

**DRAFT STAFF REPORT -**

**REVISION TO THE EARLY LIFE STAGE IMPLEMENTATION  
PROVISION OF THE FRESHWATER AMMONIA OBJECTIVES  
FOR INLAND SURFACE WATERS**

**September 21, 2005**

# TABLE OF CONTENTS

	PAGE NUMBER
I. INTRODUCTION	1
A. Revised Ammonia Objectives	1
B. April 2002 Implementation Approach [for ELS provision]	2
II. BACKGROUND	2
A. Definition of Early Life Stages	2
B. Factors Effecting the 30-day Average Objective	3
III. SUMMARY OF PROPOSED ACTION	4
IV. DISCUSSION OF PROCESS	5
A. Summary of Technical Advisory Committee Meeting	5
B. Definitional Clarifications	6
C. Evaluation of Alternatives for Implementing the ELS Provision	7
V. OTHER CONSIDERATIONS	7
VI. CONSIDERATION OF 13241 FACTORS	7
VII. DEVELOPMENT OF THE RECOMMENDED ALTERNATIVE	8
A. Development of Alternative	8
B. Implementation of Alternative	9
VIII. REFERENCES	12

## PAGE NUMBER

### TABLES

Table 1: Duration of ELS for Selected Species	3
Table 2: Fish species in the Los Angeles Region that reproduce at temperatures less than 15 degrees Celsius	9
Table 3: Water bodies to which “ELS Absent” objective applies	10

## TABLE OF CONTENTS

### FIGURES

Figure 1: 30-day Average Ammonia Criterion Values in the 1999 Update	4
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### APPENDICES

Appendix A: Members of the Technical Advisory Committee	A-1
Appendix B: Survey to Determine Location of Fish Species that Reproduce below 15 degrees Celsius	B-1
Appendix C: Assessment of Physical Conditions in Major Water Bodies that Limit Significant Reproduction and Early Development of Fish Species	C-1
Appendix D: Evaluation of Alternatives	D-1

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WATERS**

**I. INTRODUCTION**

On April 25, 2002, the Los Angeles Regional Water Quality Control Board (Regional Board) adopted a Basin Plan Amendment updating the freshwater ambient water quality objectives for ammonia based on guidance from U.S. EPA. The U.S. EPA guidance is entitled "1999 Update of Ambient Water Quality Criteria for Ammonia," December 1999.

One implementation provision of this amendment that was unresolved at the April 25<sup>th</sup> Board meeting was how to most accurately determine where early life stages (ELS) of fish were present in local water bodies. Regional Board staff were directed by the Board to convene a Technical Advisory Committee (TAC) to advise staff in this effort. A determination of where ELS are present is necessary because where ELS are present at temperatures below 15 degrees C, or 59 degrees F, the 30-day average ammonia objective is more stringent to protect developing fish.

**(A) Revised Freshwater Ammonia Objectives**

The Ammonia Basin Plan Amendment was approved by the State Water Resources Control Board on April 30, 2003; the Office of Administrative Law on June 5, 2003; and U.S. EPA on June 19, 2003. The approved basin plan amendment is available on the Los Angeles Regional Board web site at the following web address <http://www.swrcb.ca.gov/~rwqcb4> by selecting "Basin Plan" from the quick menu and "Basin Plan Amendments" from the subsequent menu.

The ammonia objectives vary depending upon temperature and pH and based on various conditions, including salmonids present, salmonids absent, early life stages (ELS) present or early life stages (ELS) absent. U.S. EPA concluded in the development of its recommended freshwater ambient water quality criteria for ammonia that it would be appropriate to relax the 30-day average ammonia objective, as ambient water temperature decreases, in water bodies where early life stages are not present. The Early Life Stage (ELS) provision relaxes the 30-day average objective *when ELS are not present* because at low ambient water temperatures, invertebrates and adult and juvenile fish are less sensitive to ammonia toxicity than are ELS fish.

The ELS provision relaxes the 30-day average objective at low ambient temperatures (<59 degrees F or <15 degrees C) *when ELS are not present*. U.S. EPA's rationale for recommending that the 30-day average objective vary based on the presence or absence of early life stages of fish is that in winter it is more difficult to treat ammonia, therefore, the objectives can safely and efficiently be relaxed during this time if there are no early life stages of fish present. However, trout and other cold-water fish reproduce at colder temperatures. So when early life stages of fish are present, the 30-day average objective cannot be relaxed.

