Cumulative Effects Assessment
Scope of Review

November 4, 2014

This paper is a combination of previous papers presented to the Board. The first five sections provide an overview. Section VI covers the general recommendations previously made. Section VII is the detailed recommendations made by the CWE task force in 2005. Section VIII is the current work (TRA 2, corresponding to general recommendation 1 in Section VI). Section IX is the EMC work, corresponding to general recommendation 5.

I. Definition

"Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Important direction to the practical use of this definition is found in Section 15130 of the CEQA Guidelines:

(a)(1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts.

(b)... The discussion of cumulative impacts shall... focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

Projects can cause significant impacts by direct physical changes to the environment or by triggering reasonably foreseeable indirect physical changes. Physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. You must

determine whether the cumulative impact is significant, as well as whether an individual effect is "cumulatively considerable."

If it is determined that the project will result in a significant indirect or cumulative impact, the CEQA analysis must also identify feasible mitigation measures for each significant environmental effect identified in the EIR. The CEQA Guidelines state that, **"With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis" (Guidelines Section 15130(c))**. However, CEQA also specifies that, "If the lead agency determines that a mitigation measure cannot be legally imposed, the measure need not be proposed or analyzed. Instead, the EIR may simply reference that fact and briefly explain the reasons underlying the lead agency's determination" (Guidelines Section 15 126.4(a)(5)).

CEQA requires that significant impacts be specifically identified and disclosed. As stated in the Guidelines, "Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects" (Guidelines Section 15126.2(a)).

The CEQA Guidelines require a discussion of cumulative impacts of a project when a project's incremental effect is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current and probable future projects. As stated in Section 15130(b):

II. Procedural Issues related to CEQA-

Court cases have refined and validated the Board's process. Recently, courts have found in favor of the Department despite numerous challenges. Essentially, The Board and the department are CEQA compliant. Changes to the process must be considered carefully, in order to avoid invalidating the process.

III. Perceived Problems

Over the course of the past years numerous critiques have been offered relating to the analysis. There are those who feel the analysis does not include enough information, or the analysis is flawed (SRP, Dunne report, Harris and Gerstein, Munn Report, CWE task force). Although there have been many suggestions, no one has been able to present a **real world example** of an analysis that solves the issues, only theoretical ones. The Board has pursued (as part of its Strategic Plan) an Adaptive Management approach utilizing effectiveness monitoring, which was mentioned as a possible solution in most reviews of the process. Additionally, most of the emphasis has been on watershed, rather than terrestrial effects. Generally, there are three main categories of concern: information, analysis methodology, and monitoring.

IV. Technical Issues-

1. Natural systems are complex, natural variability of physical processes is extreme, and our knowledge of these processes is imperfect.

2. On-site control offers the closest linkage to cause and effect, direct mitigation of problem sites, and more direct estimation of associated risks.

3. Approaches for estimating cumies in California have generally fallen into four categories: indices of land-use intensity, qualitative checklists, narrative discussions, and a research-based approach.

A. The primary index of land use intensity is the US Forest Service Equivalent Roaded Area (ERA) method. This approach provides a measure of ground disturbance, but does not directly relate to degraded channel conditions (mention other proxies).

B. Qualitative approach is the approach used in the FPRs, and is highly flexible. This approach relies on the user's expertise and experience, so results may not be reproducible. However, it meets both BOF and CEQA procedural requirements.

C. Narrative descriptions of topics specified in the BOF's Technical Rule Addendum No. 2. This includes disclosing where continuing significant impacts exist in a basin and, if necessary, a discussion of offsetting mitigations that will be used to reduce overall impacts to insignificant levels.

D. Scientific Approaches. A good example is watershed analysis. This approach utilizes a screening procedure to determine key issues and concerns, as well as the intensity of analysis needed for the basin under review. Monitoring to track the effectiveness of the prescriptions is an important component of this process. CEQA mandated CWE questions, however, are not directly addressed with this approach alone. It does not necessarily provide for evaluating the potential of future activities to contribute CWEs

The best synthesis of the scientific literature regarding cumulative Effects is Beschta et al. (1995). Among their findings are the following points:

1. Channel changes following periods of sedimentation or removal of riparian forests along unconstrained watercourse systems are likely to last decades to centuries.

2. Early CWE methodologies attempted to develop a threshold level, beyond which catastrophic changes would occur. Natural systems, however, rarely recognize discrete thresholds and can respond incrementally and interactively to change.

