, the lead agency should describe physical environmental conditions as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project's impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record.

(2) A lead agency may use projected future conditions (beyond the date of project operations) baseline as the sole baseline for analysis o.nly if it demonstrates with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public. Use of projected future conditions as the only baseline must be supported by reliable projections based on substantial evidence in the record.

(3) An existing conditions baseline shall not include hypothetical conditions, such as those that might be allowed, but have never actually occurred, under existing permits or plans, as the baseline.

(b) When preparing an EIR for a plan for the reuse of a military base, lead agencies should refer to the special application of the principle of baseline conditions for determining significant impacts contained in Section 15229.

Comment writers take exception to the assessment produced by the Registered Professional Foresters claiming it to be subjective and not sufficient upon which to make determinations on potential plan impacts. Additionally, commenters propose alternative methods that quantify impacts based upon the expected change to vegetation. Attempts to codify statewide, quantitative standards for determining thresholds of concern for impacts have consistently proved problematic due to the wide variety of conditions found in California.

Faced with similar comments, the Board of Forestry addressed this issue during the rulemaking for Technical Rule Addendum #2 in 1991:

> Final Statement of Reasons (FSOR) for Technical Rule Addendum #2 (1/18/91)
>
> Pages 56-57 (In response to concerns on the need for Quantitative Data for establishing baselines):
>
> Response - The Board reviewed several drafts of regulations before noticing the proposed language. One of the drafts offered to the Board by the Department contained a set of required measurements which could be reproduced as suggested.

(c) Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project. 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.

(d) The EIR shall discuss any inconsistencies between the proposed project and applicable general plans, specific plans, and regional plans. Such regional plans include, but are not limited to, the applicable air quality attainment or maintenance plan or State Implementation Plan, area-wide waste treatment and water quality control plans, regional transportation plans, regional housing allocation plans, regional blueprint plans, plans for the reduction of greenhouse gas emissions, habitat conservation plans, natural community conservation plans and regional land use plans for the protection of the Coastal Zone, Lake Tahoe Basin, San Francisco Bay, and Santa Monica Mountains.

(e) Where a proposed project is compared with an adopted plan, the analysis shall examine the existing physical conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced as well as the potential future conditions discussed in the plan.

Public comment received by the Board from the agencies and public convinced the Board that there is not a set of quantitative values which can withstand peer review in all areas which are affected by cumulative effects. The breadth of this expertise ranges from geologists, hydrologists, soils scientists, and various biologists.

Given this, the Board relied upon the experience of others in the field of cumulative effects and decided that a qualitative method would be most reliable for the decision maker. Most other agencies currently use the qualitative method which means that an independent analysis is conducted on each project. In this method available data is collected and evaluated to determine that defined topic and issue areas (i.e. stream bank or bed condition) are considered and a condition identified. There then are certain conditions which can be identified. One example is a lack of certain stream biota which indicate the threshold of significant cumulative effects has been reached.

To date, the quantitative methods identified by the Board rely upon numbers which are assigned on the basis of professional judgment. This means that it is only a modified qualitative analysis at best. An example of this is the Chatoian Method of Equivalent Roaded Acres being developed for use by the United States Forest Service. Recent field evaluations have shown that there is little relationship between Equivalent Roaded Acres and the conditions of the water quality in a watershed.

For these reasons the Board did not believe it could require a standardized set of data measurements in the THP regulations. Further, the data collected would have to be entered into a common data base if any analytical value is to be gained. This would be a costly proposition for the

State. The Board believes that such a data base will ultimately be developed and will be invaluable but it should be sought at this time in a nonregulatory manner.

Proceeding with the development of a data base in this manner will allow the necessary data to be identified, the analysis process to be developed, the funding to be identified, and most of all the necessary peer acceptance of such a system to be nurtured.

Also page 70

Response - Refer to response No. 1 in the letter dated August 1, 1990 by Mr. Benjamin Kor, Northcoast Regional Water Quality Control Board. Further, the Board conducted an extensive review of cumulative effects methodologies during 1988 and 1989 most recently and has had at least two previous reports prepared on the topic. The Board in developing this proposal released several draft cumulative effects methodologies for peer review. These methods were originally quantitative to the extent numerical values were assigned to professional judgments. Those values were then totaled and used to estimate whether a cumulative effects threshold had been crossed. The peer review always resulted in criticism of the time required to develop determinations which still relied upon best professional judgment. In response the Board chose to pursue development of the adopted proposal which relies on an independent analysis which provides guidance on what measures must be considered when judging if a cumulative impact will occur. This method as is now currently used by most planning departments and other lead agencies. Use of this method requires information of sufficient detail to support a record of decision.

The CEQA Guidelines encourage agencies to develop specific Thresholds of Concern that can be applied to environmental review, but this is not required (14 CCR §15064.7(b)). For CAL FIRE, the establishment of Thresholds of Concern rest with the Board of Forestry and they will make the final determination on if, when and where these thresholds should be applied.

What is (and is not) Answered in an Official Response

In its simplest form, the Official Response (OR) is an apologia, which is latin for "speaking in defense." This involves CAL FIRE providing an explanation for why the plan was approved within the context of the comments received. Usually, this is why the plan was approved over comments that it should be denied or modified. The OR is limited to only substantial environmental concerns (PRC §21080.5(d)(2)(D)[8], 14 CCR §1037.8[9], §1090.22[10], §1094.21[10]) and does not address issues that are outside of CAL FIRE jurisdiction, involve points of law, or policy.

Public Comment

Public comment for this plan came in the form of two separate letters. These have been included in Appendix A along with a reference to where they are specifically responded to in the document. The discussion preceding this section provides responses to broader questions received through public comment, and information below provides specific responses to individual questions responded to separately. The brackets around the snapshot below show that this is considered specific Concern #1, of which a corresponding Response #1 is provided.

[8] (d) To qualify for certification pursuant to this section, a regulatory program shall require the utilization of an interdisciplinary approach that will ensure the integrated use of the natural and social sciences in decision making and that shall meet all of the following criteria:… 2) The rules and regulations adopted by the administering agency for the regulatory program do all of the following: … (D) Require that final action on the proposed activity include the written responses of the issuing authority to significant environmental points raised during the evaluation process.

[9] At the time the Director notifies the plan submitter that the plan has been found in conformance, as described in 14 CCR 1037.7, the Director shall transmit a notice thereof to the agencies and persons referred to in 14 CCR 1037.3, and for posting at the places named in 14 CCR 1037.1. A copy of the notice shall be filed with the Secretary for Resources. The notice of conformance shall include a written response of the Director to significant environmental issues raised during the evaluation process.

[10] §1090.22 and §1094.21 contain the same language related to the Official Response as §1037.8

#1

Sustainable Harvests.

On page 188, Sierra Pacific Industries (SPI) states that because of their large scale of ownership for their forest lands, "Over the first 20-years tracked and available from public records provided to CALFIRE we have under harvested by a combined 20.1 percent or just over a little more than one percent per year."

The Bear Pit THP spans five different planning watersheds as shown in Table 1. The largest watershed where most of the logging is proposed is in the Bear Canyon watershed at 681.72 acres. This is followed in harvest size by the McCandless Gulch watershed at 92.71 acres with the remaining watersheds harvest area much smaller in size.

Table 1, Bear Pit THP, Planning Watersheds

Calwater #	Planning Watershed	THP #	Harvest Acres
5506.200602	Bear Canyon	2-22-00125-SHA	681.72
5507.330202	McCandless Gulch	2-22-00125-SHA	92.71
5506.200804	Sugarpine Canyon	2-22-00125-SHA	23.02
5507.330203	Ingot	2-22-00125-SHA	22.89
5526.130002	Willow	2-22-00125-SHA	19.23

Response #1: (Past Harvesting and Equivalent Clearcut Acres [ECA])

When it comes to the evaluation of potential cumulative effects of a project, 14 CCR §898 specifies "Cumulative Impacts shall be assessed based upon the methodology described in Board Technical Rule Addendum Number 2, Forest Practice Cumulative Impacts Assessment Process and shall be guided by standards of practicality and reasonableness." With respect to the discussion of past projects, Technical Rule Addendum #2 specifies:

> *D. Past Projects and Reasonably Foreseeable Probable Future Projects*
> *Past Projects and Reasonably Foreseeable Probable Future Projects included in the Cumulative Impacts assessment shall be described as follows:*

1. Identify and briefly describe the location of Past Projects and Reasonably Foreseeable Probable Future Projects within assessment areas. Include a map or maps and associated legend(s) clearly depicting the following information:

a. Township and Range numbers and Section lines.
b. Boundary of the planning watershed(s) which the Plan area is located along with the CALWATER 2.2 Planning Watershed number(s).
c. Location and boundaries of Past Projects and Reasonably Foreseeable Probable Future Projects on land owned or controlled by the Timberland Owner (of the proposed timber harvest) within the planning watershed(s) depicted in provision (b) above. For purposes of this provision, Past Projects shall be limited to those Projects submitted within ten years prior to submission of the Plan.

For this plan, these are included on pages 131-132. The commenter suggests that thresholds of significance exist for cumulative watershed effects in the form of maximum harvest rates, as represented by the equivalent clearcut acres (ECA), and that these rates can be applied for the Bear Pit THP.

It should be noted that the ECA method relies on the assumption that all management-related disturbance can be represented by a unit clearcut area, or in the case of equivalent roaded area (ERA), a unit road area (MacDonald, Evaluating and managing cumulative effects: process and constraints, 2000). The major limitation to this approach is that changes in sedimentation and runoff are both represented in this single index, even though the distinct activities that occur within a timber harvesting plan (e.g., roads vs harvest) can have very different outcomes in regard to changes in runoff and sediment, as well as how those products are routed to watercourses (MacDonald & Coe, Influence of headwater streams on downstream reaches in forested areas, 2007). For instance, a haul road may be located on a ridgetop, and therefore has a lower likelihood of delivering sediment and runoff to a watercourse due to the longer distance to stream (Benda, James, Miller, & Andras, 2019). However, this ridgetop road would receive the same ECA/ERA score as a road that is 20 feet from a stream. Similarly, some rock types are less sensitive to hydrogeomorphic impacts from canopy removal than others (Bywater-Reyes, Segura, & Bladon, 2017), indicating that a single lumped coefficient like ECA/ERA may be insufficient to predict cumulative watershed effects even at the scale of a planning watershed, where lithology can vary substantially.

Another problem with the ECA/ERA approach is that it does not explicitly relate the changes in runoff and sediment to changes in water quality objectives (e.g., turbidity) or impacts to the beneficial uses of water (e.g., fisheries, domestic water supply, etc). Also, the ECA/ERA methods are largely unvalidated beyond a few studies across the western United States (MacDonald, Evaluating and managing cumulative effects: process and constraints, 2000). As such, great caution should be used when applying single values of ERA/ECA derived from one watershed, across areas as physiographically and geologically variable as California.

