



California Regional Water Quality Control Board
North Coast Region
Bob Anderson, Chairman



Linda S. Adams
*Secretary for Environmental
Protection*

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**Arnold
Schwarzenegger**
Governor

September 3, 2009

Mr. George D. Gentry
Executive Officer
Board of Forestry and Fire Protection
Post Office Box 944246
Sacramento, California 94244-2460

Subject: Comments on the proposed Anadromous Salmonid Protection Rules
(previously the Threatened or Impaired Watershed Rules) dated May 8, 2009,
as revised July 24, 2009, Title 14 of the California Code of Regulations

File: Timber, General

Dear Mr. Gentry:

Enclosed are comments on the latest draft of proposed Anadromous Salmonid Protection Rules, as revised July 24, 2009 (formerly referred to as Threatened or Impaired Watershed Rules), Title 14 of the California Code of Regulations. We previously submitted extensive comments on the draft version distributed May 8, 2009. At this time, we have not received BOF response to the earlier comments and therefore, these attached comments are in large part similar.

We are also providing a more extensive evaluation of the effect of the proposed ASP Rules relative to the Basin Plan Water Quality Objective for temperature. The report, titled *Evaluation of Anadromous Salmon Protection Rules Relative to the Water Quality Objective for Temperature*, is enclosed as an attachment to our comments on the proposed rules.

Overall, we have attempted to identify where we believe there are opportunities to improve the ASP Rules' consistency with state and regional water board requirements and policies. We urge the Board of Forestry to take an active role in recognizing and addressing the water board and US Environmental Protection Agency designations of streams and watersheds with consistent regulations that go beyond listed salmonid species to the other beneficial uses of water that may be impaired from timber harvesting activities.

Unfortunately, the review and revision of section 916.12 regarding Clean Water Act section 303(d) listed streams is not included in the proposed ASP Rule package. To our knowledge, section 916.12 has never been used. We urge the BOF to revisit section

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916.12 with an eye towards addressing stream listings by the water boards and US EPA and recognizing those other beneficial uses of water. Such an approach is consistent with what the BOF has already done in recognizing the federal and state listings of endangered species and developing rules specific to addressing needed protections for those listings. We are prepared to engage in a process with your staff to modify and develop rules to address water quality listed waterbodies as well.

If you or your staff have any questions regarding our comments, please contact me at 707-576-2693.

Sincerely,



f Robert Klamt, Chief
Timber and Nonpoint Source Division

- Enclosures: 1) Memo from Maggie Robinson and David Fowler, Staff review of the proposed Threatened or Impaired Watershed Rules, 2009
2) Memo from Bryan McFadin, Evaluation of Anadromous Salmon Protection Rules Relative to the Water Quality Objective for Temperature

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**Arnold
Schwarzenegger**
Governor

September 3, 2009

To: Robert Klamt
Chief, Timber Harvest and Non-point Source Division

From: Maggie Robinson, David Fowler
Representing review staff

Subject: Review and Comments on the Board of Forestry proposed revisions to the
Anadromous Salmonid Protection Rules (previously the Threatened or Impaired
Watershed Rules) dated May 8, 2009, as revised July 24, 2009

General Comments

The North Coast Regional Water Quality Control Board staff (Regional Water Board staff) have completed reviewing the proposed Anadromous Salmonid Protection Rules (ASP Rules, previously the Threatened or Impaired Watershed Rules). We recognize the proposed changes to the rules contain many commendable goals and objectives with the intent to address the beneficial functions of riparian buffers for anadromous salmonids and the impacts of timber operations. The following are general overall comments on the rule package followed by more specific comments keyed to the page in the proposed rules.

Regional Water Board staff recommend that the goals and objectives of the proposed ASP Rules also recognize the need to protect all beneficial uses of water and comply with water quality objectives in accordance with the Water Quality Control Plan for the North Coast Region, also known as the Basin Plan. Although the proposed ASP Rules leave intact the current wording with regard to watersheds listed under Section 303(d) of the federal Clean Water Act (303(d) listed), the proposed ASP Rules do not adequately address the potential for cumulative effects from timber operations in 303(d) listed watersheds, particularly those watersheds listed for sediment and/or temperature impairments. Pursuant to Clean Water Act 303(d), the goal for sediment-impaired waters is to recover water quality to the point the waters can be de-listed. Total Maximum Daily Loads (TMDLs) have been or are being developed for listed watersheds.

We recognize the level of effort expended by the Board of Forestry and Fire Protection (BOFFP) reviewing the scientific literature regarding the beneficial functions of riparian buffers for anadromous salmonids and the impacts from timber operations. However, due to limited salmonid population data and the heavy disturbance in watersheds prior to the collection of sediment yield and temperature data, a time period reflective of

reference conditions is not available in most areas. Therefore, it should be recognized that the sediment reduction and temperature goals of the TMDLs are only conservative starting points to stimulate positive changes and response in the channel. The Forest Practice Rules (FPRs) should lead to compliance with TMDLs. TMDL implementation should be clearly incorporated into the proposed ASP Rules.

Conflicts with Water Quality Objectives

The FPR framework defines protective measures that are more protective in streams with known fisheries than those where they are absent. The Water Quality Objectives defined in regional Water Quality Control Plans, however, apply to all waters of the state, regardless of whether species are known to be present. For instance, the Water Quality Objectives for Temperature states that natural receiving water temperatures shall not be altered, whereas the proposed rules is less protective for class II streams than for class I streams. Pg 43 of the Initial Statement of Reasons (IOSR) document states:

“Adequate shade retention and high numbers of large conifer trees for large wood recruitment are required for large Class II watercourses, since watershed products such as heated water, wood, and fine sediment can be transported into fish-bearing Class I watercourses from these reaches. Since these watercourses are not fish-bearing, however, it is appropriate to have the standards in this secondary zone for wood and shade retention somewhat lower than for Class I watercourses.”

This reasoning implies that streams where fish are not present only need water quality protections to protect fish in higher order reaches downstream. This approach is inconsistent with the Water Quality Objectives in regional Water Quality Control Plans and will create a situation in which CAL FIRE would approve plans that would be in violation of the Basin Plan Water Quality Objectives. We suggest that rules be developed that are consistent with applicable Water Quality Objectives in all stream reaches, particularly with respect to temperature. As the BOFFP has been responsive to the need to address both state and federal salmonid listings, likewise they should be responsive to state and federal Clean Water Act section 303(d) listings for other beneficial uses of water.

ASP geographic limitation

While the proposed ASP Rules include application to one planning watershed upstream of the limit of anadromy, they remain limited in geographic extent. The effects of upstream disturbance on salmonid habitat must be recognized and the ASP Rules should be modified to add protection for upstream watersheds in order to have a realistic chance of restoring salmonid populations. Water entering salmonid habitat needs to be cool, sediment inputs controlled and large wood inputs enhanced as an integral part of any projects near a stream zone.

