State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Division of Ecosystem Conservation
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

October 13, 2014

Susan Britting, Ph.D., Member
Richard Wade, Member
Michael Miles, Member
Forest Practice Committee
California Board of Forestry and Fire Protection
1416 Ninth Street
P.O. Box 944246
Sacramento, CA 94244-2460

Dear Dr. Britting, Mr. Wade and Mr. Miles:

COMMENTS AND RECOMMENDATIONS FOR REVISIONS TO AUGUST 19, 2014 DRAFT PLEAD REGARDING SECTIONS 912.9, 932.9, 952.9 CUMULATIVE IMPACTS ASSESSMENT CHECKLIST AND TECHNICAL RULE ADDENDUM NO. 2; PROPOSAL TOWARD REFORMS TO CUMULATIVE IMPACTS ASSESSMENT PROCEDURES

California Department of Fish and Wildlife (CDFW) staff has reviewed the August 19, 2014 draft plead titled, "Forest Practice Committee Cumulative Impacts Assessment Discussion". This plead pertains to proposed changes to Title 14, California Code of Regulations, sections 912.9, 932.9, and 952.9, Cumulative Impacts Assessment Checklist [All Districts], including, "Technical Rule Addendum No. 2 Cumulative Impacts Assessment". CDFW is taking this opportunity to provide comments and recommendations for revisions, which are included in the enclosed copy of the August 19, 2014 draft of the plead, for the Forest Practice Committee's consideration. Also enclosed for the Committee's consideration is a proposal for a comprehensive review of the cumulative effects procedures under the Forest Practice Rules (FPRs).

The draft plead proposes numerous but relatively modest changes to sections 912.9, 932.9, and 952.9, Cumulative Impacts Assessment Checklist [All Districts] and Technical Rule Addendum No. 2. One stated impetus for the draft plead is to bring the procedures under the Forest Practice Rules (FPRs) intended to address cumulative effects in line with reforms under the California Environmental Quality Act (CEQA) and the CEQA Guidelines that pertain to greenhouse gas emissions. CDFW adds to the suggested text changes in the enclosed draft plead.

While the proposed changes in the draft plead have merit, CDFW recommends the Committee consider a more fundamental review of the cumulative effects procedures under the FPRs that have been in place now and largely unchanged for some 23 years. These procedures long have been seen by many as onerous yet providing limited guidance on how to actually determine whether a proposed timber harvesting plan would create or add to existing significant cumulative effects on the environment. The proposed changes to the plead do not address these concerns.

The enclosed proposed problem statement and suggested way forward calls for a comprehensive review of the findings and recommendations regarding cumulative effects prepared by earlier Board of Forestry and Fire Protection committees, and panels formed by other entities during these past nearly two-and-a-half decades. The enclosed document notes the convergence of interest in a review of the FPR's cumulative effects assessment procedures and the statutory mandate to establish ecological performance measures under AB1492.

CDFW appreciates the opportunity to provide comments and recommendations to the Forest Practice Committee on the August 19, 2014 plead and to offer an approach for a robust review of the cumulative effects procedures. Should you have any questions and/or would like to discuss our input, please contact Environmental Program Manager William Condon with the Department's Timberland Conservation Program in the Habitat Conservation Planning Branch, at (916) 651-3110 or by email at William.condon@wildlife.ca.gov.

Sincerely,

Sandra Morey
Deputy Director

Enclosure

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California Forest Practice Rules Cumulative Effects Review Concept

October 13, 2014

Problem statement

The California Board of Forestry and Fire Protection (Board), Forest Practices Committee (FPC), has for some time considered revisiting the Forest Practice Rules (FPRs) promulgated nearly 25 years ago pertaining to analysis and disclosure of cumulative effects. During this period, stakeholders and agencies have questioned whether the FPRs effectively address cumulative effects of timber operations approved under timber harvesting plans (THPs). The primary focus of concern has shifted from loss of old-growth habitat and forest habitat elements and the impacts to old-growth-dependent species, to effects on listed salmonids and cumulative watershed effects. Concerns over cumulative effects have been the subject of deliberations by past Board committees and "blue-ribbon panels", each of which in turn has presented conclusions and recommended actions. The recent FPR reforms to the watercourse and lake protection rules, including the "Anadromous Salmonid Protection (ASP) Rules" and the "Road Rules", have been represented as "two legs of a three-legged stool", constituting FPR reforms toward conservation of fish and wildlife values. There is now interest in the "third leg", i.e., reforms to the rules pertaining to cumulative effects and the procedures described in Technical Rule Addendum No. 2 (TRA#2), "Cumulative Impacts Assessment".

The FPC has recently considered several alternative actions drafted by Board Executive staff: a) essentially take no action, b) review changes to CEQA and CEQA Guidelines regarding cumulative effects that have occurred since TRA#2 was first established and as needed effect changes to the Rules and TRA#2 and c) provide a new guidance document for plan submitters to use when addressing cumulative effects in plans. Other, similar or additional actions or objectives that have been discussed include a) provide relief to registered professional foresters and their employers by streamlining what is considered an onerous THP cumulative effects analysis process and b) complete a thorough review of the cumulative effects analysis rules and procedures, taking into account recommendations from the earlier advisory bodies, advances in the scientific literature and thought regarding cumulative effects, and using current analytical tools and resources not available when the cumulative effects rules were initially established. All of these proposals appear to have merit and most are not mutually exclusive.

Related to the Board's interest in considering, and as needed reforming, the FPR's cumulative effects analysis procedures, AB 1492 calls for establishment of "ecological performance measures" through which the status of managed forest landscapes, possibly in terms of "ecological services" or "indicators", are to be assessed and tracked over time. Assuming forest management regimes on private timberlands can affect ecological performance both directly and cumulatively, there appears to be a convergence between the Board's interest in evaluating cumulative effects procedures and provisions of the FPRs and the statutory requirements in AB 1492 to establish and monitor ecological performance measures.

The "Anadromous Salmonid Protection Rules" and "Road Rules" are believed by some to have largely addressed potential cumulative watershed effects, including those on listed salmonids, by avoiding or minimizing potential impacts of forest management to watershed processes, aquatic species and habitats, and impacts to species closely associated with riparian areas. Validation of this belief, however, is on-going. Also, in the absence of similar rule packages that pertain to conservation of terrestrial wildlife species and habitats, the effectiveness of the FPRs in addressing potential cumulative effects on these other resources remains less assured.

The following tasks constitute a possible path forward for helping the Board complete a thorough review of the cumulative effects procedures under the FPRs, with particular focus on terrestrial wildlife species and their habitats.

Tasks

1. Establish a Cumulative Effects Working Group under the aegis of the Board.
2. Compile and review reports, memoranda, and other documents pertaining to cumulative effects analysis generated during the past 20+ years by Board committees and panels, agencies, and stakeholders.
    a. Work with Board staff to search Board files for documents.
    b. Conduct outreach to agency staffs for documents.
    c. Summarize recommendations presented by past committees.
3. Update earlier reviews of literature pertaining to cumulative effects relevant to forest landscapes and resources.
    a. Review past literature reviews and cited articles and reports for their relevance to current circumstances.
    b. Prepare an updated literature review and annotated bibliography.
    c. Share updated literature review/annotated bibliography for comment.
4. Identify analytical tools and methods (e.g. use of GIS, analysis of data from remote sensing) that have emerged since the time the Board established the cumulative effects rules. Develop options for incorporating these into FPRs cumulative effects procedures and Rules.