While ECA and other methods such as ERA can be used to analyze past projects and their expected interactions with proposed actions, their use is not required. This is discussed in greater detail in the General Discussion above. CAL FIRE reviewed the past projects assessment and concluded that it was consistent with the requirements of TRA2.

Response #2 (Sustainability of Harvests):

Harvesting forests when viewed at the watershed level can produce a biased view of overall sustainability. Landowners who own more than 50,000 acres are required to demonstrate long term sustainability of their forestlands using one of two methods:

14 CCR 933.11(a) “Option a”

> **(a)** Where a Sustained Yield Plan (14 CCR § 1091.1) or NTMP, or a WFMP has not been approved for an ownership, MSP will be achieved by:
>
> **(1)** Producing the yield of timber products specified by the landowner, taking into account biologic and economic factors, while accounting for limits on productivity due to constraints imposed from consideration of other forest values, including but not limited to, recreation, watershed, wildlife, range and forage, fisheries, regional economic vitality, employment and aesthetic enjoyment.
>
> **(2)** Balancing growth and harvest over time, as explained in the THP for an ownership, within an assessment area set by the Timber Owner or Timberland Owner and agreed to by the Director. For purposes of this subsection the sufficiency of information necessary to demonstrate the

balance of growth and harvest over time for the assessment area shall be guided by the principles of practicality and reasonableness in light of the size of the ownership and the time since adoption of this section using the best information available. The projected inventory resulting from harvesting over time shall be capable of sustaining the average annual yield achieved during the last decade of the planning horizon. The average annual projected yield over any rolling 10-year period, or over appropriately longer time periods for ownerships which project harvesting at intervals less frequently than once every ten years, shall not exceed the projected long-term sustained yield.

(3) Realizing growth potential as measured by adequate site occupancy by species to be managed and maintained given silvicultural methods selected by the landowner.

(4) Maintaining good stand vigor.

Making provisions for adequate regeneration. At the plan submitter's option, a THP may demonstrate achievement of MSP pursuant to the criteria established in (b) where an SYP has been submitted but not approved.

14 CCR 933.11(b) “Option b” or “Sustained Yield Plan (SYP)”

(b) Where a SYP, NTMP, or WFMP is submitted for an ownership, an approved SYP, NTMP, or WFMP achieves MSP by providing sustainable harvest yields established by the landowner which will support the production level of those high quality timber products the landowner selects while at the same time:

(1) meeting minimal stocking and basal area standards for the selected silvicultural methods as provided in these Rules as described;

(2) protecting the soil, air, fish and wildlife, water resources and any other public trust resources;

(3) giving consideration to recreation, range and forage, regional economic vitality, employment and aesthetic enjoyment;

> **(4)** balancing growth and harvest over time. The projected inventory resulting from harvesting over time shall be capable of sustaining the average annual yield achieved during the last decade of the planning horizon. The average annual projected yield over any rolling 10-year period, or over appropriately longer time periods for ownerships which project harvesting at intervals less frequently than once every ten years, shall not exceed the projected long-term sustained yield. A THP which relies upon and is found to be consistent with an approved SYP shall be deemed adequate to achieve MSP.

For demonstrating long term sustainability, each landowner must provide CAL FIRE with a defined program of management at sufficient detail to allow for tracking of harvesting over time. SPI decided to demonstrate sustainability pursuant to “Option a” and this was approved as part of THP 2-97-359-SHA approved on September 16, 2002.

CAL FIRE must be able to determine at any point in time, whether or not actual harvesting is consistent with the demonstration of sustainability. This is typically done through annual reporting that the landowner provides to CAL FIRE, although individual THPs must also demonstrate consistency. Such reporting often contains metrics such as acres harvested by silviculture and harvest volumes across the ownership. Sustainability is demonstrated at the ownership level, not at the individual watershed. This allows for all harvesting to be viewed within the context of all the landowners’ holdings, as opposed to smaller areas where current operations may be focused. SPI provides annual reporting of harvesting to CAL FIRE as part of their ongoing obligation to demonstrate consistency with their Option a demonstration of sustainability. CAL FIRE review has determined this information to be consistent with their original Option a projections.

Response #3 (Alternatives Analysis):

The concern as expressed essentially finds fault with the RPF analysis of project alternatives and takes exception with the conclusions reached. As has been discussed above, disagreement over methods and/or conclusions reached in the CEQA process does not mean the analysis is faulty. Indeed, with complex decision-making

disagreements between experts is commonplace. When it comes to evaluating potential alternatives to the proposed project, many factors must be considered:

1. The forest that is currently present onsite.
2. The landowner objectives, both short and long term.
3. The requirements under the Act and Rules to provide for Maximum Sustained Production of High Quality Timber Products (MSP).
4. The available range of silvicultural treatments allowed for in the Rules.

While there may be several ways to achieve the objectives of the landowner and the Rules, the RPF is ultimately responsible for determining what methods to implement:

14 CCR § 897(a) contains the requirements for how an RPF is to develop a THP in order to comply with the Rules and Act:

> ***897 Implementation of Act Intent***
> ***(a)*** *RPFs who prepare plans shall consider the range of feasible silvicultural system, operating methods and procedures provided in these Rules in seeking to avoid or substantially lessen significant adverse effects on the environment from timber harvesting. RPFs shall use these Rules for guidance as to which are the most appropriate feasible silvicultural systems, operating methods and procedures which will carry out the intent of the Act.*
>
> *While giving consideration to measures proposed to reduce or avoid significant adverse Impacts of THPs on lands zoned TPZ, the RPF and Director shall include the following legal consideration regarding feasibility:*
>
> *The Timberland Productivity Act restricts use of lands zoned Timberland Production Zone to growing and harvesting timber and compatible uses and establishes a presumption that timber harvesting is expected to and will occur on such lands.*

The California Government Code § 51104 provides instruction on how Timberland Production Zone (TPZ) is to be designated on a County level. The responsibility for

determining areas as within the TPZ lie with the Board of Supervisors for the county where the timberlands are located:

> *(g) "Timberland production zone" or "TPZ" means an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, as defined in subdivision (h).*
>
> *With respect to the general plans of cities and counties, "timberland preserve zone" means "timberland production zone."*
>
> *(h) "Compatible use" is any use which does not significantly detract from the use of the property for, or inhibit, growing and harvesting timber, and shall include, but not be limited to, any of the following, unless in a specific instance such a use would be contrary to the preceding definition of compatible use:*
>
> *(1) Management for watershed.*
>
> *(2) Management for fish and wildlife habitat or hunting and fishing.*
>
> *(3) A use integrally related to the growing, harvesting and processing of forest products, including but not limited to roads, log landings, and log storage areas.*
>
> *(4) The erection, construction, alteration, or maintenance of gas, electric, water, or communication transmission facilities.*
>
> *(5) Grazing.*
>
> *(6) A residence or other structure necessary for the management of land zoned as timberland production.*

In addition to zoning designations, individual counties may also declare additional rights or restrictions on activities that occur within the bounds of the County. Shasta County has a "right to farm" ordinance that specifies a priority use for productive agricultural lands such as those within the boundary of this THP:

§ 18.06.020. Purpose and policy.

A. It is the declared policy of Shasta County to protect, promote and encourage agricultural and forestry operations within the county. It is the further intent of Shasta County to provide to the residents of this county proper notification of the county's recognition and support through this chapter of those persons' and/or entities engaged in agricultural practices.

B. When nonagricultural land uses extend into agricultural areas, agricultural operations may become the objects of nuisance complaints or suits. As a result, agricultural operations may be forced to cease or curtail operations to the point at which the viability of the agricultural operation is threatened. It is the purpose and intent of this section to minimize the loss of agricultural resources to the county of Shasta by clarifying and limiting the circumstances under which agricultural operations may be considered a nuisance. No agricultural activity shall become a nuisance, public or private, when the operations are managed and conducted in a manner consistent with existing laws, regulations, proper and accepted customs and standards established in Shasta County, or with the accepted management practices established by the agricultural industry.

C. An additional purpose of this chapter is to promote a good neighbor policy by advising purchasers and users of property adjacent to or near agricultural operations of the inherent potential concerns associated with such purchases or residence. Such concerns may include, but are not limited to, the noises, open range cattle, odors, dust, chemicals, smoke and hours of operations that may accompany agricultural operations. It is intended that, purchasers and users will better understand the impact of living near agricultural operations and be prepared to accept such conditions as the natural result of living in or near rural areas.

The Regulations, Statues and Ordinances discussed above, along with the landowner objectives, provide the basis upon which the RPF considered what activities are appropriate for the THP area. Alternatives to the proposed THP, including a “no project” option are discussed on pages 107-119. This discussion also explains the different silvicultural methods that could have been chosen for this plan, along with a justification of the chosen method.

When reviewing if the proposed THP conforms to the Rules and Regulations that govern timber harvesting, CAL FIRE has the following requirements:

14 CCR § 897(b)-(d)

(b) *In determining whether a THP conforms to the intent of the Act, the Director shall be guided by the following principles:*

(1) *The goal of forest management on a specific ownership shall be the production or maintenance of forests which are healthy and naturally diverse, with a mixture of trees and under-story plants, in which trees are grown primarily for the production of high quality timber products and which meet the following objectives:*

(A) *Achieve a balance between growth and harvest over time consistent with the harvesting methods within the Rules of the Board.*

(B) *Maintain functional wildlife habitat in sufficient condition for continued use by the existing wildlife community within the planning watershed.*

(C) *Retain or recruit late and diverse seral stage habitat components for wildlife concentrated in the Watercourse and lake zones and as appropriate to provide for functional connectivity between habitats.*

(D) *Maintain growing stock, genetic diversity, and soil productivity.*

(2) *Individual THPs shall be considered in the context of the larger forest and planning watershed in which they are located, so that biological diversity and watershed integrity are maintained within larger planning units and adverse cumulative Impacts, including Impacts on the quality and beneficial uses of water are reduced.*

(3) *While the responsibility for implementation of the Act and Rules belongs to the Director and the Department, RPFs who prepare plans have the responsibility to provide the Director with information about the plan and resource areas and the nature and purpose of the operations proposed which is sufficiently clear and detailed to permit the Director to exercise the discretion and make the determinations required by the Act and Rules. The information in proposed plans shall also be sufficiently clear and detailed to permit adequate and effective review by responsible agencies and input by the public to assure that significant adverse individual and cumulative Impacts are avoided or reduced to insignificance.*

(c) *The Director shall use the standards provided in these Rules when reviewing plans to determine if they conform to the Rules and regulations of the Board and the provisions of the Act. In specific circumstances provided in these Rules, the Director shall disapprove plans because they conflict with the intent of the Act as interpreted by the Board.*

(d) *Due to the variety of individual circumstances of timber harvesting in California and the subsequent inability to adopt site-specific standards and regulations, these Rules use judgmental terms in describing the standards that will apply in certain situations. By necessity, the RPF shall exercise professional judgment in applying these judgmental terms and in determining which of a range of feasible (see definition 14 CCR 895.1) silvicultural systems, operating methods and procedures contained in the Rules shall be proposed in the plan to substantially lessen significant adverse Impacts in the environment from timber harvesting. The Director also shall exercise professional judgment in applying these judgmental terms in determining whether a particular plan complies with the Rules adopted by the Board and, accordingly, whether he or she should approve or disapprove a plan. The Director shall use these Rules to identify the nature of*

and the limits to the professional judgment to be exercised by him or her in administering these Rules.