Preferred Management Practices (PMPs)

We strongly support the inclusion of “Preferred Management Practices” within the Class I Watercourse and Lake Protection Zones (WLPZs) (Proposed Rule Sections 916.9(f)(2)(D), 916.9(f)(3)(E), and 916.9(f)(5)(D)). However, we are concerned that the proposed language requires they only “should be considered.” We recommend implementation of adequate PMP should be required rather than considered.

Winter Road Operations

As written, the proposed ASP Rules would allow the discharge of visibly turbid water to a watercourse, in violation of existing Basin Plan prohibitions and water quality standards. In other words, the thresholds defined as indications of when “saturated soil conditions” exist do not give adequate warning of when a Basin Plan violation may be imminent. Instead, they represent conditions where a violation has already occurred. Regional Water Board staff recommend that thresholds with clear indicators of when a violation may be imminent, instead of when it has already occurred, be developed and implemented.

Minimum vs Appropriate standards

The proposed rule section 916.2(b) contains a simple word change from “minimum” to “appropriate,” essentially shifting the meaning from the minimum protective measures necessary for protecting waters of the State, to now being the “appropriate” protective measures. We do not concur. The BOFFP and CalFire do not have the legal authority to determine the “appropriate” level of protection for water quality. The State and Regional Water Boards have been granted that mandate and authority by the Legislature. The protection measures prescribed by the Forest Practice Rules should continue to be considered the minimum necessary.

Site-specific or nonstandard measures

The proposed rule section 916.9(v) would allow for site-specific management, designed for the specific conditions of an individual watershed. While we agree, in concept, that a site-specific approach may provide a superior method for determining appropriate watershed protection measures than the standard rules, it is unclear the scope and rigor of analysis required in order to justify nonstandard practices. Furthermore, there will be an inherently greater level of resources required to review site-specific plans. We are concerned the Regional Water Board, as well as Cal Fire and others involved in THP reviews, do not have adequate staff resources that would be required. If this proposal is approved, we suggest that THPs that propose alternative plans, be removed from the standard THP review timeline, to allow appropriate review and oversight for site-specific plans in complex watersheds. We also recommend that clear direction be given on where and when such an approach may be used and the level of analysis required in order to make implementation clear, effective, and enforceable.

Optional Amendments to ASP Rule changes

The proposed rules contain numerous optional amendments along with the recommended rule changes. Generally, the proposed optional amendments that pertain to water quality protection recommend reduced protection to those in the proposed change. Regional Water Board staff recommend that the BOFFP do not adopt any of the proposed optional amendments except Optional Amendment 23.

Finally, it is important to note that several very important items are not addressed by the proposed ASP Rules. These include monitoring of adaptive management practices, cumulative effects assessment, and requirements for 303(d) listed water bodies. These omissions make it impossible to reduce the potential impacts to a level of insignificance.

We recognize that a great deal of effort was spent in reviewing the current scientific literature regarding the beneficial functions of riparian buffers for anadromous salmonids and the impacts of timber operations. However, neither the proposed ASP Rule text nor the accompanying supporting documents identify which references have been used to support the conclusions and ultimately the recommended changes to the ASP rules. The Initial Statement of Reasons (IOSR) document identifies many literature sources as the basis of the various proposed rules, however the ISOR lacks in discussing the justification for the proposed rules. The document lacks specifics that would describe how the proposed rule relates to the literature source, and how the proposed rule meets the stated goals. It is not enough to describe a rule and cite literature to support the rule, without describing what aspects of the cited literature support the rule. Additionally, many of the references cited are not peer-reviewed papers or articles but rather internal memoranda that are, in turn, relying on previous internal memos to arrive at a recommendation. Regional Water Board staff suggest that a clear distinction be made in the bibliographic references between internal memoranda, self published documents, and peer-reviewed papers.

Specific Comments

The following relate to specific sections of the proposed ASP Rules. Each comment is referenced to the corresponding Rule section (14 CCR) and page number.

Re: 895.1 Definitions Stable Operating Surface (page 10, lines 6 through 13)

The proposed ASP rules change the definition of stable operating surface from one that prevents the surface of logging roads or landings from generating waterborne sediment in amounts sufficient to cause turbidity increases in downstream Class I, II, III, or IV watercourses or in drainage facilities that discharge to Class I, II, III, or IV watercourses, to *“a road or landing surface that can support vehicular traffic and has a structurally sound road base appropriate for the type, intensity and timing of intended use.”*

Regional Water Board staff are concerned that this change can result in turbidity increases in Class I, II, III, and IV watercourses in violation of the Basin Plan. Staff recommend that the original definition be left in the rules and that the new definition simply be added to it.

Re: 895.1 Definitions, Stream Order (page 10, line 18 through page 11 line 11)

Except within very limited settings, stream order is not an appropriate tool for completely differentiating stream types or processes. It does not fully predict the ability to transport sediment or the presence or absence of habitat. A stream of a certain order in one specific location may have entirely different values and habitat from a stream of the same order in a different location. The use of stream order alone will likely result in inappropriate protection measures, and increased field scrutiny.

Re: 898 Feasibility Alternatives (page 15, line 22)

Regional Water Board staff support cumulative effects assessments with respect to impacts that may combine with listed stressors in 303(d) listed waterbodies. However, the use of the word “may” makes measures to help attain water quality standards in a listed waterbody optional. This is in conflict with the Basin Plan and the Porter Cologne Water Quality Control Act (California Water Code Section 13000 et seq.). Regional Water Board staff suggest changing lines 21 through 23 to, “The plan preparer shall provide feasible mitigation measures to reduce any such impacts from the plan to a level of insignificance, and shall provide measures, insofar as feasible, to help attain water quality standards in the listed portion of the waterbody.”

Re: 916 Intent of Watercourse and Lake Protection (page 17, lines 16 through 19)

The Regional Water Board staff supports the proposed additions, both to avoid threatened violations of legal requirements and the recognition of watersheds listed as water quality impaired under Section 303(d) of the Federal Clean Water Act. The proposed additions are consistent with the Porter Cologne Water Quality Control Act.

Re: 916 Intent of Watercourse and Lake Protection (page 17, lines 21)

We are concerned about the proposal to change the level of consideration given to the quality and beneficial uses of water relative to timber production from “equal” to “appropriate.” It is difficult to determine the meaning of “appropriate levels of consideration.” What is considered appropriate by one may not be considered appropriate by another. It is the responsibility of the regional water boards, who have the legal mandate and authority, to determine if adequate consideration has been given to the quality and beneficial uses of water. Regional Water Board staff suggest changing line 21 to “... while providing equal consideration protection for the quality and beneficial uses of water relative to that productivity.”

Re: 916 Intent of Watercourse and Lake Protection (page 18, line 10)

Language should be added to state that watercourse and lake protection measures should ensure that water quality objectives, as described in an applicable approved water quality control plan, are maintained where they are currently being met, and their attainment is not hindered or delayed in areas where they aren't currently being met.