3. Limiting harvest to a certain percent of the basin per year to keep annual sediment levels below a set level is a simplistic approach that does not account for regional or watershed variability, harvest location, yarding system, roading, etc. and assumes a direct causal mechanism between harvest and the magnitude of impact. In most cases, it is not the fact that trees were harvested, but how they were harvested, where on the landscape, methods of roading and yarding, degree of riparian protection, and other factors that determine the impact of a forestry operation.

4. If the accumulation of individual impacts from various forest practices provides the mechanism for causing a particular cumulative effect, then the prevention of potentially adverse impacts at the project level is of fundamental importance to preventing CWEs.

5. CWEs are ownership blind, in that they occur across a wide variety of ownerships and land uses. Basins seldom experience only one type of land use. Urbanization, grazing, agriculture, and other land uses can be important contributors to CWEs. Therefore, other land uses must be incorporated into solutions for cumulative effects.

V. Legacy Issues

Timber harvesting practices that have contributed to large scale erosion and sediment production include:

- Skidding down draws and otherwise disrupting intermittent stream channels.
- Constructing Tractor roads without waterbars.
- Abandoning road and skid trail crossings without adequate (or, in some cases, any) drainage.
- Diversion of streams at road and skid trail crossings onto road surfaces and hillslopes.
- Placement of roads and skid trails on unstable terrain.
- Inadequate compaction and other poor road and landing construction practices that created unstable cuts and fills.
- Inadequate drainage design for runoff from road and landing surfaces.
- Placement of roads adjacent to watercourses and sometimes within the high flow channel.

These practices, and many other potentially damaging timber operations, are now prohibited by the FPRs.

The issue of these pre 1974 practices is that they persist in varying degrees within the system, and therefore create a difficult starting point.

VI. General Recommendations:

1. Review existing Guidance document, and identify areas of possible improvement.

2. Research new computer modeling to improve analysis and address risk and uncertainty (e.g. NetMap)

3. Improve collection of information from on-going analysis to create watershed databases for agencies and public use.

4. Identify thresholds. Thresholds are commonly used to determine if an analysis is needed. "Light touch" forestry may not require in depth analysis.

5. Focus on effectiveness monitoring activities to provide adaptive management approaches.

6. Conduct a survey for examples of cumulative effect analysis to provide a comparative basis for further work.

VII. Detailed Problems and Solutions as identified by the CWE Task Force (2005)

PROBLEM

1a. Risk needs to be considered and incorporated in CWE assessment* (Gerstein and Harris, 2003 and Dunne et al., 2001), including both scoping and analysis phases.

1b. Hazard describes a potential source of impact and should also be addressed in CWE assessment.

SOLUTION

- Incorporate and apply concepts of risk and hazard into the CWE process
- Non-regulatory: develop multi-agency guidelines for assessing and applying hazard and risk
- Regulatory: a new BOF rule may be needed to provide direction to RPFs.

PROBLEM

1c. Uncertainty in decision making should be acknowledged and addressed to the extent feasible in CWE assessment. Uncertainty comes from four different sources: 1) the knowledge of the hazard (i.e., natural variability of the hazard); 2) the method used to assign risk; 3) the effects of the management activity on risk; and 4) the knowledge of the potential response of the receptor to occurrence.

SOLUTION

- Apply increasingly conservative assumptions and/or more rigorous analytical approach as uncertainty and/or risk to BUs increases (implicit margin of safety).
  Impediment - At some point, more analysis will not reduce the uncertainty.
- Apply an explicit margin of safety.
  Impediment - Would require additional guidance and possibly rule changes.
- Apply monitoring (e.g. effectiveness and/or forensic monitoring) to identify sources of impairment and thus reduce uncertainty.
  Impediment - Monitoring is not mitigation. Unclear if this approach is legal. Monitoring is post hoc.
- Address uncertainty through adaptive management.
  Impediments - Adaptive management approach is unacceptable for individual Plans. However, adaptive management is appropriate for planning scale documents.

PROBLEM

2a. RPFs, other consultants, and agency staff conducting and reviewing CWE assessments need tools, data, and enhanced expertise.

2b. There is a lack of technical guidance on how to do CWE assessment (LSA, 1990 and Dunne et al., 2001).

SOLUTION

- Address uncertainty through adaptive management.
- Develop multiple examples or templates for CWE assessment under various risk and hazard conditions.
  Impediments - Staff, budget, and priorities.
- Further training among agencies and RPFs.
  Impediment - Funding.
- Create a website that acts as a clearinghouse for information on conducting CWE assessments.
  Impediment - Funding.