Ultimately, the RPF who writes the plan must consider these and other regulations when deciding on the harvesting methods that will achieve the landowner's goals while meeting the objectives of the Forest Practice Rules and the Forest Practice Act. Likewise, CAL FIRE must consider the range of values that must be evaluated while allowing for legally permitted activities on Timberland. These activities are often a tradeoff between competing and sometimes contradictory objectives(see also "CEQA Analysis" above). CAL FIRE believes that the plan as approved has mitigated any potential significant adverse effects to below the level of significance.

SUMMARY AND CONCLUSIONS

The Department recognizes its responsibility under the Forest Practice Act (FPA) and CEQA to determine whether environmental impacts will be significant and adverse. In the case of the management regime which is part of the THP, significant adverse impacts associated with the proposed application are not anticipated.

CAL FIRE has reviewed the potential impacts from the harvest and reviewed concerns from the public and finds that there will be no expected significant adverse environmental impacts from timber harvesting as described in the Official Response above. Mitigation measures contained in the plan and in the Forest Practice Rules adequately address potential significant adverse environmental effects.

CAL FIRE has considered all pertinent evidence and has determined that no significant adverse cumulative impacts are likely to result from implementing this THP. Pertinent evidence includes, but is not limited to the assessment done by the plan submitter in the watershed and biological assessment area and the knowledge that CAL FIRE has regarding activities that have occurred in the assessment area and surrounding areas where activities could potentially combine to create a significant cumulative impact. This determination is based on the framework provided by the FPA, CCR's, and additional mitigation measures specific to this THP.

CAL FIRE has supplemented the information contained in this THP in conformance with Title 14 CCR § 898, by considering and making known the data and reports which have been submitted from other agencies that reviewed the plan; by considering pertinent information from other timber harvesting documents including THP's, emergency notices, exemption notices, management plans, etc. and including project review documents from other non-CAL FIRE state, local and federal agencies where appropriate; by considering information from aerial photos and GIS databases and by considering information from the CAL FIRE maintained timber harvesting database; by technical knowledge of unit foresters who have reviewed numerous other timber harvesting operations; by reviewing technical publications and participating in research gathering efforts, and participating in training related to the effects of timber harvesting on forest values; by considering and making available to the RPF who prepares THP's, information submitted by the public.

CAL FIRE further finds that all pertinent issues and substantial questions raised by the public and submitted in writing are addressed in this Official Response. Copies of this response are mailed to those who submitted comments in writing with a return address.

ALL CONCERNS RAISED WERE REVIEWED AND ADDRESSED. ALONG WITH THE FRAMEWORK PROVIDED BY THE FOREST PRACTICE ACT AND THE RULES OF THE BOARD OF FORESTRY, AND THE ADDITION OF THE MITIGATION MEASURES SPECIFIC TO THIS THP, THE DEPARTMENT HAS DETERMINED THAT THERE WILL BE NO SIGNIFICANT ADVERSE IMPACTS RESULTING FROM THE IMPLEMENTATION OF THIS THP.

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October 12, 2022

Forest Practice Program Manager
CAL FIRE
6105 Airport Road
Redding, California 9600

Re: Bear Pit Timber Harvest Plan (THP), 2-22-00125-SHA

Dear Forest Manager,

My comments concern the **Cumulative Effects from Unsustainable Harvests** resulting from THP 2-22-00125-SHA, hereafter referred to as Bear Pit.

The Bear Pit THP consists of an 841-acre timber harvest of which 569 acres is Alternative Prescription harvest (closest to a clearcut), and 260 acres of fuel breaks. The Alternative Prescription logging (clearcuts) is harvested in groupings up to 20 acres in size. Post-harvest stocking consists of even-aged management with a 125-point count within 5-year post-harvest.

Sustainable Harvests.

On page 188, Sierra Pacific Industries (SPI) states that because of their large scale of ownership for their forest lands, "Over the first 20-years tracked and available from public records provided to CALFIRE we have under harvested by a combined 20.1 percent or just over a little more than one percent per year."

#1 The Bear Pit THP spans five different planning watersheds as shown in Table 1. The largest watershed where most of the logging is proposed is in the Bear Canyon watershed at 681.72 acres. This is followed in harvest size by the McCandless Gulch watershed at 92.71 acres with the remaining watersheds harvest area much smaller in size.

Table 1, Bear Pit THP, Planning Watersheds

Calwater #	Planning Watershed	THP #	Harvest Acres
5506.200602	Bear Canyon	2-22-00125-SHA	681.72
5507.330202	McCandless Gulch	2-22-00125-SHA	92.71
5506.200804	Sugarpine Canyon	2-22-00125-SHA	23.02
5507.330203	Ingot	2-22-00125-SHA	22.89
5526.130002	Willow	2-22-00125-SHA	19.23

Unfortunately, the timber companies know exactly how to use the Forest Practice rules to figure out where to log next. For Bear Pit, SPI split these harvests up across multiple planning watersheds to make the clearcut impact effects on each individual THP to look minor. In order to avoid any scrutiny for Bear Pit, SPI has chosen the Bear Canyon Watershed, its largest watershed within Bear Pit. This watershed contains the bulk of Bear Pit harvest and has been touched less within the past 10 years.

#1

The forest practice rules are further designed (unintentionally or intentionally) to obscure the cumulative effects of forest harvests which sometimes makes it difficult to see with data and charts. One particular forest practice rule allows LTO and the RPF to not go back further than ten-years when addressing sustainability impacts.

For the purpose of simplicity, my following forest sustainability comments will be limited to that portion of the harvest contained in the Bear Canyon watershed. Although any of my comments could also be applicable to the harvests in the other four watersheds.

Ethan Arutunian of the Friends of the Gualala River has developed a program with a large database containing the California's THP for the last 25-years including currently proposed THPs. The program generates tables (see table 2), graphs plus Google maps depicting timber harvests in specific watersheds (Cumulative Acres, and Harvest Rates). Mr. Arutunian has used both a 10-year satellite imagery (figure 2), and data (table 2) along with older 25-year harvest satellite imagery (figure 3) and data to demonstrate the problem. For example, the Bear Canyon planning watershed, which is 681 acres of clearcut in this THP, does not look so horribly bad over the past 10 years. But you only need to go back 17 years and it was the most harvested watershed in the entire basin!

#2

The satellite imagery shows more clearly the magnitude and scope of the unsustainability of the massive harvesting now happening. That is the proof in the pudding. It's obvious when looking at the satellite imagery, significant cumulative effects have occurred from past harvests. This previous logging has reduced much of the for canopy and exposed much of the surface areas causing a drying out of the lands. As such, those past harvest areas have not recovered whatsoever, and from the aero views they certainly don't look like a 20-yr old plantation. This is further evident due to the number of fewer trees growing in them.

Satellite image 1 shows the proposed timber harvest area which doesn't look altogether that bad. When Bear Pit is overlayed on timber harvest over the last ten years (satellite Image 2) it still doesn't appear quite as bad. However, when you combine the Bear Canyon satellite image over the last 25-years (satellite image 3) the full extent of the clearcut impacts is really apparent. Most of the clearcut patches are over 10 years old (and some close to 20 years old).

*ECA stands for equivalent clearcut acres in the following table 2. ECA is an important concept because it is how the cumulative effects of clearcuts are calculated by acres. Basically, a clearcut acre is counted as 100% logged. If the harvest silviculture is "Group Selection", which are smaller clearcuts, it is counted as "75%" logged. If the silviculture method is "Selection", it is counted as 50% logged. For other types of harvests, such as fire breaks, defensible space, and clearing along roads, I have assigned the value of "100%" ECA. Those methods are equivalent to clearcut.

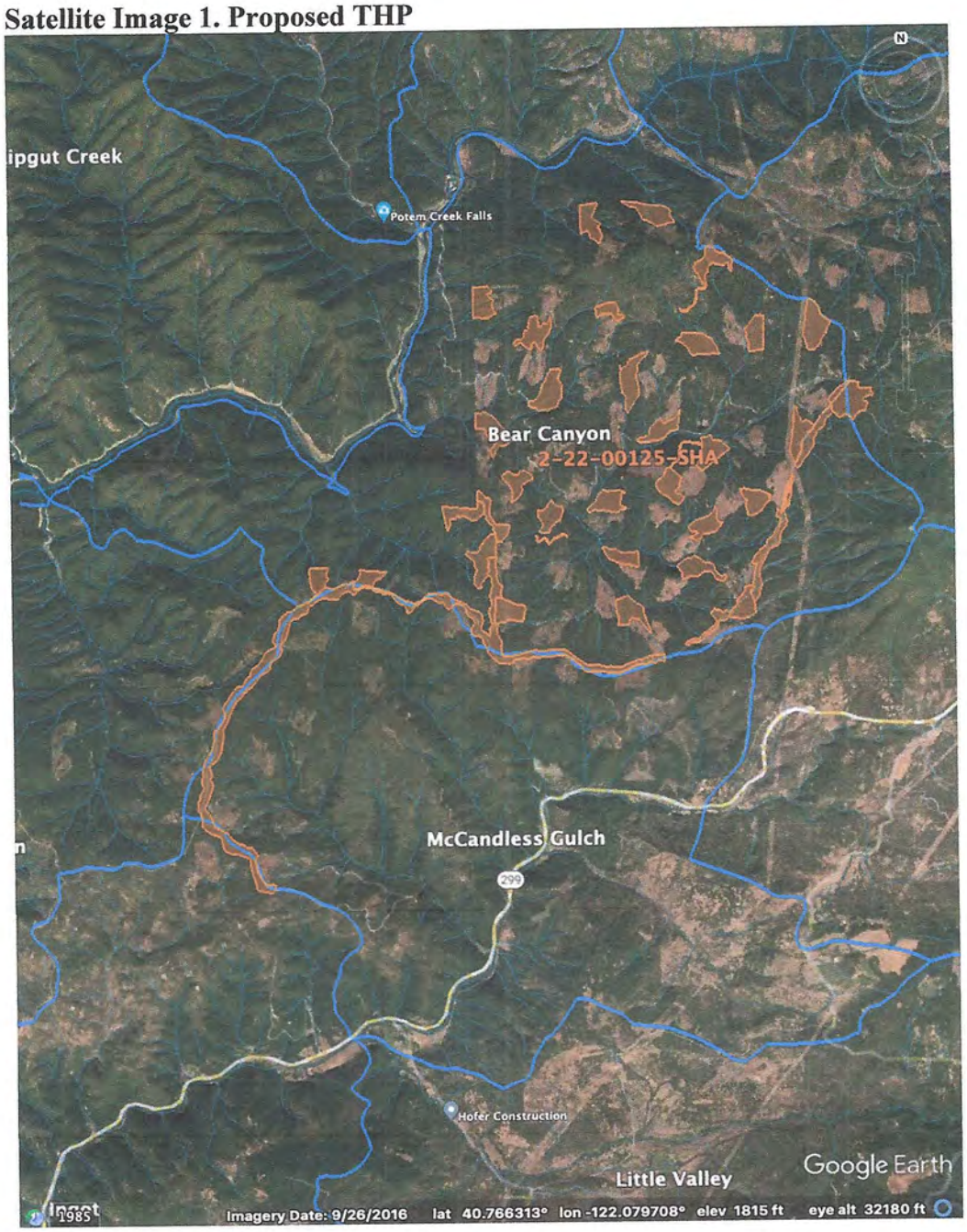
Table 2, Proposed and Past THP (1997 to Present) Bear Canyon Planning Watershed