Re: 916(a) Intent of Watercourse and Lake Protection (page 18, lines 12 through 16)

It appears subsection (a) was split into two sentences in an attempt to break up a run-on sentence. The split, however, removes the existing goal of restoring the beneficial uses of water where they are impaired. This implies that subsequent references to

maintaining, protecting, and restoring resources exclude the beneficial uses of water. As such, we strongly oppose this revision. We propose the new sentence on lines 3 through 5 read: “insofar as feasible, the beneficial uses of water, native aquatic and riparian-associated species, and the beneficial functions of riparian zones shall be restored where they are impaired.

Re: 916.2(a)(3), 916.2(b), 916.2(c) Protection of the Beneficial Uses of Water and Riparian Functions (page 20, lines 7, 8, 22, 24, and 25)

The added words “when the plan is in a planning watershed with listed anadromous salmonids” change the rules to exclude many watersheds currently protected. In addition, it may exclude watersheds that are listed as water quality impaired under Section 303(d) of the Federal Clean Water Act. It is important to acknowledge that water runs down hill, and what happens above the limit of anadromy affects the downstream receiving waterbodies. Increased stream temperatures and sediment generated in a planning watershed above the limit of anadromy *will* be delivered down stream and *does* have the potential to negatively impact listed anadromous species and other downstream beneficial uses.

Re: 916.2(b) Protection of the Beneficial Uses of Water and Riparian Functions (page 20, line 17)

The Regional Water Board staff strongly oppose the proposed ASP Rules word change from “minimum” to “appropriate.” This change implies that the protective measures prescribed in the FPRs are *in all cases* the measures that will serve to satisfy the water quality mandate to protect, maintain, and restore beneficial uses. The inclusion of allowances for site-specific exceptions in 916.9(v) demonstrates that this is not the case. The protection measures prescribed by the FPRs should be viewed as the foundation upon which to build, and considered the minimum protections required. In some specific cases, greater protections may be required, in others, when supported by a site-specific analysis, less protections may be allowed. Calling the protection measures prescribed in the FPRs the “appropriate” appears at odds with the very next section (916.2(c), “when the protective measures ... are not adequate”) and the BOFFPs desire to move away from a “one-size-fits-all” approach. Also, as stated above, the BOFFP and CalFire do not have the legal authority to determine the “appropriate” level of protection for water quality. The State and Regional Water Boards have been granted that mandate and authority by the Legislature.

Re: 916.5(e) Procedure for Determining Watercourse and Lake Protection Zone (WLPZ) Widths and Protective Measures (page 22, lines 3, 13, and 20 through 22)

The Regional Water Board staff oppose the proposed change from “watersheds with threatened or impaired values” to “watersheds with listed anadromous salmonids.” This may exclude watersheds that are listed as water quality impaired under Section 303(d) of the Federal Clean Water Act, many of which are upstream of, are hydrologically connected to, and have the potential to affect watersheds with listed anadromous salmonids.

Re: 916.9 Title (page 23, lines 2 and 3)

Regional Water Board staff strongly oppose deleting “Watersheds with Impaired Values” from the title of this section. Regional Water Board staff are very concerned that watersheds with impaired values have been deleted from this section. The proposed change is inconsistent with the wording of section 916, which explicitly states the intent to provide protection to watersheds listed under Section 303(d) of the federal Clean Water Act. The proposed ASP Rules do not adequately address the potential for cumulative effects from timber operations in 303(d) listed watersheds, particularly those watersheds listed for sediment and/or temperature impairments.

Re: 916.9 Geographic Scope (page 23, lines 18 through 25, and page 24, lines 1 through 5)

The effects of upstream disturbance on salmonid habitat must be recognized and the ASP Rules should include protection for upstream watersheds in order to have a realistic chance of restoring salmonid populations. Fine sediment has the potential to travel downstream regardless of the limit of anadromy. Regional Water Board staff are concerned that the proposed exclusions in this section define protective measures that are more protective in streams with known fisheries than those where they are absent. The Water Quality Objectives defined in regional Water Quality Control Plans, however, apply to all waters of the state, regardless of whether species are known to be present.

Re: 916.9(a)(1) Goals (page 24, line 18)

Regional Water Board staff support compliance with the Total Maximum Daily Loads (TMDLs), but since section 916 states that this section does not apply to watersheds that “do not meet the definition of ‘watersheds with listed anadromous salmonids,’” it may imply that watersheds that do not meet the definition of “watersheds with listed anadromous salmonids” do not need to comply with the terms of a TMDL. Pursuant to Clean Water Act 303(d), the goal for impaired waters is to recover water quality to the point the waters can be de-listed. The Forest Practice Rules should lead to compliance with TMDLs in all impaired watersheds, not just those with known anadromous salmonids.

Additionally, it is unclear whether this section is referring to the allocation goals of the TMDL itself, a TMDL action plan, or the TMDL implementation policy. Regional Water Board staff recommend that this section be amended to state: “Comply with the terms, recommendations, guidelines, or goals of a technical Total Maximum Daily Load (TMDL), a TMDL implementation plan, or TMDL implementation policy.”

Re: 916.9(a)(2) Goals (page 24, line 22)

In addition to being sediment impaired, many watercourses are impaired due to excessive temperature. Additionally, Regional Water Board staff are concerned about the use of the word “significant.” “Significant” is a very subjective term with no clear meaning. Regional Water Board staff recommend revising the section to state: “(2) Not result in any Prevent significant-sediment load or solar radiation increase to a watercourse or lake.”

Re: 916.9(a)(3, 4, 5) Goals (page 24, line 24, page 25, lines 1 through 4)

The Regional Water Board staff oppose the proposed change from “measurable” to “significant.” On the one hand, “significant” is a very subjective term with no clear meaning, but on the other connotes a statistical meaning that may be unreasonable. What is significant under one standard may not be significant under another. “Measurable” is a term with a clear and objective meaning that is both verifiable and enforceable. Either the existing language should be retained or the word “measurable” should be deleted without substituting “significant.” In other words, Regional Water Board staff recommend either retaining existing wording or making the following revisions:

~~“(3) Not result in Prevent any measurable decrease in instability of a watercourse channel or of a watercourse or lake bank.~~

~~“(4) Not result in Prevent any measurable blockage of any aquatic migratory routes for any life stage of anadromous salmonids or listed species.~~

~~“(5) Not result in Prevent any measurable adverse effects to streamflow reductions during critical low water periods except as part of an approved water drafting plan pursuant to 14 CCR § 916.9(r) [936.9(r), 956.9(r)], subsection (r).”~~

Re: 916.9(a)(7)(A) Goals (page 24, lines 14 through 16)

As proposed, this section does not meet the Water Quality Objectives for Temperature. Regional Water Board staff recommend the section be amended to state: “(A) provide shade to the watercourse or lake so that the natural receiving water temperature shall not be altered and to maintain daily and seasonal water temperatures within the preferred range for anadromous salmonids or listed species where they are present or could be restored; and”

Re: 916.9(a)(7)(B) Goals (page 24, lines 17 through 21)

This section should be removed. This section previously addressed the need for minimizing temperature fluctuations. It has been modified with the goal of providing a deciduous vegetation component for nutrient inputs. In our review of THPs over the past 20 years, we are not aware of situations where streams needed additional nutrient inputs from deciduous vegetation. For that matter, we have not been made aware of any situation where nutrients are a limiting factor for anadromous fish populations in our Region. Our experience is that fish are far more limited by increased temperature and reduced shade, which is best provided by conifers. This appears to be an attempt to allow the taking of conifers so deciduous trees can provide nutrients in a situation where nutrients have not been shown to be limiting anadromous fish populations.