## **(B) April 2002 Implementation Approach**

The Basin Plan Amendment to update the ammonia objectives was presented to the Regional Board on April 25, 2002. It identified waters with the Spawning, Reproduction, and/or Early Development (SPWN)<sup>1</sup> beneficial use designation as ELS present waters. The rationale for this was that water bodies with a Basin Plan beneficial use designation of SPWN are defined as those that “support high-quality, aquatic habitats suitable for reproduction and early development of fish.” This definition seemed to convey that "ELS" and "SPWN" specified the same set of waters. Early Life Stages of fish were assumed present year-round if the water body had the SPWN designation, unless a site-specific study justified a seasonal provision. The Basin Plan Amendment process would be followed to develop a seasonal beneficial use designation.

At the board meeting on April 25, 2002, the Board directed Region 4 staff with ensuring that the “SPWN” designation would in fact cover all water bodies that support early life stages of fish. The Board directed staff to convene an advisory committee to assist in this determination and bring the issue back to the Board. On February 10, 2003 Regional Board staff convened a Technical Advisory Committee made up of fisheries experts from academia and various public agencies.

## **II. BACKGROUND**

### **(A) Definition of Early Life Stages according to U.S. EPA “1999 Update of Ambient Water Quality Criteria for Ammonia”**

Early Life Stages (ELS) refers to a particular developmental stage (of fish in this case). This stage includes the pre-hatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. The ELS does not include the juvenile stage. The duration of ELS lasts from the beginning of spawning until the end of the larval period. The end of ELS varies per fish species. The ELS duration of selected fish can be seen in Table 1 below.

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<sup>1</sup> SPWN is defined in Region 4's Basin Plan as “Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.”

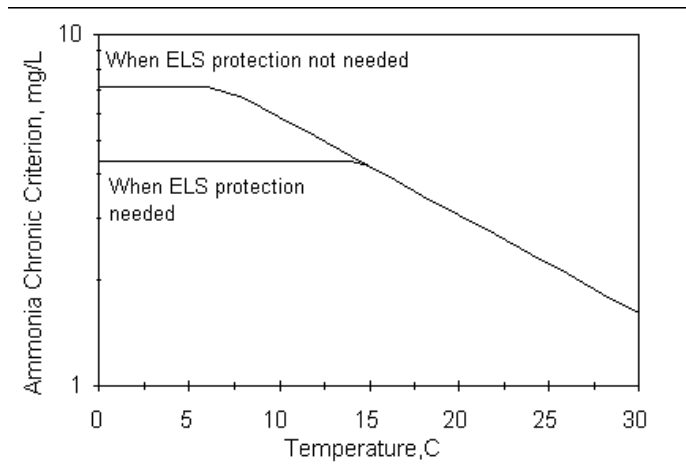
**TABLE 1: DURATION OF ELS FOR SELECTED SPECIES**

<b>TAXON</b>	<b>End of ELS Development (in days after spawning)</b>
Fathead minnow	34 days
Channel catfish	34 days
Bluegill	34 days
White sucker	34 days
Northern pike	34 days
Striped bass	46 days
Trout, salmon, char	30 days after swim-up (swim-up is the stage when fry leave the nest and swim up to the surface to catch food).

**(B) Factors Affecting the 30-day Average Objective**

The 30-day average ammonia objective is a function of pH, temperature and presence/absence of “early life stages” (ELS) of fish. The 1999 update to the 30-day average objective is based on a revised relationship to temperature. Above 15 degrees Celsius, invertebrates are the most sensitive chronic test species. The higher the temperature or pH, the greater the proportion of the more toxic un-ionized ammonia (NH<sub>3</sub>), and the less ammonia invertebrates can tolerate. At low temperatures (below 15 degrees Celsius), the 30-day average objective depends instead on whether early life stages of fish are present. At temperatures below 15 degrees Celsius, where ELS of fish are present, the 30-day average objective for total ammonia is 4.36 mg/L as nitrogen (mg N/L). However, ELS have the same sensitivity to ammonia irrespective of how low the temperature is below 15 degrees Celsius, therefore the curve flattens beginning at 15 degrees Celsius in Figure 1. At temperatures below approximately 7 degrees Celsius, when ELS are not present, fish are more sensitive to ammonia than are invertebrates. Again, fish sensitivity to ammonia does not depend upon temperature changes below 7 degrees Celsius, so the curve flattens out where the total ammonia objective is 7.09 mg N/L. The magnitude of the ELS absent adjustment is dependent upon temperature between 7 to 15 degrees Celsius. There are two tables in the 1999 Update for the 30-day average objective; one for when early life stages are present and one for when they are absent.