Timber Harvest Plan	THP Year	THP Acres	ECA *	% Watershed	Percent ECA* Watershed
2022 PROPOSED THPs					
2-22-00125-SHA	2022	681.72	681.72	9.0%	9.0%
SUBTOTAL PROPOSED		**681.72**	**681.72**	**9.0%**	**9.0%**
THPs 2012-2022					
2-17-017-SHA	2017	208.58	208.58	2.8%	2.8%
2-13-039-SHA	2013	9.35	9.35	0.1%	0.1%
SUBTOTAL 2012-2022		**217.93**	**217.93**	**2.9%**	**2.9%**
Timber Harvest Plan					
THPs pre-2012					
2-11-040-SHA	2011	2.91	2.91	0.0%	0.0%
2-09-069-SHA	2009	765.44	751.14	10.1%	10.0%
2-04-139-SHA	2004	1568.3	1009.09	20.8%	13.4%
2-99-150-SHA	1999	62.03	62.03	0.8%	0.8%
2-99-155-SHA	1999	117.5	117.5	1.6%	1.6%
2-98-066-SHA	1998	684.24	525.18	9.1%	7.0%
2-98-084-SHA	1998	565.86	456.11	7.5%	6.0%
2-98-101-SHA	1998	104.34	104.34	1.4%	1.4%
2-98-193-SHA	1998	3.69	2.77	0.0%	0.0%
2-97-173-SHA	1997	251.32	251.32	3.3%	3.3%
SUBTOTAL pre-2012		**4125.63**	**3282.38**	**54.7%**	**43.5%**
Total Harvested Acres		**5025**	**4,182**	**66.6%**	**55.4%**

#2

#2

Satellite Image 1. Proposed THP



Orange = Proposed THP boundaries

Red = Active or completed THPs

Blue = Planning watershed boundary, rivers and tributaries.

Shading inside THP boundaries indicates the type of Silviculture used:

Clearcuts: dark shading

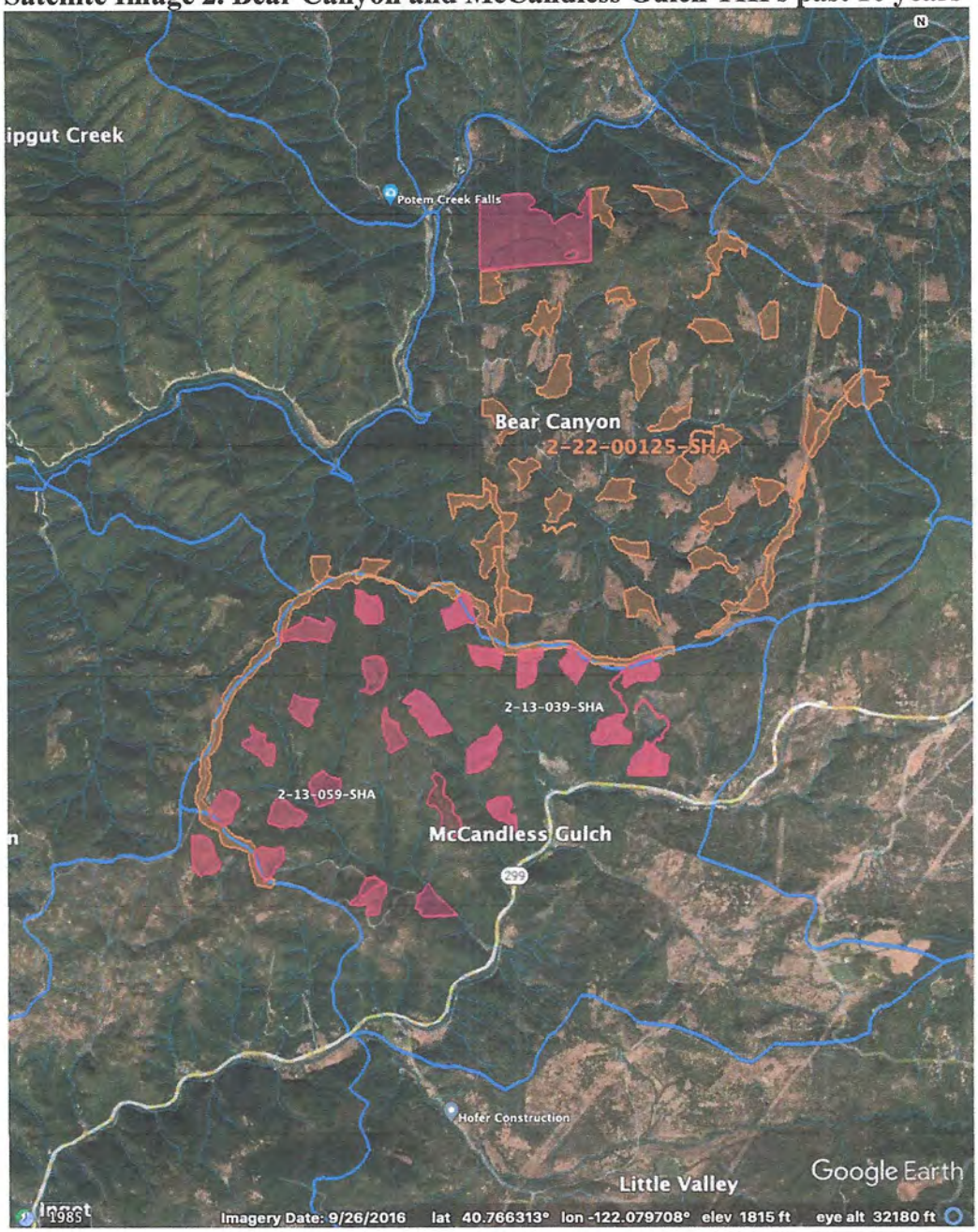
Group Selection: light shading

Selection: no shading

4

#2

Satellite Image 2. Bear Canyon and McCandless Gulch THPs past 10 years



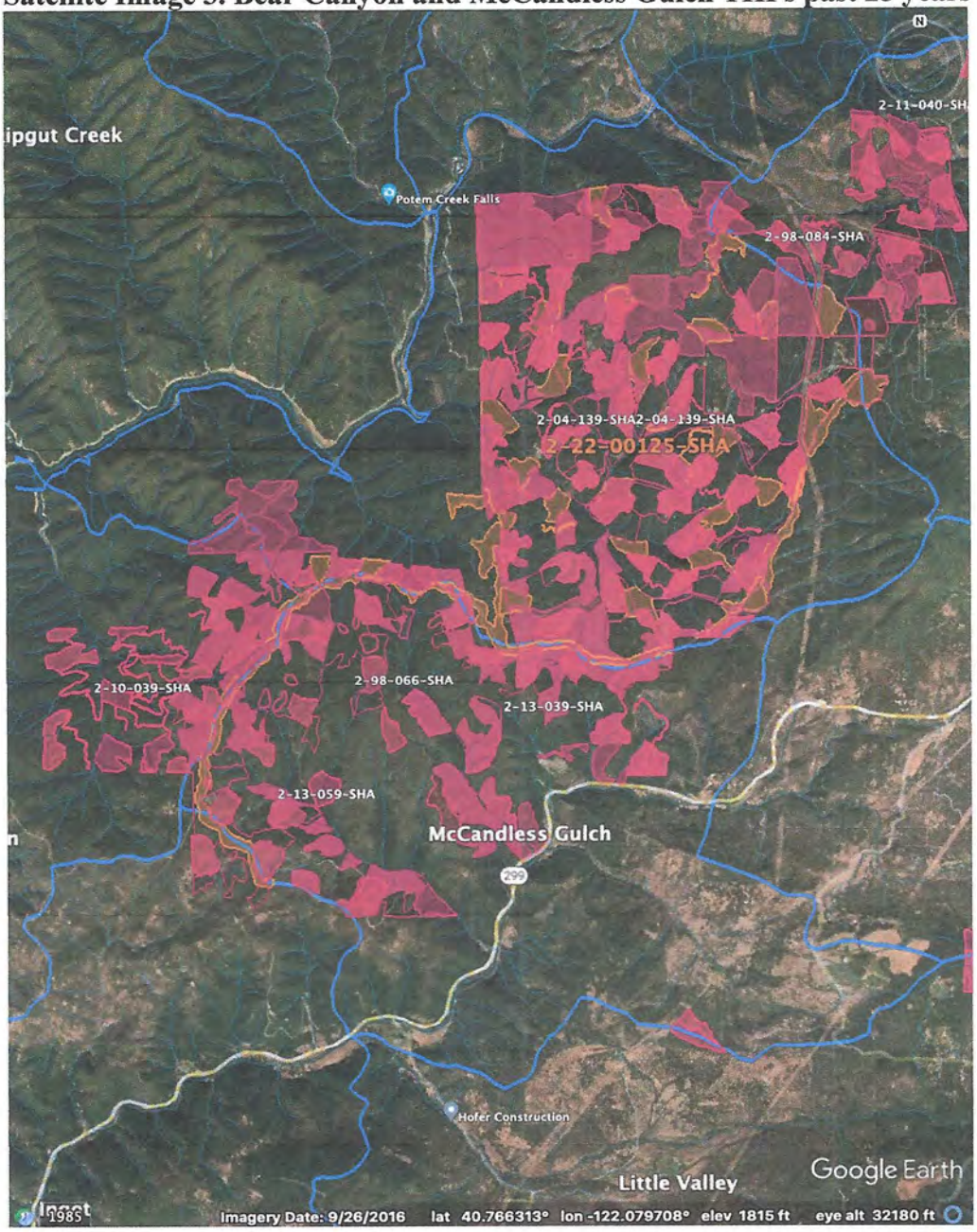
Orange = Proposed THP boundaries

Red = Active or completed THPs

Blue = Planning watershed boundary, rivers and tributaries.