Re: 916.9(b) Pre-plan adverse cumulative watershed effects (page 26, lines 4 and 5)

The proposed additional wording appears to remove the requirement to address existing adverse watershed effects. The proposed wording implies that existing adverse watershed conditions need be addressed *only* if the proposed timber operations would “add significantly” to existing effects. This proposed addition appears to be at odds with the stated goal of “the restoration, enhancement, and maintenance of the beneficial uses of water.” Regional Water Board staff suggest retaining the existing language:

~~“Where appropriate, t~~The plan shall ~~set forth~~ include measures to effectively reduce such effects.”

Re: 916.9(c)(4) Class II large watercourses (page 27, lines 11 through 24)

Regional Water Board staff are concerned that the stated objectives for Class II watercourses do not address temperature or that flow from a Class II watercourse can effect the temperature of receiving Class I waters. The Regional Water Board suggests adding temperature considerations to the list of objectives and protective measures to address elevated temperatures in Class II watercourses.

Re: 916.9(f)(2)(E) Class I watercourses with confined channels in watersheds in the coho salmon ESU, Additional Special Operating Zone (page 37, line 4)

In order to be consistent with the Water Quality Objectives for Temperature, Regional Water Quality staff recommend replacing the term “significant adverse impact on” with “to measurably alter.”

Re: 916.9(f)(3)(C)(3) Class I watercourses with flood prone areas or channel migration zones, Inner Zone A (page 42, lines 2 and 3)

Regional Water Board staff oppose the reduced canopy retention standards in watersheds with listed salmonids outside of the Coast and Southern Forest Districts.

Re: 916.9(g)(1)(A)(1) Class II large watercourses, Stream Order (page 63, line 21 through page 64, line 3)

While Regional Water Board staff are encouraged that the “Office-based approach to identify Class II-L watercourses” is to be conducted after a preliminary field investigation pursuant to section 916.5, we are nevertheless concerned that the definitive method for designating a Class II-L watercourse is based solely on stream order. As stated earlier, except within very limited settings, stream order is not appropriate for differentiating stream types or processes. It does not fully predict the ability to transport sediment or the presence or absence of habitat. The use of stream order alone will likely result in inappropriate protection measures.

Re: 916.9(g)(1)(B) Class II large watercourses, field-based approaches (page 64, lines 12 through 15)

Regional Water Board staff are concerned that field based approaches “may” be used for verification of the “office-based approach to identify Class II-L watercourses.” Regional Water Board staff are also concerned that the intent of this section appears to be to allow the downgrading of a Class II-L to a Class II-S, without the complimentary requirement to upgrade a Class II-S watercourse, determined through the “office-based approach,” to a Class II-L watercourse should the field conditions warrant.

Re: 916.9(g)(1)(D) Class II Large watercourses, distance from a Class I watercourse (page 65, line 23 through page 66, line 4)

This approach is inconsistent with the Water Quality Objectives contained in regional Water Quality Control Plans, since it may allow temperature alteration upstream of the 1,000 foot distance and may create a situation where plans could be approved that lead to exceedences of Water Quality Objectives. Class II-L protection measures should extend the entire length of the watercourse where Class II-L conditions exist. Regional Water Board staff suggest the following wording: “(D) All Class II-L watercourses designated above shall incorporate requirements stated in 14 CCR § 916.9 [936.9, 956.9], (g)(2) for the greater of either a distance of 1000 feet measured from the confluence with a Class I watercourse or the total length of Class II-L.”

Re: 916.9(k)(1) and (2) Year-round logging road, landing and tractor road use limitations (page 85, lines 18 through 24)

The threshold of visibly turbid water that may cause a turbidity increase in receiving waters is an inappropriate standard. The described conditions don't merely “threaten” to violate the applicable Basin Plan water quality standards, they are a violation of those standards. The threshold does not give adequate warning of when a Basin Plan violation may be imminent. Instead, they represent conditions where a violation has already occurred. The Regional Water Board recommends that the section be amended to prohibit sediment discharges that threaten to violate applicable legal requirements.

Re: 916.9(k)(3) and (4) Year-round logging road, landing and tractor road use limitations (page 86, line 1 through line 9)

The “quantities deleterious to the beneficial uses of water” requires interpretation and has in the past led to disagreements between the agencies and between the public and reviewing agencies. It causes conflict between the differing review and approval standards of the various agencies. The Regional Water Board suggests that the section be amended to prohibit sediment discharges that threaten to violate “Water Quality Requirements” as defined in Regional Board Orders R1-2004-0030 Section I.L and R1-2009-0038 Attachment A:

“Water Quality Requirements’ means a water quality objective (narrative or numeric), prohibition, TMDL implementation plan, policy, or other requirement contained in a water quality control plan adopted by the Regional Board and approved by the State Water Board, and all other applicable plans or policies adopted by the Regional Board or State Water Board, including, but not limited to, the State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality Waters in California.”

Re: 916.9(l)(2) Winter period operations (page 87, line 4)

The term “low antecedent soil wetness” is undefined and therefore it is not possible to determine when extended periods with low antecedent soil wetness may exist. Antecedent soil moisture may be defined in several of different ways, each with its own unique units, values, and appropriate applications. The term “low antecedent soil wetness” should either be defined or removed.

Re: 916.9(l)(3) and (4) Winter period operations (page 87, lines 8 through 13)

Similar to section 916.9(k)(1) and (2), the threshold of visibly turbid water that may cause a turbidity increase in receiving waters is an inappropriate standard. The described conditions don't merely "threaten" to violate the applicable Basin Plan water quality standards, they are a violation of those standards. The threshold does not give adequate warning of when a Basin Plan violation may be imminent. Instead, they represent conditions where a violation has already occurred. The Regional Water Board recommends that the section be amended to prohibit sediment discharges that threaten to violate applicable legal requirements.

Re: 916.9(n)(4) Treatments to stabilize soils (page 88, line 24 through page 89, line 2)

This section exists in the current FPRs, but has been deleted from the proposed ASP Rules. It removes the requirement to ensure that once important function of a buffer is to protect beneficial uses of water from upslope timber harvest operations. The Regional Water Board strongly recommends restoring this section in the proposed ASP Rules.