**Figure 1. 30-day criterion values in the 1999 Update; pH=7.5.**



### III. SUMMARY OF PROPOSED ACTION

There are few fish species in the Los Angeles Region reproduce at temperatures less than 15 degrees Celsius. Recall it is only at temperatures less than 15 degrees Celsius that the 30-day average objective is affected by the presence of ELS. The TAC identified the following species in the Los Angeles Region as those that reproduce at temperatures below 15 degrees Celsius: Steelhead/Rainbow trout, Three-spine stickleback, Brown trout, Prickly sculpin, Staghorn sculpin, Striped mullet, Starry flounder, Arrow goby and Pacific lamprey. On the basis of expert opinions and published literature, Regional Board staff identified for major water bodies in the Los Angeles region where these fish species are or have been present. Where these fish are present, we make the assumption that ELS of these fish are present, unless obvious physical characteristics of the water body would preclude their presence in significant numbers. These water body characteristics include the presence of concrete bottoms and sides that would make the channel inhospitable for reproduction in significant numbers. Where these fish are absent, we make the assumption that it is not necessary to apply the 'ELS present' objective, since no local fish species are reproducing at lower temperatures where the objective is affected by the presence of ELS.

For all smaller water bodies, we presume that ELS are present, absent local knowledge to the contrary for these waters. These smaller water bodies are not subject to major wastewater discharges and it is for these situations, particularly at low temperatures when ammonia is more difficult to treat, that the more relaxed 'ELS absent' objective is most desired by the regulated community. In addition, from a practical standpoint, the 'ELS present' objective is only more stringent than the 'ELS absent' objective at temperatures less than 15 degrees Celsius; at temperatures above 15 degrees Celsius the 30-day average objective is driven by invertebrates, which are universally present in local water bodies.

The development and implementation of this recommended implementation approach is discussed in detail in Section IV below and corresponds to Alternative (i) in the Alternatives Analysis presented in Appendix D.

If there is a site-specific ammonia objective (SSO) for the water body then the fish species used in the analysis of the ELS present condition for the water bodies affected by the SSO must be revisited since the 15 degrees C threshold may no longer be appropriate (i.e. the temperature threshold at which fish species become the more chronically sensitive species may be higher than in the regional objectives).

Any change in the implementation provision for the ELS present/absent condition, including the assignment of water bodies, must be approved through the Basin Plan Amendment process. To justify the ELS absent provision, information regarding fish species distributions, spawning periods, nursery periods and the duration of early life stages found in the water body must be presented. Expert opinions from fisheries biologists and other scientists will be considered. Where it can be obtained, a consensus opinion from a diverse body of experts would carry significant weight in determining the presence or absence of the ELS. The determination of the time frame during the year when early life stages are most likely not to be present in numbers that, if chronic toxicity did occur, would affect the long-term success of the fish populations, should include adequate scientific justification. The Regional Board will use the record supporting a Basin Plan amendment as the basis upon which to approve or disapprove changes to these implementation provisions for the 30-day average ammonia objective. The record should clearly explain all the factors and information considered in arriving at the determination. The Regional Board will consider and weigh the breadth and depth of scientific evidence in determining whether to remove the early life stage designation. Early life stages are presumptively present and must be protected at all times of the year unless a subsequent Basin Plan amendment removes the condition.

#### **IV. DISCUSSION OF PROCESS**

##### **(A) Summary of Technical Advisory Committee Input**

On February 10, 2003 a Technical Advisory Committee meeting was held to discuss the most appropriate way to implement the Early Life Stage (ELS) provision of the newly adopted freshwater ammonia objectives. Again, the ELS provision relaxes the freshwater 30-day average objective at low ambient temperatures (<59 degrees F or <15 degrees C) when ELS are not present. The rationale for including this provision, according to U.S. EPA staff <sup>2</sup>, is that ammonia is most difficult to control in the wintertime. Concurrently, warm-water fish generally do not reproduce in the winter. Therefore, the 30-day average objective could be relaxed in the winter if there are only warm-water fish present (that are not spawning during the winter).