5. Prepare summary of updated literature review and new analytical tools and methods. Share for comment.
6. Convene workshops to solicit input and ideas from the scientific community and stakeholders.
7. Review the FPRs and Technical Addendum #2 in light of this new information in terms of scope and relevance; prepare and present findings.
8. Prepare periodic updates to the FPC.

Participants

1. Board staff, CalFire and other review team agency staffs, consultants, stakeholders.
2. Staff from other agencies with pertinent expertise.
3. Participants of joint workshops sponsored by the Board including participation by researchers, industry, other practitioners and stakeholders.

Timeframe

To be determined. Gantt chart to be developed.

Resources

To be determined.

Forest Practice Committee Cumulative Impacts Assessment Discussion

August 19, 2014

912.9, 932.9, 952.9 Cumulative Impacts Assessment Checklist [All Districts]

STATE OF CALIFORNIA BOARD OF FORESTRY AND FIRE PROTECTION

CUMULATIVE IMPACTS ASSESSMENT

(1) Do the assessment area(s) of resources that may be affected by the proposed project contain any past, present, or reasonably foreseeable probable future projects? Yes ___ No___

If the answer is yes, identify the project(s) and affected resource ~~subject(s)~~.

(2) Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts of the proposed project? Yes ___ No ___

If the answer is yes, identify the activities, and describe~~ing~~ their location, impacts and affected resource ~~subject(s)~~.

(3) Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable probable future projects identified in items (1) and (2) above, have a reasonable potential to cause or add to significant cumulative impacts in any of the following resource subjects?

Resource Subjects	Yes after mitigation (a)	No after mitigation (b)	No reasonably potential significant effects (c)
1. Watershed			

Comment [CDFW1]: Should not imply that one assessment area will work for all impacts.

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Comment [CDFW2]: Should this be clarified to include the impacts from past "projects" as defined under CEQA? How are pre-CEQA "legacy" impacts to be accounted for?

Comment [CDFW3]: How is the RPF to determine this? Criteria?

Comment [CDFW4]: "projects"?

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Comment [CDFW5]: Extend #2 to include future on-site and assessment area projects.

Comment [CDFW6]: The CEQA Guidelines Appendix G, "Environmental Checklist Form" includes additional and different "resource subjects", which are referred to as "Environmental Factors". While the form appears to pertain to "Potentially Significant Impacts," "significant cumulative impact" is one category of such impacts.

Resource Subjects	Yes after mitigation (a)	No after mitigation (b)	No reasonably potential significant effects (c)
2. Soil Productivity			
3. Biological			
4. Recreation			
5. Visual			
6. Traffic			
7. Greenhouse Gases (GHG)			
~~7~~8. Other			

a) "Yes after mitigation", means that the project contributes to potential significant adverse cumulative impacts that remain~~are left~~ after application of the Fforest pPractice Rrules, restoration activities, and mitigation smeasures or alternatives proposed by the plan submitter.

b) "No after mitigation" means that ~~any~~ potential for the proposed timber operation to cause or add to significant adverse cumulative impacts by itself or in combination with other projects has been reduced to insignificance or avoided by mitigation measures, restoration activities, or alternatives proposed in the THP and application of the Fforest pPractice rRules.

c) "No reasonably potential significant cumulative effects" means that past projects have not, current projects are not, and potential future projects will not lead to significant adverse cumulative impacts, and thus the project cannot contribute to

Comment [CDFW6]: The CEQA Guidelines Appendix G, "Environmental Checklist Form" includes additional and different "resource subjects", which are referred to as "Environmental Factors". While the form appears to pertain to "Potentially Significant Impacts," "significant cumulative impact" is one category of such impacts.

Comment [CDFW7]: If the purpose of the restoration activities is to minimize or off-set impacts, then they are mitigations. This applies to where "restoration activities" are referenced elsewhere in this document.

Comment [CDFW8]: See above.

Comment [CDFW9]: "b" could be either there are no significant cumulative impacts at all, or that there are – but the plan is not contributing to them.

Resource Subjects	Yes after mitigation (a)	No after mitigation (b)	No reasonably potential significant effects (c)
them. ~~the operations proposed under the THP do not have a reasonable potential to join with the impacts of any other project to cause, add to, or constitute significant adverse cumulative impacts~~.			

Comment [CDFW6]: The CEQA Guidelines Appendix G, "Environmental Checklist Form" includes additional and different "resource subjects", which are referred to as "Environmental Factors". While the form appears to pertain to "Potentially Significant Impacts," "significant cumulative impact" is one category of such impacts.

Comment [CDFW10]: A project may have led to an impact, but recovered by the time of the project under review.

(4) If column (a) is checked in (3), ~~above~~ describe why the expected impacts cannot be feasibly mitigated or avoided and what mitigation measures, restoration activities, or alternatives were considered to reach this determination. If column (b) is checked in (3), ~~above~~ describe what mitigation measures and/or restoration activities have been selected which will substantially reduce or avoid reasonably potential significant cumulative impacts except for those mitigation measures or alternatives mandated by application of the Forest Practice R~~r~~ules ~~of the Board~~. If column (c) is checked in (3), ..[?]

(5) Provide a brief description of, and rationale for the resource assessment area~~(s)~~ used for each resource subject. More than one assessment is likely ~~may be~~ needed for each resource subject.

(6) Identify ~~List and briefly describe the~~ individuals, organizations, and records consulted in the assessment of cumulative impacts ~~for each resource subject~~. Records of the information used in the assessment shall be provided to the Director upon request.

BOARD OF FORESTRY AND FIRE PROTECTION

TECHNICAL RULE ADDENDUM NO. 2

CUMULATIVE IMPACTS ASSESSMENT

Introduction

The purpose of this addendum is to guide the assessment of cumulative impacts as required in 14 CCR 898, 912.9, 932.9, 952.9 and 1034 that may ~~occur as a~~ result from~~of~~ the proposed timber operations and other ~~activities under~~ projects. This assessment shall ~~include~~ evaluate~~ion of~~ both on-site and off-site interactions of the proposed project activities in light of ~~with~~ the impacts of past and reasonably foreseeable future projects.

In conducting an assessment, the RPF must distinguish between ~~on-site~~ potential impacts that would ~~be caused by the proposed project~~ (that may not be significant when considered alone) combined ~~with are mitigated by application of the Forest Practice Rules and the interactions of proposed activities (which may not be significant when considered alone)~~ with the impacts of past, present and reasonably foreseeable future projects.

Resource subjects to be considered in the assessment of cumulative impacts are described in the Appendix.

The RPF preparing a ~~THP~~ Plan shall conduct an assessment based on information ~~that is~~ reasonably available before ~~submission~~ submitting ~~of~~ the ~~THP~~Plan. RPFs are expected to submit ~~sufficient~~ information sufficient to support their findings if ~~significant~~ issues are raised during the Department's review of the ~~THP~~Plan.

Information used in the assessment of cumulative impacts may be supplemented during the ~~THP~~ Plan review period. Agencies participating in plan review may provide input into the cumulative impacts assessment based upon their jurisdiction~~area of expertise~~. Agencies should support their recommendations with documentation.

The Department, as lead agency, shall ~~make the final determination regarding assessment~~determine assessment sufficiency and the presence or absence of

Comment [CDFW11]: Should not this section of the Rules also be reviewed at this time?

Comment [CDFW12]: Analyses of cumulative effects include effects of past, present and reasonably foreseeable projects in all sectors.