Re: 916.9(v)(8) Agency concurrence with site-specific measures (page 106, line 23 through page 107, line 3)

Regional Water Board staff are concerned that limiting the consideration for rejecting site-specific measures to comments from the Department of Fish and Game or "two or more agencies ... [that have] participated in the review of the plan, including an on-the-ground inspection" may add a significant burden to the review process. Additionally, this section, as written, appears to unequally burden reviewing agencies, giving preferential consideration to the Department of Fish and Game. Due to the increased burden on resources to adequately review and inspect THPs that propose site-specific measures under 916.9(v), Regional Water Board staff suggest that such THPs be removed from the standard THP review timeline, to allow appropriate review and oversight for site-specific plans in complex watersheds.

Optional Amendments

Re: Optional Amendment 100: Reduces Class I Inner Zone retention

Regional Water Board staff oppose Optional Amendment 100. In order to maintain adequate shade and prevent the risk of elevated temperatures, a minimum of 80% post harvest canopy should be maintained in the Class I Inner Zones.

Re: Optional Amendment 9: Restricts Outer Zone Class I protections

Regional Water Board staff oppose Optional Amendment 9. The Optional Amendment unnecessarily restricts the Class I Outer Zone protections. The first of the two conditions that could require Outer Zone protections would be extremely difficult to implement and enforce. It requires an Outer Zone only "where windthrow is a demonstrated occurrence," which may only become apparent postharvest.

Re: Optional Amendment 101: Restricts Outer Zone Class I protections in watersheds outside the Costal Anadromy Zone

Regional Water Board staff oppose Optional Amendment 101. The Optional Amendment unnecessarily restricts the Class I Outer Zone protections. The first of the two conditions that could require Outer Zone protections would be extremely difficult to implement and enforce. It requires an Outer Zone only “where windthrow is a demonstrated occurrence,” which may only become apparent postharvest.

Re: Optional Amendment 102: Determine the Class II Watercourse Type

Regional Water Board staff support *portions of* Optional Amendment 102. While we strongly oppose the use “Blue Line Streams” (optional 916.9(g)(1)(A)(2)) for any determination of watercourse type, we support field verification (optional 916.9(g)(1)(B)) of watercourse clasification.

Re: Optional Amendment 103: Class II WLPZ widths and operational requirements

Regional Water Board staff oppose Optional Amendment 103. This optional amendment represents a reduction of protections measures for both Class II-S and Class II-L watercourses.

Re: Optional Amendment 104: Retain hardwoods within the ELZ

Regional Water Board staff oppose Optional Amendment 104. Hardwoods should be retained for the entire width of the ELZ.

Re: Optional Amendment 105: Substitutes “non-merchantable conifers” for “countable trees” within the ELZ

Regional Water Board staff oppose Optional Amendment 105. All “countable” trees, not simply non-merchantable conifers, should be retained within the ELZ.

Re: Optional Amendments 20: Eliminates prevention of waterborne sediment transport from road surfaces

Regional Water Board staff strongly oppose Optional Amendment 20. In order to reduce the risk of sediment transport to a watercourse, the traveled surface of logging roads should be treated to prevent waterborne transport of sediment and concentration of runoff that results from timber operations.

Re: Optional Amendment 22: Requires showing of “quantities deleterious” before treatment of disturbed soil prior to rain

Regional Water Board staff oppose Optional Amendment 22. The term “quantities deleterious” is very subjective and unclear. The lack of a defined standard will likely lead to disagreement between agency staff and reduced protection from sediment delivery.

Re: Optional Amendment 23: Adds protection where natural ground cover is inadequate

Regional Water Board staff support Optional Amendment 23. Where the natural ability of ground cover is inadequate to protect beneficial uses of water, it is appropriate to propose protection measures to retain and improve the natural ability of the ground cover to filter sediment and minimize soil erosion.

Re: Optional Amendment 26: Removes “equal to or more favorable” requirement to site-specific measures.

Regional Water Board staff strongly oppose Optional Amendment 26. Site-specific measures designed for the specific conditions of an individual watershed are only appropriate when they provide protections that are equal to or more favorable than the standard rules. Site-specific management proposals should not provide a less favorable result.

Re: Optional Amendments 27: Restricts agency determination that proposed site-specific measures are not adequate

Regional Water Board staff oppose Optional Amendment 27. Regional Water Board staff favor the primary “two or more agencies” wording. It is assumed that the agencies will base their determination on “substantial evidence in the record” in light of their legislative mandates.

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Linda S. Adams
Secretary for
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North Coast Region
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Arnold
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September 3, 2009

To: Robert Klamt
Chief, Timber and Non-point Source Division

From: Bryan McFadin, PE
Senior Water Resource Control Engineer

Subject: Evaluation of Anadromous Salmon Protection Rules Relative to the
Water Quality Objective for Temperature

Introduction

This document is intended to identify and describe Regional Water Board staff concerns regarding stream temperature issues that remain unaddressed by Cal Fire's proposed *Anadromous Salmon Protection Rules*. Regional Water Board staff have reviewed the proposed *Anadromous Salmon Protection Rules* (ASP rules) originally published May 8, 2009, re-noticed July 24, 2009, as well as the *Initial Statement of Reasons, Questions and Answers "Threatened and Impaired Watershed" regulation proposal A Basis for the Initial Statement of Reason (Q&A)*, and the *Scientific Literature Review of Forest Management Effects on Riparian Functions for Anadromous Salmonids* (literature review) documents. We believe that the proposed rule package represents a substantial step forward in protection of stream temperatures in California. In particular, we believe the designation of no-cut "core zones" accompanied with high retention "inner zones", as well as the establishment of the Class II-L stream classification, are major steps towards ensuring that forest practices will not result in exceedences of the water quality objective for temperature. Implementation of the proposed rules will substantially reduce the number of temperature-related conflicts in the timber harvest review process.

The literature review presents discussion of many of the factors and thermodynamic processes that affect stream temperature. Many of the thermodynamic principles outlined in the literature review are concepts that we agree on. Some of these include:

- Shade is a key factor, and the most important factor in limiting heat inputs from the dominant heat source, solar radiation.
- The relative importance of riparian vegetation varies by location.
- Riparian effectiveness depends on vegetation height and density.

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- The effectiveness of riparian vegetation in providing shade to a watercourse decreases with channel width.
- Solar exposure is influenced by channel morphology, width, orientation, and topography.
- Stream temperatures are ultimately determined by a suite of factors.
- Thermal conditions respond to downstream riparian conditions as water flows downstream.
- Stream temperatures respond to tributary and groundwater inputs.
- Temperatures are moderated by hyporheic exchange, the magnitude of which is a function of bed composition and channel morphology.
- Heat exchange is affected by the depth, velocity, and volume of a stream.
- Air temperatures vary by location, and affect stream temperatures.
- Timber harvest can influence microclimate.

Despite these broad areas of agreement, there remain aspects of the science of stream temperatures and the approach to managing them that our staff interpret differently.