The purpose of convening the TAC was to evaluate whether the Regional Board's beneficial use designation of "Spawning, Reproduction, and/or Early Development (SPWN)" would provide adequate protection for Early Life Stages of fish (ELS). This led to a discussion about where ELS were present in the Region's water bodies. It became clear that the SPWN beneficial use

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<sup>2</sup> Telephone conversation with Charles Delos, U.S. EPA Headquarters, and Robyn Stuber, U.S. EPA Region IX, on 08/20/03.



designation and the ELS present condition did not describe the same subset of waters. Therefore, continuing to use the SPWN designation to protect ELS would require the Regional Board to undertake a detailed region-wide beneficial use survey to re-evaluate and update the SPWN designations. This could potentially alter the intended meaning of the SPWN designation, which is intended to protect "high quality habitat" that is not necessarily characteristic of all ELS present waters.

Based on input from the TAC, Regional Board staff undertook the following tasks:

- (1) Researched the intent behind the definitions of SPWN and COLD (cold freshwater habitat) beneficial uses and the ELS present condition.
- (2) Reevaluated staff's proposed approach of using the SPWN beneficial use as a proxy for the ELS present condition.

### **(B) Definitional Clarifications**

The COLD beneficial use identifies water bodies that support habitat associated with a cold-water environment and with cold temperatures. SPWN is similar in concept to "Early Life Stages". However, it covers a narrower range of "ELS present" water bodies. The statewide SPWN designation is reserved for high quality habitat, which seems to equate to habitat supporting cold-water species—though this is not explicitly stated in the statewide standard beneficial use definition for SPWN.

Regions 2 and 9 have provided further clarification on the definition of SPWN in their Basin Plans. The Region 9 Basin Plan states, "The use is applicable only for the protection of anadromous fish." This implies that SPWN applies to cold water habitat. The Region 2 Basin Plan states that SPWN specifically includes the following characteristics of SPWN waters:

- specific water temperature, depth and velocity,
- dissolved oxygen levels (which should ideally approach saturation levels),
- size distribution and organic content of sediments, and
- free movement of water (which is essential to maintain well-oxygenated conditions around eggs deposited in sediments).

The California Department of Fish and Game supports the idea that any water body with the beneficial use designation COLD should also have the beneficial use designation SPWN to support the cold-water species. In addition, an examination of the expanded descriptions of COLD and SPWN in the Basin Plans of Regions 2 and 9 indicated that COLD and SPWN apply to similar habitats, i.e. those where conditions are suitable for spawning of anadromous fish.

In the Los Angeles Region (4) there are 328 inland surface water bodies identified in Table 2-1 of the Basin Plan. Of these, 311 water bodies are assigned the beneficial uses COLD and SPWN similarly, i.e. if a water body has one designation, it is also has the other designation and, conversely, if it does not have one designation, it typically does not have the other. Only 57 of the 328 water bodies (17%) have differences in beneficial use designations between COLD and SPWN. Hence, for 83% of water bodies the SPWN and COLD beneficial use designations are correlated.

The ELS present condition, on the other hand, applies to both warm- and cold-water species and is not limited to "high quality" habitat. Furthermore, discussions with U.S. EPA staff<sup>3</sup> indicate that it was assumed that ELS would be present in all water bodies during at least some period during the year, echoing previous comments of the TAC that fish reproduce in virtually all water bodies at some time during the year.

### **(C) Evaluation of Alternatives for Implementing the ELS Provision**

Upon further clarification of the definitions of various beneficial uses and identification of the drawbacks of using the SPWN beneficial use designation to identify water bodies where Early Life Stages of fish are present, Regional Board staff evaluated with the input of the TAC various implementation approaches. Staff's evaluation of these alternatives is presented in Appendix D. Based on this evaluation, staff recommends Alternative (i) described in Appendix D. Under this alternative, the Regional Board would apply the "ELS Absent" objective in major water bodies known to not have fish species that reproduce below 15 degrees C or where physical conditions preclude reproduction and early development in significant numbers even where fish species that reproduce below 15 degrees C are present. The Regional Board would apply the "ELS Present" objective in all other water bodies unless a site-specific study was conducted and approved through the Basin Plan amendment process.