Comment [CDFW13]: The Addendum uses "THP" and "Timber Harvesting Plan". The term "project" is also used. Suggest using "project" or "Plan" consistently.

significant cumulative impacts. This determination shall be based on a review of all sources of information provided and developed during review of the ~~Timber Harvesting~~ Plan.

Identification of Resource Areas

The RPF shall establish, explain the rationale, and briefly describe the geographic extent of ~~resource~~ assessment areas within or surrounding the plan for each resource subject ~~to be~~ assessed. ~~and shall briefly explain the rationale for establishing the resource assessment~~ area. ~~This shall be a narrative description and~~Resource assessment areas shall be ~~shown on a~~ mapped where a map adds clarity to the assessment; e.g., ~~Examples include~~ the Watershed Assessment Area and Biological Assessment Area~~(s)~~.

Identification of Information Sources

The RPF shall identify (name, date, and contact information, or publication citations) ~~list and briefly describe~~ the individuals, organizations, and records used ~~as~~ ~~sources of information~~ in the assessment of cumulative impacts~~, including references for listed records and the names, affiliations, addresses, and phone numbers of specific individuals contacted~~. Records of information used in the assessment shall be provided to the Director upon request.

~~Common s~~Sources of information for cumulative effects assessment ~~are identified below. Sources to be used~~ will depend upon the complexity of individual situations and the amount of information available from other plans. Any relevant s~~S~~ource~~s not~~, whether listed below or not, may have to be consulted based on individual circumstances. Only relevant ~~Not all~~ sources of information need to be consulted for any~~every~~ ~~THP~~Plan.

1. ~~Consultation with~~ Experts and Organizations:

(a) County Planning Department; **(b)** Biologists and Landscape ecologists~~;~~

(c) Geologists; **(d)** Soil Scientists;

(e) Hydrologists; **(f)** Local, State and Federal Agencies;

(g) ~~State Agencies~~ Foresters ; **(h)** Public and private utilities. (i) University and college professors.

2. Records ~~Examined~~:

(a) Soil Maps; **(b)** Geology Maps;

(c) Remotely sensed images~~Aerial Photographs and Satellite Imagery;~~

(d) CDFW records: e.g., California Natural Diversity Data Base, Biogeographic Information & Observation System (BIOS);

(e) ~~THP~~ Plan Records; **(f)** Special Environmental Reports;

(g) Topographic Maps

(h) Basin and/or Water Quality Control Plans; **(i)** Fire History Maps;

(j) Relevant Federal Agency Documents or Plans

(k) ~~Relevant~~ Scientific and professional society publications

~~T~~theseis, other unpublished studies

~~Watershed or Wildlife Studies (published or unpublished)~~

~~(l) Available Modelsing Approaches~~

~~(j) Biogeographic Information & Observation System (BIOS)~~

Comment [CDFW14]: Not sure what a "Special environmental report is ... is this a relevant CEQA and/or NEPA document?

Comment [CDFW15]: "Water Quality Control Plans" are referenced under the CWE section, below.

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~~As provided in Section 898 of the Forest Practice Rrules, the RPF or supervised designee and the plan submitter must consult information sources that are reasonably available~~.

Past, Present and Future Projects & Environmental ProblemsActivities

Past, present, and foreseeable future projects as well as known environmental problems that may interact with the project shall be assessed ~~included in the cumulative impacts assessment shall be described~~ as follows:

A. Identify and ~~briefly~~ describe ~~the location of~~ past, present and reasonably foreseeable ~~probable~~ future projects as defined in 14 CCR § 895.1 within each ~~described~~ resource assessment areas. Include a map or maps and associated legend(s) ~~clearly~~ depicting the following information:

1. Township and Range numbers and Section lines.

2. If used for the watershed assessment area, the b~~B~~oundary of the planning watershed(s) within which the plan ~~area~~ is located and ~~along with~~ the CALWATER 2.2 identification number(s).

3. Location and boundaries of past, present and reasonably foreseeable probable future ~~timber harvesting~~ projects ~~on land owned or controlled by the timberland owner of the proposed timber harvest~~ within the planning watershed(s) depicted in ~~s~~Section ~~(2)~~ above, or resource assessment area, whichever is larger. For purposes of this section, past projects ~~shall~~ may be limited to those ~~projects~~ submitted within ten years prior to submission of the ~~THP~~Plan.

4. Silvicultural methods for ~~each of the~~ timber harvesting projects within the area and timeframe specified ~~depicted~~ in ~~s~~Section ~~(3)~~ above. Each specific silvicultural method must be ~~clearly~~ delineated on the map(s), and

Comment [CDFW16]: Already said ...see line 19, page 4.

Comment [CDFW17]: This title as was originally only goes with section "A", not "B"

Comment [CDFW18]: Do we mean "Plan" here or "project" as defined under CEQA? CEQA analyses are not to be limited to the effects of projects in any specific sector.

Comment [CDFW19]: Project locations are in the public record. How could an effective cumulative effects analysis be completed without consideration of the effects of projects in landscapes that include multiple ownerships; e.g. with "checkerboard" ownership patterns?

Comment [CDFW20]: Or "Plan"?

Comment [CDFW21]: Cumulative effects

Comment [CDFW22]: This is all a repeat of the "A" heading.

Comment [CDFW23]: The RPF might want to consider the on-going effects of projects that were submitted greater than 10 years ago.

Comment [CDFW24]: "this section" only mean "3"?

Why limit to 10 years when resources and habitat may have not yet recovered from older projects.

Indicate if older projects need not be mapped and named, unrecovered resources and need to be identified.

associated ~~THP~~ Plan number referenced in the legend or an annotated list. In addition, shading, hatching, or labeling shall be used which ~~clearly~~ differentiates silvicultural methods into one of the four categories outlined in Table 1. For projects other than timber harvesting ~~projects~~, the mapping symbols shall be employed and defined to ~~clearly~~ depict changes to habitat structure, composition and function caused by the project.

5. A north arrow and scale bar (or scale text).

6. Source(s) of geographical information; e.g., ...

Comment [CDFW25]: Isn't #6 already required above?

The map scale shall be large enough to ~~clearly represent~~ portray the assessment area at a scale ~~one planning watershed per page or~~ of a scale not less than 1:63,360. ~~Planning watersheds or r~~Resource assessment areas larger than planning watersheds with densely situated or overlapping harvest units, or those which are large or irregular in size, may require multiple maps to achieve clarity. Map(s) shall be reproducible on black & white copiers, and submitted on an 8½ x 11 inch page(s).

Comment [CDFW26]: Isn't this paragraph a part of the "A" supra-heading? This does not appear to relate to " Source(s) of geographical information".

Table 1

Silvicultural Category	Silvicultural Method
Evenaged Management 14 CCR § 913.1 [933.1, 953.1]	Clearcutting, Seed Tree Seed Step, Seed Tree Removal Step, Shelterwood Preparatory Step, Shelterwood Seed Step, Shelterwood Removal Step
Unevenaged Management 14 CCR § 913.2 [933.2, 953.2]	Selection, Group Selection, Transition

Intermediate Treatments 14 CCR § 913.3 [933.3, 953.3]	Commercial Thinning, Sanitation-Salvage
Special Prescriptions and Other Management 14 CCR § 913.4 [933.4, 953.4]	Special Treatment Area Prescriptions, Rehabilitation of Understocked Area Prescription, Fuelbreak/Defensible Space, Southern Subdistrict Special Harvesting Method (14 CCR § 913.8), Variable Retention, Conversion
Alternative Prescriptions shall be put into the category within which the most nearly appropriate or feasible silvicultural method in the Forest Practice Rules is found pursuant to 14 CCR § 913.6 (b)(3)[933.6(b)(3), 953.6(b)(3)].	