These remaining issues are:

- Managing for natural temperatures vs. a specified temperature range or criterion.
- The concept of stream temperature relaxation downstream of heat inputs.
- The influence of forestry activities on microclimate, and effects of microclimate on stream temperatures.

Our concerns related to each of these aspects are described in detail, below.

Natural Temperatures vs. Specified Range:

The Regional Water Quality Control Boards are charged with protecting the water quality of waters of the state by ensuring compliance with water quality objectives (e.g. temperature, suspended sediment, settleable material, dissolved oxygen, etc) and protection of beneficial uses (e.g. cold freshwater habitat; rare, threatened, or endangered species; spawning, reproduction, and/or early development, etc.), as described in each regions' respective Water Quality Control Plan.

The North Coast Region's water quality objective for temperature states:

"The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.

At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.

At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperatures."

The term “COLD” refers to cold freshwater habitat and “WARM” refers to warm freshwater habitat. The cold freshwater habitat beneficial use is defined as:

“Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.”

Similarly, the warm freshwater beneficial use is defined as:

“Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.”

The water quality objective for temperature identifies the natural temperatures that occur at a site as the default temperature standard, with an allowance for limited temperature alteration if it can be demonstrated that the alteration won't harm the beneficial uses. In practice, the most sensitive beneficial use of concern has most often been considered those related to salmonids, and in those cases the biological temperature requirements for rearing salmonids have used to defined the criteria for adverse impacts. This application is too narrow to be fully protective, especially considering the definition of COLD beneficial use. There may be other temperature sensitive species present in a waterbody that also require special management considerations, such as the southern torrent salamander. In all cases, the thermal needs of all beneficial uses present in a waterbody must be considered before an increase in temperature can be allowed.

The ASP Rules were developed to address the habitat needs of salmonids. The literature review discusses the temperature requirements of salmonids, and establishes the maintenance of those temperature conditions as a criterion for successful forest management. For example, the literature review states:

“...some streams need more shade to maintain a suitable temperature regime than others because of its (sic) location and physical characteristics.”
-Ch 3, pg 21

and,

“...streams that are naturally cool may become more favorable for growth as a result of shade reduction and stream warming.”
-Ch3, pg 22

Together, these statements imply that the thermal environment is protected as long as temperatures are within the range suitable for salmonids, and that streams that are colder than necessary to support salmonids can accommodate temperature increases. This approach is not compliant with the WQO for temperature, however, because the objective prohibits temperature increases without a demonstration that all beneficial uses wouldn't be adversely affected.

An implicit assumption within the literature review discussion of streams that do not support salmonids (variously described in the literature review as headwater streams, low-order streams, and Class II streams) is that forest practices are protective of salmonids if thermal impacts do not persist in downstream reaches where salmonids are present. The protection of Class II watercourses is the area of the ASP rules (and forest practice rules, generally) in which water temperature protections consistent with the Basin Plan temperature objective are most lacking. The establishment of the Class II-L watercourse designation and no-cut core zones are a substantial improvement over the previous rules. However, the rules remain oriented to protection of watercourses that have the potential to affect Class I streams, rather than the thermal protection of the cold-water ecosystems of Class II streams themselves.

The literature review discussion on page 17, chapter 3, concluded that because the magnitude of the headwater stream flows are small relative to the flow of fish-bearing receiving waters, the temperature of the receiving water is unlikely to be affected by temperature increases. This may be true, however the approach is only protective of the salmonid species in the Class I stream and ignores beneficial uses in the Class II streams. There is no discussion of the importance of the headwater streams in providing thermal refugia in the fish-bearing streams, which is more commonly the case in the north coast region, nor is there a discussion of the beneficial uses present in Class II streams and the thermal requirements of those beneficial uses. This logic results in the 916.9(g)(1)(B)(2) provision that allows a forester to re-classify a Class II-L watercourse to a Class II-S if she or he can demonstrate that the resulting downstream temperature of the receiving water will result in a temperatures above a specified temperature. The language goes on to dismiss very minimal mid to late-summer tributary streamflow as ecologically insignificant, based on the receiving Class I temperature, without acknowledging the beneficial uses of the Class II.

In justification of additional riparian protections along Class II streams the *Questions and Answers* document states the following:

“High shade and high numbers of conifer trees are required for large Class II watercourses, since watershed products such as heated water, wood, and fine sediment can be transported into fish-bearing Class I watercourses from these reaches. Since these watercourses are not fish-bearing, however, it is appropriate to have the standards in this secondary zone for wood and shade retention somewhat lower than the Class I watercourses.”

This statement implies that some warming of Class II streams is acceptable because fish are not present. This approach is not compliant with the Basin Plan WQO for temperature, because the objective prohibits temperature increases without a demonstration of no adverse effects to beneficial uses.

The same logic is implicit in the ASP rule provisions of 916.9(g)(1)(D) that increase Class II-L riparian protections upstream of Class-I watercourses. The justification given

for the increased protections is temperature protection. If the increased protections are required to protect the temperature within 1000', what about the remainder of the Class II stream? This approach is also not compliant with the Basin Plan WQO for temperature.

The water quality objective for temperature requires that a cautious approach to stream temperature be followed, and that no stream temperature increase is allowable without a demonstration that the beneficial uses won't be adversely affected. By referencing the natural state as the default standard, the temperature objective ensures that all beneficial uses are protected in all of the waters of the state, our basic legal mandate. The proposed ASP rules are designed solely for the protection of salmonids. Thus, the proposed rules do not ensure compliance with the Basin Plan water quality objective for temperature in situations where salmonids are not present or where they are not the beneficial use most sensitive to elevated temperatures.

Relaxation vs. Acceleration

The proposed ASP rules incorporate the concept of stream temperature "relaxation" downstream of reaches with elevated heat inputs. The relaxation concept rests on the assumption that a stream that has had its temperature elevated in a reach exposed to solar radiation will lose heat and return to its original temperature once it leaves the exposed reach and re-enters a reach with the original conditions (Figure 1). The Literature Review discusses studies that reported cooling in the downstream direction, but is silent regarding studies that reported no downstream cooling following harvest (e.g. Brown et al 1971, Storey and Cowley 1997 as cited in Moore et al 2005) The literature review also states that the temperature response is a function of many variables, that the factors governing downstream temperature response are consistent, and that the primary drivers would apply anywhere. The Literature Review further states more research is needed in California. Regional Water Board staff agree that more research is needed on this topic. Because the relaxation concept is dependent on equilibrium temperature, it is prudent to evaluate this concept given the climatic conditions of California now and in the future.