PROBLEM

3a. Watershed-wide datasets needed for conducting quality CWE assessments typically do not exist. For mixed ownership watersheds, information needed for CWE assessments on other ownerships may not be accessible.

SOLUTION

- Establish multi-agency, interdisciplinary state efforts to systematically collect and organize watershed information. Revisit and update watershed information as necessary.
  Impediment – Funding.
- Develop and maintain CWE watershed files containing:
  - relevant CWE analyses
  - known germane references used in such analyses/assessments.
    Impediment – Funding.

PROBLEM

3b. Watershed information collected by landowners is not always available for review by agencies under claims that it is proprietary. Reasons for not releasing information include:

i. Information is truly proprietary and landowners don't want it in the public domain.
ii. Landowners want reimbursement for data that they have collected.
iii. Landowners fear that releasing information may make them vulnerable to lawsuits or regulatory actions.
iv. There may be licensing issues if the information was collected by non-licensed professionals.

SOLUTION

- Agencies should work with landowners to resolve issues of proprietary concerns. May need to set up a new process to ensure confidential information can be reviewed by all agencies but remain confidential.

PROBLEM

4a. Plan-by-Plan evaluations of cumulative watershed effects do not adequately identify and address cumulative effects at the watershed scale.

SOLUTION

- Conduct CWE assessment at the planning scale as well as on an individual Plan basis
- Provide CWE assessment at the planning scale through:
    1. Pilot projects to develop technology (e.g. Dunne Committee recommendations)
    2. NCWAP approach
    3. TMDLs

  Impediment – 1 & 2. Funding and agreement on approach. 4. TMDLs are developed for specific pollutants in impaired waterbodies. TMDLs do not address all potential CWEs.
- Require long-term, landscape level planning documents (e.g., SYPs) and tier Plans to them.
  Impediments - Planning document requirements need to be more explicit to address CWE.

PROBLEM

4b. The same analysis is repeated for multiple Plans in the same watershed (LHC, 1994). This redundancy makes the process inefficient.

SOLUTION

- Create a process where THPs can be tiered to an approved CWE analysis for a specific watershed. See other solutions in 4a.
  Impediment - New rules and regulations, including rules for updating and reviewing assessment. Disagreement among agencies on content of CWE assessments. See 4a.

PROBLEM

4c. Different agency mandates impose varying standards for establishing CWE significance. For example, the CDF CEQA-based standard for CWE "significance" is less restrictive than the RWQCB standards of review that are based on the federal Clean Water Act (e.g., restore impaired beneficial uses) and/or on Porter-Cologne (e.g., comply with Basin Plan standards).

SOLUTION

- Recognize and clarify different agency standards.
- Recognize divergent agency processes to address issues (e.g. TMDLs, WDRs).

PROBLEM

4d. Multi-ownership watersheds suffer from limited information available and lack of access across ownerships. Furthermore, state agencies play only a limited role as repositories for information on CWEs.

SOLUTION

- Have the state take the lead for CWE assessments. See 4a.
  Impediment - See 4a.

PROBLEM

4e. Rate of watershed disturbance and recovery, including harvest, roads, restoration activities and other land disturbances, is not adequately addressed. However, there is disagreement about the use of proxy measures (e.g. rate of harvest) for disturbance and how to set thresholds or benchmarks for disturbance.

SOLUTION

- Address rate of disturbance in CWE process.
- At a minimum, require discussion of disturbance information.
  Impediment- only a proxy, not reflective of actual conditions

PROBLEM

4f. The CWE process does not have clear scoping, analysis, and implementation and management phases (McDonald, 2000) that identify and analyze key cumulative watershed effects issues.

SOLUTION

- Clarify and emphasize the steps in the CWE process.
- Create new guidance documents. See "Suggested Project Scale Cumulative Watershed Effect Assessment Approach."
  Impediment – Funding.

PROBLEM

5a. Pertinent information is often lacking in CWE assessments.

SOLUTIONS

- Provide better guidance for CWE scoping and analysis.
- Change Technical Rule Addendum #2.
  Impediment - Would require adoption by Board of Forestry and Fire Protection.
- Create a Notice of Preparation (NOP) supplied by RPF to responsible review agencies to facilitate the scoping process.
  Impediment - Would require rule (and possibly statute) changes. Funding
- Continue to develop guidance documents.