## **V. OTHER CONSIDERATIONS**

A National Consultation between U.S. EPA and U.S. Fish and Wildlife Service will take place in the next few years to determine if threatened and endangered (T&E) species are adequately protected by various U.S. EPA 304(a) criteria.<sup>4</sup> The outcome of this consultation could result in the reconsideration of the freshwater ammonia objectives Region 4 adopted in April 2002 and this Basin Plan Amendment. However, U.S. EPA advised us to proceed with the proposed Basin Plan Amendment. If the national consultation determines that the "1999 Update of Ambient Water Quality Criteria for Ammonia" is not adequately protective of T&E species, the Services' Biological Opinion would provide the groundwork for what EPA should do to ensure that T&E species are protected.

## **VI. CONSIDERATION OF 13241 FACTORS**

The California Water Code (CWC), section 13241, specifies that Regional Boards shall establish water quality objectives that in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisances.

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<sup>3</sup> Telephone conversation with Charles Delos, U.S. EPA Headquarters, and Robyn Stuber, U.S. EPA Region IX, on 08/20/03.

<sup>4</sup> Section 304(a)(1) of the federal Clean Water Act requires U.S. EPA to develop criteria for water quality that accurately reflects the latest scientific knowledge. These criteria are based solely on data and scientific judgments on pollutant concentrations and environmental or human health effects. Section 304(a) also provides guidance to states and tribes in adopting water quality standards. Criteria are developed for the protection of aquatic life as well as for human health.

Water Code section 13241 identifies factors to be considered by the Regional Board when establishing water quality objectives. The Regional Board has considered these factors, identified in California Water Code, section 13241. Water Code section 13241 only requires consideration of the enumerated factors when a water quality objective is being revised or amended. Here, the Basin Plan amendment only revises the implementation of the existing ammonia objectives. Therefore, the Regional Board's analysis is somewhat limited. Moreover, the analysis is limited solely to the changes resulting from this amendment.

In summary, based on the limited nature of the revisions, the Basin Plan amendment will protect past, present, and probable future beneficial uses; accounts for the existing quality of the water bodies; and accounts for conditions that could reasonably be achieved by coordinated control of all discharges. Each of these factors is discussed below.

1. Past, present and probable future beneficial uses of water.

*This amendment does not change the past, present or probable future beneficial uses of water. The amendment is designed to protect all early life stages of fish and therefore will not alter the level of protection for aquatic life.*

2. Environmental characteristics of the hydrographic unit under consideration including the quality of the water available thereto.

*Again, this Basin Plan amendment will result in full protection of early life stages of fish.*

3. Water quality conditions that could reasonably be achieved through coordinated control of all factors, which affect water quality in the area.

*The "Beneficial Uses" and "Water Quality Objectives" chapters of the Basin Plan (Water Quality Control Plan for the Los Angeles Region) are incorporated by reference to address the above three factors.*

4. Economic considerations.

*The Regional Board has considered the costs of implementing the amendment, and other factors identified in California Water Code, section 13241. This amendment specifies an increased number of water bodies requiring the lower ELS present objectives. Prior to this amendment, 104 water bodies were considered ELS present based on the use of the SPWN beneficial use designation as a proxy for the ELS present condition. This amendment would result in applying the ELS present condition year-round to 298 water bodies (all but 38 water bodies in the Region).*

*This amendment specifies an increased number of water bodies requiring the lower ELS present objectives. The decrease in the ammonia objective if a water body is treated as ELS present is not great enough to require additional treatment (beyond minor adjustments to treatment plant operations) if POTWs have in place nitrification and denitrification (N/DN). N/DN is capable of eliminating ammonia to approximately 1.0 - 2.0 mg total ammonia as N/L. The ELS present objective in the typical pH range for water bodies in Region 4 is above 2.0 mg total ammonia as N/L and so would be adequately treated by N/DN. The need for N/DN was prompted by the requirements of the 1994 Basin Plan ammonia objectives. Therefore the economic cost of this amendment should not be significant.*

5. The need for developing housing within the region.

*The change in the 30-day average objective should not affect the housing market, as the difference in concentration between the ELS present versus ELS absent conditions is not significant enough to have an impact on the development of housing.*

6. The need to develop and use recycled water.

*The difference in concentration between the ELS present versus ELS absent objectives is not significant enough to impact the development or use of recycled water because both objectives require concentrations of ammonia that are acceptable for recycled water use.*

**VII. DEVELOPMENT AND IMPLEMENTATION OF THE RECOMMENDED ALTERNATIVE (i)**

Under the recommended alternative (i) described in Appendix D and below, the Regional Board would apply the ‘ELS Absent’ objective in major water bodies known to not have fish species that reproduce below 15 degrees C or where physical conditions preclude reproduction and early development in significant numbers even where fish species that reproduce below 15 degrees C are present. The Regional Board would apply the ‘ELS Present’ objective in all other water bodies unless a site-specific study was conducted and approved through the Basin Plan amendment process.