Shading inside THP boundaries indicates the type of Silviculture used:

Satellite Image 3. Bear Canyon and McCandless Gulch THPs past 25 years



#2

Orange = Proposed THP boundaries

Red = Active or completed THPs

Blue = Planning watershed boundary, rivers and tributaries.

Shading inside THP boundaries indicates the type of Silviculture used:

Clearcuts: dark shading

Group Selection: light shading

Selection: no shading

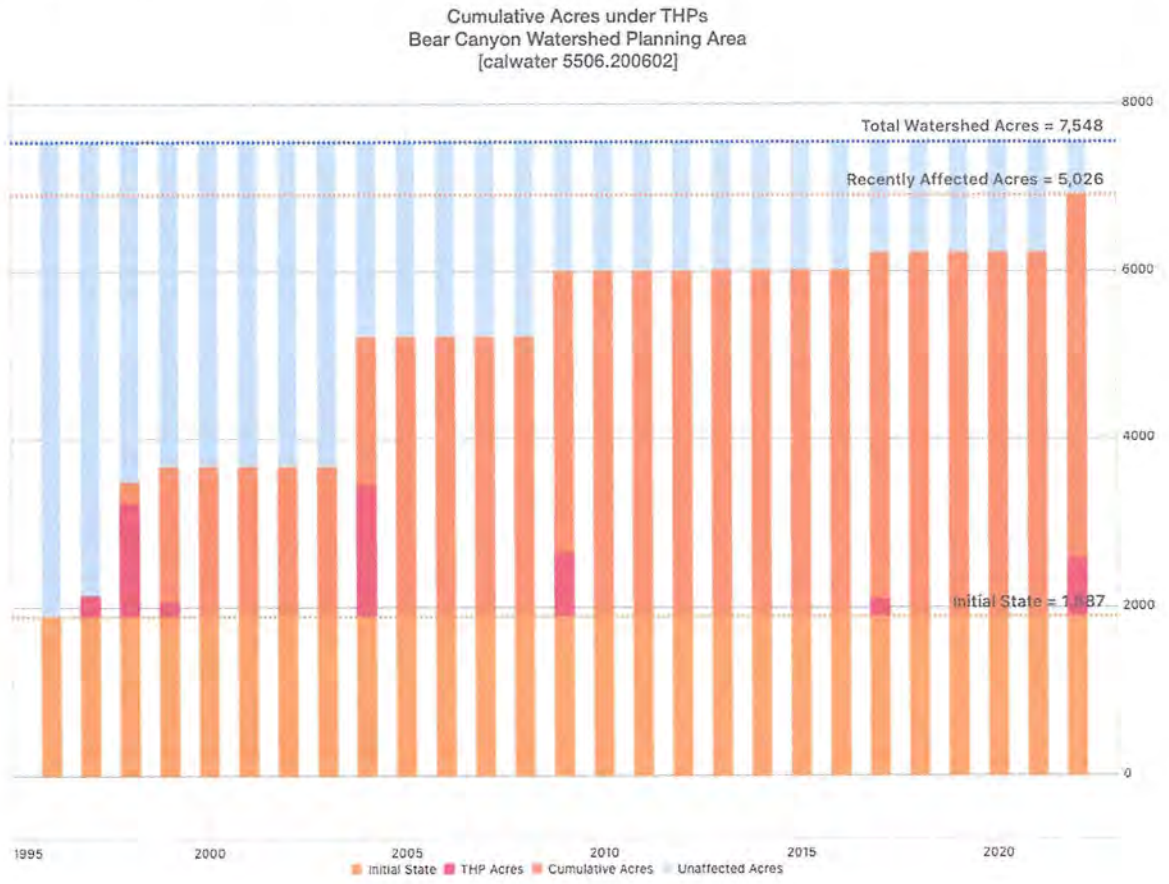
As you can see by the Google Earth (satellite image) map of the last 25-years for Bear Pit, its watershed has been intensively harvested and disturbed. Within the blue lines delineating Bear Canyon watershed boundaries over the past 25 years Bear Canyon watershed had a much of its diverse forests now replaced by patchwork clearcuts and group selection. The proposed THP is outlined in orange.

If the Bear Pit THP is approved, 66.6 percent of its Bear Canyon watershed will have been intensively harvested within the last 25-years. Breaking down SPI's previous harvest further into terms of Equivalent Clearcut Acres (ECA), 55.4 percent of Bear Canyon's watershed will have been clearcut in less than 25-years. No wonder there are so many baren areas even where we have allowed the lands to recover post-logging.

According to our calculations and based on an 80-year rotation, SPI is harvesting in the Bear Canyon watershed at 2.67 percent per year. At this rate, SPI will be running out of trees by their 38th year based upon an 80-year harvest rotation.

In addition, this above percentage does not take into account tree losses due insect or fire. And it certainly does not account for the possibility of slow or no growth on replanted land due to hot and dry climate conditions.

#2



#2

Lastly, another factor that we haven't taken into consideration in Mr. Arutunian's calculations was the condition of the lands older than 25-years out. Records show that some logging had taken place at Bear Pit prior to 1997 and that these lands were somewhat degrade already. Assuming a 25 percent harvested area prior to 1997, the above graph shows how much of the watershed probably has already been disrupted. 25 percent of the watershed would amount to 1,887 acres of harvested disturbed watershed (shown as graph color yellow) prior to 1997. Adding in the known logging plus the proposed Bear Pit harvest (5,026 acres shown as graph color orange), this would leave very little of the harvest lands that have not been disturbed and subjected to logging.

Due to all the reasons detailed above and, therefore, I reiterate its strong belief that the Bear Pit THP is unsustainable and irreparably flawed and must be denied. Based upon the sustainability of the watershed there are sufficient grounds for plan denial and it's my recommendation CAL FIRE must deny approval of this plan.

Thank you for your serious consideration of our comments.

Sincerely,

Perry Metzger

Perry Metzger

Copy furnished:

Secretary Wade Crowfoot, California Natural Resources Agency

Senator Henry I. Stern, Chair, California Senate Natural Resources and Water Committee

Assemblymember Luz M. Rivas, Chair, California Assembly Committee on Natural Resources

October 27, 2022

RECEIVED
By REDDING FOREST PRACTICE at 7:21 am, Oct 28, 2022

Forest Practice Program Manager
CAL FIRE
6105 Airport Road
Redding, California 9600

Re: 2-22-00125-SHA, Bear Pit Timber Harvest Plan (THP)

Dear Forest Manager,

#3

The below comments concern the **Cumulative Effects Assessment, CEQA Alternatives Considered** for THP 2-22-00125-SHA, hereafter referred to as Bear Pit. Due to the flawed and inadequate analysis of this critical issue as addressed in the following letter, there are sufficient grounds for plan denial and it's my recommendation CAL FIRE must deny approval of this plan.

The Bear Pit THP consists of an 841-acre timber harvest of which 569 acres is Alternative Prescription harvest (closest to a clearcut) and 260 acres of fuel breaks. The clearcuts are harvested in groupings up to 20 acres in size. Post-harvest stocking for clearcut lands consists of even-aged management with a 125-point count within 5-year post-harvest.

The Bear Pit THP area is located approximately 9-8 miles southwest of the community of Montgomery Creek in Shasta County.

CEQA Alternatives Considered

Sierra Pacific Industries (SPI), pages 108 to 111, analyzed six different alternatives, (1) the proposed project, (2) no project, (3) alternative land uses, (4) timing of project, (5) alternative site, and (6) public acquisition. Without exception, all of the not selected alternates were graded in the provided tables as having environmental (CEQA) impacts even after mitigation. The proposed project that includes 569 acres of alternative prescription (clearcuts) showed either no environmental impacts after mitigation or no reasonably potential significant adverse impacts. Whereas, all of the other unselected alternatives have un-mitigatable watershed impacts, soil productivity impacts, biological impacts, recreation impacts, visual impact, greenhouse gas impacts, and are wildfire risks? However, all of these same impacts have been mitigated in the proposed clearcut project. How is it not that even a no project alternate or public acquisition of the property has greater environmental impacts than the clearcutting of these same lands? Either this alternative analysis is extremely bias on behalf of SPI or inadequate in its analysis as prepared by the Registered Professional Forester.

My other question is why were not some of the more obvious alternatives such as selective uneven-aged harvests considered in this analysis? On page 189, a silvicultural analysis done by SPI's in-house scientist (James et al. study Dec 12, 2007) was referenced as the scientific basis for SPI's use of even-

aged management. The James study analyzed the four following different management regimes:

1. Regulated form of even-aged management using area control for age classes.
2. Custodial management (light to moderate selection harvest) similar to that practiced by the federal government on public lands.
3. Selective uneven-age management (heavy thinning with reduced level of stocking).
4. Intensively managed scenario and regulated silvicultural (even-aged management).

In his study, James compared the two even-aged management styles with two other uneven-aged management silvicultural practices. The James study concluded as stated, "to re-invigorate these (previous carbon depleted) forest lands by the use of predominately even-aged silviculture balanced by appropriate use of other silvicultural systems that leads to the increasing carbon stocks and increased rate of carbon sequestration shown in our [James' study] modeling efforts." As such, the James study attempted to show that an intensively managed scenario (used by SPI) of post-harvest lands would provide the best carbon sequestration rates with the least environmental impacts.

Following the release of SPI's James' study, a number of environmental forest organizations had serious concerns about the overall validity and bias of the James study and analysis as funded by SPI and the timber industry. Subsequently, Dr. Olga N. Krankina of the Department of Forestry Science, Oregon State University and Dr. Peter Miller at NRDC were contracted to review the findings of the James' study.

#3

- Dr. Krankina's conclusion was that there are several significant flaws in the approach adopted by the SPI Report and these flaws likely bias the calculation result in favor of the intensive management scenario. Even with that apparent bias, the results indicate advantages of less intrusive management (custodial management) at the time scales that are relevant for policy decisions. Enclosed is Dr. Krankina's complete review of the James' study (Review of SPI Report; "Carbon Sequestration in California Forests, Dec. 12, 2007, Attachment (1).
- The review done by Dr. Peter Miller of the NRDC (A Review of SPI's Study: Carbon Sequestration in California Forests, May 5, 2008, Attachment (2) collaborates many of flaws and biases noted in Dr. Krankina's review. In addition, Miller states, "the Intensive management scenario proposed by SPI (the proposed plan, option A would have serious effects on environmental values other than climate. Replacement of diverse, uneven-aged, mixed species stands with even-aged monocultures would greatly reduce wildlife habitat and other environmental services provided by the existing forests."