VIII. Problem Statement, General Recommendation 1

BACKGROUND

The Board of Forestry first considered adoption of 14 CCR 912.9, 932.9, 952.9 in 1990. This was in response to a number of lawsuits that had been filed against the Board through the 1980s challenging the Timber Harvesting Plan (THP) process as functionally equivalent to the California Environmental Quality Act (CEQA). The courts generally upheld the THP process as functionally equivalent, but found that the evaluations of individual THP's, in some cases, had failed to meet the broad policy standards of CEQA. The first attempt to adopt these regulations in 1990 was rejected by the Office of Administrative Law (OAL). After addressing OAL's concerns and the addition of Technical Rule Addendum #2, these regulations were adopted in 1991 and remain in effect today.

PUBLIC/RESOURCE PROBLEM TO BE ADDRESSED

The regulation of timber harvesting operations by the California Department of Forestry and Fire Protection (Cal Fire) and the State Board of Forestry and Fire Protection (BOF) are certified by the Secretary for Resources as a certified program meeting the requirements of the CEQA process under Public Resources Code (PRC) section 21080.5. Timber harvesting plans are considered "functionally equivalent" to an environmental impact report (EIR) otherwise required under CEQA for projects that could potentially have significant effects on the environment. CEQA requires project proponents to disclose potential significant impacts and proposed mitigations to reviewing agencies and the public, and to provide mitigation measures to prevent significant, avoidable environmental damage.

The primary means for disclosing potential significant impacts in timber harvesting plans is through addressing 14 CCR 912.9, 932.9, 952.9. Guidance is given in Technical Rule Addendum No. 2 to assist the Registered Professional Forester (RPF) in fully addressing the potential cumulative impacts that may occur as a result of timber harvesting. Additionally, Cal Fire provided a document titled "Timber Harvesting Plan Form Instructions and Information" in January of 2000, and a memo from Bill Snyder on August 2, 2004 that help clarify the expectations of the RPF to address cumulative impacts.

In reviewing timber harvesting plans for potential significant impacts, Cal Fire requires enough detailed information from RPFs to make a determination on both the incremental effect of the proposed operations, and the cumulative effect of the proposed operations when taken in consideration with closely related past, current, and reasonably foreseeable probable future projects (CEQA Guidelines Section 15355). The evaluation of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency. Since an effect's significance varies with the projects timing, scope, and setting, a clear line does not always exist between significant and less than significant effects (CEQA Statutes Section 15064). The effects of any proposed harvesting

are influenced by site specific conditions such as the public trust values present (watershed, wildlife, recreation, etc), the geographic setting (geology, topography, etc), the silvicultural requirements of the managed tree species, and the location of physical improvements (roads, landings, skid trails, etc). This requires a determination be made by the lead agency based on the totality of the evidence presented by the project proponent, public comment, and agency local expertise.

There have been a number of changes to the CEQA Guidelines dealing with cumulative impacts (Section 15130) since the Board adopted 14 CCR 912.9, 932.9, and 952.9 and Technical Rule Addendum No. 2 in 1991. Most significantly is the inclusion of an analysis of a projects contribution to greenhouse gas (GHG) emissions in 2009 pursuant to passage of SB 97.

Technical Rule Addendum No. 2 currently does not offer any guidance on addressing GHG emissions. The department does provide a THP GHG emissions calculator and user guide on its' resource management memorandum webpage for use by plan submitters.

OPTIONS TO ADDRESS PROBLEM

- **Take No Action**
  Under this option the Board would retain 14 CCR 912.9, 932.9, and 952.9, and Technical Rule Addendum No. 2 in their current form. CEQA does not prescribe a specific method for assessing the GHG emissions from proposed projects. The lead agency has discretion to either use a model or methodology to quantify these emissions or rely on a qualitative analysis or performance based standards.
  Under current rules RPFs use a number of different analytical tools to address GHG emissions. These are addressed in the cumulative impact assessment by utilizing the "other" category of 14 CCR 912.9, 932.9, and 952.9(3).

- **Review and Consideration of Forest Practice Rule Amendments**
  Under this option the Board would review the changes to CEQA interpretations regarding cumulative impacts that have occurred since implementation of 14 CCR 912.9, 932.9, and 952.9, and Technical Rule Addendum No. 2. The Board could propose amendments to this and other rule sections within the limits of its' statutory authority where inconsistencies are identified.