B. Identify, ~~and give the~~ locate, ~~ion~~ and describe ~~ption of~~ any known, continuing significant environmental problems caused by past projects as defined in 14 CCR § 895.1. The RPF who prepares the plan or supervised designee shall obtain information from plan submitters (timberland or timber owner), and from appropriate agencies, landowners, and individuals about past, other current, and future land management activities and shall consider past experience, if any, in the assessment area related to past impacts and the impacts of the proposed operations, rates of recovery, and land uses. Discussions with and obtaining information from ~~A poll of~~ adjacent land owners is encouraged and may be required by the Director to ~~determine such~~identify relevant activities and to discover significant ~~adverse~~ environmental problems on adjacent ownerships.

Appendix Technical Rule Addendum # 2

In evaluating cumulative impacts, the RPF shall consider the factors set forth herein.

A. Watershed Resources

Cumulative Watershed Effects (CWEs) occur within and near bodies of ~~water or significant wet areas~~wetwater, wet meadows, or other wet areas~~, where individual impacts are combined to produce an effect that is greater than any of the individual impacts acting alone.~~ ~~CWEs can be adverse or beneficial depending upon the activity (i.e., resource extraction versus restoration).~~ Factors to consider in the evaluation of cumulative watershed effects ~~impacts~~ are listed below.

1. Impacts to watershed resources within the Watershed Assessment Area (WAA) shall be evaluated based on ~~significant~~ on-site and off-site ~~cumulative~~ effects on beneficial uses of water, as defined and listed in applicable Water Quality Control Plans.

~~2.~~ Watershed effects produced by timber harvest and other activities may include one or more of the following:

- Sediment discharge leading to aggradation and turbidity
- Water temperature increase
- Organic debris (large and fine) changes
- Chemical contamination
- Instream flow regimes, including increased ~~P~~peak flows and reduced low summer flows.

The following ~~general guidelines~~ shall guide ~~be used when~~ evaluating watershed impacts. The factors ~~described are general and~~ may not be appropriate for all situations. Actual measurements may be required ~~if needed~~ to evaluate significant

Comment [CDFW27]: This definition is already given elsewhere.

Comment [CDFW28]: Under CEQA, "effects" are adverse. Under NEPA, "effects" can be adverse or beneficial.

Comment [CDFW29]: We might consider using "cumulative watershed effects" consistently.

Comment [CDFW30]: Same as "Basin Plans"?

environmental effects. The plan must comply with the quantitative or narrative water-quality objectives set forth in an applicable Water Quality Control Plan.

a. Sediment Discharge and Turbidity Effects. Sediment-induced CWEs occur when earth materials transported by surface erosion or mass wasting ~~erosion~~ discharge into ~~enter~~ a stream or other waterbody~~stream system at separate locations and are then combined at a downstream location~~ to produce a change in water quality or channel condition. The discharged ~~eroded~~ materials can originate from the same or different projects and at the same or different times. Potentially adverse changes are most likely ~~to occur~~ in the following locations and situations:

- ~~Downstream areas of~~ ~~reduced~~ Low-gradient stream reaches ~~gradient~~ where sediment from a new source may be deposited in addition to sediment derived from existing or other new sources.

- ~~Immediately downstream from w~~ Where sediment from a new source is combined with sediment from other new or existing sources and the combined amount of sediment exceeds the transport capacity of the stream.

- Any location where sediment from new sources in combination with ~~suspended~~ sediment from existing or other new sources significantly reduces the survival and ability to meet life-requisite needs of fish or other aquatic organisms or reduces the quality of waters used for domestic, agricultural, or other beneficial uses.

- Channels with relatively steep gradients which contain accumulated sediment and debris that can be mobilized by sudden new sediment inputs, such as debris flows, resulting in debris torrents and severe channel scouring.

Potentially significant adverse ~~impacts of~~ cumulative effects of sediment ~~and turbidity inputs~~ discharge may include:

Comment [CDFW31]: Basin Plan?

Comment [CDFW32]: Low-gradient reaches can be within the project area, not necessarily downstream.

Comment [CDFW33]: "Existing" should be defined; e.g., does it include "potential"?

Comment [CDFW34]: What about "future" sources from "reasonably foreseeable future projects"?

- Increased turbidity and treatment needs or reduced suitability for domestic, municipal, industrial, or agricultural water use.

- Direct mortality of fish and other aquatic species.

- Reduced growth and survival of juvenile salmonids, and impaired spawning and rearing habitat for salmonids.

- Reduced viability of aquatic organisms or disruption of aquatic habitats and loss of stream productivity caused by filling of pools, loss of cover and plugging or burying streambed gravel.

- Accelerated channel filling (aggradation) resulting in loss of streamside vegetation and stream migration that can ~~cause~~ accelerated bank erosion and warm water.

-Accelerated channel filling (aggradation) resulting in increased frequency and magnitude of overbank flooding.

- Accelerated filling of downstream reservoirs, navigable channels, water diversion and transport facilities, estuaries, and harbors.

- Channel scouring by debris flows and torrents.

- Nuisance to or reduction in water-related recreational activities.

Situations where sediment production potential is greatest include:

- Sites with high or extreme erosion hazard ratings.

- ~~Sites~~ Where ground-based yarding occurs~~which are tractor logged~~ on steep slopes.

- Where timber operations occur during the winter period.

- Where road and landing facilities have not been hydrologically disconnected from watercourses

- Where drainage structures and facilities do not comply with current standards.

- Where timber operations occur on ~~U~~unstable areas.

b. Water Temperature Effects. Water temperature~~-~~related CWEs are changes in water chemistry or biological properties that result from ~~caused by the~~ changes in insolation of water bodies ~~combination of solar warmed water from~~ at two or more locations (e.g. within a stream or where two or more affected streams combine flows) ~~in contrast to an individual effect that results from impacts along a single stream segment).~~ These CWEs are most ~~commonly occur where~~distinguishable where natural vegetative cover has been removed. Cumulative changes in water temperature are most likely ~~to occur~~ in the following situations, where:

- ~~Where s~~Stream bottom materials are dark in color;~~.~~

- ~~Where w~~Water is shallow and slow moving, especially during summer months;

- The channel affords little hyporheic exchange or ~~and has~~there is little ~~underflow and~~ input from springs and ground water;~~.~~

- Effective shade from streamside canopy and adjacent forest stands is diminished resulting in substantial additional~~.~~

~~- Where removal of streamside canopy results in substantial, additional solar exposure~~ insolation and transfer of heat through radiation ~~or increased contact~~ of water ~~with warm air at two or more locations along a stream or at locations along two or more streams that are tributary to the same stream.~~

~~- Where removal of streamside canopy results in substantial, additional solar exposure or increased contact with warm air at two or more streams that are tributary to a larger stream.~~

- ~~Where~~ Average and peak water temperatures are ~~is~~ near a biological thresholds for specific species.

- In non-volcanic terrain (i.e., ~~non-spring~~non-spring-fed watersheds).

- In lower-elevation watersheds and outside of coastal air influence.

Significant adverse impacts of cumulative temperature ~~increases~~ effects include:

- Increases in the metabolic rates (peaks and amplitudes) of aquatic species causing stress and reduced resilience and survival.