Based upon Dr. Krankina's and Dr. Miller's reviews, SPI's basis for using an "Intensive managed scenario" even-aged management is significantly flawed. In actuality, any of the other selective harvest alternatives most likely would be less environmentally impactful and produced better long-term carbon sequestration results. Accordingly, SPI's intensively managed, even-aged forests would not have been the preferred alternative taking into account the adverse compounding effects of bias assumptions and omitted impacts.

Before this THP can go forward, new and a more complete analysis of all viable alternatives needs consideration. At a minimum, this analysis needs to include a selective harvest alternate, and some form of uneven aged management. Without an unbiased and thorough analysis of all harvest alternatives CAL FIRE must deny this Bear Pit THP plan.

Due to all the reasons detailed above and in the documents being appended to this comment letter and, therefore, by reference being considered part of the letter itself, I reiterate my strong belief that the Bear Pit THP is irreparably flawed without a full and unbiased Alternative Analysis and must be denied.

Thank you for your serious consideration of my comments.

Sincerely,

Perry Metzger

Attachments:

1. "REVIEW of SPI Report, "Carbon Sequestration in Californian Forests: Two case Studies in Managed Watersheds", Dr. Olga N Krankina Dec. 12, 2007
2. "A Review of SPI Report, "Carbon Sequestration in Californian Forests: Two case Studies in Managed Watersheds", Dr. Peter Miller, NRDC, May 5, 2008

Copy furnished:

Secretary Wade Crowfoot, California Natural Resources Agency

Senator Henry I. Stern, Chair, California Senate Natural Resources and Water Committee

Assemblymember Luz M. Rivas, Chair, California Assembly Committee on Natural Resources

REVIEW

of Sierra Pacific Industries Report

"Carbon Sequestration in Californian Forests: Two Case Studies in Managed Watersheds"

by C. James, B. Krumland, and P. J. Eckert

(completed Dec. 12, 2007, press release April 2, 2008, accessed April 15, 2008 at

http://www.spi-ind.com/html/pdf_forests/CARBONSEQUESTRATION.pdf)

Prepared by Dr. Olga N. Krankina
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for
Defenders of Wildlife
Sierra Forest Legacy
Forests Forever
ForestEthics
Ebbetts Pass Forest Watch

May, 2008

Summary

The Sierra Pacific Industries Report "Carbon Sequestration in Californian Forests: Two Case Studies in Managed Watersheds" evaluates 4 management scenarios (3 scenarios with initial condition reflecting current status of forest stands and one theoretical scenario representing "normal" or "regulated" forest). While the press release and the text of the report emphasize the advantages of intensive management scenario, the calculation results indicate that within the first 40-60 years of future projections the "custodial management" scenario leads to greater carbon storage than the intensive management scenario. Thus the conclusions of the report are not fully consistent with the results of calculations. This inconsistency is significant because the effects of carbon removal from the atmosphere are critical within the next decades and the time horizon of policy decisions tends to be even shorter.

The approach adopted in the report includes several assumptions that bias the results in favor of intensive management. The model projects carbon yields in Ponderosa Pine plantations sustained through age 80 at the level twice as high as naturally regenerating mixed conifer stands and this projection appears unrealistic. If in fact the growth rates of plantations decline with age this would reduce the carbon gains in intensive management scenario. While the assumption regarding the long-term growth rates of plantations seems questionable, the assumption that harvest residues and wood products begin to accumulate at the start of the projections is demonstrably untrue. The report does not include any specifics on past timber harvest but it mentions the fact that virtually all the stands in the examined watersheds are second-growth. This suggests wide-spread past harvest that had to result in substantial carbon stores both in harvest residues and in wood products. New harvest would offset some of the decomposition losses in these pools but it is unclear if any real net carbon gains would occur. In addition, stasis is assumed for all dead biomass pools including snags and forest floor (which has to include logs even though they are not mentioned). In reality, logs and snags are created by tree mortality and are **NOT** in stasis (equilibrium) when there is a change in forest management. These are significant carbon pools and losses from these pools were shown to be a major source of carbon to the atmosphere as old-growth forests were harvested in the PNW. As forest stands grow older, dead biomass pools increase unless timber harvest removes live trees. Aggressive management reduces tree mortality which is input into dead biomass carbon pools; the result is the extremely low level of dead biomass, especially coarse woody debris in intensively managed forests. Omission of the essential link between live and dead biomass pool is a major flaw of the report that likely biased the results in favor of intensive management scenario.

Some aspects of carbon calculations employ sound methods described in great detail but several critical pieces of information are missing making it impossible to fully understand the results. The most important among the missing information is the history of timber harvest and resulting distribution of forest stands by age classes; this is a major factor that controls future change in carbon pools. Furthermore, there is no indication of how (if at all) the response to thinning was accounted for both in terms of growth of the remaining tree stand and regeneration/ingrowth. If the model in fact assumes no growth response to thinning and no regeneration resulting from opening of the tree canopy this would bias the results against thinning and in favor of clearcutting. The report did not consider non-intervention scenario or "business as usual" baseline for Sierra Pacific Industries operations.

Introduction

This review was prepared at the request of ForestEthics, Defenders of Wildlife, Sierra Forest Legacy, Forests Forever, and Ebbetts Pass Forest Watch to assess the scientific merit of the materials presented in Sierra Pacific Industries Report "Carbon Sequestration in Californian Forests: Two Case Studies in Managed Watersheds" (further referred to as SPI Report). The review evaluates the overall approach, assumptions, methods, results and their interpretations. The critique of the report focuses on flaws that are significant for results and policy recommendations; minor errors, inconsistencies, and inaccuracies in terms are not discussed. The focus of the review is on policy-relevant information contained in the report and no policy recommendations are provided or implied.

Methods and Assumptions

Scenarios.

The report examines four management scenarios including Custodial Management (light to moderate selection harvests), Option C Selective Management (heavy thinning that reduces the stocking to minimum allowed level), Intensive Management (converting all remaining mixed conifer forests to Ponderosa Pine plantations with 80-year rotation age), Regulated Management (hypothetical – even distribution of plantations by eight 10-year classes). While the first three scenarios are generally comparable as they are initiated with the results of forest inventory, the fourth scenario cannot be directly compared to the first three as the initial condition is the fully established "normal" or "regulated" forest. This starting point is achieved by the Intensive Management Scenario after 80 years. Therefore direct comparison of projected gains in carbon pools that involve Regulated management Scenario (e.g., p. 3; bottom paragraphs) is inappropriate. Note that the Business as Usual scenario (showing the long-term effects of current company management extended into the future) was not included in the report and neither was a "no management" scenario (showing the long term effect of natural processes of carbon exchange between the existing forest stands and the atmosphere). The latter two scenarios would be critical for a meaningful assessment of the role of forest management practices.

Carbon Pools.

Estimation methods for live biomass components are carefully documented and appear solid. However, the transitions from live to dead biomass pools are not properly accounted for. For example, stasis is assumed for all dead biomass pools including snags and forest floor (which has to include logs even though they are not mentioned). As a result, the SPI projections do not include losses or gains in dead biomass pools. In reality, these pools are created by tree mortality and are NOT in stasis (equilibrium) when there is a change in forest management. These are very significant carbon pools and losses from these pools were shown to be a major source of carbon to the atmosphere as old-growth forests were harvested in the PNW (Harmon et al. 1990). As forest stands grow older, dead biomass pools increase unless timber harvest removes live trees. Aggressive management reduces tree mortality which is input into dead biomass carbon pools; the result is the extremely low level of dead biomass, especially coarse woody debris in intensively managed forests. There is a vast body of literature on the subject. Omission of the essential link between live and dead biomass pool is a major flaw of the report that likely biased the results in favor of intensive management scenario.

The only context where the transition from live to dead biomass is actually accounted for involves timber harvest and associated production of logging residue and wood materials. However, in this case it is assumed that harvest residues and wood products begin to accumulate at the start of the projections and this assumption is demonstrably untrue. The report does not include any specifics on past harvest but it mentions the fact that virtually all the stands in the examined watersheds are second-growth. This suggests wide-spread past harvest that had to result in substantial carbon stores both in harvest residues (including stumps, tops, roots, branches decomposing over time) and in wood products. New harvest would offset some of the losses in these pools but it is unclear if any real net carbon gains would occur.

The assumption that forest products taken out of service and transferred to landfills retain carbon in perpetuity (p. 29; bottom) is clearly untrue. While the decomposition is slow in landfills it does occur and carbon is gradually released into the atmosphere. The no-decomposition assumption is yet another one that biases the results in favor of intensive management scenario.

Finally, the assumption that wood products are taken out of service at an annual rate of 1% per year is also unrealistic. This would imply that 50% of long-term wood materials produced in 1930-ies are still in service today.

Response to thinning. The report text does not describe if and how the response of forest stands to thinning is simulated other than "reducing the basal area and 'reseeding' the model for future forecasts" (p. 47 last paragraph). From the presentation of results (p. 31) one can surmise that the model assumes declining growth rates as the stands get older and no regeneration/ingrowth occurs in response to repeated thinning. In reality mixed conifer forests can be expected to produce an abundant and productive new generation of trees after the main canopy is thinned (e.g., Zald et al. 2008-in press). While the available data on growth and regeneration response to thinning of mixed conifer stands may be limited, assuming that there is no response at all obviously biased the results in favor of the Intensive management scenario.

Projected growth of Ponderosa Pine plantations. The SPI Report admits that "Ponderosa pine plantation management is in its relative infancy in California" (p. 48) yet they project the growth of these plantations at twice the rate of native mixed conifer stands AND assume that this growth rate can be sustained through age 80, even though the only data available for older managed ponderosa pine plantations comes from "a few" stands 50-70 years old. Clearly, the assumption of high growth rates sustained throughout the 80-year rotation is poorly supported by data, yet it is a critical assumption that results in unrealistically high carbon store and yield projections for "regulated management scenario" and for the rapid increase in carbon stores projected for intensive management scenario as greater and greater proportion of forest lands is converted to plantations (Figures 12.2, 12.3 and 12.4).

Results and their interpretations.