**(A) Development of Alternative**

Again, at low temperatures (<15°C), the 30-day average ammonia objective is more stringent if ELS are present. At temperatures greater than 15°C, invertebrates are the most chronically sensitive species and therefore drive the 30-day average objective. Therefore, at temperatures greater than 15°C there is effectively only one applicable 30-day average objective, which is dependent on pH and temperature.

The critical determination is whether ELS are present or absent at temperatures below 15 degrees C. At the third meeting with the Technical Advisory Committee (TAC), the TAC agreed that few fish species in the Los Angeles Region reproduce at temperatures less than 15 degrees Celsius. These fish species were identified by the TAC members and are listed in Table 2 below.

**TABLE 2: Fish species in the Los Angeles Region that reproduce at temperatures less than 15 degrees Celsius**

Rainbow/Steelhead trout
Three-spine stickleback
Brown trout
Prickly sculpin
Staghorn sculpin
Striped mullet
Starry flounder
Arrow goby
Pacific lamprey

Regional Board then surveyed the TAC to identify those inland surface water bodies where these fish species are present or have been present in the recent past. Where these fish are present, we make the assumption that ELS of these fish are present.

This survey contains a list of all inland surface water bodies listed in the Basin Plan with columns where the survey respondent can specify which of the key fish species are present or absent. The completed survey is included as Appendix B.

However, where obvious physical characteristics of the water body would preclude reproduction and early development in significant numbers, Regional Board staff concluded that these water bodies should be considered 'ELS absent', even if the adult fish of these species are present. These physical characteristics include the presence of concrete bottoms and sides that would make the channel inhospitable for fish reproduction and early life stages. Regional Board staff with intimate knowledge of these water bodies made an assessment of these limiting physical characteristics. The assessment results are contained in Appendix C.

For all smaller water bodies, the Regional Board makes the conservative assumption that ELS are present, absent local knowledge to the contrary for these waters. Most of these smaller water bodies are not subject to wastewater discharges and it is for these situations, particularly at low temperatures when it is more difficult to treat ammonia, that the more relaxed ELS absent objective is desired by the regulated community. While the 'ELS Present' objective will be applied to these smaller water bodies, it should be noted it is only at temperatures less than 15° C that the 'ELS Present' objective is more stringent than the 'ELS Absent' objective. These temperature conditions occur only infrequently in the Los Angeles Region.

Where there is a site-specific ammonia objective (SSO) for the water body, the fish species used in the analysis of the 'ELS Present' condition for the water bodies affected by the SSO must be revisited, since the temperature threshold at which ELS are more sensitive than invertebrates may differ based on site-specific conditions or the methodology for developing the SSO.

Any change in the implementation provision for the ELS present/absent condition, including the assignment of water bodies, must be approved through the Basin Plan Amendment process. To justify the ELS absent provision, information regarding fish species distributions, spawning periods, nursery periods and the duration of early life stages found in the water body must be presented. Expert opinions from fisheries biologists and other scientists will be considered. Where it can be obtained, a consensus opinion from a diverse body of experts would carry significant weight in determining the presence or absence of the ELS. The determination of the time frame during the year when early life stages are most likely not to be present in numbers that, if chronic toxicity did occur, would affect the long-term success of the fish populations, should include adequate scientific justification. The Regional Board will use the record supporting a Basin Plan amendment as the basis upon which to approve or disapprove changes to these implementation provisions for the 30-day average ammonia objective. The record should clearly explain all the factors and information considered in arriving at the determination. The Regional Board will consider and weigh the breadth and depth of scientific evidence in determining whether to remove the early life stage specification of a water body. With the exception of the water bodies listed in the attached table, early life stages are presumptively present and must be protected at all times of the year unless a subsequent Basin Plan amendment removes the condition.

