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 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, describing 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?

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

	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, means that potential significant adverse cumulative impacts are left after application of the forest practice rules, restoration activities, and mitigations 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 forest practice rules.

c) No reasonably potential significant cumulative effects means that 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.

(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 rules of the Board.

(5) Provide a brief description of the assessment area used for each resource subject.

(6) 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 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 and 1034 that may occur as a result of proposed timber operations. This assessment shall include evaluation of both on-site and off-site interactions of proposed project activities with the impacts of past and reasonably foreseeable future projects.

In conducting an assessment, the RPF must distinguish between on-site impacts that are mitigated by application of the Forest Practice Rules and the interactions of proposed activities (which may not be significant when considered alone) with impacts of past 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 of the ~~THP~~Plan. RPFs are expected to submit sufficient information 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 area of expertise. Agencies should support their recommendations with documentation.

The Department, as lead agency, shall make the final determination regarding assessment sufficiency and the presence or absence of 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 and briefly describe the geographic assessment area within or surrounding the plan for each resource subject to be assessed and shall briefly explain the rationale for establishing the resource area. This shall be a narrative description and shall be shown on a map where a map adds clarity to the assessment.

Identification of Information Sources

The RPF shall 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 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. Sources not listed below may have to be consulted based on individual circumstances. Not all sources of information need to be consulted for every ~~THP~~Plan.

1. Consultation with Experts and Organizations:

(a) County Planning Department; **(b)** Biologists;

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

(e) Hydrologists; **(f)** Federal Agencies;

(g) State Agencies; **(h)** Public and private utilities.

2. Records Examined:

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

(c) Aerial Photographs; **(d)** Natural Diversity Data Base;

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

(g) Topographic Maps

(h) Basin Plans; **(i)** Fire History Maps;

(j) Relevant Federal Agency Documents or Plans

(k) Relevant Watershed or Wildlife Studies (published or unpublished)

(l) Available Modeling Approaches

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

Past and Future Activities

Past and future projects included in the cumulative impacts assessment shall be described as follows:

A. Identify and briefly describe the location of past and reasonably foreseeable probable future projects as defined in 14 CCR § 895.1 within 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. Boundary of the planning watershed(s) within which the plan area is located along with the CALWATER 2.2 identification number.

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 section (2) above. For purposes of this section, past projects shall 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 depicted in section (3) above. Each specific silvicultural method must be clearly delineated on the map(s), and 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.

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

6. Source(s) of geographical information.

The map scale shall be large enough to clearly represent one planning watershed per page or of a scale not less than 1:63,360. 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 page(s).

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,	Special Treatment Area Prescriptions, Rehabilitation of Understocked Area Prescription, Fuelbreak/Defensible Space, Southern Subdistrict Special Harvesting Method (14 CCR § 913.8),

953.4]	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 location and description 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, 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. A poll of adjacent land owners is encouraged and may be required by the Director to determine such activities and 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~~<u>wet meadows or other wet areas</u>, where individual impacts are combined to produce an effect that is greater than any of the individual impacts acting alone. <u>CWEs can be adverse or beneficial depending upon the activity (i.e., resource extraction versus restoration).</u> Factors to consider in the evaluation of cumulative watershed 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 and turbidity
- Water temperature
- Organic debris
- Chemical contamination
- Peak flow

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

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

- Immediately downstream from 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 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 sediment and turbidity inputs may include:

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

- Direct mortality of fish and other aquatic species.

- Reduced growth 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 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.

-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 which are tractor logged on steep slopes.

- Unstable areas.

b. Water Temperature Effect. Water temperature related CWEs are changes in water chemistry or biological properties caused by the combination of solar warmed water from two or more locations (in contrast to an individual effect that results from impacts along a single stream segment) where natural cover has been removed. Cumulative changes in water temperature are most likely to occur in the following situations:

- Where stream bottom materials are dark in color.

- Where water is shallow and has little underflow.

- Where removal of streamside canopy results in substantial, additional solar exposure or increased contact with warm air at two or more locations along a 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 water temperature is near a biological threshold for specific species.

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

Significant adverse impacts of cumulative temperature increases include:

- Increases in the metabolic rate of aquatic species.
- Direct increases in metabolic rate and/or reduction of dissolved oxygen levels, either of which can cause reduced vigor and death of sensitive fish and other sensitive aquatic organisms.
- Increased growth rates of microorganisms that deplete dissolved oxygen levels or increased disease potential for organisms.
- Stream biology shifts toward warmer water ecosystems.

c. Organic Debris Effects. CWEs produced by organic debris can occur when logs, limbs, and other organic material are introduced into a stream or lake at two or more locations. Decomposition 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 is an important stabilizing agent that should be maintained in small to medium size, steep gradient channels. It also produces pool habitat and cover in larger fish-bearing watercourses and should be maintained or enhanced where increased habitat complexity will benefit listed fish species.~~,~~ ~~but~~ T~~t~~he 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 may cause debris torrents during periods of high flow.