  Evaluation of GHG emissions could be added to the 14 CCR 912.9, 932.9, and 952.9(3) checklist and guidance for addressing these could be added to Technical Rule Addendum No. 2. This could bring greater clarity to RPFs addressing GHG emissions in proposed timber operations, and greater uniformity to Cal Fire's evaluation of these assessments.

- **Publish a Memorandum Addressing Cumulative Impacts in THPs**
  Under this option the Board would produce a guidance document that RPF's could utilize when addressing cumulative impacts. Any changes in interpretation of the underlying CEQA statute that have occurred since passage of 14 CCR 912.9, 932.9 and 952.9 can be incorporated. The Board can also provide guidance on addressing GHG emissions relative to timber harvesting activities.

NEXT STEPS

Further Assessment of Problem Scope:

- Continue gathering information on the changes that have occurred to the cumulative impacts assessment under CEQA since adoption of 14 CCR 912.9, 932.9, and 952.9, including relevant court rulings.
- Query Cal Fire forest practice staff on any deficiencies in Cal Fire's ability to evaluate THPs due to lack of RPF guidance in addressing GHG emissions or other aspects of cumulative impacts assessments.
- Conduct public outreach to see if the public is receiving adequate information to evaluate the plan's potential cumulative impacts, including those from GHG emissions.

IX. General Recommendation 5, Adaptive Management Framework

The framework for the Adaptive Management Program rests in the following four goals:

1. To provide compliance with the Endangered Species Act for species on non-federal forest lands;
2. To restore and maintain on non-federal forest lands species dependent on them;
3. To meet the requirements of the Clean Water Act and Porter-Cologne for water quality on non-federal forest lands; and
4. To keep the timber industry economically viable in the State of California.

Each goal must be considered when considering how to act on results of EMC studies.

The Board recognizes there is still scientific uncertainty concerning how forested ecosystems function within the framework of managed forests and how various ecosystem components relate to one another. Scientists and policy-makers agree that because ecosystems are complicated, we can increase our scientific knowledge over time, but we may never fully understand the complex relationships that occur within ecosystems. Though stakeholders recognize uncertainty, it is important that overall performance goals are met by the forest practices rules and that adaptive management research helps to inform policy makers as to whether these goals are being met or not.

The Adaptive Management Program is designed to develop additional scientific knowledge and to better inform policy makers about the relationship of managed forests and ecosystem and riparian functions and specifically how well the rules are meeting performance goals.

Since Adaptive Management will provide science-based and technical information for policy- makers, it is critical for Board members to understand the implications of research being conducted within the Adaptive Management Program and overall policy framework and goals. One important aspect of this is to understand the purpose of the study and the types of results that may emerge. They must also understand that study results can be significant or insignificant and/or may be stand-alone or linked to completion of other studies.

First, there is a series of questions leading to a recommendation to the Board. These questions should be answered for all EMC studies and for any other study that any organization sets forth as the basis for a recommendation. These questions are broken into two groups. There are six questions that should be answered about each study as it is initiated (preferably) or when it is presented for use in decision making (if the questions were not answered when the study was initiated). These are scientific questions that should be answered by EMC. Then, there are four questions that should be answered after EMC has delivered the study report and the answers to the first six questions to Committee.

Questions leading to a Policy adaptive management recommendation to the Board
"Committee" refers to the appropriate Board committee

EMC	relevance	1. Does the study inform a rule, numeric target, performance target, or resource objective?
		2. Does the study inform the forest practices rules or technical rule addendums?
	quality	3. Was the study carried out pursuant to EMC scientific protocols (i.e., study design, peer review)?
		4. What does the study tell us? What does the study not tell us?
	completeness	5. What is the relationship between this study and any others that may be planned, underway, or recently completed? Factors to consider in answering this question include, but are not limited to: a. Feasibility of obtaining more information to better inform Policy about resource effects. b. Are other relevant studies planned, underway, or recently completed? c. What are the costs associated with additional studies? d. What will additional studies help us learn? e. When will these additional studies be completed (i.e., when will we learn the information? f. Will additional information from these other studies reduce uncertainty?
		6. What is the scientific basis that underlies the rule, numeric target, performance target, or resource objective that the study informs? How much of an incremental gain in understanding do the study results represent?
Committee	options	7. Should any action be taken at this time, in response to the information that EMC has provided?
		8. What are the alternative courses of action, each of which would be an appropriate management response to the information that EMC has provided?
		9. How feasible is each alternative from operational and regulatory perspectives?
	decision	10. Will Committee make an adaptive management recommendation to the board? If so, which alternative will Committee recommend?