## **(B) Implementation of Alternative**

Using the survey results and the assessment of limiting physical conditions, Regional Board staff developed a list of all water bodies to which the ‘ELS absent’ objective shall apply (Table 3). All other water bodies not listed in Table 3 are subject to the ‘ELS present’ objective. The water bodies listed in Table 3 include those waters where either: 1) the TAC concluded that no fish species that reproduce below 15 degrees Celsius are present or 2) Regional Board staff concluded that physical conditions in the water body segment preclude reproduction and early development in significant numbers even though fish species that are able to reproduce below 15 degrees Celsius are present.

**TABLE 3 – Water bodies subject to 30-day average objective applicable to “ELS absent” condition**

<b>Hydro Unit No.</b>	<b>Waterbody</b>
<b>VENTURA RIVER WATERSHED</b>	
402.10	Canada Larga
<b>CALLEGUAS-CONEJO CREEK WATERSHED</b>	
403.11	Calleguas Creek
403.11	Revolon Slough
403.61	Beardsley Wash
403.12	Conejo Creek
403.63	Conejo Creek
403.64	Arroyo Conejo
406.68	Arroyo Conejo
403.12	Arroyo Las Posas
403.62	Arroyo Las Posas
403.62	Arroyo Simi
403.67	Arroyo Simi
<b>MALIBU CREEK WATERSHED</b>	
404.23	Medea Creek
404.24	Medea Creek
404.24	Triunfo Creek
404.25	Triunfo Creek
<b>BALLONA CREEK WATERSHED</b>	
405.13	Ballona Creek to Estuary
405.15	Ballona Creek
<b>DOMINGUEZ CHANNEL WATERSHED</b>	
405.12	Dominguez Channel to Estuary
<b>LOS ANGELES RIVER WATERSHED</b>	
405.12	Los Angeles River to Estuary
405.15	Los Angeles River
405.21	Los Angeles River

<b>Hydro Unit No.</b>	<b>Waterbody</b>
405.15	Rio Hondo below Spreading Grounds
405.15	Rio Hondo to Spreading Grounds
405.41	Rio Hondo (except from Whittier Narrows to 4 miles north)
405.32	Arroyo Seco
405.21	Tujunga Wash
405.15	Compton Creek
405.15	Arroyo Seco S. Of Devil' s Gates (L)
405.31	Arroyo Seco S. Of Devil' s Gates (U)
405.21	Burbank Western Channel
405.21	Pacoima Wash
<b>SAN GABRIEL RIVER WATERSHED</b>	
405.15	San Gabriel River: Firestone Blvd-Estuary
405.15	San Gabriel River: Whittier N-Firestone (2)
405.41	San Gabriel River
405.42	San Gabriel River
405.15	Coyote Creek to Estuary
405.41	San Jose Creek
405.51	San Jose Creek

Notes:

- 1) All wetlands/estuaries and lagoons are assumed to have ELS.
- 2) Whittier Narrows flood control basin is listed separately in the Basin Plan
- 3) Based on published literature and expert opinion, fish species known to reproduce in significant numbers below 15 degrees Celsius are absent in these water bodies, or the water bodies are known to have physical conditions that preclude reproduction and early development of these species in significant numbers. These species include :
  - ♣ Steelhead/Rainbow trout
  - ♣ Three-spine Stickleback
  - ♣ Brown trout
  - ♣ Prickly sculpin
  - ♣ Staghorn sculpin
  - ♣ Striped mullet
  - ♣ Starry flounder
  - ♣ Arrow goby
  - ♣ Pacific lamprey

## VIII. REFERENCES

California Department of Fish and Game. California Department of Fish and Game Habitat Conservation Planning Branch. California' s Plants and Animals.

[http://www.dfg.ca.gov/hcpb/species/t\\_e\\_spp/tespp.shtml](http://www.dfg.ca.gov/hcpb/species/t_e_spp/tespp.shtml)

[http://www.dfg.ca.gov/hcpb/species/t\\_e\\_spp/t\\_e07fishes.pdf](http://www.dfg.ca.gov/hcpb/species/t_e_spp/t_e07fishes.pdf)

<http://www.dfg.ca.gov/whdab/pdfs/TEAnimals.pdf>

City of Calabasas. July 17, 2003. Survey for Native Fish Habitat in Streams of the City of Calabasas. Chapter 4.0 Synopsis of Biology of Native Species. p. 11- 15.

Desert Fishes Council - <http://www.desertfishes.org/>

Taxonomically structured index for North America.