Removing streamside vegetation can reduce the natural, annual inputs of 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 materials, direct application or run-off from pesticide treatments, contamination by equipment fuels and oils, and the introduction of nutrients released during slash burning or wildfire from two or more locations.

e. Peak Flow Effects. CWEs can be caused by management induced peak flow increases in streams during storm events ~~are difficult to anticipate~~. Peak flow increases may result from management activities that reduce rainfall interception loss and vegetative water use (i.e., transpiration), ~~or~~ produce openings where snow can accumulate (such as ~~clear-cutting~~ clearcut and ~~site preparation~~ intense wildfire areas), or that change the timing of flows by producing more efficient runoff routing (such as insloped roads). While t~~T~~hese increases~~, however,~~ are likely to be small relative to natural peak flows from medium and large storms, they can produce increased streambank erosion, channel incision, and headward 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 of percentage of watershed harvested and lengthening recurrence intervals of flow. Peak flow effects are more pronounced and easier to detect in small watersheds, areas where rain-on-snow events 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 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, etc.

3. Watercourse Condition. The watershed impacts of past upstream and on-site projects are often reflected in the condition of stream channels on the project area. Following is a list of channel characteristics and factors that may be used to describe current watershed conditions and to assist in the evaluation of potential project impacts:

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

◊ 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.

◊ Aggrading - Stream channels filled or filling with sediment that raises the channel bottom elevation. 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 the stream may be meandering or cutting into its banks above the level of the former streambed. Depositional areas in aggrading channels are often increasing in size and number.

◊ Bank Cutting - Can either be minor or severe and 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, or aggrading, which can cause the channel to migrate against slopes that were previously above the high flow level of the stream.

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

◊ Downcutting - Incised stream channels with relatively 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.

◊ 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.

◊ 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 in small ~~to medium sized~~ headwater streams with relatively steep gradients. ~~-~~ Large wood accumulations are highly desirable for producing improved aquatic habitat conditions in larger fish-bearing watercourses, particularly in coastal watersheds without bedrock/boulder channel conditions. Large accumulations of organic debris can block fish passage, block or divert streamflow, or could be released as a debris flow~~.~~

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

◊ 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.

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 potential. These impacts most often occur on-site within the project boundary, and the 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.

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

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, 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. 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. 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 structure.
- Soil organic matter content.
- Presence and amount of coarse fragments in the soil.
- Soil texture.
- Soil moisture status.

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.

C. Biological Resources

Biological assessment areas will vary with the species 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) 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 on the habitat of the species.

2. Any significant, known wildlife 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, species requiring special elements, sensitive species, and significant natural areas). Significant cumulative effects may be expected where there is a substantial reduction in required habitat or the project will result in substantial interference 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 immediate surrounding area. Habitat conditions of major concern are: Pools and riffles, Large woody material in the stream, Near-water vegetation. 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 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. 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, nutrients, vertical diversity, migration corridors, nesting, roosting, and escape. Recruitment of large woody material is also an important element in maintaining habitat quality.

4. The biological habitat condition of the THP Plan and immediate surrounding area. Significant factors to consider are:

◊ Snags/den trees ◊ Hardwood cover

◊ Downed, large woody debris ◊ Late seral (mature) forest characteristics.Successional Forest Stands

◊ Multistory canopy ◊ Late seral Successional habitat continuity

◊ Road density

The following general guidelines may be used when evaluating biological habitat. The factors described are general and may not be appropriate for all situations. The ~~THP~~ Plan preparer must also be alert to the need to consider factors which are not listed below. Each set of ground conditions are unique and the analysis 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 timberlands. Snags of greatest value are >16" DBH and 20 ft. in height. The degree of snag recruitment over time should be considered. Den trees are partially live trees with elements of decay which provide wildlife habitat. Nest trees have importance to birds classified as a sensitive species.

b. Downed large, woody debris: Large downed logs (particularly conifers) in the upland and near-water environment in all stages of decomposition provide an important habitat for many wildlife species. Large woody debris of greatest value consists of downed logs >16" diameter at the large end and >20 feet in length.

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 amount of upland multistoried canopy may be evaluated by estimating the percent of the stand composed of two or more tree layers on an average per acre basis.

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 vegetative canopy strata, with more emphasis placed on shrub species along Class III and IV streams (14 CCR 916.5, 936.5, or 956.5).

d. Road Density: Frequently traveled permanent and secondary roads have a significant influence on wildlife use of otherwise suitable habitat. Large declines in deer and bear use of areas adjacent to open roads are frequently noted. Road density influence on large mammal habitat may be evaluated by estimating the miles of open permanent and temporary roads, on a per-section basis, that receive some level of maintenance and 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).