- ~~Direct increases in metabolic rate and/or r~~ Increases in biological oxygen demand and reduction of dissolved oxygen levels, either of which can cause reduced vigor and mortality ~~death~~ of ~~sensitive~~ fish and other ~~sensitive~~ aquatic organisms.

- Changed ~~Increased growth rates of~~ microorganism communities that may ~~s that~~ deplete dissolved oxygen levels or increased their disease virulence~~potential for organisms~~.

- Shifts in stream community flora and fauna through reduction or loss of one suite of species with an increase in another suite of species as ~~adapted to specific~~ water temperature regimes change~~after stream temperatures have changed to outside these regimes Stream biology shifts toward warmer water ecosystems~~.

c. Organic Debris Effects. ~~CWEs produced by o~~Organic debris produce CWEs~~can occur~~ when logs, limbs, and foliage~~other organic material~~ are introduced -- or prevented from being introduced -- into a stream or lake at two or more locations or times. Microorganisms that d~~D~~ecompose~~ition of~~ this debris, particularly the smaller sized and less woody material, removes dissolved oxygen from the water~~and can cause impacts similar to those resulting from increased water temperatures~~. Introduction of excessive small organic debris can also increase water acidity.

Large organic debris (logs) is an important stabilizing agent ~~that should be maintained~~ in small- to medium-sized, steep- gradient channels. It also produces pool habitat and cover for fish as well as promotes channel substrate conditions conducive to fish and aquatic organism production in low gradient alluvial channels~~in larger fish-bearing watercourses and should be maintained or enhanced where increased habitat complexity will benefit listed fish species.~~, ~~but~~ Excessive large organic debris can ~~T~~the ~~sudden introduction of large, unstable volumes of bigger debris (such as logs, chunks, and larger limbs produced during a logging operation), however,~~ can obstruct and divert streamflow against erodible banks, block fish migration, and under certain circumstances may contribute to ~~cause~~ mass wasting (undercutting the base of unstable areas through streambank erosion, debris torrents~~,~~ and others). ~~during periods of high flow~~.

Removing streamside vegetation ~~can~~ reduces ~~the~~ natural dynamics and constituents ~~, annual inputs~~ of fine organic litter to the stream (after decomposition of logging-related litter). This can cause both a drop in food supply, and resultant productivity, and a change in types of food available for organisms that normally dominate the lower food chain of streams with an overhanging or adjacent forest canopy. Additionally, removal of large riparian trees reduces the potential for wood recruitment to the watercourse channel.

d. Chemical Contamination Effects. Potential sources of chemical CWEs include run-off from roads treated with oil or other dust ~~retarding~~abating materials, direct application or run-off from pesticide and herbicide treatments, contamination by spills or leaks of equipment fuels and oils, use of fertilizers to promote growth, and the introduction of nutrients released during slash burning or wildfire from two or more locations.

Comment [CDFW35]: Are these covered under "projects" or are the outside the scope of projects and project effects?

e. Effects on Instream Flow Regimes~~, Including Peak Flows and Low Summer Flows~~ ~~**Peak Flow Effects**~~. CWEs ~~can be~~ caused by management-induced increases in peak flow ~~increases in streams~~ during storm events are ~~difficult to anticipate~~specific to scale and to silviculture and other management practices. Peak flow ~~increases~~ may increase~~result~~ from management activities that reduce rainfall interception loss and vegetative water use (i.e., transpiration), reduce water percolation and retention in soil through soil compaction and thereby increase surface run-off, ~~or~~ produce openings where snow can accumulate (such as ~~clear-cutting~~ in clearcuts and on roads and landings, ~~site preparation~~ intense wildfire areas), or ~~that change~~alter the timing of flows by affecting ~~producing more efficient~~ the routing of runoff ~~routing~~ (such as insloped and hydrologically-connected roads). ~~While t~~These ~~i~~Increased peak flows ~~s, however, are likely to be small relative to natural peak flows from medium and large storms, they~~ can ~~produce~~ intensify~~increased~~ streambank erosion, channel incision, and head cutting ~~ward channel migration in erodible landscapes~~. Impacts on channel morphology are likely to be greatest where streambeds are composed of gravel and finer material. Increases in peak flows generally diminish with decreasing intensity (even-aged verse uneven-aged) or ~~of~~ percentage of the watershed harvested, as well as ~~and~~ the length~~ening~~ of the flow recurrence interval~~s of flow~~. Peak flow effects are ~~more~~ pronounced and detectable ~~easier to detect~~ in small watersheds, areas characterized by ~~where~~ rain-on-snow events

Comment [CDFW36]: This is not a project effect.

~~occur~~, and for relatively small runoff events (e.g., two-year return interval flow). ~~Research to date on the effects of management activities on channel conditions indicates that channel changes during storm events are primarily the result of large sediment inputs.~~Hydrologic conditions recovery from increased peak flows ~~generally occurs~~ within approximately 10 to 20 years~~,~~ depending on timber type, regeneration success, site quality, pre-commercial thinning operations, and other factors~~etc~~.

CWEs can be caused by management-induced reductions in low-summer flows.

Comment [CDFW37]: Need a treatment of this topic.

3. Watercourse Condition. ~~The watershed i~~Impacts of past upstream and on-site projects are often reflected in the condition of stream channels ~~on~~ in the project area and downstream. The ~~F~~following is a list of channel characteristics and factors that may be used to describe current ~~water~~watercourse ~~shed~~ conditions and to assist in the evaluation of potential cumulative project impacts:

Comment [CDFW38]: Many of the following do not provide any analysis guidance

~~0~~ a. Gravel Embeddedness - Spaces between stream gravel filled with sand or finer sediments. Gravels are often configured in a tightly packed arrangement.

~~0~~b. Pools Filled - Former pools or apparent pool areas filled with sediments leaving few areas of deep or "quiet" water relative to stream flow or size.

~~0~~c. ~~-~~Channels ~~Aggrading~~ Aggraded - Stream channels filled or filling with sediment that raises the channel bottom elevation and reduces water depth. Pools will be absent or greatly diminished and gravel may be embedded or covered by finer sediments. Streamside vegetation may be partially or completely buried~~, and~~ T~~t~~he stream may be meandering or cutting into its banks above the former level of the ~~former~~ streambed. Depositional areas (e.g., point and mid-channel bars) in aggrading channels are often increasing in size and number.

◊ d. Bank Cutting — ~~Can either be minor or severe and~~ Bank cutting is indicated by areas of fresh, unvegetated soil or alluvium/colluvium exposed along the stream banks, usually above the low-flow channel and often with a vertical or undercut face. Severe bank cutting is often associated with channels that are downcutting~~,~~ which can lead to over-steepened banks. On the other hand, ~~or~~ aggrading~~,~~ channels ~~which~~ can ~~cause the channel to~~ migrate to deliver flow against slopes that were previously above the high flow level of the stream.

◊ e. Bank Mass Wasting - Channels with landslides directly entering the stream system. Slide movement may be infrequent (single events) ~~or~~ frequent (recurring events) or continuous (e.g. earth flows~~continuing creep or periodic events~~).

Comment [CDFW39]: Needs expansion – how might it inform CWE analysis?

◊ f. Downcutting - Incised stream channels with relatively simplified and linear form~~clean, uncluttered beds~~ cut below the level of former streamside vegetation and with eroded, often undercut or vertical, banks that are subject to mass wasting.

Comment [CDFW40]: Ditto prior comment

◊ g. Scoured - Stream channels that have been stripped of gravel and finer bed materials by large flow events or debris torrents. Streamside vegetation has often been swept away, and the channel has a raw, eroded appearance. Scoured streams have fewer roughness elements and can deliver sediment more readily than hydraulically rough channels.