<http://www.desertfishes.org/na/index.shtml>

Federal Register. December 22, 1999. Environmental Protection Agency, Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia; Notice. FRL-6513-6. Volume 64, No. 245.

FishBase - A Global Information System on Fishes

<http://www.fishbase.org/home.htm>

Search engine for finding information about fish species by country using common or scientific name.

<http://www.fishbase.org/search.cfm>

Information Center for the Environment, University of California at Davis. Distribution maps of fishes in California (maps for each fish species present in California).

<http://ice.ucdavis.edu/aquadiv/fishcovs/fishmaps.html>

Information Center for the Environment, University of California at Davis. GIS data layers used to develop the "Distribution maps of fishes in California."

Information Center for the Environment, University of California at Davis. Meta data and narrative summary sheets for the "Distribution maps of fishes in California."

Los Angeles Regional Water Quality Control Board. 1994. Water Quality Control Plan, Los Angeles Region, Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

Los Angeles Regional Water Quality Control Board. April 25, 2002. [Final Resolution](#). Resolution Number - 2002-011. Amendment to the Water Quality Control Plan for the Los Angeles Region to Update the Ammonia Objectives for Inland Surface Waters (including enclosed bays, estuaries and wetlands) with Beneficial Use designations for protection of "Aquatic Life."



Draft Staff Report  
Early Life Stage Provision - Ammonia Objectives  
September 21, 2005

Los Angeles Regional Water Quality Control Board. February 4, 2003. [Final Basin Plan Amendment](#). Amendments to the Water Quality Control Plan – Los Angeles Region With respect to Inland Surface Water Ammonia Objectives.

Los Angeles Regional Water Quality Control Board. April 12, 2002. [Staff Report](#). Proposed Amendment of the Water Quality Control Plan – Los Angeles Region – To Revise Ammonia Objectives For Inland Surface Waters.

Moyle, Peter. B. 1976. [Inland Fishes of California](#), University of California Press, Berkeley and Los Angeles, California.

Moyle, Peter. B. and Davis, Liam H. 2000. A List of Freshwater, Anadromous, and Euryhaline Fishes of California. California Fish and Game 86(4): 244-258.

National Oceanic and Atmospheric Administration. National Marine Fisheries Service. Northwest Regional Office. <http://www.nwr.noaa.gov/>  
<http://www.nwr.noaa.gov/1salmon/salmesa/pubs/1pgr.pdf>  
<http://www.nwr.noaa.gov/1salmon/salmesa/index.htm>

State of California. The California Environmental Resources Evaluation System. California Wetlands Information System. Provides information on the fish present in these three wetlands in a section called, "Animal Use."  
[http://ceres.ca.gov/wetlands/geo\\_info/so\\_cal/ballona.html](http://ceres.ca.gov/wetlands/geo_info/so_cal/ballona.html)  
[http://ceres.ca.gov/wetlands/geo\\_info/so\\_cal/los\\_angeles\\_river.html](http://ceres.ca.gov/wetlands/geo_info/so_cal/los_angeles_river.html)  
[http://ceres.ca.gov/wetlands/geo\\_info/so\\_cal/rincon\\_creek.html](http://ceres.ca.gov/wetlands/geo_info/so_cal/rincon_creek.html)

Swift, Camm C, Haglund, Thomas R., Ruiz, M, Fisher, R., The Status and Distribution of the Freshwater Fishes of Southern California, Southern California Academy of Sciences, p.101-167. 1993.

Trout Restoration - San Diego County Fish and Wildlife Advisory Commission  
<http://www.sdfwac.org/fwacc.html>

University of California Cooperative Extension, Natural Resources Program, Southern California Species Profiles, Los Angeles County.

U.S. EPA. 1999. 1999 Update of Ambient Water Quality Criteria for Ammonia. EPA 882-R-99-014. Office of Water, Washington DC.

Wang, Johnson C. S. January 1986. Technical Report 9 (FS/B10-4ATR 86-9). Fishes of the Sacramento-San Joaquin Estuary and Adjacent Waters, California: A Guide to the Early Life Histories. <http://elib.cs.berkeley.edu/kopec/tr9/html/home.html>  
Prepared for the Interagency Ecological Study Program for the Sacramento-San Joaquin Estuary. A cooperative study by the California Department of Water Resources, California Department of Fish and Game, U. S. Bureau of Reclamation and U. S. Fish and Wildlife Service.