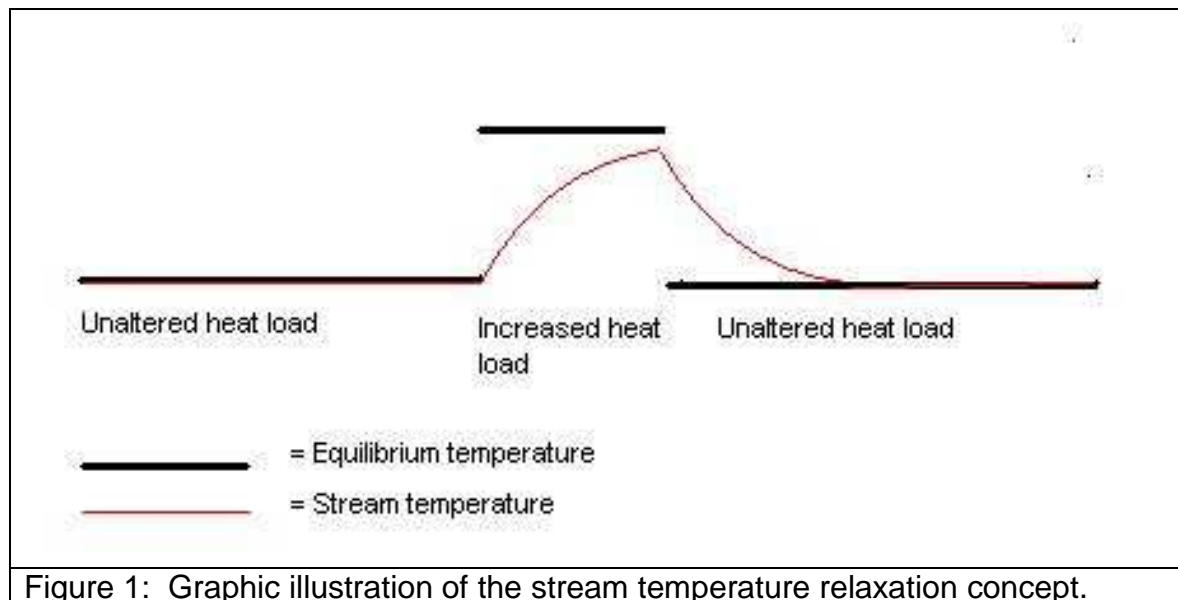


Figure 1: Graphic illustration of the stream temperature relaxation concept.

What the Literature Review does not do is recognize that the initial equilibrium temperature for such an example may not be “natural” and thus not meet the Basin Plan WQO for temperature in the first place. Given that equilibrium temperature is a fundamental concept in the stream temperature relaxation concept, it is notable that the *Literature Review* lacks any discussion that puts stream temperature dynamics in the context of equilibrium temperature. Equilibrium temperature is defined as the temperature that occurs when a balanced is achieved between heat sources and sinks (Bogan et al, 2003, Caldwell et al, 1991).

The second law of thermodynamics guarantees the temperature of a stream will trend towards the equilibrium temperature. Newton’s law of cooling tells us that the rate of temperature increase will be proportional to the difference between the waterbody’s temperature and the equilibrium temperature. This process continuously determines stream temperatures (Bogan et al, 2003). Effective management of stream temperatures for coldwater ecosystems is about limiting heat inputs to streams that are below equilibrium in order to minimize the rate of heating as the waterbody trends toward equilibrium (Figure 2).

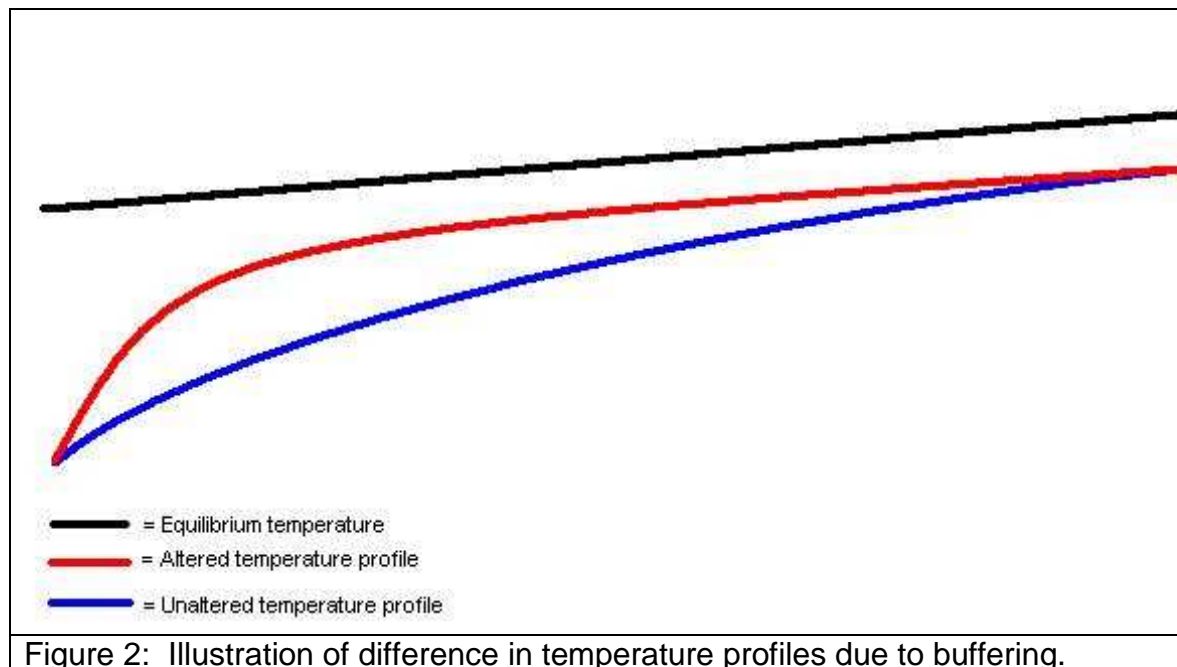


Figure 2: Illustration of difference in temperature profiles due to buffering.

In cases where water temperatures are relatively far from equilibrium temperature (such as downstream of springs, areas of high groundwater discharge, or melting snow) an increase in heat load may cause an increase in temperature that can't be mitigated by downstream conditions (Figure 3). In those situations the result is an acceleration of stream temperature in the downstream direction, rather than a localized increase quickly followed by an equal decrease. Management measures should be designed to prevent increased heat loads when the temperature of a waterbody is uniquely cold, regardless of stream classification.

Regardless of the downstream cooling that may or may not occur, any temperature increase more than 5 °F constitutes a Basin Plan violation, and any increase in water temperature that adversely affects beneficial uses constitutes a Basin Plan violation. Given that stream temperatures are very sensitive to solar radiation inputs (Sound Watershed Consulting 2009), it is not unlikely that even modest increases in solar radiation can result in temperature increases of 5 °F or more.