Comment [CDFW41]: Ditto prior comment

◊ h. Organic Debris - Debris in the watercourse can have either a positive or negative impact depending on the amount and stability of the material. Some stable organic debris present in the watercourse helps to form pools and retard sediment transport and downcutting, especially in small ~~to medium sized~~ headwater streams with relatively steep gradients. - In higher-order watercourses, ~~Large~~ wood accumulations and associated channel materials are highly desirable as they ~~for producing~~ improved aquatic

habitat conditions in larger fish-bearing watercourses on-site and downstream, particularly in coastal watersheds without bedrock/boulder channel conditions. Large accumulations of organic debris combined with tightly packed bedload can block fish passage, block or divert streamflow, or could be released as a debris flow.

◊ i. Stream-Side Vegetation - Stream-side vegetation and near-stream vegetation provide shade or cover to the stream, which may affects microclimate and have an impact on water temperature, and provides root systems that stabilize streambanks and floodplains, and obstructs stream flow that filter sediment during from flood flows.

◊ i. Recent Floods - A recent high flow event that would be considered unusual in the project area may have an impact on the current watercourse condition.

Comment [CDFW42]: Is this an adverse cumulative effect?

Comment [CDFW43]: Is this a project-related effect or condition?

B. Soil Productivity

Cumulative soil productivity impacts occur when the effects of two or more activities, from the same or different projects, combine to produce a significant decrease in soil biomass production and shallow groundwater retention potential. These impacts most often occur on-site within the project boundary. , and tThe relative severity of productivity losses for a given level of impact generally increases as site quality declines. The primary factors influencing soil productivity that can be affected by timber operations include:

◊ Organic matter loss. ◊ Soil compaction.

◊ Surface soil loss. ◊ Growing space loss.

Comment [CDFW44]: Change format to black bullets, the same as for A. Watershed Resources 2.?

The following general guidelines may be used when evaluating soil productivity impacts.

Comment [CDFW45]: Cumulative effects on soil resources are not limited to productivity.

1. Organic Matter Loss. Displacement or loss of organic matter can result in a long term loss of soil productivity. Soil surface litter and downed woody debris are the

store-house of long term soil ~~-~~fertility, provide for soil moisture conservation, mediate surface run-off percolation into ground water storage, function in carbon storage, and support soil microorganisms that are critical in the nutrient cycling and uptake process. Much of the chemical and microbial activity of the forest nutrient cycle is concentrated in the narrow zone at the soil and litter interface.

Displacement of surface organic matter occurs as a result of skidding, mechanical site preparation, and other land disturbing timber operations. Actual loss of organic matter occurs as a result of burning or erosion and biomass extraction. The effects of organic matter loss on soil productivity may be expressed in terms of the percentage displacement or loss as a result of all project activities.

2. Surface Soil Loss. The soil is the storehouse of current and future site fertility, and the majority of nutrients are held in the upper few inches of the soil profile. Topsoil displacement or loss can have an immediate effect on site productivity, although effects may not be obvious because of reduced brush competition and lack of side-by-side comparisons or until the new stand begins to fully occupy the available growing space.

Surface soil is primarily lost by erosion, ~~or~~ by displacement into windrows, piles, or fills and road, skid trail, layout and landing construction. Mass wasting is a special case of erosion with obvious extreme effects on site productivity. The impacts of surface soil loss may be evaluated by estimating the proportion of the project area affected and the depth of loss or displacement.

3. Soil Compaction. Compaction affects site productivity through loss of large soil pores that transmit air and water in the soil and by restricting root penetration. Soils are most susceptible to compaction at water contents near field capacity (not

saturated soil conditions, where they are puddled or displaced). The risk of compaction is associated with:

- Depth of surface litter.
- Soil organic matter content.
- Soil texture.
- Soil structure.
- Presence and amount of coarse fragments in the soil.
- Soil moisture status.
- Yarding method and types of equipment used.

Compaction effects may be evaluated by considering the soil conditions, as listed above, at the time of harvesting activities, type of yarding proposed, and the proportion of the project area subjected to compacting forces.

4. Growing Space Loss. Forest growing space is lost to roads, landings, permanent skid trails, and other permanent or non-restored areas subjected to severe disturbance and compaction.

The effects of growing space loss may be evaluated by considering the overall pattern of roads, ~~etc.,~~ relative to feasible silvicultural systems and yarding methods.

Comment [CDFW46]: To what "etc." refers is not clear.

C. Biological Resources

Biological assessment areas will vary with the resources (species and their habitat, natural communities) being evaluated ~~and its habitat~~. Factors to consider in the evaluation of cumulative biological impacts include:

1. Any known rare, threatened, or endangered species or -sensitive species (as described in the Forest Practice Rules) or species that meet the criteria under Section 15380 (c) of the CEQA Guidelines that may be directly or indirectly affected by project activities. Significant cumulative effects on ~~listed~~ species may be expected from the results of activities over time which combine to have a substantial effect on the species or

Comment [CDFW47]: Should this be qualified to refer to "project" activities?

on the habitat of the species. Species identified by Sstate and federal fish and wildlife agenciesy as of special concern should be evaluated.

2. Any significant, known wildlife, botanical or fisheries resource concerns within the immediate project area and the biological assessment area (e.g. loss of oaks creating forage problems for a local deer herd, loss of ~~species requiring~~ special habitats or habitat elements required by species, reductions in sensitive species populations, and impacts to significant natural areas). Significant cumulative effects may be expected where required habitat ~~there~~ is ~~a~~ substantially reduced ~~tion in~~ and/or fragmentedation ~~of required habitat~~. Similarly, ~~a or the~~ project may ~~will~~ result in significant cumulative effects if it ~~substantial~~ interferesence with the movement of resident or migratory species. The significance of cumulative impacts on ~~non-listed~~ species viability should be determined relative to the benefits to other ~~non-listed~~ species. For example, the manipulation of habitat results in conditions which discourage the presence of some species while encouraging the presence of others.

3. The aquatic and near-water habitat conditions on the ~~THP~~ Plan and associated assessment areas~~immediate surrounding area~~. Habitat conditions of primary~~major~~ concern are: p~~P~~ools and riffles, bottom material size-class distribution (especially the proportion of fine materials, bedload imbrication, l~~L~~arge woody material in the stream, n~~N~~ear-water vegetation, water quality and water temperature, presence of artificial barriers, and flow regimes (seasonal and in response to storm events). Much of the information needed to evaluate these factors is described in the preceding Watershed Resources section. A general discussion of their importance is given below:

a. Pools and Riffles. Pools and riffles affect overall habitat quality and fish community structure. Streams with little structural complexity offer poor habitat for fish communities as a whole, even though the channel may be stable. Structural

Comment [CDFW48]: Or simply "biological resource concerns"

Comment [CDFW49]: This applies to both listed and unlisted species.

Comment [CDFW50]: This is appropriate only in cases where both species are of management concern ... i.e., don't cloud the decision space by saying common species are benefited so reduction in viability of sensitive spp is ok.