Change in carbon pools over time as reported on Figure 12.2 indicates that among the 3 comparable scenarios (i.e., excluding the theoretical "regulated scenario") the least intrusive "custodial management" results in greater forest carbon pools during the first 40 years of projection period for Upper San Antonio Creek watershed and during 60+ years in Canyon Creek watershed. When the total carbon pool is considered (including harvest residues and wood

products; Figure 12.4) there is little difference among the three comparable scenarios during the first 40 years of projection period, but still custodial management results in slightly bigger carbon pools. Thus during the time period that is both policy-relevant and critical in terms of addressing climate change the custodial management gives better results than other management scenarios (!). This is a truly amazing result considering that the calculations were biased in favor of intensive management scenario as described above. Nevertheless the SPI Report concludes in summary on page 3 (bottom) that "Intensively managed and regulated forests show substantial increases in the forest carbon pool and total carbon pool yield when compared to the other more extensive Option C Selection and Custodial management approaches." This is also the main message of the press release based on SPI Report. These conclusions of the SPI Report are supported by calculation results only for the last 3-4 decades of the 100-year projection period, but they are untrue for a significant (and the most policy-relevant) portion of the time-interval examined.

The role of wood products and harvest residues is very important in supporting the conclusions of SPI Report: they account for more than a half of all carbon gains projected for Intensive management scenario. Yet, the estimated increase in carbon pools associated with wood products and harvest residues is the function of assuming that these pools are at zero level at the start of the planning period and this assumption is clearly untrue.

Missing considerations and information

History of forest harvest, other disturbance, and resulting distribution of forest stands by age classes in not presented. Past management is a major factor that shapes future patterns of carbon accumulation and loss in forest landscapes (e.g., Alig et al. 2006). The SPI Report gives some indications that the examined forest landscapes were heavily harvested in the past, including a nearly 30% increase in carbon stores for custodial management scenario during the first 60 years of projections in Canyon Creek watershed. Using forest landscapes heavily harvested in the past as the starting point for future projections minimized losses associated with harvest of existing stands as the land is converted to Ponderosa Pine plantations in intensive management scenario. For landscapes with higher stocking and less harvest impact in the past the losses associated with conversion to plantations would be greater.

No management intervention scenario is not considered. Reduction of timber harvest in PNW National Forests resulted in dramatic increase in forest carbon stores (Alig et al. 2006). Figures in Appendix I suggest that allowing the existing mixed conifer forests attain age 160 years would result in forest carbon pool that is more than twice as high as the average forest carbon store in a regulated scenario for plantations.

The risk of fire is not considered even though the examined watersheds are located in a forest region with considerable fire risk. While the risk of fire and associated carbon emissions apply to all management scenarios the impact of fire on carbon stores can be expected to be higher in Ponderosa Pine Plantations than in native mixed conifer stands. Including the potential impact of fire would reduce the projected carbon pools for all scenarios, but more so for intensive management and regulated scenarios.

In conclusion, there are several significant flaws in the approach adopted by the SPI Report and these flaws likely bias the calculation results if favor of intensive management scenario. Even with that apparent bias, the results indicate advantages of less intrusive management (custodial management) at the time scales that are relevant for policy decisions (years to decades).

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A Review of SPI's study: "Carbon Sequestration in Californian Forests; Two Case Studies in Managed Watersheds"

Peter Miller, NRDC
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Sierra Pacific Industries (SPI) recently released a study[1] which purports to compare the total amount of carbon sequestered under three different forest management scenarios[2] for two different forested watersheds in the Sierra Nevada. The report concludes that a transition to forest plantations in which existing forests are replaced with genetically-selected, even-aged, monocultures – termed the "Intensive scenario" – would result in an increase in sequestered carbon of 75 to 95 tons C/acre[3] over 100 years compared to minimum compliance with Option C of the California Forest Practice Rules.[4]

As detailed below, the SPI study raises numerous methodological and policy issues that call into question both the quantitative conclusions and the value of those conclusions for the development of climate policy. A critical review of this study demonstrates that, contrary to the report's conclusions, replacing existing diverse forests with uniform tree plantations is unlikely to produce significant carbon benefits and will instead increase the risk of catastrophic fire and threaten the extensive range of benefits provided by existing forest ecosystems. This memo provides an overview of methodological problems with the analysis, offers revised estimates of the carbon savings from each of the three scenarios, and concludes with a discussion of the key policy issues raised by the SPI study

Methodological problems with the SPI study include the following:

- The SPI analysis is based on a non-peer-reviewed, unvalidated statistical model. While the authors acknowledge that their model violates normal statistical conditions, they reject alternative, unbiased approaches because they would be "tedious." (p. 43-45)
- GHG emissions from logging, transport, and landfills are ignored or assumed to be zero even though the Intensive management approach is likely to have significantly

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[1] "Carbon Sequestration in Californian Forests; Two Case Studies in Managed Watersheds." C. James, B. Krumland, and P. Eckert. Dec. 12, 2007

[2] The SPI study also includes a fourth scenario -- the "Regulated scenario" – which is intended to simulate carbon levels under long-term continued management using the Intensive management approach. Because the starting point is significantly different under the Regulated scenario than under the other three scenarios, it does not provide a relevant point of comparison and is not addressed in this memo.

[3] All carbon estimates in the SPI report are provided in "English" units of pounds and tons (i.e. 1 ton = 2,000 lbs.). This memo maintains this approach for simplicity of comparison with the SPI report.

[4] Option C of the CA Forest Practice Rules serves as the baseline for forest projects under CARB's forest protocols.

increased emissions in all of these categories compared to less intensive management approaches. (p. 26-30)

- The SPI analysis assumes that soil carbon levels remain constant across management scenarios, despite the significant soil disturbance proposed under the Intensive scenario. In the Intensive scenario, forest soils would be mechanically ripped to three feet deep after existing stands were cleared, likely resulting in a significant loss of soil carbon.[5] (p. 48)

- The analysis assumes a high average lifetime (i.e. half-life) of approximately 70 years for all wood products. (p. 30) This long lifetime is particularly unrealistic for paper and paper products which account for almost 30% of total wood products in the SPI model. The analysis also assumes wood carbon in landfills is permanently sequestered, disregarding both the U.S. Department of Energy and the Environmental Protection Agency's methodology that includes decay rates for land filled wood.[6] (p. 29) The use of a more realistic lifetime and decay rates would result in significantly reduced estimates of carbon storage in wood products and a smaller, if any, net climate benefit from increased wood product production in the Intensive scenario.

- The SPI analysis fails to include a scenario with reduced harvest levels that allow a forest to sequester significantly increased amounts of carbon in forest biomass. Both watersheds evaluated in the SPI analysis are middle-aged forests that are near their maximum rates of growth and with reduced harvest levels could double or triple the volume of carbon sequestered as well as provide valuable wildlife habitat. (p. 50) However, even the Custodial scenario is only designed to "maintain current stocking levels." (p. 20) A comparison of any of the SPI scenarios with a scenario designed to maximize forest carbon would demonstrate the climate benefits of a high-habitat value approach. Consideration of demand-side forest product programs like recycling and wood use efficiency could allow for reduced harvests.

- In order to estimate tree biomass from forest stand characteristics, the authors evaluate three different statistical live biomass (LBM) models and conclude that it isn't possible to "verify which of the … models … provide the most accurate biomass assessments." (p. 25) Given the difficulty in choosing among them, the report provides a comparison of forest carbon over time using each of the three models. (p. 33) This comparison shows significant differences among the LBM models, particularly for the Intensive scenario. However, despite these differences, the comparison across management scenarios that is reported in the Results and

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[5] Most studies quantifying soil carbon loss associated with mechanical turnover have involved agricultural practices. See, for example, S.A. Prior, R.L. Raper, and G.B. Runion, 2004. Effect of implement on soil CO_2 efflux: fall vs. spring tillage. Transactions of the ASAE. 47(2): 367-373.

[6] Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005,* Annex 3 p. 235, April 2007. Department of Energy, "Technical Guidelines for Voluntary Reporting of Greenhouse Gas Program: Chapter 1, Emission Inventories, Part I: Appendix." p. 220, June 2006.

Executive Summary is arbitrarily limited to model 2[7], which produces the largest increase in sequestration from the Intensive scenario compared to the Option C scenario. The net carbon benefit estimated using either of the other two models appears to be approximately 40% lower than the reported results. (p. 33) Model 2 also produces an estimate of decreased sequestration from the Option C scenario that is approximately 50% larger than either of the other two models.

- In the text of the report the authors identify two different possible options for tracking harvest residue (e.g. tree tops, branches, and foliage). The first option is to assume that this material contributes to maintaining forest floor biomass, which the study elsewhere assumes to remain constant at 11.5 tons C/acre. (p. 23) The second option is to assume that this material comprises an additional pool of sequestered carbon. Of course, this latter approach assumes that the forest floor carbon pool somehow remains constant without continued additions to compensate for decomposition. Nevertheless, having identified these two options, the study only reports results using the latter option. As a result, the study concludes that in the Intensive scenario, harvest residue comprises a large incremental pool of sequestered carbon, totaling approximately 20-40 tons C/acre of additional sequestration by the end of the timeframe. (p. 39) In contrast, the report concludes that harvest residue adds no more than 5 tons C/acre under either the custodial or option C scenarios.

- The SPI analysis only provides a comparison of the sequestered carbon at the end of the 100-year study timeframe. However, the relevant comparison for climate policy is the average amount of sequestered carbon over the life of the project. Because the transition to the Intensive management approach initially results in a decrease in total carbon sequestered[8], it shows a net decrease in carbon sequestration relative to custodial management for the first 40 years of the analysis. (p. 40) Even under the favorable assumptions of this analysis, Intensive management does not result in an increase in average sequestration relative to custodial management for over 50 years. Overall, the average differences between the scenarios are much smaller than the reported differences at the end of the timeframe.

Given the significant methodological issues in the SPI analysis, the conclusion is far too flawed to provide useful policy guidance. Inclusion of soil carbon losses and process emissions, adoption of a more realistic wood product lifetime, proper accounting of harvest residues, and use of either one of the other LBM models would result in a dramatic reduction in the estimated climate benefits of Intensive management. A revised analysis that incorporates these improvements could show substantially different results.

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[7] "We arbitrarily used Model 2 as a comparative basis since model differences are largely proportional and can be inferred from the data in Figure 12.1." (p. 34)

[8] The reason for the initial decrease in sequestration rates is that the Intensive management scenario would replace middle-aged trees that sequester a great deal of carbon each year with very young trees that sequester very little carbon in their early years.

For example, it is possible to estimate how the results of the SPI analysis would change in response to three revisions: 1.) exclude paper/paper products from the wood products pool because they do not provide reliable long-term sequestration; 2.) assume that harvest residue contributes to maintaining stable levels of forest floor carbon rather than providing additional carbon storage; and 3.) use either LBM Model 1 or 3, rather than Model 2 which produces results that are significantly more favorable to the Intensive Scenario and less favorable to the Option C scenario.