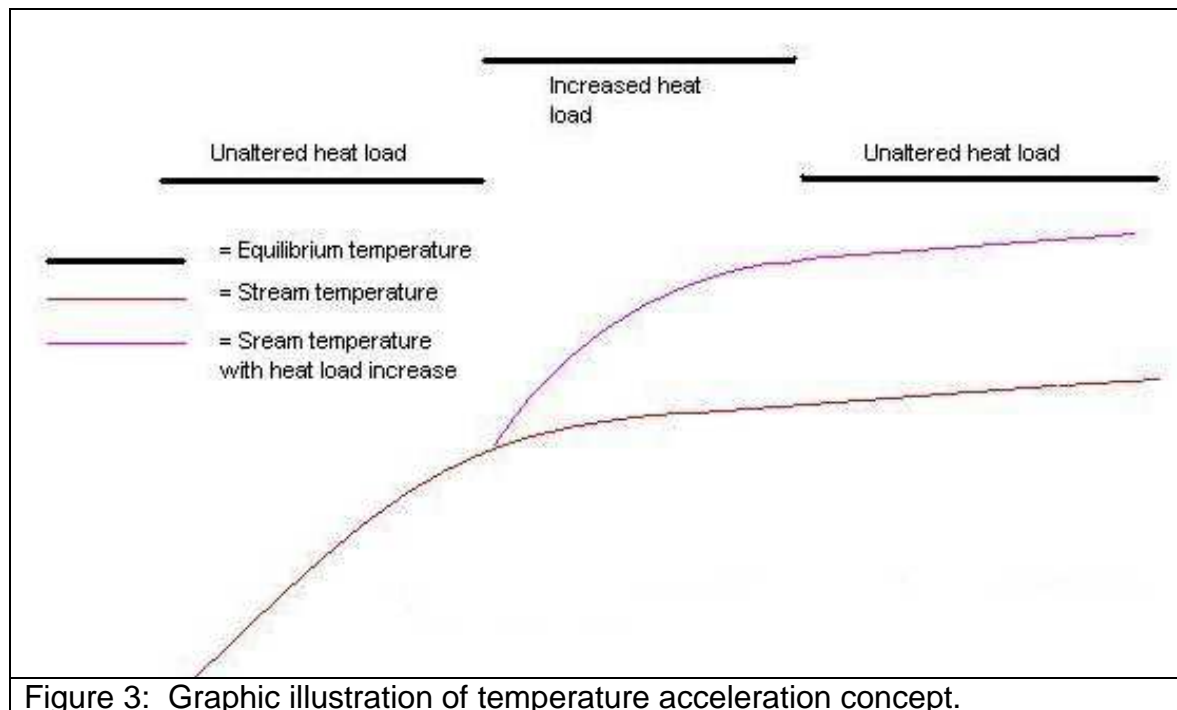


Figure 3: Graphic illustration of temperature acceleration concept.

Forest management and regulatory approaches that incorporate the concept of temperature relaxation should also consider the possibility of temperature acceleration as the response to the same management action, depending on the setting. The factor that determines whether or not a stream will “relax” is the equilibrium temperature. Streams that cool downstream of riparian harvest do so because the equilibrium temperature increases through the affected reach, then decreases in the downstream cooling reach. In these situations, the stream is already near equilibrium temperature. This is not always the situation, however.

One of the major heat sinks downstream of heat sources is the loss of heat to the hyporheic zone via conduction (Johnson 2004, Moore et al 2005). In these cases the heat is not lost from the stream environment. Rather, the alluvial substrate retains some of the heat, while some is lost to the largest heat sink, the earth (Poole and Berman 2001). These alluvial substrates are habitat for benthic species whose incubation and growth rates are affected by temperature (Moore et al 2005).

The use of the equilibrium temperature concept as a decision making criterion may be a reasonable approach for quantifying a waterbody’s sensitivity to increased heat loads. Regional Water Board staff suggest a collaboration with Cal Fire staff on an approach prior to making use of the equilibrium concept in forest management decision making.

Microclimate

The Literature Review discussion concludes that none of the studies reviewed demonstrated a stream temperature change attributable to changes in microclimate, and summarily dismisses the concept that management-related changes in near-stream

microclimate may affect stream temperatures. The Literature Review justifies this, in part, by pointing out that the heat exchange between air and water occurs at rates that are an order of magnitude less than rates of heat input from solar radiation. Regional Water Board staff agree that solar radiation dominates all other natural heat sources, but also recognize that air temperature is perhaps the single largest factor that determines equilibrium temperatures, particularly in streams with low solar radiation inputs (Bogan et al, 2003).

We find the Literature Review's conclusion regarding microclimate inconsistent with their discussion of the coastal influence on water temperatures. We recognize that fog is a factor near the coast, but note that even the streams with 75-100% canopy closure showed an average temperature difference of approximately 1.5 °C temperature between those in and out of the zone of coastal influence (Figure 3, Literature Review). We also note that the majority of microclimate studies in the literature focus on defining the change in microclimates that occur as a result of vegetation removal, while very few studies have evaluated stream temperature changes associated with microclimate changes. Given the lack of definitive study results, what is known regarding stream heat exchange, and climate changes in the future, Regional Water Board staff have determined that more study of this topic is prudent.

Summary

In conclusion, we commend Cal Fire staff and the Board of Forestry for proposing rules that provide significant riparian protections. The proposed rules will result in riparian protections that achieve the water quality objective for temperature in a substantial number of situations in the North Coast, particularly Class I streams. It is clear, however, that these rules were not developed to comply with the water quality objective for temperature, specifically. The Basin Plan is hardly mentioned in the rules, and the literature review, *Question and Answers*, and *Initial Statement of Reasons* documents do not identify the water quality objective for temperature as being a management criterion, or a water quality standard that must be met for compliance with the law. The fact that water temperature increases are anticipated as a result of implementation of the rules, without any discussion of the effects on beneficial uses, also indicates that these rules were not crafted to achieve compliance with the Basin Plan. One might also question of the requirements of the California Environmental Quality Act are met in terms of identifying and mitigating water temperature effects.

Without an analysis of effects of temperature increases on beneficial uses, Regional Water Board staff are unable to make a determination that the proposed rules ensure compliance with the water quality objective for temperature. Additionally, the possibility of temperature increases more than 5 °F must also be evaluated. Without these analyses, and given the narrow geographic extent of the application of the proposed rules, we are left to conclude that the proposed rules do not fully comply with the Basin Plan, and must identify the real possibility that many timber harvesting plans compliant with the rules may need modifications in order to comply with the Basin Plan. This is likely true to a larger extent in other regions that do not have the geographic extent of

anadromous salmonids, and to which even Class I streams would not receive the additional protections of the proposed rules.

Additionally, without these analyses the proposed rules are not sufficient for certification as a third party regulatory program, consistent with the Non-Point Source Policy, and thus cannot serve as the basis as a waiver of waste discharge requirements. That fact has been stated in public meetings in the last year, most notably during the Regional Water Board hearing on the conditional waiver for timber harvesting on non-federal lands on June 4, 2009. Regional Water Board staff wish to resolve the remaining issues in order to move towards waiver certification, and wish to do so collaboratively with Cal Fire staff. We urge the Board of Forestry and Fire Protection to direct its staff to work with the Regional Water Board staff to bring the Forest Practice Rules into compliance with water quality regulations regarding beneficial use protection from elevated water temperature.

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