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 a large proportion of the state's bird and mammal 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 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 s~~Seral (Mature)~~uccessional f~~F~~orest ~~Characteristics~~stands:

Determination of the presence or absence of mature and over-mature forest stands and their structural characteristics provides a basis from which to begin an assessment of the influence of management on associated wildlife. These characteristics include large trees 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 s~~eral stage~~uccessional forest ~~amount~~ forest stands may be evaluated by estimating the percentage of the land base within the project and the biological assessment area occupied by areas conforming to the ~~following~~ definition~~s~~ provided in 14 CCR 895.1:

~~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~~successional forest, ~~which generally conform to the definition of unharvested forests~~ but do not meet these ~~acreage~~ criteria.

g. Late ~~Seral~~ successional ~~Habitat~~ habitat ~~Continuity~~continuity:

Projects containing areas meeting the definition~~s~~ for late ~~seral~~ successional ~~stage~~

~~characteristics~~forest stands must be evaluated for late ~~seral~~ successional habitat continuity and functionality. The fragmentation and resultant isolation of late ~~seral~~ successional habitat types is one of the most significant factors influencing the sustainability of wildlife populations not adapted to edge environments.

This fragmentation may be evaluated by estimating the ~~amount of the on-site~~ number of acres within both the project area, ~~and~~ as well as the biological assessment area occupied by late ~~seral~~ successional forests stands greater than ~~80~~ 20 acres in size (considering the mitigating influence of adjacent and similar habitat, if applicable) and less than one mile apart or connected by a corridor of similar habitat.

h. Special Habitat Elements: The loss, protection or maintenance of ~~a~~ key habitat elements 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. Terrestrial mammals may rely upon the presence of large woody debris for denning or scavaging opportunities. Large hardwoods may provide desired mast or nesting opportunities. 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:

1. Identify any Special Treatment Areas designated as such by the Board because of their visual values.

2. Determine how far the proposed timber operation is from the nearest point that significant numbers of people can view the timber operation. At distances of greater than 3 miles from viewing points activities are not easily discernible and will be less significant.

3. Identify the manner in which the public identified in 1 and 2 above will view the proposed timber operation (from a vehicle on a public road, from a stationary public viewing point or from a pedestrian pathway).

F. Vehicular Traffice Impacts ~~EHICULAR TRAFFIC IMPACTS:~~

The traffic assessment area involves the first roads not part of the logging area on which logging traffic must travel. To assess traffic cumulative effects:

1. Identify whether any publicly owned roads will be used for the transport of wood products.

2. Identify any public roads that have not been used recently for the transport of wood products and will be used to transport wood products from the proposed timber harvest.

3. Identify any public roads that have existing traffic or maintenance problems.

4. Identify how the logging vehicles used in the timber operation will change the amount of traffic on public roads, especially during heavy traffic conditions.

G. Greeenhouse Gas ~~REENHOUSE GASES~~ (GHG) Impacts~~MPACTS:~~

Cumulative GHG e~~E~~ffects occur atmospherically where individual potential impacts are combined to produce an effect that is greater than any of the individual impacts acting alone. Factors to consider in the evaluation of cumulative GHG effects are listed below.

1. Identify greenhouse gas emissions either directly or indirectly that may have a significant effect on the environment.

2. Identify GHG emissions that conflict with an applicable plan, policy or regulation adopted of the purpose of reducing GHG emissions.

3. Quantify the potential impacts, or lack thereof, through synthesis of the following metrics:

A. Identification of planning horizon for GHG impacts assessment

B. Inventory, growth and harvest over planning horizon

C. Harvesting e~~E~~missions over planning horizon

D. Long-termed storage from milling and wood product manufacturing over planning horizon

~~**A.**~~**E.** Project sequestration over planning horizon

H. Wildfire Hazard and Risk

Modifications to fuel loading through timber harvest activities may affect wildfire hazard and risk. In turn, this can potentially affect cumulative watershed effects. Alteration of overstory and understory structure and composition, as well as fuel bed depths, are affected to varying degrees depending on silviculture, selected yarding methods, site preparation, or alternative treatments identified within a Plan. Metrics that may be utilized to address fire hazard or risk may include:

◊ Crown bulk density	◊ Overstory vegetative communities
◊ Crown base height/Height to live crown	◊Understory vegetative communities
◊ Flame lengths	◊ Rate of spread
◊ Use of adjacent landscapes	◊ Use of project area
◊ Fire weather	◊ Ignition and fire history
◊ Current fuel loading	◊ Physical setting (e.g., highways near the project area)

Amend 895.1 – Definitions

Project means an activity which has the potential to cause a physical change in the environment, directly or ultimately, and that is: 1) undertaken by a public agency, or 2) undertaken with public agency support, or 3) requires the applicant to obtain a lease, permit, license or entitlement from one or more public agencies. This includes ~~Timber Harvesting~~ Plans.

NOTE: This regulatory amendment could be considered by the Board to accompany the updating of Technical Rule Addendum # 2. The current revisions to Technical Rules Addendum # 2 include replacing “THP” with “Plan”, therefore potentially requiring a revision to the definition of “project” to clarify that all Plans would be considered projects throughout the existing FPRs, inclusive of Technical Rule Addendum #2.