Comment [CDFW51]: Why are these capitalized?

complexity is often lower in streams with low gradients, and filling of pools can reduce stream productivity.

b. Large Woody Material. Large woody debris in the stream plays an important role in creating and maintaining habitat through the formation of pools and sorting of gravel used for spawning and providing substrate for benthic macroinvertebrates. These pools comprise important feeding locations that provide maximum exposure to drifting food organisms in relatively quiet water. Removal of woody debris can reduce frequency and quality of pools.

c. Near-Water Vegetation. Near-water vegetation provides many habitat benefits, including: shade, ambient humidity, nutrients, vertical diversity, migration corridors, nesting, roosting, and escape. Recruitment ~~potential over short and long terms~~ of large woody material from near-water vegetation over short and long terms is also ~~an~~ important in maintaining in-stream habitat quality.

4. The ~~biological~~ species habitat conditions in~~of~~ the ~~THP~~ Plan and its associated assessment areas~~immediate surrounding area~~. Significant factors to consider are:

◊ Snags/~~den~~ and other wildlife trees with special structures that make them useful~~d~~ for ~~for~~ nesting, denning, and roosting ~~and as dens.~~

◊ Hardwood cover

◊ Downed, large logs and branches~~organic woody debris~~ ◊ Late ~~seral (mature) forest characteristics.~~ Successional Forest Stands

◊ Multistory canopy ◊ Seral stage distribution

~~Late seral~~ ~~Successional~~ ~~, climax forest and other~~ Early seral stages

seral stage habitat continuity

◊ Road density

Comment [CDFW52]: how differ from 'continuity" -- one in space, one in time?

Comment [CDFW53]: This is not a habitat condition *per se* but it relates to habitat loss, fragmentation and invasive species.

The following ~~general guidelines may be used when~~ evaluation of ~~n~~terrestrial ~~biological~~ habitat. The factors described ~~are general and~~ are ~~may~~ not be pertinent ~~appropriate~~ to ~~for~~ all situations. The ~~THP~~ Plan preparer must also be alert to ~~the need to consider~~ factors ~~which are~~ not listed below. Each project and assessment area is ~~set of ground conditions are~~ unique, as should be ~~and~~ the analysis of the impacts~~conducted must reflect those conditions~~.

a. Snags/Den/Nest Trees: Snags, den trees, nest trees ~~and their recruitment~~ are required elements in the overall habitat needs of more than 160 wildlife species. Many of these species play a vital role in maintaining the overall health of forests on timberlands. Snags' value generally increase with diameter and height; that is, larger snags can function as species habitat for a larger number of species than smaller snags. Those of greatest function to wildlife and for the broadest range of species ~~value~~ are greater than ~~>~~ 16 inches~~"~~ dbh ~~DBH~~ and 20 feet~~ft.~~ tall~~in height. although s~~Some species, such as pileated woodpecker, require snags and wildlife trees much larger than this. The analysis in particular should consider impacts on large snags in large numbers ~~snag populations~~ and describe ~~potential for large degree of~~ allowances for snag recruitment over time ~~should be considered~~. Den trees are often partially live trees with elements of decay, the cavities of which provide protective shelter~~wildlife habitat~~. While most trees can provide nesting substrate to some species, structurally complex ~~Nest~~ trees provide especially important nesting opportunities to some ~~have importance to birds, including classified as a~~ sensitive bird species as well as nesting and resting sites for sensitive mammals. Nest trees~~, individually or in clusters,~~ often include ~~predominant,~~ large trees with features that make them structurally complex; e.g., deep crowns, deformities, witch's broom, and / or ~~and~~ large branches. . They can be "residual" trees (originating from a primary forest) or "biological legacies". Their presence accelerates

Comment [CDFW54]: Virtually all trees can be used by some species of birds for nesting. Maybe better to find another term for the structurally complex trees that provide unusual features required for nesting by sensitive spp?

development of late-successional habitat function in maturing stands; and as habitat elements, support species that depend on these elements ~~dependent species~~ especially in landscapes dominated by early and mid-successional forests. Distribution, both clumped and dispersed as well as upslope and streamside, are important to providing wildlife habitat value.

b. Downed large~~,~~ or coarse woody debris: Large downed logs and branches (particularly conifers) in the upland and near-water environment in all stages of decomposition provide an important habitat for many wildlife species. As for snags, larger coarse woody debris can function as species habitat for a larger number of species than smaller debris although accumulations of smaller-diameter material can serve similar habitat functions; however, larger-diameter debris tends to persist longer . Again, as with snags, ~~L~~large woody debris of greatest function to wildlife and for the broadest range of species ~~value~~ are greater than ~~>~~ 16 inches " diameter at the large end and greater than ~~>~~ 20 feet long. ~~in length~~ . Habitat value may differ between ~~, both~~ singley pieces and ~~in~~ log groups of logs or debris and slope position.

c. Multistory canopy: Upland multistoried canopies have a marked influence on the diversity and density of wildlife species ~~utilizing the area~~. More productive timberland is generally of greater value and timber site capability should be considered as a factor in an assessment. The effects of the proposed Plan combined with those of other Plans on the ~~The~~ amount of upland multistoried canopy and may be evaluated by estimating the percent of the Plan area's stands and the assessment areas that are composed of two or more tree layers ~~on an average per acre basis~~ both pre- and post-project.

Comment [CDFW55]: How?

Near-water multistoried canopies in riparian zones that include conifer and hardwood tree species provide an important element of structural diversity to the habitat

requirements of wildlife. Near-water multistoried canopy may be evaluated by estimating the percentage of ground covered by ~~one or~~ more than one vegetative canopy strata, considering also ~~with more emphasis placed on~~ shrub species along Class III ~~and IV~~ streams (14 CCR 916.5, 936.5, or 956.5).

Comment [CDFW56]: Are shrub species considered contributing to multistoried stand structure? If so, why would the evaluation only consider shrubs along Class III watercourses?

d. Road Density: Frequently traveled permanent and secondary roads have a significant influence on wildlife use of otherwise suitable habitat. ~~Large declines in d~~Deer and bear use of areas adjacent to open roads often decline~~are frequently noted~~. Other species avoid roads and their habitat may be fragmented. Roads are a primary mode of invasion by non-native species. Road density influence on ~~large mammal~~ wildlife habitat may be evaluated by estimating the miles of ~~open~~ permanent and temporary roads~~,~~ on a per-section basis, with a focus on ~~that receive some level of~~ maintenance frequency as well as ~~and~~ level and type of use~~are open to the public~~. This assessment should also account for the effects of vegetation screening and the relative importance of an area to wildlife on a seasonal basis (e.g. winter range). Roads combined with other forest openings can create impediments to wildlife movement and fragment interior forest habitat. They can act as pathways for introduction of invasive species.

e. Hardwood Cover: Hardwoods provide an important element of habitat diversity in the coniferous forest and are utilized as a source of food and/or cover by many ~~a large proportion of the state's bird and mammal~~wildlife species. Additionally, hardwood dominated forest types~~,~~ such as oak woodlands~~,~~ are ~~recognized as~~ important ecological resources for fulfilling wildlife needs and sustaining biodiversity. Productivity of ~~deer and other~~many wildlife species is ~~has been directly~~ related to mast crops associated with either dispersed hardwoods located within conifer–dominated forest types or hardwood-dominated forest types. Hardwood cover can be estimated using the basal area ~~per acre~~ provided by hardwoods of all species. When discussion of hardwood–dominated forest

types is warranted, hardwood cover can be estimated in acres or percent of total forested acres.