As reported in Table 1, based on these three changes alone, the Intensive scenario results in lower average carbon sequestration compared to the Custodial scenario in both watersheds and lower sequestration than the Option C scenario in the Canyon Creek watershed. Moreover, as can be seen in Figures 1 and 2 below, the Intensive scenario results in a decrease in carbon sequestration relative to either of the other two scenarios for at least 45 years and continues to lag behind the Custodial scenario in the Canyon Creek watershed even after 90 years. As described above, there are a number of additional problems with the SPI analysis that bias their results in favor of the Intensive scenario. Inclusion of soil carbon losses, process emissions, and landfill decay rates would further reduce the purported benefits of the Intensive scenario relative to either the Custodial or Option C scenarios.

Quantitative results aside, the SPI study raises – but fails to address – three critical policy issues: forest fires, environmental impacts, and forest product demand.

1. Forest fires: The SPI analysis completely ignores the issue of fire. The authors reject any data from forest stands that have burned and make no mention of potential differences in vulnerability to fire across management scenarios. However, the Intensive management scenarios proposed by SPI would create dense stands of uniform, young, even-aged trees which are particularly vulnerable to catastrophic fire.[9] The increase in vulnerability to fire puts at risk the purported carbon benefits and could threaten nearby communities.

SPI is well aware of the threat of catastrophic forest fires. The California Forestry Association (CFA) has submitted a proposal to the AB32 Scoping Plan that highlights the risk of catastrophic fire and concludes that significant climate benefits result from aggressive thinning of dense young forests. Only by ignoring fire in this analysis is SPI able to avoid the inherent contradictions between the purported benefits of Intensive management found in this study and the supposed benefits of aggressive thinning claimed in the CFA proposal.

2. Environmental impacts: The Intensive management scenario proposed by SPI would have serious effects on environmental values other than climate. Replacement of diverse, uneven-aged, mixed species stands with even-aged monocultures would greatly reduce

[9] See, for example, C.P. Weatherspoon and C. N. Skinner. 1995. As assessment of factors associated with damage to tree crowns from the 1987 wildfires in northern California. Forest Science 41(3): 430-451.

wildlife habitat and other environmental services provided by existing forests. Clear cuts and deep ripping of forest soils would greatly increase sedimentation rates and reduce stormwater buffering, resulting in destruction of streams and riparian ecosystems and increased flooding. Genetic selection of seedlings would reduce diversity, constrain the adaptive capacity of California's forests, and increase vulnerability to insects and disease.

In order to ensure that forest projects designed to sequester carbon do not compromise other environmental values, the forest protocols adopted by CARB last October require that all projects meet a set of eligibility criteria including maintenance of forests "that are comprised of multiple ages and mixed native species in the forest overstory and understory."[10]

The Intensive management approach proposed by SPI does not meet these criteria and would not be eligible to report carbon savings using the CARB forest protocols. The significant damage to other environmental values from conversion of complex forests to monoculture plantations reaffirms the importance of the eligibility criteria in the forest protocols and the value of including strong environmental standards in the development of state climate policy.

3. Forest product demand: The SPI analysis is limited to management scenarios that address the supply of forest products. It treats the demand for wood products as given and does not evaluate the potential climate benefits of policies that reduce demand and encourage more efficient use of timber, while allowing for lower harvest levels.

The SPI analysis also fails to address the substantial cost associated with reliance on increasing volumes of wood products in landfills as a source of long-term sequestration. A substantial fraction of the estimated benefit of the Intensive scenario is due to sequestration in landfills. Landfill storage is expensive and continued increases in transfers to landfills runs counter to the State's efforts to reduce waste streams.

Alternatively, policies to reduce the demand for wood products such as recycling and wood use efficiency can provide benefits by reducing harvest volumes and increasing sequestration in forests, rather than in landfills. Though beyond the scope of the SPI analysis, demand-side forest product policies should be considered in the development of the State's forest climate policy.

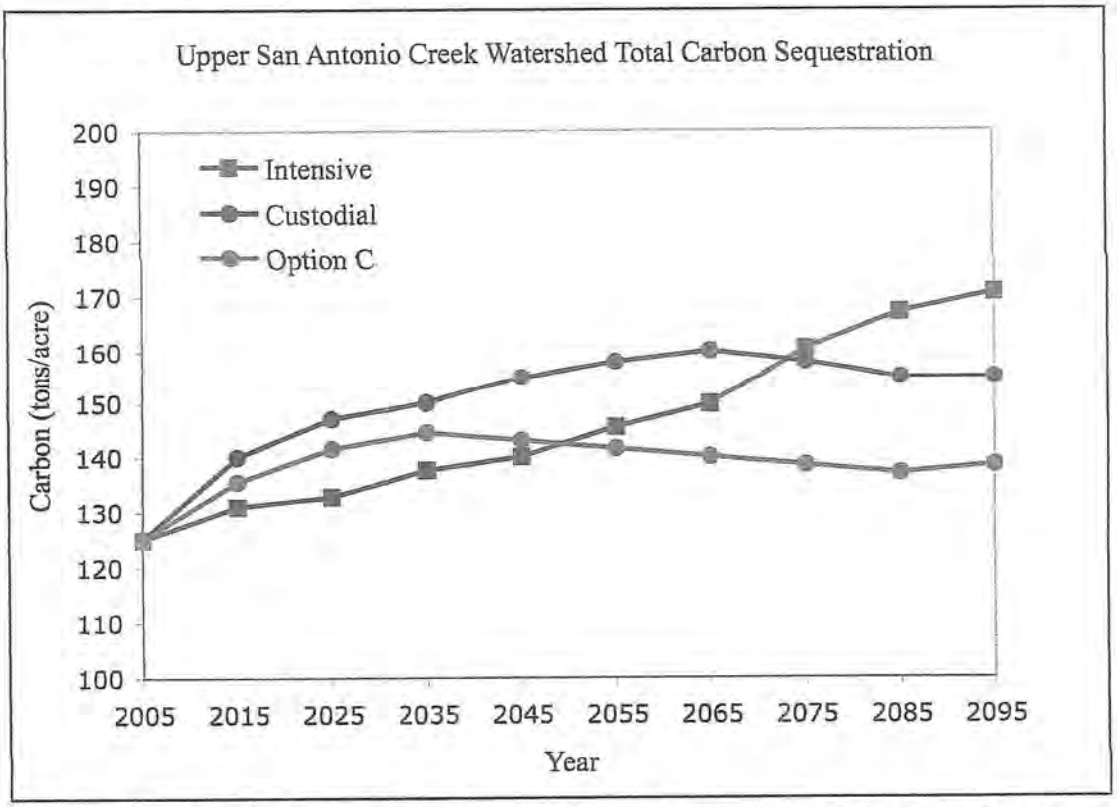
[10] Forest Project Protocol, p. 17

Table 1: Revised estimates of average total carbon sequestration by scenario*

	Upper San Antonio Creek Watershed	Canyon Creek Watershed
Intensive	146 tons C/acre	112 tons C/acre
Custodial	150 tons C/acre	123 tons C/acre
Option C	139 tons C/acre	115 tons C/acre

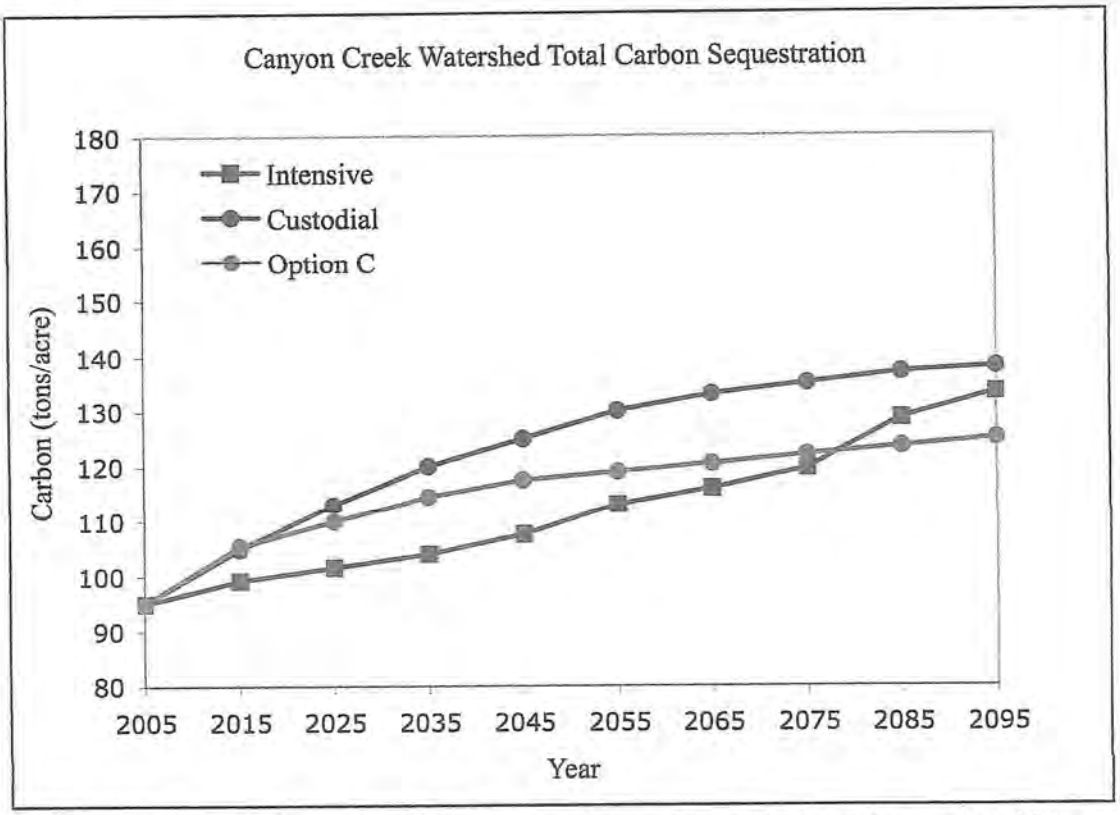
* Estimated results of SPI model with the following changes: 1.) paper/paper products excluded from long-term wood products pool; 2.) harvest residue contributes to maintaining stable levels of forest floor carbon rather than providing additional carbon storage; 3.) use of LBM Model 1 or 3; and 4.) total sequestration reported as average over timeframe rather than at end.

Figure 1: Revised estimates of total carbon sequestration for Upper San Antonio Creek Watershed*



* Estimated results of SPI model with the following changes: 1.) paper/paper products excluded from long-term wood products pool; 2.) harvest residue contributes to maintaining stable levels of forest floor carbon rather than providing additional carbon storage; and 3.) use of LBM Model 1 or 3.

Figure 2: Revised estimates of total carbon sequestration by scenario for Canyon Creek Watershed*



* Estimated results of SPI model with the following changes: 1.) paper/paper products excluded from long-term wood products pool; 2.) harvest residue contributes to maintaining stable levels of forest floor carbon rather than providing additional carbon storage; and 3.) use of LBM Model 1 or 3.