[Northern and Southern only]: Post-harvest deciduous oak retention for the maintenance of habitats for mule deer and other hardwood-associated wildlife shall be guided by the Joint Policy on Hardwoods between the California Board of Forestry and California Fish and Game Commission (5/9/94). To sustain wildlife, a diversity of stand structural and seral conditions, and tree size and age classes of deciduous oaks should be retained in proportions that are ecologically sustainable. Regeneration and recruitment of young deciduous oaks should be sufficient over time to replace mortality of older trees. Deciduous oaks should be present in sufficient quality and quantity, and in appropriate locations to provide functional habitat elements for hardwood-associated wildlife.

f. Late sSeral (Mature)uccessional fForest Characteristicsstands: Determination of the presence or absence of mature and over-mature old-growth forest stands and their structural characteristics provides a basis from which to begin an assessment of the influence of management on associated wildlife. These stands are characterizedstics by include large trees contributing to as part of a multilayered canopy and the presence of large numbers of snags and downed logs that contribute to an increased level of stand decadence and complexity. Late seral stageuccessional forest amount forest stands may be evaluated by estimating the percentage of the land base within the project and a the biological assessment area occupied by stands areas conforming to the following definitions provided in 14 CCR 895.1. Late successional forest stands of lesser extents than those as defined may be evaluated in a similar manner. :

Forests not previously harvested should be at least 80 acres in size to maintain the

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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

May 1, 2015

Members Richard Wade and Michael Miles
Forest Practice Committee
California Board of Forestry and Fire Protection
1416 Ninth Street
P.O. Box 944246
Sacramento, CA 94244-2460

Dear Messrs. Wade and Miles:

Subject: **SUPPLEMENTAL RECOMMENDATIONS FOR REVISIONS TO TECHNICAL RULE ADDENDUM NO. 2**

California Department of Fish and Wildlife (CDFW) staff has participated in discussions before the Forest Practice Committee (Committee) regarding proposed changes to Technical Rule Addendum No. 2 (TRA#2) of the California Forest Practice Rules. Most recently, the Committee's attention turned to proposed changes to sections 4. (f) and (g) of "C. Biological Resources," which address "Late Seral (Mature) Forest Characteristics" and "Late Seral Habitat Continuity," respectively.

Please find enclosed the pertinent excerpts of TRA#2 with CDFW's proposed revisions indicated. In contrast to CDFW's recommended text changes presented to the Committee on October 13, 2014, CDFW now recommends "late seral" be retained in TRA#2 to clearly distinguish references to it from "late succession forest stands" as defined in the CFPRs. Evaluations of cumulative effects on late seral forest characteristics and late seral habitat continuity include but are by no means limited to effects on late succession forest stands, which are a subset of the broader category of late seral forest characteristics.

CDFW appreciates the opportunity to provide comments and recommendations to the Committee as part of a process to reform TRA#2. Should you have any questions and/or would like to discuss our input, please contact Environmental Program Manager William Condon with the Department's Timberland Conservation Program in the Habitat Conservation Planning Branch, at (916) 651-3110 or by email at William.condon@wildlife.ca.gov.

Sincerely,

Sandra Morey
Deputy Director
Ecosystem Conservation Division

Enclosure

FPC 2.1

cc: J. Keith Gilless, Ph.D., Chair
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forest types, such as oak woodlands, are recognized as important ecological resources for fulfilling wildlife needs and sustaining biodiversity. Productivity of ~~deer and other~~many wildlife species has been directly related to mast crops associated with either dispersed hardwoods located within conifer dominated forest types or hardwood dominated forest types. Hardwood cover can be estimated using the basal area per acre provided by hardwoods of all species. When discussion of hardwood dominated forest types is warranted, hardwood cover can be estimated in acres or percent of total forested acres.

[Northern and Southern only]: Post-harvest deciduous oak retention for the maintenance of habitats for mule deer and other hardwood-associated wildlife shall be guided by the Joint Policy on Hardwoods between the California Board of Forestry and California Fish and Game Commission (5/9/94). To sustain wildlife, a diversity of stand structural and seral conditions, and tree size and age classes of deciduous oaks should be retained in proportions that are ecologically sustainable. Regeneration and recruitment of young deciduous oaks should be sufficient over time to replace mortality of older trees. Deciduous oaks should be present in sufficient quality and quantity, and in appropriate locations to provide functional habitat elements for hardwood-associated wildlife.

f. Late Seral (Mature) Forest Characteristics: Determination of the presence or absence of mature ~~and over-mature~~ forest stands and/or their structural characteristics and components provides a basis from which to begin an assessment of the influence of management on associated wildlife. These characteristics and components include large trees, occurring as individuals, in clusters or comprising stands, that contribute to ~~as part of~~ a multilayered canopy, and the presence of large numbers of snags and downed logs that contribute to an increased level of stand decadence and structural complexity. The spatial extent of ~~L~~late seral ~~stage~~ forest characteristics

amount may be evaluated by estimating the percentage of the land base within the project and the biological assessment areas. occupied by areas conforming to the following definitions:

Forests not previously harvested should be at least 80 acres in size to maintain the effects of edge. This acreage is variable based on the degree of similarity in surrounding areas. The area should include a multi-layered canopy, two or more tree species with several large coniferous trees per acre (smaller subdominant trees may be either conifers or hardwoods), large conifer snags, and an abundance of large woody debris.

Previously harvested forests are in many possible stages of succession and may include remnant patches of late seral stage forest, which generally conform to the definition of unharvested forests but do not meet the acreage criteria.

g. Late Seral Habitat Continuity: The effects of proposed pProjects on the spatial continuity of containing areas meeting the definitions for with late seral stage forest characteristics must be evaluated for late seral habitat continuity. The fragmentation or severing of continuity and resultant isolation of areas with late seral forest characteristics and associated habitats types is one of the most significant factors influencing the sustainability of wildlife populations requiring these characteristics not adapted to edge environments.

This The direct and cumulative effects on late seral habitat continuity fragmentation may be evaluated by assessing the spatial configuration and estimating the extent amount of the on-site project and the biological assessment areas occupied by areas with late seral forest characteristics. The habitat suitability for many species associated with closed canopy, interior forest environments that include late seral forest characteristic is lessened in such areas that are small and adjacent to areas with earlier seral stages. Late seral habitat continuity can be impaired by project activities that

increase fragmentation and isolation of areas with late seral forest characteristics from other such areas, and by activities that increase the extent of edge or boundaries between these areas and adjacent younger seral stages. ~~stands greater than 80 acres in size (considering t~~ The mitigating influence of adjacent and similar habitat~~, if applicable) and less than one mile apart~~ or connect~~ivity ed~~ by a corridor of similar habitat can be considered.

h. Special Habitat Elements: The loss of a key habitat element may have a profound effect on a species even though the habitat is otherwise suitable. Each species may have several key limiting factors to consider. For example, a special need for some large raptors is large decadent trees/snags with broken tops or other features. Deer may have habitat with adequate food and cover to support a healthy population size and composition but dependent on a few critical meadows suitable for fawning success. These and other key elements may need special protection.

D. Recreational ~~ECREATIONAL~~ Resources~~ESOURCES~~:

The recreational assessment area is generally the area that includes the logging area plus 300 feet.

To assess recreational cumulative impacts:

1. Identify the recreational activities involving significant numbers of people in and within 300 ft. of logging area (e.g., fishing, hunting, hiking, picnicking, camping).

2. Identify any recreational Special Treatment Areas described in the Board rules on the plan area or contiguous to the area.

E. Visual ~~ISUAL~~ Resources~~ESOURCES~~:

The visual assessment area is generally the logging area that is readily visible to significant numbers of people who are no further than three miles from the timber operation. To assess visual cumulative effects: